

**BY ORDER OF THE  
SECRETARIES OF THE AIR FORCE,  
THE ARMY, THE NAVY,  
COMMANDANT OF THE MARINE  
CORPS, AND THE DIRECTOR OF THE  
DEFENSE LOGISTICS AGENCY**

**AIR FORCE MANUAL 24-604**

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**Transportation**

**PREPARING HAZARDOUS MATERIALS  
FOR MILITARY AIR SHIPMENTS**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This manual implements AFPD 24-6, *Distribution and Traffic Management* and is consistent with Department of Defense (DoD) Instruction (DoDI) 4500.57, *Transportation and Traffic Management*, Defense Transportation Regulation (DTR) 4500.9-R, *Defense Transportation Regulation*, Department of Transportation (DOT) Special Permits 7573 and 9232 (DOT-SP 7573 and DOT-SP 9232) for commercial aircraft under contract to the Air Mobility Command (AMC). This manual applies to Department of Defense personnel (military, civilians, and contractors) participating in the movement of regulated hazardous materials (HAZMAT) for transport on military aircraft and commercial aircraft operating under DOT-SP 7573 or DOT-SP 9232 within the Defense Transportation System (DTS). Compliance with Attachments 5, 6, 7, 8, 9, 10, 11, 12, 13, and 18 in this publication is mandatory. Failure to observe the mandatory provisions of paragraphs [A5.2 through A5.27.2, A6.2 through A6.28.3.2.; A7.2 through A7.12.2.2.; A8.2 through A8.22.1.; A9.3 through A9.10.5.; A10.2 through A10.13.2.2.; A11.2 through A11.12.4.3.; A12.2 through A12.15.4.; A13.2 through A13.20.3.2.; A18.2 through A18.4.5 and any provisions of mandatory subparagraph(s) thereunder] is punishable under article 92, Uniform Code of Military Justice, for military personnel in Title 10 status; and punishable in accordance with

applicable state military codes for National Guard members in Title 32 status. Civilian employees who fail to obey the mandatory provisions of paragraphs [A5.2 through A5.27.2.; A6.2 through A6.28.3.2.; A7.2 through A7.12.2.2.; A8.2 through A8.22.1.; A9.3 through A9.10.5.; A10.2 through A10.13.2.2.; A11.2 through A11.12.4.3.; A12.2 through A12.15.4.; A13.2. through A13.20.3.2.; A18.2 through A18.4.5.] and any provisions of mandatory subparagraph(s) thereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. This publication does not apply to the Civil Air Patrol. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Defense Transportation Regulations DTR 4500.9-R, Part II, Chapter 204 and Department of Defense Directive 5015.2, *DoD Records Management Program*. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR), using the AF Form 847, Recommendation for Change of Publication; route AF Form 847s from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but all Supplements must be routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See DAFI 90-160, Publications and Forms Management, for a description of the authorities associated with the Tier numbers. Processes and authorities to waive requirements identified within this publication take precedence over Tier waiver authorities. Waiver authorities are identified in Paragraph 1.2.2, Paragraph 1.2.4, Chapter 2, Chapter 3, and Paragraph A18.6 of this manual. The use of a name of any specific manufacturer, commercial product, commodity or service in this publication does not imply endorsement by the military services.

## ***SUMMARY OF CHANGES***

This rewrite of AFMAN 24-604 is in response to international and domestic hazardous materials regulation changes, user feedback, and publication recommendations. It incorporates Administrative Change, 11 May 2021. It includes updates to the international dangerous goods and domestic Hazardous Materials Regulations (HMR).

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## Chapter 1

### GENERAL GUIDANCE

- 1.1. Applicability.** This manual provides guidance and procedures for preparing hazardous materials for shipment by military aircraft to ensure that such materials are packaged, marked, labeled, and prepared properly for transportation. It includes the shipment of nuclear materials, except for nuclear weapon major assemblies and nuclear components packaged and shipped per Department of Energy-Defense Nuclear Agency (DOE-DNA) TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51, *Transportation of Nuclear Weapons Material*, and its supplements. This publication does not apply to the Civil Air Patrol. It includes labeling requirements, instructions for transporting passengers with hazardous materials and instructions for notifying the aircraft commander regarding hazardous materials on the aircraft. Handlers, packers, inspectors, and preparers (certifiers) of hazardous materials shall comply with rules designed to maximize safety and security of the aircraft, aircrew, cargo and passengers. Hazardous materials personnel must know the exceptions, special permits, and waivers to federal laws and related government directives that are unique to military airlift operations and how to apply them. **(T-0)**.
- 1.1.1. This manual governs the transport of hazardous material when entered into the Defense Transportation System (DTS) as cargo on military controlled fixed and rotary wing aircraft according to DTR 4500.9-R. Apply the requirements specified in this manual unless modified or updated according to paragraph 1.2.1.
- 1.1.2. Certification Reference. Certify hazardous materials to a packaging reference in this manual. Hazardous material may be certified as required for air transport to the ICAO, IATA, or 49 CFR under the following conditions of A17.1.2.
- 1.1.3. Hazardous materials required as operational equipment of the aircraft for ground/air servicing as identified in applicable aircraft flight publications are not regulated by this manual.
- 1.1.4. The provisions of this manual are directive in nature, and must be complied with by those personnel whose positions or jobs entail responsibility for the functions covered. **(T-0)**.
- 1.1.5. Ensure compliance with current applicable DOT and Environmental Protection Agency (EPA) requirements when transporting hazardous materials outside of the Defense Transportation System. Hazardous waste shipments entering or exiting a domestic location must comply with Title 40, Code of Federal Regulations (CFR), Parts 260-265, *Resource Conservation Recovery Act (RCRA)*, current edition, including preparation of a hazardous waste manifest. Hazardous waste shipments originating and terminating outside the jurisdiction of the United States must comply with applicable, enforceable foreign national regulations as appropriate. If applicable enforceable foreign national regulations do not exist, comply with 40 CFR Parts 260-265. **(T-0)**.
- 1.1.6. Personnel must not deviate from any of these provisions and shall select the precise containers listed in each packaging paragraph or subparagraph. **(T-0)**. Not all packaging paragraphs are inclusive and packaging is based on the class of the hazardous cargo. See Chapter 2 for authorized waivers and deviations. See Attachment 1 for terms, abbreviations, and acronyms used in this manual.

## 1.2. Roles and Responsibilities.

- 1.2.1 As required by the DTR 4500.9R, Part II, Chapter 204, each DoD Component/Service/Agency HQ designates a Services Hazardous Material Focal Point to correspond with the SDDC/United States Transportation Command for Department of Transportation-Special Permits (DOT-SP), Competent Authority Approval (CAA), Certifications of Equivalency (COE), and waivers in accordance with Chapter 2 of this manual.
- 1.2.2. Service Command, Unified Command or Combined Command Commanders having operational control of the aircraft establish policy and procedures for approving compatibility and operational necessity waiver requests per Chapter 2.
- 1.2.2.1 The following AF offices approve compatibility waivers for AF assets under their control:
- 1.2.2.1.1. AMC/SEW, (618) 229-0950, DSN 779-0950 (involving Class 1 only)
  - 1.2.2.1.2. AMC/A4TC, (618) 229-4434, DSN 779-4434 (Non-Class 1 only)
  - 1.2.2.1.3. PACAF/A4RD, COMM (808) 449-4196/4192, DSN 315-449-4196/4192. (Note: 24/7 contact available via PACAF Command Center (PCC), COM (808) 448-8672, DSN 315-448-8672, DSN Secure 315-449-4301.)
  - 1.2.2.1.4. USAFE 603 AOC/AMD Airlift Requirements, 011-49-6371-405-7166/7146, DSN (314) 478-7166/7146. Outside of normal duty hours (0600-1600Z), call 001-49-6371-47-9292, DSN 314-480-9292 and ask for Requirements Stand-By person. (P4/P5 Local ATOC)
  - 1.2.2.1.5. ANG, National Guard Bureau Command Center, COM (301) 981-6001, DSN 858-6001
  - 1.2.2.1.6. AFRC, (478) 327-0724/1715, DSN 497-0724\1715, afrc.a4xr@us.af.mil.
  - 1.2.2.1.7. AFAFRICA Command, 617 AOC/AMD Airlift Requirements, COM 049-6371-405-1723, DSN 314-480-1723.
  - 1.2.2.1.8. SOCPAC/SOJ4, COM:(808) 477-3512 / 477-4353 / 477-5323 or DSN (315) 477-3512 / 477-4353/ 477-5323.
- 1.2.2.2. The following Marine Corps offices approve compatibility waivers for Marine Corps assets under their control: Marine Corps. Headquarters United States Marine Corps, I&L Code LPD, 3000 Marine Corps Pentagon, Pentagon Rm. 2E211, Washington, DC 20350-3000, (703) 695- 7930, DSN: 225-7930.
- 1.2.3. Air Force Directorate of Logistics, Logistics Readiness Division (AF/A4LR):
- 1.2.3.1. Promulgates Air Force (AF) cargo movement and packaging policy, providing oversight and assistance as required.
  - 1.2.3.2. Serves as Office of Prime Responsibility (OPR) for this manual completing staffing actions for its approval and publishing.
- 1.2.4. Service Focal Points for hazardous materials packaging and transportation:

- 1.2.4.1 The Service Focal Points jointly establish procedures and prepare any documentation necessary to implement this manual.
- 1.2.4.2 Manage Service Department of Transportation Special Permits (DOT SP), DOT Competent Authority Approvals (CAAs) and DoD Certifications of Equivalency (COEs).
- 1.2.4.3. Prepare, coordinate, and communicate packaging waivers per Chapter 2.
- 1.2.4.4. Coordinate any waiver involving airlift of a material identified as “Forbidden” in Table A4.1. with AFMC/A4RT
- 1.2.4.5. Service Focal Points are:
  - 1.2.4.5.1. Air Force. Air Force Materiel Command, Directorate of Logistics, Logistics Readiness Division, Packaging and Transportation Policy Branch AFMC/A4RT, 5375 Chidlaw Rd, Wright-Patterson AFB, OH 45433-5540, (937) 257-4503/1984, DSN: 787-4503/1984.
  - 1.2.4.5.2. Army. US Army Sustainment Command, Packaging, Storage, and Containerization Center, ATTN: AMAS-SPI, 11 Hap Arnold Blvd, Tobyhanna, PA 18466-5097, (570) 615-8845, DSN: 795-8845.
  - 1.2.4.5.3. Navy. Commander, NAVSUP Weapon Systems Support, Code 0772.10, PO Box 2020, 5450 Carlisle Pike, Mechanicsburg, PA 17055-0788, (717) 605-3598, DSN: 430- 3598.
  - 1.2.4.5.4. Navy Ordnance. Commander, Naval Surface Warfare Center, Indian Head Explosives Ordnance Disposal Technology Division, Code G13MLK, BLDG 458 Whittemore Ave, Picatinny Arsenal, NJ 07806, (973) 724-3388, DSN: 880-3388.
  - 1.2.4.5.5. Marine Corps. Headquarters United States Marine Corps, I&L Code LPD, 3000 Marine Corps Pentagon, Pentagon Rm. 2E211, Washington, DC 20350-3000, (703) 695- 7930, DSN: 225-7930.
  - 1.2.4.5.6. Defense Logistics Agency. Defense Logistics Agency, Attn: J344, 8725 John J. Kingman Road, Suite 4330, Fort Belvoir, VA 22060-6221, (717) 961-9726 / (717) 770-4492, [dlapkgstr@dla.mil](mailto:dlapkgstr@dla.mil).
  - 1.2.4.5.7. Defense Health Agency, Defense Centers for Public Health-Aberdeen, 8300 Ricketts Point Road, Building E-2850, Aberdeen Proving Ground, MD 21010-5403, (410) 436-5228, DSN 436-5228.
- 1.2.5. AFMC Transportation and Packaging Policy Branch (AFMC/A4RT):
  - 1.2.5.1. Develop proposals and provide recommendations to AF/A4LR on AF policy and guidance for hazardous material packaging and transportation.
  - 1.2.5.2. Serves as Office of Primary Responsibility (OPR) for developing and drafting AFMAN 24-604, Preparing Hazardous Materials for Military Air Shipments. Communicates emergency changes of an operational or technical nature that do not change policies or major procedures. Coordinate all policy changes with Service Focal Points. Issue hazardous cargo information, clarifications, updates, procedural and policy changes to Air Force activities and Service Focal Points.
- 1.2.6. Installation or Activity Commanders (or their designated representatives):



- 1.2.6.1. Train personnel according to paragraph 1.3. and Attachment 25.
  - 1.2.6.2. Appoint preparers as certifying officials to complete the Shipper's Declaration for Dangerous Goods Certification. This authorization must include the scope of the individual's authority and qualified level of training according to Attachment 25. **(T-0)**. Document the authorization in writing, electronically, or other auditable method.
  - 1.2.7. Program offices. The requiring activity shall inform the Contracting Officer when the requirement includes hazardous materials so that the appropriate clauses are included in the resultant contract(s). **(T-0)**.
  - 1.2.8. Air terminal or base operations personnel. Notify the aircraft commander (or designated representative), in writing, of all hazardous materials aboard the aircraft. The activity responsible for delivering the cargo to the aircraft provides this notification in the absence of an established air terminal or base operation. The briefing agency must meet the requirements of Attachment 21. **(T-0)**.
  - 1.2.9. Packaging Personnel. Packers package hazardous materials following the requirements in this manual, but do not sign legally binding documents.
  - 1.2.10. Preparers. Preparers certify that hazardous materials are properly classified, described, packaged, marked and labeled, and are in proper condition for military airlift according to this manual. Preparers include Technical Specialists. These individuals are qualified based on their training in handling and preparing the hazardous material in the performance of their duties.
  - 1.2.11. Handlers. Handlers maintain safe operations when transporting hazardous materials and proficiency in job specific responsibilities. Handlers include warehouse workers, aircraft load teams, pallet build-up personnel, and other individuals who routinely come into contact with hazardous materials but do not package, inspect, or certify.
  - 1.2.12. Inspectors. Inspectors ensure hazardous materials are properly prepared and documented before entering into the military airlift system (see Attachment 28).
  - 1.2.13. Movement Planners. Including load planners ensure hazardous materials and passengers are properly planned to maintain limitations, separation, and accessibility as required by this manual.
- 1.3. Hazardous Material Training Requirements.** Commanders assign hazardous material workers and ensure each successfully completes relevant training. Train hazardous material workers according to Attachment 25. Training for all levels of hazardous material workers who may affect the safety and security of hazardous materials in transportation, as a minimum, must address the following areas:
- 1.3.1. Hazardous material General Awareness and Familiarization.
  - 1.3.2. Safety procedures to include emergency response.
  - 1.3.3. Function specific responsibilities directly relevant to the individual's role in hazardous material transportation.
  - 1.3.4. Security awareness. **(T-0)**.

- 1.4. Special Assignment Airlift Missions (SAAM).** Process SAAM requests, cargo clearance, and appropriate confirmations according to DTR 4500.9-R. Unless specifically exempted under the provisions of paragraph 2.3., properly prepare, package, mark, label, and document all hazardous materials transported by SAAM aircraft according to this manual. Do not automatically apply the provisions of Chapter 3 for use of SAAM aircraft. Refer to paragraphs 3.2 and 3.3 for validation and use of SAAMs for tactical, contingency, or emergency operations.
- 1.5. Transportability Design Criteria.** Configure hazardous materials (items and articles) to ensure transportability on military aircraft. Items in their shipping configuration and skidded or wheeled equipment must meet the transportability design criteria identified in MIL-STD-1791, *Designing for Internal Aerial Delivery in Fixed Wing Aircraft*. **(T-0)**.
- 1.6. General Packaging Requirements.** Package hazardous materials in containers authorized by this manual, Title 49 *Code of Federal Regulations* (CFR) Part 173, *Shippers-General Requirements for Shipments and Packagings*, the *International Civil Aviation Organization* (ICAO) *Technical Instructions*, or the *International Air Transport Association* (IATA) *Dangerous Goods Regulation*. All packages and receptacles must be serviceable to include closures and cushioning material prior to use. **(T-0)**. Containers must be inspected and free of any incompatible residue, rupture or other damage that reduces the structural integrity. **(T-0)**. Attachment 3 applies to all military air shipments. See paragraph A17.2 for certification instructions. Pressure related type packages must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during transportation aboard aircraft (see 49 CFR 173.27( c )(2)).
- 1.7. Damaged or Improper Shipments.** Do not transport any shipment of damaged, leaking, or improperly packed, marked, or labeled hazardous item or material. Items that are damaged or leaking in a manner not affecting the hazardous material may be transported provided the shipper and aircrew can verify its safety. (e.g., minor non-hazardous oil leak from engine or condensation on refrigerated package.)
- 1.7.1. It is the originator's responsibility to correct noncompliant packaging. The originating shipping activity may provide the transportation function necessary packaging to correct the shipment, within the capability of the transportation function, or correct the packaging on site. Consider urgency of need when determining the best method for correcting a deficient shipment. Costs related to correcting a shipment are the responsibility of the originating shipping activity.
- 1.7.2. Report deficiencies in accordance with the procedures detailed in the DTR 4500.9-R, Part II, Chapter 210. Report supply discrepancies including item, packaging, and documentation discrepancies under official Supply Discrepancy Report (SDR) guidance contained in Defense Logistics Manual (DLM) 4000.25-M, Defense Logistics Management System (DLMS), Volume 2, Chapter 17, *Supply Discrepancy Reporting*.
- 1.7.3. Check packages, containers or equipment containing hazardous materials for damage or leakage of the hazardous materials when loading or unloading the aircraft. When packages or overpacks containing hazardous materials have been transported in equipment or on a pallet, check the area where the equipment or pallet was stowed. In the event of leakage or suspected leakage of hazardous materials, inspect the compartment in which the package, overpack, equipment, or pallet was carried for contamination and decontaminate if applicable. Remove any package, baggage or cargo that appears to be leaking or

contaminated by a hazardous material. In the case of a package, baggage or cargo that appears to be leaking hazardous materials, ensure that other packages, baggage or cargo are in proper condition for transport and that no other package, baggage or cargo has been contaminated or is leaking. Immediately report any release of a hazardous substance in a quantity equal to or greater than its reportable quantity to the EPA if located CONUS (including Alaska and Hawaii) by calling the US Coast Guard National Response Center at 800-424-8802 or 202-267-2675. **Note:** “Hazardous substance” for purposes of this requirement is defined in 40 CFR 300.5 (rather than the definition found in this manual).

- 1.7.4. Consult local installation operating procedures for hazardous material emergency planning, response, and reporting requirements in the event of an incident involving hazardous materials.
- 1.7.5. Do not move dropped or damaged explosive items. Ensure the Transportation or Packaging Office immediately contacts Explosive Ordnance Disposal (EOD), unexploded ordnance (UXO) qualified personnel to determine disposition. **(T-0)**.
- 1.7.6. Infectious Substance packages. If a package containing infectious substances is found to be damaged or leaking notify technical escorts, Biological Personnel Reliability Program personnel escorting the sample or medical personnel. Personnel must: (1) avoid handling the package or keep handling to a minimum; (2) inspect adjacent packages for contamination and put aside any that may have been contaminated; (3) notify the shipper and/or the receiver that the package has leaked. **(T-0)**. Upon discovering damage to the package, which indicates damage to the primary container, the carrier must isolate the container, and if located CONUS (including Alaska and Hawaii) notify the US Coast Guard National Response Center at 800-424-8802 or 202-267-2675. **(T-0)**.

## **1.8. Stowing Hazardous Materials.**

- 1.8.1. Ensure hazardous materials are compatible (Attachment 18) when stored in transit.
- 1.8.2. Ensure hazardous materials are accessible in flight.
- 1.8.3. Ensure hazard markings and warning labels are visible to aircrew and unloading personnel.
- 1.8.4. Do not stow liquid or toxic hazardous materials on the same aircraft pallet with foodstuff, feed, or any other edible material intended for consumption by humans or animals. Solid material, such as explosive articles, may be loaded on the same aircraft pallet with foodstuffs based on operational requirements. If required by operational necessity, comply with the following when loading foodstuff or Meals Ready to Eat (MRE) on the same 463L pallet with hazardous materials:
  - 1.8.4.1. Do not load MREs or other edible material on the same pallet with any hazardous material liquid or Class/division 2.3 gases.
  - 1.8.4.2. Separate hazardous materials (except Class 1) from the foodstuff/MREs by the greatest distance possible, but not less than 44 inches in all directions.
  - 1.8.4.3. Do not load hazardous materials above the foodstuff/MRE's.
- 1.8.5. Packages bearing orientation arrow (“This Way Up”) labels must be loaded, stowed and handled at all times according to label direction. **(T-0)**. Single packagings with end closures must be loaded and stowed with closures upward. **(T-0)**.

**1.9. Protective Equipment.** Bases ensure availability of protective equipment to cope with ground emergencies involving the cargo during loading operations. Coordinate respiratory and other personal protection requirements with the medical service. The aircraft operator ensures appropriate equipment is available to protect aircrew and passengers when transporting materials whose vapors are toxic, irritating or corrosive. Aircraft must have a closed oxygen system or protective mask for each person aboard. **(T-0)**. The shipper provides any required special equipment to meet unique cargo safety requirements. **(T-0)**. It is the shipper's responsibility to consult subject matter experts (SME), and the SME will, based on intimate knowledge of the material, determine necessary required protective equipment. **(T-0)**. While the exact equipment required depends on the materials being transported, the following are the recommended minimum (or equivalent substitutions):

- 1.9.1. Two pairs of rubber gloves.
- 1.9.2. One pair of protective gloves.
- 1.9.3. One plastic or rubber apron.
- 1.9.4. A five-pound (2.3 kg) package of incombustible absorbent material.
- 1.9.5. Three large plastic bags (4-mil thick, as a minimum).
- 1.9.6. One oxygen or protective mask for each person.

**1.10. Unitized, Palletized, Overpacked, or Containerized Loads.** Shippers must ensure aerial ports can handle loads. **(T-0)**. Ensure load configurations are:

- 1.10.1. Unitized loads will be as stable as a single container. **(T-0)**.
- 1.10.2. Freight containers (e.g., Internal airlift and helicopter Slingable Unit (ISU), Container Express (CONEX), Military-Owned Demountable Container (MILVAN), etc.) are not considered the outer package or overpack for any item stowed inside. Items within freight containers must be packaged as prescribed in this manual. **(T-0)**. Since air movement subjects cargo to rapid acceleration and deceleration, ensure the contents of freight containers are adequately secured/restrained to prevent damage or breakage from shifting. Consider both horizontal and vertical movement when securing/restraining the contents.
- 1.10.3. Mark and label individual packages within overpacks and freight containers according to this manual and Military Standard – 129 (MIL-STD-129), *Military Marking for Shipment and Storage*.
- 1.10.4. Designed to provide installed equipment in approved holders meeting airlift restraint criteria.
- 1.10.5. Compatible as required by Attachment 18.
- 1.10.6. Developed not using fiberboard or plywood sideboards unless specifically required by this manual.
- 1.10.7. Marked and labeled according to Attachment 14 and Attachment 15.
- 1.10.8. To the greatest extent possible, place packages on aircraft pallets (e.g., 463L) and within/on freight containers, vehicles, and trailers so that markings required by Attachment 14 and labels required by Attachment 15 are visible.

- 1.10.8.1. For like items with the same classification, only one of the required hazard label(s) need be applied and visible.
- 1.10.8.2. For items with different hazard classifications, at least one package for each classification must be positioned so hazard label(s) are visible. **(T-0)**.
- 1.10.8.3. When placement prevents hazard labels from being visible, refer to paragraph A15.1.
- 1.10.9. The use of the overpack provision may be limited by requirements in paragraph A17.2.3.2.

**1.11. Accessibility.** Do not ship hazardous material in freight containers that are not easily accessible to the aircrew during flight. Physically stow hazardous materials next to the container opening and position to allow access while on the aircraft. The aircrew must have visual and physical access to all hazardous materials to mitigate any hazard posed by an in-flight incident. **(T-0)**. If there is evidence of a leak, the crew-member can locate the hazard, determine the extent of the risk, and take appropriate action to get the leak under control or declare an in-flight emergency. Ensure air transportation personnel performing the joint inspection have knowledge and access to transportation containers containing hazardous materials during the joint inspection process. Provide a key or combination for locked, unescorted containers to the aircraft commander or designated representative. Ship only the following hazardous materials in inaccessible containers or tactical shelters when properly secured:

- 1.11.1. Recompression vans, support vans, and shelters used by the Underwater Construction Team. Hazardous items inside these escorted containers have been identified to and approved for shipment by AFMC/A4RT.
- 1.11.2. Fire extinguishers secured in appropriate holders or brackets, or properly packaged according to this manual.
- 1.11.3. Vehicles, support equipment (SE), or other mechanical apparatus. Completely drain (residual fuel not to exceed 500 ml, (17 oz) items fueled by a flammable liquid with a flash point at or above 38 degrees C (100 degrees F). Tightly seal fuel lines and tank to prevent residual fuel leaks. Drain and purge items fueled by a flammable liquid with a flash point below 38 degrees C (100 degrees F). Secure installed batteries in the upright position.
- 1.11.4. Items shipped under the Proper Shipping Name (PSN) "Life Saving Appliances" and packaged according to this manual.
- 1.11.5. Air conditioners and environmental control units, magnetic material, radioactive material, and thermometers.
- 1.11.6. Class/division 1.4S explosives packaged according to this manual.
- 1.11.7. Non-flammable gases or non-flammable aerosols prepared according to this manual and packed in strong outer containers.
- 1.11.8. "Consumer Commodities" not containing a liquid or a flammable gas.
- 1.11.9. Explosives secured for air movement according to the item's service drawing or technical manual.

- 1.12. Procedures for Airdropping Hazardous Materials.** Prepare airdrop loads according to the TO 13C7/FM 10-500 series. Prepare, mark, label, certify, and accept airdrop hazardous cargo the same as airland cargo.
- 1.13. Nuclear Weapons Material.** Use the detailed information and procedures for preparing nuclear weapons material in DOE-DNA TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51, *Transportation of Nuclear Weapons Material* (including supplements). This document provides a chart indicating the air shipment compatibility of nuclear material with nonnuclear explosives and hazardous materials. Also, determine the inter-compatibility of explosives and hazardous materials according to Attachment 18. Packaging and handling of nuclear material not specifically outlined in the above document according to the requirements of this manual.
- 1.14. Air Force Interoperability Council Air Standards.** Member nations (Australia, Canada, New Zealand, United Kingdom, and United States) agree in Air Standard 1047 to accept the categorization and authorization by participating nations of explosives, radioactive materials, and dangerous cargo for onward carriage in their own military aircraft. Label shipments according to the ICAO, IATA, or by nationally approved labels. Certify the shipment meets all requirements for air transport.
- 1.15. North Atlantic Treaty Organization Standardization Agreement (NATO STANAG) 4441, Allied Movement Publication 6, *Allied Multi-Modal Transportation of Dangerous Goods Directive*.** Part VI of this directive describes NATO standards for fixed and rotary wing aircraft when transporting dangerous goods in NATO Alliance missions by military aircraft. Participating nations agree to respect each other's regulations based on ICAO-TI/IATA-DGR, and based on country specific deviations approved for military aircraft as listed in this standard. US deviations US01 through US04 explain general requirements when using US military aircraft as part of NATO missions. Apply the national handling regulations of the carrier when transferring dangerous cargo from one nation to another for onward carriage. **Note:** Paragraphs 1.14. and 1.15. are subject to international military standardization agreements. Do not make changes or deviations without authorization as prescribed in AFI 60-106, *International Military Standardization (IMS) Program*, 3 May 2019.
- 1.16. Mail Shipments.** Shipment of hazardous material by mail is not permitted on military aircraft.
- 1.17. Transporting Foreign Troops.** Transport hazardous materials belonging to non-U.S. military units using the same guidelines as for U.S. forces.
- 1.17.1. Comply with paragraph 3.5. for hand-carried items.
  - 1.17.2. Ensure use of serviceable United Nations (UN) specification containers or packaging approved by the competent authority of the transported force. Packaged hazardous materials must be properly marked and labeled to identify the contents. **(T-0)**. Comply with paragraph A3.3.2.10. when transporting cylinders.
  - 1.17.3. Equivalent foreign certification documents as approved by the competent authority of the transported force may be accepted in place of the *Shipper's Declaration for Dangerous Goods* form. As a minimum, the foreign certification document must include in English, the proper shipping name, UN identification number, hazard class/division and compatibility group, packing group (if required), and quantity per package of hazardous materials. **(T-0)**.

- 1.18. Emergency Response Information.** Do not offer for transportation, accept for transportation, transfer, store, or otherwise handle hazardous materials unless emergency response information is available at all times. The shipper must provide a 24-hour emergency response telephone number that is monitored at all times by personnel who are knowledgeable of the hazards and characteristics of the materials being shipped. This information is required in the event of an emergency involving the material. **(T-0)**. See paragraph A17.2.9.
- 1.19. Use of Commercial Airlift.** Use DOT special permits 7573 (DOT SP-7573) and 9232 (DOT SP-9232), as outlined in Attachment 23, as required for AMC contracted commercial cargo airlift.
- 1.20. Exercises.** Hazardous materials should not be air transported during an exercise solely to demonstrate movement capability when there is no planned operational use at the deployed location. When possible, inert material should be substituted for hazardous materials.

## Chapter 2

### DEVIATIONS, WAIVERS, AND SPECIAL REQUIREMENTS

**2.1. Deviations and Waivers.** Deviations and waivers are a departure from established requirements in this manual.

**2.2. Passenger Movement Deviations.** Do not transport passengers with hazardous materials coded as cargo aircraft only in Table A4.1., column 7 and Table A4.2. Passenger Eligibility “P” Codes. See Attachment 22 for deviation authority, additional passenger information, and supplemental oxygen requirements.

**2.3. Packaging and Compatibility Waivers.** Waivers are exceptions to the packaging or compatibility requirements of this manual. Safety and risk management of airlift assets are the overriding factors for waiver consideration. Ease of operation, convenience, or program office preference are not reasons for waiver. Service Focal Points will not issue waivers if surface transportation is reasonably available. **(T-0).**

**2.3.1. Packaging Waivers.** The shipper must obtain a waiver for any hazardous item or packaging not authorized in Attachment 5 through Attachment 13. **(T-0).** Submit waiver request to the appropriate Service Focal Point (see paragraph 1.2.2.) by letter, message, or telephone. Confirm waivers requested by telephone with a letter or message. Ensure receipt of the letter or message prior to issuing the waiver. The shipper ensures a copy of the waiver accompanies the shipment. The DOD does not have authority to issue packaging waivers to UN specification requirements for items that at any time move outside military controlled modes of transportation. Do not jeopardize safety for convenience or ease of operation. Any waiver that authorizes military airlift of a forbidden hazardous material identified in this manual, either primary or subsidiary hazard, must be coordinated with AFMC/A4RT. **(T-0).** To obtain a waiver, the shipper must:

2.3.1.1. Provide a detailed description of the package, including pertinent test data.

2.3.1.2. Provide the PSN, hazard class, identification number, packing group, and net quantity of the material.

2.3.1.3. Provide a detailed explanation why the established requirements cannot be met.

2.3.1.4. Provide a transportation analysis identifying why surface transportation cannot be effectively used. **(T-0).**

**2.3.2. Compatibility Waivers for Military Aircraft.** A waiver is required when hazardous materials that are not compatible according to Table A18.1. and/or Table A18.2. require shipping aboard the same military aircraft (see A18.4. for exceptions).

2.3.2.1. Shippers submit waiver requests to their Service Focal Point (see paragraph 1.2.2.) for approval. For Air Force aircraft, the major command (MAJCOM) or Commander of a unified command having operational control of the aircraft during the mission is the waiver approval authority. Marine Corps MAJCOM's currently do not process or approve compatibility waiver request. Compatibility waiver request for Marine Corps aircraft should be sent to Headquarters Marine Corps see paragraph 1.2.2.4. Each service or MAJCOM establishes policy and procedures for approving compatibility waiver requests. Air Force approval authorities:



- 2.3.2.1.1. AMC/SEW, (618) 229-0950, DSN 779-0950 (involving Class 1 only)
- 2.3.2.1.2. AMC/A4TC, (618) 229-4434, DSN 779-4434 (Non-Class 1 only)
- 2.3.2.1.3. Pacific Air Forces (PACAF) PACAF/A4RD, COMM (808) 449-4196/4192, DSN 315-449-4196/4192. (**Note:** 24/7 contact available via PACAF Command Center (PCC), COM (808) 448-8672, DSN 315-448-8672, DSN Secure 315-449-4301.)
- 2.3.2.1.4. U.S. Air Forces in Europe (USAFE), 603 AOC/AMD Airlift Requirements, 011-49-6371-405-7166/7146, DSN (314) 478-7166/7146. Outside of normal duty hours(0600-1600Z), call 001-49-6371-47-9292, DSN 314-480-9292 and ask for Requirements Stand-By person. (P4/P5 Local ATOC)
- 2.3.2.1.5. Air National Guard (ANG), National Guard Bureau Command Center, COM (301) 981-6001, DSN 858-6001
- 2.3.2.1.6. AFRC, (478) 327-0724/1715, DSN 497-0724/1715, afrc.a4xr@us.af.mil.
- 2.3.2.1.7. Air Forces Africa (AFAFRICA), 617 AOC/AMD Airlift Requirements, COM 049-6371-405-1723, DSN 314-480-1723.
- 2.3.2.1.8. United States Special Operations Command Pacific (SOCPAC), SOCPAC/SOJ4, COM:(808) 477-3512 / 477-4353 / 477-5323 or DSN (315) 477-3512 / 477-4353/ 477-5323.when conditions in 2.3.5.1
- 2.3.2.2. Waiver requests must contain the following information in 2.3.2.2.1. through 2.3.2.2.6.:
  - 2.3.2.2.1. Reason incompatible materials require shipping together.
  - 2.3.2.2.2. Reason for air movement and why other transportation modes cannot be used.
  - 2.3.2.2.3. Statement that items are packaged or prepared as required by this manual and incompatible items are separated by greatest distance possible on the aircraft to reduce hazard in the event of a detonation, fire, or leak.
  - 2.3.2.2.4. Provide intended date of movement, routing, and type of airlift required.
  - 2.3.2.2.5. Provide national stock numbers; model numbers of explosive items; PSNs; hazard classes including divisions and storage compatibility groups as applicable; identification numbers; quantity or net explosive weight (individual and total as applicable); and packaging paragraphs.
  - 2.3.2.2.6. Provide points of contact at origin and destination bases. **(T-0).**
- 2.3.3. Compatibility Waivers for AMC-Contracted (Commercial) Aircraft. Waivers are not authorized for the movement of incompatible hazardous materials on contracted commercial aircraft. Refer to Attachment 23 for use of DOT-SP 7573 and DOT-SP 9232.
- 2.3.4. Operational Necessity Waivers. Variations to the requirements of this manual are authorized for a specific mission when strategic and compelling reasons exist. The Service/MAJCOM having operational control of the aircraft approves the operating procedures for specific missions. United States Transportation Command (USTRANSCOM) approves operating procedures for overall program management of strategic lift assets operated by Air Mobility Command. This paragraph applies to the following conditions:

- 2.3.4.1. Recovery of downed aircraft. A waiver is required for the packaging/preparation of aircraft/Unmanned Aerial Vehicle (UAV) when not prepared in accordance with the appropriate Technical Order (T.O.).
  - 2.3.4.1.1. The user/owner initiates a waiver requests (for example, Battlespace).
  - 2.3.4.1.2. The user/owner completes a memorandum detailing all the hazards that exist, or no longer exist based on determinations by EOD, other expert(s), and a review of the T.O. Ensure that owner/user addresses every part of the aircraft/UAV that is hazardous as listed in the T.O. which details aircraft/UAV preparation for shipment.
  - 2.3.4.1.3. The user/owner confirms that no leaks, fumes, or potential detonation hazards exist. It is incumbent on the requestor to ensure aircraft/UAVs are safe to move and experts have evaluated entire object.
  - 2.3.4.1.4. EOD inspects and identifies in writing whether explosive material is present or has been cleared.
  - 2.3.4.1.5. The Installation Transportation Officer (ITO) then creates a memo describing the hazards that require certification, and address hazards not requiring certification.
  - 2.3.4.1.6. Technically capable personnel (user/ITO) assess the packaging and ensure it will contain/hold the aircraft/UAV. **(T-0)**. Describe in detail how the item is packaged for air transport. (For example, This UAV is packed in an Aircraft Coffin (a case), weighing 1508 kilograms and total cube is 14 cubic meters. The case is considered airtight when it is closed, sealing the contents inside.)
  - 2.3.4.1.7. If it is determined hazard(s) exist but cannot be properly certified in accordance with the aircraft/UAV T.O., staff the memorandums to the servicing MAJCOM. The servicing MAJCOM staffs the waiver request to the MAJCOM with operational control of the transport aircraft.
  - 2.3.4.1.8. The ITO or Customs official notifies the DOD Customs Program Manager, USTRANSCOM J5J4-PT for clearance of the transport aircraft to its destination within the Continental United States (CONUS).
- 2.3.4.2. Emergency rescue operations.
- 2.3.4.3. Movement of portable generators to support critical and key functions where power has been disrupted.
- 2.3.4.4. Movement of fueled SE to replace inoperative equipment supporting an ongoing mobility exercise or operational plan. Equipment may be transported with fuel not to exceed one-half tank.
- 2.3.4.5. Shipments in accordance with the requirements of AFI 11-289, *Phoenix Banner, Silver, and Copper Operations*.
- 2.3.5. Intelligence or Criminal Investigations. Variations to the requirements of this manual are authorized for airlift of hazardous materials involved in intelligence or criminal investigations. Qualified personnel of those agencies responsible for the cargo certify that all safety precautions have been taken to transport the materials safely. The shipper ensures compliance with as many requirements of this manual as possible. This authorization is valid

only for movement out of an austere environment. At the first secure in-route airfield, prepare the cargo according to this manual or paragraph 2.3.1.

**2.4. DOT Special Permits.** A DOT special permit is authority to deviate from the requirements of 49 CFR Parts 100-199. Use special permits as authority for shipment by military controlled air movement, if applicable. Follow all requirements of the permit.

2.4.1. The shipping activity provides a copy of the permit for each shipment. If the approval date on the permit has expired, but a renewal has been applied for include a copy of the DOT timely filing continuation of use letter available on SafetyNet for DOD owned special permits. If the timely filing letter is not available, enter "Renewal Requested, Current Special Permit Still Valid". Place this statement on the permit after verifying renewal request with the Service Focal Point.

2.4.2. The permit must accompany the cargo in the Defense Transportation System. **(T-0).**

2.4.3. Maintain a copy of the permit at each facility where it is used in connection with the transportation of the hazardous material.

2.4.4. DOT special permits may not identify exceptions to international dangerous goods regulations and may require additional approvals for uninterrupted international transportation outside of military installations.

2.4.5. Forward requests for new permits or copies of existing permits according to the DTR 4500.9-R, Part II.

**2.5. Competent Authority Approvals (CAA).** A CAA is an approval issued by a national agency responsible under its national law for the regulation of hazardous materials transportation. These may also be referred to as "Special Approvals." For OCONUS, DOT recognizes International Atomic Energy Agency (IAEA) as a CAA to transport Class 7 (Radioactive) being imported, exported or through the United States and may be offered for transportation in accordance with the IAEA Regulations (49 CFR171.26). The U.S. Competent Authority is the U.S. Department of Transportation (DOT) Associate Administrator. CAAs are used for both domestic and international shipment. All approvals must be in English. **(T-0).**

2.5.1. Packaging CAAs. A CAA may be issued for packaging or other transportation requirements when specified by the responsible national agency for the originating shipment. These include CAAs issued by the U.S. Competent Authority and foreign agencies.

2.5.1.1. Use the CAA as the packaging authority for military air shipment.

2.5.1.2. Follow all requirements of the approval.

2.5.1.3. The shipping activity provides a copy of the CAA for each shipment.

2.5.1.4. The CAA must accompany the cargo in the Defense Transportation System (attach copy to the Shipper's Declaration for Dangerous Goods). **(T-0).**

2.5.1.5. Request copies of existing CAAs according to the DTR 4500.9-R, Part II.

2.5.2. Explosive Hazard Classification and Approvals. The Associate Administrator may also issue explosive hazard classification approval(s). These may also be referred to as CAAs or EX letters. See paragraph A3.3.1.4. for applicability of DOT and foreign nation issued explosive classification approvals for military air shipments. If packaging requirements are

included as part of a DOT explosive hazard classification approval, use the CAA or EX number as authority for air shipment. Attach a copy of the approval document to the Shipper's Declaration of Dangerous Goods (see Table A17.1.). Explosive hazard classification and approval(s) without packaging instructions cannot be used as a packaging certification reference. For the retrograde movement of Foreign Military Sales (FMS) procured explosives, the FMS purchasing country is required to obtain explosive hazardous class approvals from the DOT.

2.5.3. Requests for CAAs. Follow the procedures outlined in DAFMAN 24-210/AR 700-143/NAVSUPINST 4030.55E/MCO 4030.40D/DLAR 4145.41, *Packaging of Hazardous Materials*, to request a CAA from the U.S. Competent Authority. For FMS, the FMS purchasing country follows the procedures outlined in the Defense Security Cooperation Agency (DSCA) manual DSCA 5105.38-M, *Security Assistance Management Manual (SAMM)*, Chapter 7, Paragraph C7.16.

**2.6. DOD Certification of Equivalency (COE).** A COE is a certification that the proposed packaging equals or exceeds the requirements of 49 CFR Parts 100-199. Use COEs as authority for shipment by military air, if applicable. Follow all requirements of the approval.

2.6.1. The shipping activity provides a copy of the COE for each shipment.

2.6.2. The COE must accompany the cargo in the Defense Transportation System. **(T-0).**

2.6.3. A COE may be used between a domestic Aerial Port of Embarkation (APOE) and a domestic Aerial Port of Debarkation (APOD) or on a military controlled aircraft from a non-domestic APOE to a domestic APOD. Refer to DTR 4500.9-R, Part II for other authorized COE modes of transportation.

2.6.4. Do not use COEs for international commercial air shipments unless the item is exempted from UN specification requirements (see paragraph A.3.1.1.1.) or the item, at all times, is transported by military controlled airlift including Civil Air Reserve Fleet. COE's may not be recognized by all countries and may require additional approvals for uninterrupted international transportation outside of military installations.

2.6.5. COE issuing officials, as identified in the DTR 4500.9-R, Part II, follow guidance in DAFMAN 24-210/AR 700-143/NAVSUPINST 4030.55E/MCO 4030.40D/DLAR 4145.41, *Packaging of Hazardous Materials*, for approving COEs. Any COE that approves military airlift of a hazardous material that is forbidden by this manual, either primary or subsidiary hazard, must be coordinated with the respective Service Focal Point and AFMC/A4RT. **(T-0).**

**2.7. Limited and Excepted Quantities.** Use good quality packaging specified in Attachment 19 to ship small quantities of hazardous materials aboard military aircraft. Personnel may use UN specification packaging even though it's not required.

**2.8. Complying with Special Cargo Requirements.** Ensure any Inhalation Hazard Zone A material (as identified by Special Provision 1 in Table A4.1., column 7); Class 1, compatibility group K; Fissile Class III Radioactive Materials; infectious substances and biological research materials requiring a technical escort comply with the extensive protective measures outlined in Attachment 24.

## Chapter 3

### TACTICAL, CONTINGENCY, OR EMERGENCY AIRLIFT

**3.1. Purpose.** This chapter identifies procedural exceptions in support of the DOD, Federal agencies, and allies providing sustained, immediate, and responsive air movement, and delivery of personnel and hazardous material to, within, or from objective areas under tactical, contingency, or emergency conditions. Because of the increased risk to the aircraft; air crew; and participants, these procedural exceptions are only used when there are validated operational requirements. This chapter does not apply to helicopters being used for insertion or extraction of combat troops to, from, or within a combat area.

#### **3.2. Approval for Use.**

- 3.2.1. When operational requirements are validated, the use of this chapter is included in Operating Plans (OPlans). The COCOM approves and authorizes chapter 3 moves for evolutions executed in support of mission requirements within the COCOM's assigned area of responsibility.
- 3.2.2. USTRANSCOM Deployment Distribution Operations Center (DDOC) approves the use of provisions of this chapter for airlift missions not identified in the OPlan. See the DTR 4500.9-R, Part II, Chapter 204 for guidance on approval requests.
- 3.2.3. Provisions of this chapter may be used for Joint Chiefs of Staff (JCS), component, and unilateral mobility exercises designed to simulate and evaluate responsiveness to tactical, contingency, or emergency situations requiring airlift when use is identified according to paragraph 3.2.1. or paragraph 3.2.2.

#### **3.3. General Requirements and Restrictions.**

- 3.3.1. Chapter 3 approval is included as part of airlift mission execution documentation (e.g., Global Decision Support System (GDSS) Mission Detail/Form 59, Flight Advisory, etc.).
- 3.3.2. Comply with DTR 4500.9-R, Part III, *Mobility*, for movement of cargo and personnel during deployments.
- 3.3.3. Do not use the provisions of this chapter during redeployments unless mission readiness is affected.
- 3.3.4. Unless otherwise specified, comply with the packaging configurations specified in Attachment 5 through Attachment 13 and Attachment 27. Refer to Attachment 3 for any additional requirements. Do not remove hazardous materials from their required packaging except as authorized in this chapter.
- 3.3.5. Refer to Attachment 22 concerning movement of personnel with hazardous materials.
- 3.3.6. Observe all practical ground and flight rules and brief each aircraft commander (or representative designated by the commander) according to Attachment 21.
- 3.3.7. Do not transport hazardous cargo aboard tactical or strategic aeromedical evacuation missions. The field commander may allow the transportation of casualties on aircraft carrying hazardous cargo in extreme circumstances that may otherwise result in potential loss of life.

3.3.8. This chapter does not apply to contract or commercial airlift. Refer to Attachment 23 when using DOT Special Permits for AMC contracted commercial airlift.

3.3.9. Apply these provisions to notional tasking of Standard Air Munitions Package (STAMP) and deployable munitions packages in accordance with AFMAN 21-201, *Munitions Management*.

3.3.10. Refer to DTR 4500.9-R for manifesting requirements.

**3.4. Specific Operational Requirements.** Validate and approve the following operational requirements according to paragraph 3.2.:

3.4.1. Unpackaged explosives (see A5.2).

3.4.2. Vehicles and equipment fuel-in-tank-operational fuel levels (see A6.27, A7.11., A13.4., or A13.20. as appropriate).

3.4.3. Incompatible items on the same aircraft (see A18.4).

3.4.4. Personnel hand carrying hazardous materials (see paragraph 3.5).

**3.5. Basic Combat Load or Individual Issue.** Personnel are permitted to carry their basic combat load or individual issue of hazardous materials removed from its required packaging under the following conditions.

3.5.1. Personnel engaging an enemy force immediately upon deplaning at the objective or that are airdropped. The following requirements apply:

3.5.1.1. Personnel must not handle explosives and other hazardous materials during flight operations. **(T-0)**.

3.5.1.2. Ensure all individual hazardous materials are safe from accidental initiation (e.g., grenades in fiber containers, safety pins secured, etc.).

3.5.1.3. Ensure all small arms ammunition remain in the individual carrier (for example, bandoleers, ammunition belts, pouches), and all weapons remain clear until the aircraft has landed.

3.5.1.4. Ensure all chemical, biological, radiological, nuclear, and high-yield explosive (CBRNE) equipment remains in the individual carrier (for example, protective mask bag, mobility bag), and accompany the individual at all times. Ensure first aid kit components remain within individual kit carriers or pouches.

3.5.1.5. Prepare all hazardous material, other than small arms ammunition, CBRNE equipment, and first aid kits for shipment according to this manual, consolidate in one central location on the aircraft as directed by the loadmaster, and distribute to personnel before landing.

3.5.1.6. Lithium batteries installed in electronic equipment battery box or compartment require no additional packaging. Individuals may hand carry (pockets, rucksack, backpacks, etc.) the minimum number of spare lithium batteries required to sustain the immediate operation (as determined by the troop commander). Pack hand carried lithium batteries in original wrapping or in nonconductive material to prevent external short-circuiting. Prepare equipment containing lithium batteries, not considered individual issue or basic combat, according to A13.7., A13.8., or A13.9.

3.5.1.7. The troop commander or team chief briefs the aircraft commander or designated representative (e.g., loadmaster) on the location of all hazardous materials.

3.5.1.8. Provisions of this paragraph may be used during exercises when identified in the exercise operations plan. Except for small arms ammunition, CBRNE equipment, and first aid kits, do not ship items unpackaged unless there is intent to use explosives and other hazardous materials upon exiting the aircraft or as part of an airdrop exercise. Use and employment of unpackaged or hand carried explosives and other hazardous materials will be included in the exercise operations plan. **(T-0)**.

3.5.1.9. See Attachment 23 for use of contract air carriers operating under DOT-SP 9232.

3.5.1.10. A Shipper's Declaration for Dangerous Goods is not required.

3.5.2. Personnel not immediately engaging the enemy force when deplaning, but assuming a tactical mission on arrival or re-deploying upon mission completion, may deploy with their basic load or individual issue of hazardous materials in accordance with paragraph 3.5.1. However, the troop commander ensures collection of these items, including small arms ammunition, before the anti-hijack briefing. On arrival at the aircraft, the troop commander briefs the loadmaster on the hazardous materials and assist the loadmaster, as directed, in the tie-down before departing. Redistribute the hazardous materials on arrival at destination. If required, apply these provisions to redeployment of troops upon mission completion. A Shipper's Declaration for Dangerous Goods is not required.

**3.6. Passenger Eligibility.** Participants in tactical, contingency, emergency, or deployment operations, including exercises, transported on military organic aircraft according to this chapter are not considered passengers for purposes of this manual. If passenger seats are released to nonparticipants, the cargo must not be prepared using a provision authorized under the authority of this chapter and the requirements of 2.2 apply. **(T-0)**. Refer to Attachment 23 for contract airlift of personnel under DOT-SP 9232.

**3.7. Chemically Contaminated Cargo.** Decontaminate items to the greatest extent possible in the theater in which they became contaminated. Destroy reusable wood and fiberboard containers in the theater in which they became contaminated. Decontaminate reusable shipping containers other than wood and fiberboard (drums, etc.) before reusing. Double wrap palletized cargo that is susceptible to exposure to contamination. Remove the outside wrap if exposed to contamination (the inner wrap should protect the cargo). Destroy the contaminated outside wrap in the theater in which it became contaminated. Evaluate contaminated cargo to determine the appropriate hazard classification so that the cargo may be packaged, marked, labeled, documented, and shipped consistent with the hazard. If this is not able to be done, then do not accept the chemically contaminated cargo for shipment on military aircraft.

**3.8 Contaminated Human Remains (CHR).** CHR's will only be transported IAW current Military Airlift Waiver (MAW). Point of contact for this matter is Army Sustainment Center (ASC) Packaging, Storage, and Containerization Center (PSCC) [usarmy.tyad.usamc.mbx.pt@army.mil](mailto:usarmy.tyad.usamc.mbx.pt@army.mil).

Official  
WARREN D. BERRY  
Lieutenant General, USAF  
DCS/Logistics, Engineering & Force Protection

Official  
JOHN D. PRENDERGAST, Captain, SC  
Deputy Commander, Fleet Logistics Operations  
Naval Supply Systems Command

Official  
BENNIE E. WILLIAMS  
Major General, USA  
Director, Logistics Operations & Readiness

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## Attachment 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

*References*

- AFI 11-289**, *Phoenix Banner, Silver and Copper Operations*, 25 Dec 2020
- AFI 33-322**, *Records Management and Information Governance Program*, 23 March 2020
- AFI 60-106**, *International Military Standardization (IMS) Program*, 3 May 2019
- DAFM 21-201**, *Munitions Management*, 3 May 2022
- DAFMAN 91-201**, *Explosives Safety Standards*, 12 February 2024
- DAFPD 24-6**, *Distribution and Traffic Management*, 12 October 2022
- AFIC Air Standard 1047, 26 March 2020**, *Handling and Documentation of Dangerous Cargo For Air Transportation*, current edition
- DA PAM 385-64**, *Ammunition and Explosives Safety Standards*, 24 July 2023
- Defense Explosive Safety Regulation (DESR) 6055.9**, 10 March 2023
- Department of Transportation Special Permit 7573** (DOT-SP 7573), current edition
- Department of Transportation Special Permit 9232** (DOT-SP 9232), current edition
- DAFMAN 24-210/AR 700-143/NAVSUPINST 4030.55E/MCO 4030.40D/DLAR 4145.41**, *Packaging of Hazardous Materials*, 17 March 2023
- DLAR 4145.21/DA TB MED284/NAVSUPINST 4610.31B**, *Preparation of Temperature-Sensitive Products Requiring Freeze or Refrigerated (Chill) Environments for Shipment*, 20 November 2018
- DLAI 4145.25/AR 700-68/NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227\_IP**, *Storage and Handling of Liquefied and Gaseous Compressed Gasses and Their Full and Empty Cylinders*, 16 June 2000
- DLAI 4140.55/AR 735-11-2/SECNAVINST 4355.18A/AFJMAN 23-215**, *Reporting of Supply Discrepancies*, 6 August 2001
- DOE-DNA TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51**, *Transportation of Nuclear Weapons Material*, 1 October 2007
- DoDI 4500.57**, *Transportation and Traffic Management*, 23 September 2019
- DSCA 5105.38-M**, *Security Assistance Management Manual (SAMM)*, current edition
- DTR 4500.9-R**, *Defense Transportation Regulation (DTR)*, current edition
- Federal Specification**, RR-C-901c
- International Atomic Energy Agency (IAEA)**, *Regulations for the Safe Transport of Radioactive Materials*, current edition
- International Civil Aviation Organization (ICAO)**, *Technical Instructions for the Safe Transport of Dangerous Goods by Air*, current edition

**International Air Transport Association (IATA)**, *Dangerous Goods Regulations*, current edition

**MIL-STD-101C**, *Standard Practice Color Code for Pipelines and for Compressed Gas Cylinders*, 26 August 2014

**MIL-STD-129R**, *Military Marking for Shipment and Storage*, 25 February 2023

**MIL-STD-1411**, *Inspection and Maintenance of Compressed Gas Cylinders*, 5 March 2020

**MIL-STD-1791D**, *Designing for Internal Aerial Delivery in Fixed Wing Aircraft*, 22 June 2021

**NATO STANAG 4441**, *Allied Multi-Modal Transportation of Dangerous Goods Directive*, current edition

**NATO Standards Related Document AMovP-6.6 (Allied Multi-Modal) Transportation of Dangerous Goods By Air, Edition C, Version 1, March 2023**

Naval Air Systems Command (NAVAIR) Instruction 5711.1

**T.O. 37C2-8-1-127**, *Liquid Oxygen/Nitrogen Overboard Vent System*, 6 October 2011

**TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1**, *Department of Defense Ammunition and Explosives Hazard Classification Procedures*, 30 July 2012

**Title 9**, Code of Federal Regulations, Part 331, *Possession, Use, and Transfer of Select Agents and Toxins*, current addition

**Title 9**, Code of Federal Regulations, Part 102, *Licenses for Biological Products*, current edition

**Title 9**, Code of Federal Regulations, Part 103, *Experimental Products, Distribution, and Evaluation of Biological Products Prior to Licensing*, current edition

**Title 9**, Code of Federal Regulations, Part 104, *Permits for Biological Products*, current edition

**Title 10**, Code of Federal Regulations, *Energy*, current edition

**Title 14**, Code of Federal Regulations, *Aeronautics and Space*, current edition

**Title 21**, Code of Federal Regulations, Part 312, *Investigational New Drug Application*, current edition

**Title 21**, Code of Federal Regulations, Part 314, *Applications for FDA Approval to Market a New Drug*, current edition

**Title 21**, Code of Federal Regulations, Parts 600 to 680 *Biological Products*, current edition

**Title 21**, Code of Federal Regulations, Part 812, *Investigational Device Exemptions*, current edition

**Title 40**, Parts 260-265, *Protection of Environment*, current edition

**Title 42**, Code of Federal Regulations, *Public Health*, current edition

**Title 49**, Code of Federal Regulations, Subchapter C, *Hazardous Material Regulations*, current edition

**TO 11A-1-60**, *General Instructions Inspection of Reusable Munitions Containers and Scrap Material Generated from Items Exposed to, or Containing Explosives*, 27 November 2018

**TO 13C7-1-13/FM10-500**, *Reference Data for Airdrop Platform Loads*, 10 May 2006

**UN Manual of Tests and Criteria**, Part I, *Classification Procedures, Test Methods and Criteria Relating to Explosives*, current edition

**UN Manual of Tests and Criteria**, Part III, *Classification Procedures, Test Methods and Criteria Relating to Various Hazard Classes*, current edition

***Prescribed and Adopted Forms.***

***Adopted Forms***

AF Form 847, Recommendation for Change of Publication

Shippers Declaration for Dangerous Goods

GDSS Mission Detail/Form 59

NRC Form 618, Certificate of Compliance for Radioactive Material Packages

DD Form 2133, Joint Airlift Inspection Record/Checklist

Hazmat Acceptance and Inspection Checklist

***Abbreviations and Acronyms***

**AFBDS**—Aerial Bulk Fuel Delivery System

**AFIMSC**—Air Force Installation and Mission Support Center

**AFMC**—Air Force Materiel Command

**AMC**—Air Mobility Command

**AMovP-6** – Allied Movement Publication 6

**APOD**—Aerial Port of Debarkation

**APOE**—Aerial Port of Embarkation

**ASC** – Army Sustainment Command

**ASME**—American Society of Mechanical Engineers

**ASTM**—American Society for Testing and Materials

**ATA**—Air Transport Association

**ATOC**—Air Terminal Operations Center

**Bq/cm<sup>2</sup>**—Bequerel Per Square Centimeter

**BSAT**—Biological Select Agent and Toxin

**CAA**—Competent Authority Approval

**CBRNE**— Chemical, Biological, Radioactive, Nuclear, and High-Yield Explosives

**CERCLA**—Comprehensive Environmental Response, Compensation, and Liability Act

**CDC**—Centers for Disease Control and Prevention

**CFR**—Code of Federal Regulations  
**CN**—Nominal Capacitance  
**CoC - Certificate of Compliance for Radioactive Material Packages**  
**COE**—Certification of Equivalency  
**CONEX**—Container Express  
**CONUS**—Continental United States  
**CRAF**—Civil Reserve Air Fleet  
**CRR**—Complete Round Rigging  
**DACG**—Departure Airfield Control Group  
**DCSA**—Defense Security Cooperation Agency  
**DDOC**—Deployment Distribution Operations Center  
**DESR**—Defense Explosive Safety Regulation  
**DHA** – Defense Health Agency  
**DLA**—Defense Logistics Agency  
**DOD**—Department of Defense  
**DODD**—Department of Defense Directive  
**DOE**—Department of Energy  
**DOT**—Department of Transportation  
**DSN**—Defense Switched Network  
**DTR**—Defense Transportation Regulation  
**DTS**—Defense Transportation System  
**EOD**—Explosive Ordnance Disposal  
**EPA**—Environmental Protection Agency  
**ERG**—Emergency Response Guidebook  
**EX**—Explosive Approval  
**FAR**—Federal Acquisition Regulation  
**FMS**—Foreign Military Sales  
**FRH**—Flameless Ration Heater  
**G**—Gross  
**GDSS**—Global Decision Support System  
**GPS**—Global Positioning System  
**HMIRS**—Hazardous Material Information Resource System  
**HM**—Hazardous Material

**HMMWV**—High Mobility Multi-Wheeled Vehicle

**IAEA**—International Atomic Energy Agency

**IATA**—International Air Transportation Association, Dangerous Goods Regulations

**IBC**—Intermediate Bulk Container

**IBD**—Inhabited Building Distance

**ICAO**—International Civil Aviation Organization, Technical instructions for the Safe Transport of Dangerous Goods by Air

**ICC**—Interstate Commerce Commission

**ID**—Identification

**IHC**—Interim Hazard Classification

**IRFNA**—Inhibited Red Fuming Nitric Acid

**IRSO**—Installation Radiation Safety Officer

**ISO**—International Organization for Standardization

**ITO**—Installation Transportation Officer

**JCS**—Joint Chiefs of Staff

**JHCS**—Joint Hazard Classification System

**KPa**—Kilopascal

**LSA**—Low Specific Activity

**MAJCOM**—Major Command

**MFR**—Manufacturer

**MEGC**—Multiple-Element Gas Container

**MILVAN**—Military Van

**MOS**—Military Occupational Specialty

**MRE**—Meals Ready to Eat

**mrem/h**—Millirems per hour

**MSL**—Military Shipping Label

**mSv/h**—Millisieverts per hour

**NA**—North American

**NALO**—Navy Air Logistics Office

**NATO**—North Atlantic Treaty Organization

**NEW**—Net Explosive Weight

**N.O.S.**—Not Otherwise Specified

**NPT**—National Pipe Thread

**NRC** – United States National Regulatory Commission

**NSN**—National Stock Number

**OCONUS**—Outside Continental United States

**Oplans**—Operating Plans

**OPR**—Office of Primary Responsibility

**PCB**—Polychlorinated Biphenyls

**PG**—Packing Group

**POD**—Port of Debarkation

**POE**—Port of Embarkation

**POP**—Performance Oriented Packaging

**PPM**—Parts Per Million

**PSI**—Pounds Per Square Inch

**PSCC** – Packaging Storage and Containerization Center

**PSIA**—Pounds Per Square Inch Absolute

**PSIG**—Pounds Per Square Inch Gauge

**PSN**—Proper Shipping Name

**RQ**—Reportable Quantity

**SAAM**—Special Assignment Airlift Mission

**SCF**—Standard Cubic Feet

**SCFH**—Standard Cubic Feet per Hour

**SCO**—Surface Contaminated Object

**SCUBA**—Self Contained Underwater Breathing Apparatus

**SDR**—Supply Discrepancy Report

**SDS**—Safety Data Sheet

**SE**—Support Equipment

**SME**—Subject Matter Expert

**SP**—Special Permit

**SPI**—Special Packaging Instruction

**STAMP**—Standard Air Munitions Package

**TBq/L**—Terabequerel per Liter

**TCN**—Transportation Control Number

**T.O.**—Technical Order

**UAV**—Unmanned Aerial Vehicle

**UL**—Lower Limit Voltage

**UN**—United Nations

**UR**—Rated Voltage

**USG**—United States Government

**USAPHC**--U.S. Army Public Health Command

**UXO**—Unexploded Ordnance

**VCR**—Vacuum Coupling Radiation

**W/m<sup>2</sup>**—Watts Per Square Meter

### ***Terms***

**A1**—The maximum activity of special form radioactive material permitted in a type A package.

**A2**—The maximum activity of radioactive material, other than special form, low specific activity radioactive material, and surface contaminated objects permitted in a type A package. These values are either listed in A11.4 or may be derived using the procedure in A11.3.

**Adsorbed gas**- A gas which when packaged for transport is adsorbed onto a solid porous material resulting in an internal receptacle pressure of less than 101.3 kPa at 20 degrees C and less than 300 kPa at 50 degrees C.

**Activity (Radioactivity)**— The number of radioactive atoms that decay per unit time. The unit of activity is the curie or bequerel. The amount of radioactivity that may be transported in various types of packages and various types of vehicles.

**Aerial Port of Debarkation (APOD)**— Any airfield location where hazardous materials are received by military controlled airlift whether by channel, SAAM, airdrop, exercise, or deployment.

**Aerial Port of Embarkation (APOE)**— Any airfield location where hazardous materials are entered into the Defense Transportation System in accordance with DTR 4500.9-R, for movement by military controlled airlift whether by channel, SAAM, airdrop, exercise, or deployment.

**Aerosol**—Any non-refillable receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a nonpoisonous (other than a division 6.1 packing group III material) liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be ejected as solid or liquid particles in suspension in a gas, as a foam, paste, or powder, or in a liquid or gaseous state.

**Accessorial hazard**—A distinct and separate hazardous item that is a component or integral part of a larger item that is considered the primary hazard.

**Article**—A manufactured item, containing a hazardous material or substance, in a specific shape or design which end use is dependent on the shape or design. The shape or design prevents loss of hazardous contents during normal conditions of transport.

**Atmospheric Pressure**—Atmospheric pressure is 101.3kPa (14.7 psi).

**Bag**—A flexible packaging made of paper, plastic film, textiles, woven material or other similar materials.

**Becquerel (Bq)**—The unit of measure for the activity of a radioactive material. Because this is a very small unit of measure (1 Bq = one atomic transformation per second), the standard is the larger multiple terabecquerel (TBq). One TBq = one trillion Bq. Other multiples may also be used (MBq, GBq). This unit of measure is used when measuring how radioactive the item is.

**Biological Product**—A virus, therapeutic serum, toxin, antitoxin, vaccine, blood, blood component or derivative, allergenic product, or analogous product used in the prevention, diagnosis, treatment, or cure of diseases in humans or animals. A biological product includes a material manufactured and distributed in accordance with one of the following provisions:

- Title 9, Code of Federal Regulations, Part 102, *Licenses for Biological Products, current edition*; 9 CFR Part 103 (*Experimental Products, Distribution, and Evaluation of Biological Products Prior to Licensing*); 9 CFR Part 104, *Permits for Biological Products*;
- Title 21, Code of Federal Regulations, Part 312, *Investigational New Drug Application*; 21 CFR Part 314 *Applications for FDA Approval to Market a New Drug*; 21 CFR Parts 600 to 680, *Biologics*; or 21 CFR Part 812 *Investigational Device Exemptions*. Unless otherwise excepted, a *biological product* known or reasonably expected to contain a pathogen that meets the definition of a Category A or B infectious substance must be assigned the identification number UN2814, UN2900, or UN3373, as appropriate. **(T-0)**.

**Biological Substances, Category B** - An infectious substance not in a form generally capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs.

**Bottle**—An inner packaging having a neck of relatively smaller cross section than the body and an opening capable of holding a closure for retention of the contents.

**Box**—A packaging with complete rectangular or polygonal faces made of metal, wood, plywood, reconstituted wood, fiberboard, plastic, or other suitable material.

**Bulk Packaging**— A packaging, other than a vessel or a barge, including a transport vehicle or freight container, in which hazardous materials are loaded with no intermediate form of containment. A Large Packaging in which hazardous materials are loaded with an intermediate form of containment, such as one or more articles or inner packagings, is also a bulk packaging. Additionally, a bulk packaging has: a maximum capacity greater than 450 L (119 gallons) as a receptacle for a liquid; a maximum net mass greater than 400 kg (882 pounds) and a maximum capacity greater than 450 L (119 gallons) as a receptacle for a solid; or a water capacity greater than 454 kg (1000 pounds) as a receptacle for a gas as defined in 49 CFR Section 173.115.

**Channel Airlift**—Common user airlift service provided on a scheduled basis between two points.

**Class 1 (Explosives)**—Any substance or article (including a device) which is designed to function by explosion (e.g., an extremely rapid release of gas and heat). Unless the substance or article is otherwise classed in Table A4.1., the term "explosive" may also refer to an item that is able to produce a chemical reaction within itself and is able to function in a similar manner even if not designed to function by explosion. Explosives in Class 1 are divided into six divisions as follows:

1. **Division 1.1**-Consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.



2. **Division 1.2**-Consists of explosives that have a projection hazard but not a mass explosion hazard. Additionally, there are three subdivisions (1.2.1, 1.2.2 and 1.2.3). Refer to Defense Explosive Safety Regulation (DESR) 6055.9 for specific subdivision definitions.
3. **Division 1.3**-Consists of explosives that have a fire hazard and a minor blast hazard or a minor projection hazard (or both), but not a mass explosion hazard.
4. **Division 1.4**-Consists of explosive devices that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire does not cause virtually instantaneous explosion of almost the entire contents of the package.
5. **Division 1.5**-Consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal transportation conditions.
6. **Division 1.6**-Consists of extremely insensitive articles that do not have a mass explosion hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation. The risk from these articles is limited to the explosion of a single article.

**Class/Division 2.1 (Flammable Gas)**—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psia), in addition to one of the following properties:

1. Is ignitable at 101.3 kPa (14.7 psia) when in a mixture of 13 percent or less by volume with air.
2. Has a flammable range of 101.3 kPa (14.7 psia) with air of at least 12 percent regardless of the lower limit.
3. The limits specified above is determined at 101.3 kPa (14.7 psia) of pressure and a temperature of 20 degrees C (68 degrees F) according to ASTM E681-85 Standard Test Method for Concentration Limits of Flammability of Chemicals.

**Class/Division 2.2 (Nonflammable, Nonpoisonous Compressed Gas, Including Compressed Gas, Liquefied Gas, Pressurized Cryogenic Gas, Compressed Gas in Solution, asphyxiant gas and oxidizing gas)**— Any material (or mixture) which exerts in the packaging a gauge pressure of 200 kPa (29 psig/43.8 psia) or greater at 20 degrees C (68 degrees F), is a liquefied gas or is a cryogenic liquid, and does not meet the definition of Division 2.1 or 2.3.

**Class/Division 2.3 (Gas Poisonous by Inhalation)**—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psia), in addition to one of the following properties:

1. The material is known to be so toxic to humans as to pose a hazard to health during transportation.
2. In the absence of adequate data on human toxicity, the material is presumed to be toxic to humans because when tested it has an LC<sub>50</sub> (inhalation toxicity) value of not more than 5000 parts per million (ppm).

Note: Class 2 does not include Flammable Liquids, Gasoline or Petrol

**Class 3 (Flammable Liquid)**—A flammable liquid is any liquid having a flash point equal to or below 60 degrees C (140 degrees F), or liquids offered for transportation at temperatures at or above their flash point, **except:**

1. Any liquid meeting the definition of a Class 2 material (i.e. Class/Division 2.1 Flammable Gas, 2.2 Nonflammable, Nonpoisonous Compressed Gas, Including Compressed Gas, Liquefied Gas, Pressurized Cryogenic Gas, Compressed Gas in Solution, asphyxiant gas and oxidizing gas, 2.3 Gas Poisonous by Inhalation).
2. Any mixture having one or more compounds with a flash point above 60 degrees C (140 degrees F) that makes up at least 99 percent of the total volume of the mixture. Distilled spirits of 140 proof or lower are considered to have a flash point no lower than 23 degrees C (73 degrees F).

**Class/Division 4.1 (Flammable Solids)**—Flammable solids consist of solids (other than those classed as explosives) which are readily combustible under conditions encountered in transport, or may cause or contribute to fire through friction.

**Class/Division 4.2 (Spontaneously Combustible Material)**—Liquids or solids which are prone to spontaneous heating under normal conditions encountered in transport or to heating in contact with air, thus being liable to ignite.

**Class/Division 4.3 (Dangerous When Wet Material)**—Solids that are liable to become spontaneously flammable or emit flammable or toxic gases when they come into contact with water.

**Class/Division 5.1 (Oxidizers)**—A material that may cause or enhance the combustion of other material, generally by yielding oxygen.

**Class/Division 5.2 (Organic Peroxides)**—Any organic compound containing oxygen (O) in the bivalent -O-O- structure, and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals. Organic peroxides are thermally unstable substances which may undergo exothermic self-accelerating decomposition. These substances may be prone to explosive decomposition or rapid burning; be sensitive to impact or friction; react dangerously with other material; or cause damage to the eyes. A material which meets this definition is classed in Class 5.2, unless it also meets the definition of a Class 1 material, or unless the available oxygen content of an organic peroxide formulation is less than the amount specified (by the percentage equation) in 49 CFR Section 173.128.

1. Type A: An organic peroxide that can detonate or deflagrate rapidly as packaged for transport. Transportation of type A organic peroxides is forbidden.
2. Type B: An organic peroxide that, as packaged for transport, neither detonates nor deflagrates rapidly, but can undergo a thermal explosion.
3. Type C: An organic peroxide that, as packaged for transport, neither detonates or deflagrates rapidly and cannot undergo a thermal explosion.
4. Type D: An organic peroxide which exhibits the following characteristics:
  - 4.1. Detonates only partially, but does not deflagrate rapidly and is not affected by heat when confined.

- 4.2. Does not detonate, deflagrates slowly, and shows no violent effect if heated when confined.
- 4.3. Does not detonate or deflagrate, and shows a medium effect when heated under confinement.
5. Type E: An organic peroxide that neither detonates or deflagrates, and shows low or no effect when heated under confinement.
6. Type F: An organic peroxide that will not detonate in a cavitated state, does not deflagrate, shows low or no effect if heated when confined, and has low or no explosive power.
7. Type G: An organic peroxide that will not detonate in a cavitated state, will not deflagrate, shows no effect when heated under confinement, has no explosive power, is thermally stable (self—accelerating decomposition temperature is 50 degrees C (122 degrees F) or higher for a 50 kg (110 pounds) package). An organic peroxide meeting all characteristics of type G except thermal stability and requiring temperature control is classed as a type F, temperature control organic peroxide.

**Class/Division 6.1 (Poisonous/Toxic Material)**—A material, other than a gas, which is known to be so toxic to humans as to afford a hazard to health during transportation, or is presumed to be toxic to humans because it falls within one of the test categories identified in 49 CFR Section 173.132. The term “toxic” and “poisonous” are used synonymously in this manual.

**Class/Division 6.2 (Infectious Substances)**—A material known to contain or suspected of containing a pathogen. A pathogen is a microorganism that can cause disease. There are four types of pathogens: bacteria, viruses, parasites, fungi. Additionally, there are other agents known as prions which are infectious proteins that can cause fatal neurodegenerative disease. Division 6.2 materials are assigned to the following categories:

1. Category A – An infectious substance which is transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease in otherwise healthy humans or animals, and is assigned UN2814, UN2900 or UN3549. UN3549 is for waste solid materials meeting the Category A criteria, which does not apply to UN2814, Infectious substances, affecting humans nor UN2900, Infectious substances, affecting animals.
2. Category B – An infectious substance which does not meet the criteria for inclusion in Category A, and is assigned UN3373. Formerly known as “diagnostic specimens,” Category B materials are now described as “Biological Substances, Category B.”

**Class 7 (Radioactive Material)**—Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values in Table A.11.1.

**Class 8 (Corrosive Material)**—A liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time. A liquid, or a solid which may become liquid during transportation, that has a severe corrosion rate on steel or aluminum based on the criteria in 49 CFR Subparagraph 173.137(c)(2) is also a corrosive material. The main hazard from Class 8 liquids and vapors is the corrosive effect on humans and the aircraft or cargo. Some Class 8 materials have very dangerous additional hazards such as toxicity, flammability, and explosiveness.

**Class 9 Material**—A material that may pose an unreasonable risk to health, safety, or property during transport, but does not meet any of the definitions of the other hazard classes specified in this manual. This class includes:

1. A material that has an anesthetic, noxious, or other similar property which can cause extreme annoyance or discomfort to passengers and crew in the event of leakage during transportation, so as to prevent the correct performance of the crews assigned duties.
2. A material in quantities that meets the definition of a hazardous waste or a hazardous substance, but does not meet the definition of any other class.

**Combination Packaging**—A combination of packaging, for transport purposes, consisting of one or more inner packagings secured in a nonbulk outer packaging. It does not include a composite packaging.

**Combustible Liquid**—A combustible liquid is any liquid that does not meet the definition of any other classification specified in this manual and has a flash point above 60 degrees C (140 degrees F) and below 93 degrees C (200 degrees F). Any mixture having one or more components with a flash point of 93 degrees C (200 degrees F) or higher, that makes up at least 99 percent of the total volume of the mixture is not a combustible liquid.

**Compatibility Group Letter**—A designated alphabetical letter used to categorize different types of explosive substances and articles for stowage and segregation.

**Complete Round Rigging (CRR)**— All items, to include those normally incompatible (e.g., primers, propelling charges, projectiles, fuses, etc.), necessary to complete an end item when configured, packaged or unpackaged, on the same pallet or platform according to a Service approved technical order or publication.

**Composite Packaging**—Packaging consisting of an outer packaging and inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, shipped, and emptied as such.

**Compressed Gas**- see “Class 2”

**Compressed Gas in Solution**—A nonliquefied compressed gas dissolved in a solvent.

**Consignment**—A package or group of packages or load of radioactive material offered by a person for transport in the same shipment.

**Consumer Commodity**—A material that is packaged and distributed in a form intended or suitable for retail sale for purposes of personal care or household use. This does not include material designed for military or industrial use that is not readily available from commercial retail sources.

**Contamination**—The presence of a radioactive substance on a surface in quantities in excess of 4Bq/ cm<sup>2</sup> for beta and gamma emitters and low toxicity alpha emitters or 0.4Bq/cm<sup>2</sup> for all other alpha emitters. Contamination exists in two phases:

1. Fixed radioactive contamination means radioactive contamination that cannot be removed from a surface during normal conditions of transport.

2. Nonfixed radioactive contamination means radioactive contamination that can be removed from a surface during normal conditions of transport.

**Contingency**—An emergency involving military forces caused by natural disasters, terrorists, subversives, or by required military operations. Due to the uncertainty of the situation, contingencies require plans, rapid response, and special procedures to ensure the safety and readiness of personnel, installations, and equipment.

**Conveyance**—Any aircraft for the purposes of this manual.

**Corrosive Material**- see “Class 8”

**Crate**—An outer packaging with incomplete surfaces.

**Criticality Safety Index (CSI)**—A number (rounded up to the next tenth) which is used to provide control over the accumulation of packages overpacks or freight containers containing fissile material. The CSI for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR Part 71. The CSI for an overpack, freight container, or consignment or consignment containing fissile material packages is the sum of the CSIs of all the fissile material packages contained within the overpack, freight container or consignment.

**Cryogenic Liquid**—A refrigerated liquefied gas having a boiling point colder than -90 degrees C (-130 degrees F) at 101.3 kPa (14.7 psi) absolute. A material meeting this definition is subject to requirements of Attachment 6, regardless of whether it also meets the definition of a nonflammable, nonpoisonous compressed gas. The material is partially described as "(\* \* \*), refrigerated liquid (cryogenic liquid)" in Table A4.1., (with the asterisks replaced by the name of the gas).

**Cultures or Stocks**—Materials prepared and maintained for growth and storage and containing a Category A or B infectious substance.

**Cylinder**—A pressure vessel designed for pressures higher than 40 psia and having a circular cross section.

**Dangerous Goods**- Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the International Air Transport Association (IATA) Dangerous Goods Regulations, the International Civil Aviation Organization (ICAO) Technical Instructions, or the Items Listing (Table A4.1) in this manual. The term Dangerous Goods is synonymous with Hazardous Materials.

**Dangerous When Wet Material**- see “Class/Division 4.3”

**De minimis - Lacking significance or importance (See A19.1)**

**Depleted Uranium**—Uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes.

**Dermal Toxicity**—A material with an LD<sub>50</sub> for acute dermal toxicity of not more than 1000 mg/kg.

**Design**— The description of a special form Class 7 (radioactive) material, a package, packaging, or Low Specific Activity-III, that enables those items to be fully identified. The description may include specifications, engineering drawings, reports showing compliance with regulatory requirements, and other relevant documentation.

**Diagnostic Specimens**— Now called “Biological Substances, Category B.” See Class 6.2 (Infectious Substances) for “Category B” definition.

**Diluent Type A**—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point not less than 150 degrees C (302 degrees F) at atmospheric pressure. Type A diluents may be used for desensitizing all organic peroxides.

**Diluent Type B**—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point, at atmospheric pressure, of less than 150 degrees C (302 degrees F) but at least 60 degrees C (140 degrees F), and a flash point greater than 5 degrees C (41 degrees F). Type B diluents are only used when specified in 49 CFR (173.224 Self-Reactive Materials Table) (173.225(c) Organic Peroxide Table). The boiling point of a type B diluent must be at least 60 degrees C (140 degrees F) above the control temperature of the organic peroxide. **(T-0)**. A type A diluent may be substituted for a type B diluent in equal concentration.

**Division**—A subdivision of a hazard class.

**Domestic Addressee**—The continental United States, Alaska, Hawaii, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, and other US Territories.

**Drum**—A flat-ended or convex-ended cylindrical packaging made of metal, fiberboard, plastic, plywood, or other suitable materials. This definition also includes packagings of other shapes, (e.g., round taper-necked packagings or pail-shaped packagings).

**Emergency**—An emergency operation is the movement of personnel, equipment and supplies of an organization so they can respond to a non-combat (e.g., natural disaster) event requiring special and immediate action.

**Empty Packages/Containers/Cylinder** – See 3.1.16

**Enriched Uranium**—Uranium containing more uranium-235 than 0.72%.

**Exclusive Use**— (Also referred to in other publications as "sole use" or "full load.") The sole use of a conveyance by a single consignor for which all initial, intermediate, and final loading and unloading are carried out according to the direction of the consignor or consignee. Specific instructions for maintaining exclusive use shipment controls must be issued in writing and included with the shipping paper information provided to the carrier by the consignor. **(T-0)**.

**Explosives- see “Class 1”**

**Filling Density**—Designates the percent ratio of the weight of gas in a container to the weight of water that the container will hold at 16 degrees C (60 degrees F) (one pound of water equals 27.737 cubic inches at 16 degrees C).

**Fissile Material**—Is plutonium-239, plutonium-241, uranium-233, uranium-235, or any combination of these radionuclides. Fissile material means the fissile nuclides themselves, not material containing fissile nuclides, but does not include: Unirradiated natural uranium or depleted uranium; and natural uranium or depleted uranium that has been irradiated in thermal reactors only. Certain exceptions for fissile materials are provided in paragraph A3.3.7.3.4.2.

**Flammable Liquid- see “Class 3”**

**Flammable Solid-** see “Class/Division 4.1”

**Flash Point**—The minimum temperature at which a liquid within a test vessel gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. Flash points are determined by the testing prescribed in 49 CFR Section 173.120.

**Freight Container**—A reusable transportation conveyance designed and constructed to permit loading, lifting, and movement of consolidated air eligible packages in unit form. Includes internal slingable units (ISUs), quadruple containers (QUADCONS), military vans (MILVANS), and similar military and commercial unit load devices authorized for air transportation.

**Fuel Cell Cartridge**—An article that stores fuel for discharge into the fuel cell through a valve(s) that controls the discharge of fuel into the fuel cell.

**Genetically Modified Microorganisms (GMMOs) and Genetically Modified Organisms (GMOs)**- Microorganisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally. GMMOs or GMOs which do not meet the definition of toxic or infectious substances are assigned to UN3245.

**Graduated Dip-Stick-** A device marked with lines for measuring that provide a positive means to accurately determine the level of fluid in a tank/container.

**Gross Weight (Gross Mass):**—

1. Weight of a vehicle, fully equipped and serviced for operation, including the weight of the fuel, lubricants, coolant, vehicle tools and spares, crew, personal equipment, and load.
2. Weight of a container, packaging or pallet including freight (contents) and binding.

**Handlers**—Personnel who only handle hazardous materials or hazardous materials documentation.

**Hazard Class**—The category of hazard assigned to a hazardous material based on defining criteria. Hazard classes are: explosives (Class 1), compressed gases (Class 2), flammable liquids (Class 3), flammable solids (Class 4), oxidizers and organic peroxides (Class 5), poisons and infectious substances (etiologic agents) (Class 6), radioactive materials (Class 7), corrosive materials (Class 8), and miscellaneous dangerous goods (Class 9).

**Hazard Zone**—One of four levels of hazard (hazard zones A through D) assigned to gases and one of two levels of hazard (hazard zones A and B) assigned to liquids that are poisonous by inhalation. A hazard zone is based on the LC50 value for acute inhalation toxicity of gases and vapors.

**Hazardous Materials Inspectors**— DOD personnel whose duties require them to review the integrity of the packaging and accuracy of documentation for all hazardous materials being transported within the Defense Transportation System (DTS) or by commercial carriers.

**Hazardous Materials**—A substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. §5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR Section 172.101), and materials that meet the defining criteria for hazard classes and divisions in 49 CFR Part 173. May

also be referred to as hazardous cargo. Term is synonymous with Dangerous Goods. **Note:** For identification, listing, and rules pertaining to Hazardous WASTE, refer to Title 40 CFR Parts 260 et seq., Hazardous Waste Management System, established by the EPA. This definition applies to materials identified in this manual transported by military aircraft regardless of whether or not the materials are in commerce.

**Hazardous Substance**—A material, including its mixtures and solutions, that meets ALL of the following conditions:

1. Listed in Table A4.3. as originated in 49 CFR Section 172.101, Appendix A, Table 1, or a radionuclide listed in 49 CFR Section 172.101, Appendix A, Table 2.
2. In a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in Table A4.3.
3. When in a mixture or solution-
  - 3.1. For radionuclides, conforms to paragraph 7 of 49 CFR Section 172.101, Appendix A.
  - 3.2. For other than radionuclides, is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material shown in the following table:



**Table A1.1. Quantity Required to be a Hazardous Substance Mixture or Solution.**

RQ	RQ	Concentration by Weight	
Pounds	Kilograms	Percent	PPM
5,000	2270	10	100,000
1,000	454	2	20,000
100	45.4	0.2	2,000
10	4.54	0.02	200
1	0.454	0.002	20

**Note:** This definition only applies to transportation-related activities as described in this manual and not in other contexts (other regulatory definitions of hazardous substances apply in other contexts).

**Hazardous Waste**—Any material that is subject to the hazardous waste MANIFEST requirements of the EPA specified in 40 CFR Part 262.

**Inert Solid**—A solid that does not damage the thermal stability or increase the hazard of the organic peroxide.

**Infectious substances-** See “Class/Division 6.2”

**Inhabited Building Distance (IBD)**—Distance in feet to be maintained between a potential explosion site and an inhabited building. IBD is expressed as a unitless number in parenthesis representing IBD in hundreds of feet e.g., (02) = 200 foot distance.

**Inhalation Toxicity**—

1. A dust or mist with a lethal concentration where 50 percent of the test subjects die (LC<sub>50</sub>) from acute toxicity on inhalation of not more than 4 mg/L.
2. A material with a saturated vapor concentration in air at 20 degrees C (68 degrees F) of more than one-fifth of the LC<sub>50</sub> acute toxicity on inhalation of vapors and with an LC<sub>50</sub> for acute toxicity on inhalation of vapors of not more than 5000 mL/m<sup>3</sup> (5000 parts per million (PPM)).
3. An irritating material, with properties similar to tear gas which causes extreme irritation, especially in confined spaces.

**Inner Packaging**—Packaging for which an outer packaging is required for transport. It does not include the inner receptacle of a composite packaging.

**Inner Receptacle**—Receptacle which requires an outer packaging in order to perform its containment function. The inner receptacle may be an inner packaging of a combination packaging or the inner receptacle of a composite packaging.

**Jerrican**—A metal or plastic packaging of rectangular or polygonal cross-section.

**Kit**—A set of materials or articles used for a specific purpose, shipped as a single item and assigned a single National Stock Number or Part Number by the Service/Agency Item Manager. A kit may include one or more different hazardous materials. Hazardous components may or may not be compatible but may be transported together as a kit.

**Leakproof**— designed to prevent any of the contents of material from escaping or anything unwanted from entering. May indicate ability to pass the leakproofness test required by 49 CFR Section 178.604.

**Leak-tight**— See leakproof

**Limited Quantity of Radioactive Materials**—A quantity of radioactive material which is not over the limits and conforms to the requirements specified in A11.5.

**Liquefied Compressed Gas**—A gas, which under charged pressure, is partially liquid at a temperature of 20 degrees C (68 degrees F).

**Lithium Ion Cell or Battery**- A rechargeable electrochemical cell or battery in which the positive and negative electrodes are both lithium compounds constructed with no metallic lithium in either electrode. A lithium ion polymer cell or battery that uses lithium ion chemistries, as described herein, is regulated as a lithium ion cell or battery.

**Lithium Metal Cell or Battery** means an electrochemical cell or battery utilizing lithium metal or lithium alloys as the anode. The lithium content of a lithium metal or lithium alloy cell or battery is measured when the cell or battery is in an undischarged state. The lithium content of a lithium metal or lithium alloy battery is the sum of the grams of lithium content contained in the component cells of the battery.

**Low Specific Activity (LSA) Material**— Radioactive material, which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply, is termed Low Specific Activity, or LSA material. External shielding material surrounding the LSA material is not considered in determining the estimated average specific activity. LSA material is classed in one of three groups; LSA-I, LSA-II, and LSA-III (see attachment 3 for more information on these groups).

**Low Dispersible Material**— Either a solid radioactive material or a solid radioactive material in a sealed capsule that has limited dispensability and is not in powder form.

**Magnetic Material**—Any packaged material that has a magnetic field strength of 0.002 gauss or more measured at 2.1 m (7 ft) from any surface of the package.

**Metal Hydride Storage System**—A single complete hydrogen storage system that includes a receptacle, metal hydride, pressure relief device, shut-off valve, service equipment and internal components used for the transportation of hydrogen only.

**Miscellaneous Hazardous Material**- see “Class 9”

**Multiple-Element Gas Container (MEGC)**— Assemblies of DOT Specification and UN approved cylinders, tubes, or bundles of cylinders, interconnected by a manifold and assembled within a framework.

**Natural Thorium**—Thorium with the naturally occurring distribution of thorium isotopes (essentially 100 weight percent thorium-232).

**Natural Uranium**—Uranium containing the naturally occurring distribution of uranium isotopes (approximately 99.28% uranium-238 and 0.72% uranium-235 by mass).

**Net Explosive Weight (NEW)**—As it relates to this manual, NEW is the total weight, expressed in kilograms, of all explosive components. Refer to DESR 6055.9 or Service directives for definition of NEW used to determine Quantity Distance (QD) criteria.

**Net Mass**—The weight of the contents in a single packaging.

**Net Quantity Limitations**—the maximum quantities that may be offered for transportation in one package by passenger-carrying aircraft or by cargo aircraft only, subject to the following:

1. When articles or devices are specifically listed by name, the net quantity limitation applies to the entire article or device (less packaging and packaging materials) rather than only to its hazardous components (i.e. Lithium Batteries, Fire Extinguishers).

**Non-Bulk Packaging**—A maximum capacity of 450 L (119 gallons) or less as a receptacle for a liquid. A maximum net mass of 400 kg (882 pounds) or less and a maximum capacity of 450 L (119 gallons) or less as a receptacle for a solid. A water capacity of 454 kg (1000 pounds) or less as a receptacle for a gas. Regardless of the definition of bulk packaging, a maximum net mass of 400 kg (882 pounds) or less for a bag or a box conforming to the applicable requirements for specification packagings, including the maximum net mass limitations.

**Nonfixed Radioactive Contamination**—Radioactive contamination that can be readily removed from a surface by wiping with an absorbent material. Nonfixed (removable) radioactive contamination is not significant if it is not over the limits specified in A3.3.7.9.

**Nonliquefied Compressed Gas**—A gas, other than gas in solution, which under charged pressure is entirely gaseous at a temperature of 20 degrees C (68 degrees F).

**Normal Form Radioactive Material**—Radioactive material that has not been demonstrated to qualify as "special form radioactive material."

**Oral Toxicity**—Liquid with a lethal dose where 50 percent of the test subjects die (LD50) from acute oral toxicity of not more than 500 mg/kg or a solid with an LD50 for acute oral toxicity of not more than 200 mg/kg.

**Organic Peroxides**- see "Class/Division 5.2"

**Other Form (radioactive material)**—Radioactive material that does not meet the definition of Special Form radioactive material.

**Outage or Ullage**—The amount a packaging falls short of being liquid full, usually expressed in percent by volume.

**Outer Packaging**—The outermost enclosure of a composite or combination packaging together with any absorbent materials, cushioning, and any other components necessary to contain and protect the inner receptacles or inner packagings.

**Overpack**—A container or enclosure used to hold one or more air eligible packages to form a single unit for convenience of handling or storage during transportation. Freight containers are not considered overpacks.

**Oxidizers**- see "Class/Division 5.1"

**Oxidizing Gas**—A gas that may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. Specifically, this means a pure gas or gas mixture with an oxidizing power greater than 23.5% as determined by a method specified in ISO 10156: or 10156–2.

**Package**—For radioactive materials, the packaging together with its radioactive contents as presented for transport.

**Package or Outside Package**—The packaging plus its contents.

**Packaging(s)**—A receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this manual. For radioactive materials, the assembly of components necessary to ensure compliance with the packaging requirements of this manual. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The conveyance, tie down system, and auxiliary equipment may sometimes be designated as part of the packaging.

**Packers**—Personnel who package hazardous materials, but do not sign legally binding documents.

**Packing Group**—The degree of danger presented by the hazardous material.

1. Packing Group I indicates great danger.
2. Packing Group II indicates medium danger.
3. Packing Group III indicates minor danger.

**Participant**— Unit-move personnel directly attached to and moving with a deploying unit and their associated cargo as part of a tactical, contingency, or emergency operation or an exercise. Also, may be applied to non-channel airlift missions (e.g., Special Assignment Airlift Missions (SAAM) providing an exclusive service for movement of unit personnel and their associated cargo). Non-unit personnel are considered passengers.

**Patient Specimens**— Any human or animal material, including excreta, secretions, blood and its components, tissue, and tissue fluids being transported for diagnostic or investigational purposes, which have a minimal likelihood of containing pathogens in Category A or B. In determining whether a patient specimen has a minimal likelihood that pathogens are present, an element of professional judgment is required and determination made based upon the known medical history, symptoms, and individual circumstances of the source human or animal, and endemic local conditions. Generally, these include samples being tested for other than the presence of a pathogen. Examples are cholesterol tests, drug tests, pregnancy.

**Polymerizable Material**—Any material that may polymerize (combine or react with itself) with an evolution of a dangerous quantity of heat or gas.

**Poisonous/Toxic Material**- see “Class/Division 6.1”

**Pounds Per Square Inch (PSI)**—The amount of force exerted on one square inch of the container or cylinder wall.

**Pounds Per Square Inch Absolute (PSIA)**—The absolute value of the force exerted on the container or cylinder wall. Absolute pressure is atmospheric pressure plus gauge pressure.

**Pounds Per Square Inch Gauge (PSIG)**—The gauge pressure is the pressure taken by a pressure gauge that represents the force exerted within the container or cylinder. Gauge pressure is always that pressure above atmospheric pressure.

**Purged**—As it relates to this manual, purged means void of hazardous material. Removal of liquid hazardous material by physical, chemical, or mechanical means as directed by a technical publication or directive. In the absence of a specific technical procedure, it is the shipper's determination based on the specific knowledge of the item to decide the appropriate preparation to ensure the item is void of hazardous material.

**Preparers**—DOD personnel whose duties require them to sign legally binding documentation certifying that hazardous materials are properly classified, packaged, marked and labeled, and in all respects meet the legal requirements for transportation within the DTS or by commercial carriers.

**Primary Hazard**—The hazard class of the material as assigned by Table A4.1.

**Pyrophoric Material**—This material is a liquid or solid that, even in small quantities and without an external ignition source, can ignite within five minutes of coming in contact with air. This material is the most likely to spontaneously combust.

**Radiation Level**—The radiation dose-equivalent rate expressed in millisievert per hour or mSv/h (millirem per hour or mrem/h). Neutron flux densities may be converted into radiation levels according to 49 CFR Paragraph 173.403(v).

**Radioactive Contents**—The radioactive material, together with any contaminated or activated solids, liquids or gases, within the package.

**Radioactive Instrument or Article**—Any manufactured instrument or article such as clock, electronic tube or apparatus, or a similar instrument or article having radioactive material in gaseous or non-dispersible solid form as a component part.

**Radioactive Material**— see “Class 7.” Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values in Table A.11.1.

**Receptacle**—A containment vessel for receiving and holding materials, including any means of closing.

**Refrigerant Gas (Dispersant Gas)**—This term applies to all flammable, nonflammable, nonpoisonous refrigerant gases, dispersant gases (fluorocarbons), or mixtures listed in Table A4.1.; or any other compressed gas meeting one of the following conditions:

1. A nonflammable mixture containing not less than 50 percent fluorocarbon content, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).
2. A flammable mixture containing not less than 50 percent fluorocarbon content, not over 40 percent by weight of a flammable component, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).

**Regulated Medical Waste**—Wastes derived from medicinal treatment of humans or animals or from bio-research, where there is low probability that infectious substances are present. Regulated medical waste known to contain an infectious substance in Category A must be classed as Division 6.2 and assigned to UN2814, UN2900 or UN3549 as appropriate. **(T-0)**. Also known as Biomedical Waste, Clinical Waste, Medical Waste.

**Reportable Quantity**—The quantity of hazardous substance, as set forth in 40 CFR Section 302.4, the release of which requires notification pursuant to 40 CFR Part 302. **Note:** “Hazardous substance” for purposes of this requirement is defined in 40 CFR Section 300.5 (rather than the definition found in this manual).

**Residue**—The hazardous material remaining in a packaging after its contents have been removed to the maximum extent possible and before the packaging has been cleaned of hazardous material and purged to remove any hazardous vapors.

**Safety Data Sheet**—standard document that includes information such as the properties of each chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting hazardous chemicals.

**Sealed Source**—Radioactive source in a bonded cover, which prevents contact with and dispersion of the radioactive material under the conditions of use and wear for which it was designed.

**Secondary Load**—A distinct and separate hazardous item (other than an accessorial hazard) that is loaded and transported by a vehicle or on SE. May also be referred to as an accompanying load.

**Self-Heating Material**—Is a material that generates heat through a process of the gradual reaction of that substance with oxygen (in air). If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance will rise which, after an induction time, may lead to self-ignition and combustion.

**Self-Reactive Material**—At normal or elevated temperatures, this material is liable to undergo a strong exothermic reaction. Exothermic reaction can be caused by excessively high transport temperatures or by contamination.

**Service Focal Points**—Personnel from each service or agency identified in DTR 4500.9-R, Chapter and this manual to jointly establish procedures and prepare any documentation necessary to implement this manual, handle HAZMAT inquiries and interpretations, and provide waivers to this manual when appropriate involving the transportation of HAZMAT.

**Service Pressure**—This term refers to the authorized pressure marking on the container. For example, for a cylinder marked "DOT 3A1800" the service pressure is 12410 kPa (1800 psi).

**Sharps**—Any object potentially contaminated with a pathogen or that may become contaminated with a pathogen through handling or during transportation and also capable of cutting or penetrating skin or a packaging material. Sharps includes needles, syringes, scalpels, broken glass, culture slides, culture dishes, broken capillary tubes, broken rigid plastic, and exposed ends of dental wires. Sharps are assigned the proper shipping name of Regulated Medical Waste.

**Shipping Activity**—Unit, organization, or activity that originally offers a hazardous material into the Defense Transportation System.

**Shipping Paper**—The Air Cargo Manifest which includes minimum hazardous material information as required by DTR 4500.9-R. In the absence of an Air Cargo Manifest, the Shipper's Declaration for Dangerous Goods form may serve as a shipping paper.

**Short circuit**- A direct connection between positive and negative terminals of a cell or battery that provides an abnormally low resistance path for current flow.

**Siftproof**— A packaging impermeable to dry contents, including fine solid material produced during transportation.

**Single Packaging**—Nonbulk packaging other than a combination or composite packaging.

**Sievert (Sv)**—The standard unit of measure for radiation dose-equivalent. It is represented by the symbol “Sv.” The sievert replaces the older unit for dose-equivalent, the “rem.” One Sv is equal to 100 rem.

**Special Approvals**—An authorization issued by the appropriate authority for transport of certain hazardous materials. These approvals may be a Department of Transportation Special Permits (DOT-SPs), Competent Authority Approval (CAA), or a Certification of Equivalency (COE).

**Special Form Radioactive Material**—A single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule; has at least one dimension not less than 5 millimeters (0.197 inch); and meets the requirements of 49 CFR Section 173.469.

**Specific Activity of a Radionuclide**—The activity of the radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

**Spontaneously Combustible Material-** see “Class/Division 4.2”

**Stabilized**— The substance is in a condition that precludes uncontrolled reaction. This may be achieved by methods such as addition of an inhibiting chemical, degassing the substance to remove dissolved oxygen and inerting the air space in the package, or maintaining the substance under temperature control.

**Strategic Airlift**— A military mission to move personnel, equipment and supplies of an organization in support of United States’ military objectives and interests, including supporting multi-national missions or alliances.

**Strong Outer Packaging**— The outermost enclosure that provides protection against the unintentional release of its contents under normal conditions of transportation, to include rough handling. It is a packaging that is sturdy, durable, and constructed so that it will retain its contents under normal conditions of transportation. In addition, a strong outer packaging must meet the general packaging requirements in Attachment 3, but need not comply with UN specification packaging requirements.

**Subsidiary hazard**— An additional hazardous property of a material other than the primary hazard as identified in Table A4.1.

**Supplementary Packaging**— Additional packaging for hazardous materials that are contained in an inner packaging which does not in itself meet the pressure requirements identified in Attachment 3.

**Surface Contaminated Object (SCO)**— Surface Contaminated Object (SCO) means a solid object which is not itself radioactive but which has radioactive material distributed on its surfaces. SCO is classified in one of two groups: SCO-I and SCO-II. See Attachment 3 for more information.

**Tactical**—A tactical operation is the movement of personnel, equipment and supplies of an organization so they can accomplish their immediate military combat objective.

**Technical Name**—A recognized chemical name or microbiological name currently used in scientific and technical handbooks, journals, and texts. Generic descriptions are authorized provided they readily identify the general chemical or micro biological group.

**Toxic/Poisonous Material-** see “Class/Division 6.1”

**Toxin**—A Division 6.1 material from a plant, animal, or bacterial source. A toxin containing an infectious substance or a toxin contained in an infectious substance must be classed as Division 6.2, described as an infectious substance, and assigned to UN2814 or UN2900, as appropriate. (T-0).

**Transport Index**—A single number assigned to a package, overpack, or freight container to provide control over radiation exposure. The transportation index is the radiation level at 1 meter from the outer surface of a package.

**Type A Package**—A type A packaging (see definition for type A packaging) together with its limited radioactive contents. A type A package does not require competent authority approval since its contents are limited to A<sub>1</sub> or A<sub>2</sub>.

**Type A Packaging**—A packaging designed to retain the integrity of containment and shielding required by this manual under normal conditions of transport, as demonstrated by the tests set forth in 49 CFR Sections 173.465 or 173.466.

**Type B (M) Package**—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires multilateral approval of the package design and may require approval of the conditions of shipment. Type B(M) packages are those type B package designs that have a maximum normal operating pressure of more than 7 kg/cm<sup>2</sup> (100 pounds/in<sup>2</sup> gauge) or a relief device that allows the release of radioactive material to the environment under the hypothetical accident conditions specified in 10 CFR Part 71.

**Type B (U) Package**—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires unilateral approval only of the package design and of any stowage provisions that may be necessary for heat dissipation.

**Type B Package**—A type B packaging (see definition for type B packaging) together with its radioactive contents is designed to transport greater than an A<sub>1</sub> or A<sub>2</sub> quantity of radioactive material.

**Type B Packaging**—Is a packaging designed to retain the integrity of containment and shielding required when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10 CFR Part 71.

**Uncompressed Gas**—For the purposes of this manual, gas at a pressure not exceeding the ambient atmospheric pressure at the time and location the containment system is closed. All radioactive gases at pressures exceeding ambient atmospheric pressure are considered to be compressed.

**Unirradiated Thorium**—Thorium containing not more than 10<sup>-7</sup> grams uranium-233 per gram of thorium-232.

**Unirradiated Uranium**—Uranium containing not more than 2 x 10<sup>3</sup>Bq of plutonium per gram of uranium-235, not more than 9 x 10<sup>6</sup>Bq of fission products per gram of uranium-235 and not more than 5 x 10<sup>-3</sup> g of uranium-236 per gram of uranium-235.



**UN Pressure Drum**--A welded transportable pressure receptacle of a water capacity exceeding 150 L (39.6 gallons) and not more than 1,000 L (264.2 gallons) (e.g., cylindrical receptacles equipped with rolling hoops, spheres on skids).

**UN Pressure Receptacle**— A transportable pressure receptacle with a water capacity not exceeding 150 L that has been marked and certified as conforming to the applicable UN testing requirements. A UN cylinder, drum, or tube.

**Used Health Care Product**— A medical, diagnostic, or research device or piece of equipment or a personal care product contaminated with potentially infectious body fluids or materials other than a Category A infectious substance.

**Vehicle**—Any device or conveyance used for carrying or transporting passengers, equipment, or cargo. Includes, but not limited to automobiles, trucks, motorcycles, aircraft, boats, etc.

**Waterproof**—Impervious to water; constructed to be impermeable, impenetrable, and unaffected by water.

**Water resistant**— Having a degree of resistance to permeability by and damage caused by water in liquid form.

**Watertight**—See waterproof

**Watt-hour (Wh)**- A unit of energy equivalent to one watt (1 W) of work acting for one hour (1 h) of time. The Watt-hour rating of a lithium ion cell or battery is determined by multiplying the rated capacity of a cell or battery in ampere-hours, by its nominal voltage. Therefore, Watt-hour (Wh) = ampere-hour (Ah) × volts (V).

**Wetted Explosive**—This material, when dry, is a Class 1 material other than those of compatibility group A. Items in compatibility group A have been wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties. Wetted explosives also includes items specifically authorized by name in Table A4.1. or which have been assigned a PSN and hazard class by the DOT.

## Attachment 2

**STEPS FOR PREPARING HAZARDOUS MATERIAL**

**A2.1** Use the following illustration as a guide for preparing hazardous materials for military air shipment.

**Table A2.1 STEPS FOR PREPARING HAZARDOUS MATERIAL**

<b>STEP 1 -- TRAINING</b>	<p>1.1. Ensure proper training and qualification according to paragraph 1.3 and Attachment 25.</p> <p>1.2. If a Preparer, ensure compliance with paragraph 1.2.4. for authorization to certify.</p>
<b>STEP 2 -- IDENTIFY MATERIAL</b>	<p>2.1. Determine if material is hazardous and appropriate hazard classification by utilizing:</p> <p>2.1.1. Hazardous Material Information Resource System (HMIRS).</p> <p>2.1.2. Product Safety Data Sheets (SDS).</p> <p>2.1.3. Manufacturers Information.</p> <p>2.1.4. Joint Hazardous Classification System (JHCS) or Service Technical Directives.</p>
<b>STEP 3 -- DETERMINE PROPER SHIPPING NAME (PSN) AND HAZARDOUS MATERIALS DESCRIPTION</b>	<p>3.1. See Table A4.1. for listing of PSNs.</p> <p>3.2. Determine whether item is “forbidden.” “Forbidden” item(s) may not be shipped via military airlift unless waived per paragraph 2.3.1.</p> <p>3.3. Also listed with PSN is the hazard class, UN number, packaging group (PG)(if assigned), special provisions, and packaging paragraph(s).</p> <p>3.4. Determine whether a technical name is required.</p> <p>3.5. Determine passenger eligibility.</p> <p>3.6. Determine whether item is a “Hazardous Substance” according to Table A4.3.</p>
<b>STEP 4 -- DETERMINE REQUIREMENT FOR CHAPTER 3 AND NON-</b>	<p>4.1. Non- Chapter 3 Airlift, See Chapter 1 &amp; 2 for general requirements that cover all hazardous</p>

<b>CHAPTER 3 MISSION (CHANNEL)</b>	<p>materials shipments by military airlift. Chapter 2 covers deviations, waivers, and special requirements.</p> <p>4.2. Chapter 3 Operations, See Chapter 3 for exceptions.</p>
<b>STEP 5 -- PACKAGE ITEM</b>	<p>5.1. Package or prepare the item for airlift. Use, as applicable:</p> <p>5.1.1. DOD POP program.</p> <p>5.1.2. Special Packaging Instruction (SPI) or drawing.</p> <p>5.1.3. Technical order, directive or field manual.</p> <p>5.1.4. Manufacturer or vendor packaging.</p> <p>5.1.5. Technical Training.</p> <p>5.1.6. UN Specification Packaging.</p> <p>5.2. If already packaged, go to step 6.</p>
<b>STEP 6 -- VERIFY PACKAGING IS ACCEPTABLE</b>	<p>6.1. Review the paragraph listed in Table A4.1 to determine if it describes the hazardous material as packaged or prepared.</p> <p>6.2. Determine whether special provisions apply.</p> <p>6.3. Review Attachment 3 to determine if package is air eligible and for general packaging requirements.</p> <p>6.4. Ensure UN specification packaging requirements are met, if applicable.</p> <p>6.5. Review Attachment 19 for “Excepted” and “Limited Quantity” exceptions.</p> <p>6.6. Ensure absorbent, closure, and cushioning requirements found in Attachment 20 are met, if applicable.</p> <p>6.7. Determine if vehicle and equipment fuel levels are acceptable.</p> <p>6.8. Ensure accessorial hazards. are secured, if applicable.</p>
<b>STEP 7 -- MARK AND LABEL PACKAGE</b>	<p>7.1. Mark container in accordance with Attachment 14.</p>

	<p>7.2. Review general marking requirements.</p> <p>7.3. Review hazard class specific marking requirements.</p> <p>7.4. Label container inaccordance with Attachment 15. Subsidiary labels are listed in column 6 of Table A4.1.</p> <p>7.5. Review general labeling requirements.</p> <p>7.6. Review handling label requirements.</p>
<b>STEP 8 -- COMPLETE HAZARDOUS MATERIAL CERTIFICATION</b>	<p>8.1. Certify shipment in accordance with Attachment 17.</p> <p>8.2. Review hazard class specific requirements.</p> <p>8.3. Review exceptions for Chapter 3 operations.</p> <p>8.4. Samples of shipper's declarations are included in Attachment 17 for reference.</p>
<b>STEP 9 -- COMPATIBILITY REQUIREMENTS</b>	<p>9.1. Ensure material is compatible in accordance with Attachment 18.</p> <p>9.2. Table A18.1 details segregation requirements for all hazardous material.</p> <p>9.3. Table A18.2. specifies compatibility requirements for Class 1.</p> <p>9.4. Review exceptions for Chapter 3 operations.</p> <p>9.5. If determination that HM is not compatible and separate shipments can not be made, get incompatible HM waiver In accordance with Para 2.3.3.</p>
<b>STEP 10 -- BRIEFING AGENCY REQUIREMENTS</b>	<p>10.1. Attachment 21 details information required to be briefed to the aircraft commander (or designated representative).</p>

### Attachment 3

## GENERAL AND HAZARD CLASS SPECIFIC AIR TRANSPORTATION REQUIREMENTS

**A3.1. General Packaging Requirements.** The general requirements of Attachment 3 are in addition to the specific packaging requirements outlined in Attachment 5 through Attachment 13. Hazardous material packaging must be authorized by this manual, 49 CFR Part 173, ICAO, or IATA, and meet the requirements outlined in this attachment. **(T-0).** Comply with specific requirements contained in a technical directive governing the packaging or preparation of an item, commodity, or article, when stricter than requirements in this manual.

A3.1.1. United Nations (UN) Performance Specification Packaging. Prepare hazardous materials in UN specification containers unless exempted by a specific packaging paragraph in this manual. DOD activities use the DOD POP Program to locate tested and authorized DOD packaging configurations. If the hazardous material is procured in a manufacturer's UN specification container, use that container. Ensure compliance with all other requirements of this manual, including air-eligibility. If the managing activity has specified a container SPI, use that UN specification container. For additional information concerning UN specification packaging or performance test requirements see DAFMAN 24-210/AR 700-143/NAVSUPINST 4030.55E/MCO 4030.40D/DLAR 4145.41, *Packaging of Hazardous Materials*. Service Focal Points are unable to waive UN specification requirements.

NOTE: Outer packaging for equipment that contains HAZMAT (Lithium Batteries) must be packaged in a high strength plastic (Pelican or like type) case with non-conductive, non-combustible foam material between the intermediate packaging and the high strength case which serves as an outer packaging. These type packaging must meet applicable testing, packaging and marking requirements of 49 CFR for transport by all modes. **(T.0).**

A3.1.1.1. Exempt Items. The following materials are exempt from UN performance specification packaging test requirements. The packaging paragraph from Table A4.1. specifies required packaging. While UN specification packaging is not required, material may be subject to package performance tests. **(T.0).**

A3.1.1.1.1. Compressed gas cylinders

A3.1.1.1.2. Radioactive material

A3.1.1.1.3. Dry ice

A3.1.1.1.4. Magnetized material

A3.1.1.1.5. Life-saving appliances

A3.1.1.1.6. Mercury contained in manufactured articles

A3.1.1.1.7. Items identified in this manual as requiring "strong outer packaging"

A3.1.1.1.8. Limited and Excepted Quantities.

A3.1.1.1.9. Biological Substances, Category B.

- A3.1.2. Transportability. Securely close and construct containers to prevent leakage due to changes in temperature, humidity, altitude, and damage during transportation and in-transit handling. Hazardous materials must be packaged/prepared according to one of the following: DoD Performance Oriented Packaging Program, DOD SPI or an approved service drawing, technical publication (e.g., technical order/manual), manufacturer's supplied closing instructions, UN specification test report, or technical knowledge/training to construct strong outer packaging when required by this manual. **(T-0)**.
- A3.1.2.1. Primary and secondary items and their containers (unit or exterior) must provide protection without deformation, leakage, or rupture against:
- A3.1.2.1.1. Temperature changes (-40 to 65.5 degrees C [-40 to +150 degrees F]).
- A3.1.2.1.2. Pressure changes due to altitude changes (sea level to 3.7 km (12,000 feet)).
- A3.1.2.1.3. Pressure changes due to explosive decompression from 3.7 to 15.24 km (12,000 to 50,000 feet). **(T-0)**.
- A3.1.2.2. Do not fill a UN specification packaging to a gross mass greater than the authorized gross mass marked on the packaging.
- A3.1.2.3. Provide adequate protection for material susceptible to damage by temperature extremes during both ground and air operations.
- A3.1.3. Compatibility. All containers must be designed and constructed of materials that do not react with, or are not decomposed by, the material contained therein. **(T-0)**. Plastic containers or liners must prevent permeation of contents. **(T-0)**. Plastic packaging or receptacles used for liquid hazardous materials must be capable of withstanding, without failure, the test specified in 49 CFR Part 173, Appendix B, *Procedure for Testing Chemical Compatibility and Rate of Permeation in Plastic Packagings and Receptacles*. **(T-0)**.
- A3.1.4. Leak Containment (Liner) General Requirements. Leak containment must be provided for hazardous liquids when required outer packaging is not liquid-tight. **(T-0)**. This does not apply to overpacks used only for air shipment consolidation. Use a leak-proof liner, plastic bag, or other equally efficient means of containment specified in packaging or closure instructions according to A3.1.2. Items drained and purged that are susceptible to leaking purging fluid (e.g., small fuel components) will also be contained in a liner to prevent leaking. **(T-0)**.
- A3.1.5. Ullage (Outage). Do not entirely fill containers designed to hold liquids. When filling packagings with liquid hazardous material, leave sufficient interior space (outage) to prevent leakage of contents or distortion of containers due to change of temperature during transportation, storage, and handling. For flammable liquids and other volatile liquids with a high coefficient of expansion, a minimum outage of 2 percent at 54 degrees C (130 degrees F), is required.
- A3.1.6. Closures. Packages and containers must be closed as specified in a test report, packaging instruction, drawing, or manufacturers closure instructions except as identified in A28.2.2. **(T-0)**. When used, stoppers, corks, or other such friction-type devices must be held in place securely, tightly, and effectively. **(T-0)**. Each screw-type closure on any packaging/container (other than UN specification jerricans) containing a hazardous liquid must be secured with pressure-sensitive tape, self-shrinking plastic, wire, a device designed to prevent the cap from

loosening (integral locking cap), or other positive means to prevent the closure from loosening due to vibration or substantial temperature change. **(T-0).**

#### A3.1.7. Air-Eligible Packaging Requirements.

A3.1.7.1. Combination Packaging Pressure Standard. Inner packagings (including closures) used to retain a hazardous liquid or semi-solid in a combination packaging must be capable of withstanding (without leaking) an internal air gauge pressure of not less than 95 kPa (14 psi); or 75 kPa (11 psi) for Packing Group III liquids in Class 3 or Class 6.1; or a pressure related to the vapor pressure of the liquid contained in the receptacle, whichever is greater. **(T-0).** Repack or pack liquid hazardous materials in containers that do not meet the internal hydraulic pressure standard, into supplementary UN certified specification containers that meet this requirement. Determine the pressure related to the vapor pressure of the liquid by one of the following methods:

A3.1.7.1.1. The total gauge pressure measured in the receptacle (that is, the vapor pressure of the liquid and the partial pressure of the air, or other inert gases, less 100 kPa (15 psi) at 55 degrees C (131 degrees F), multiplied by a safety factor of 1.5. The total gauge pressure is determined on the basis of a filling temperature of 15 degrees C (59 degrees F) and a degree of filling such that the receptacle is not liquid full at a temperature of 55 degrees C (131 degrees F).

A3.1.7.1.2. Not less than 1.75 times the vapor pressure at 50 degrees C (122 degrees F) of the material to be transported minus 100 kPa (15 psi) but with a minimum test pressure of 100 kPa (15 psi).

A3.1.7.1.3. Not less than 1.5 times the vapor pressure at 55 degrees C (131 degrees F) of the material to be transported minus 100 kPa (15 psi) but with a minimum test pressure of 100 kPa (15 psi).

A3.1.7.2. Single and Composite Packaging Pressure Requirement. Single packagings containing liquid hazardous material must meet the hydraulic pressure test requirements of 49 CFR Section 178.605. A test pressure of not less than 250 kPa (36 psi) for liquids of PG I; 80 kPa (12 psi) for PG III liquids in Class 3 or Class 6.1; and 100 kPa (15 psi) for all other liquids as outlined in 49 CFR Paragraph 173.27(c). **(T-0).** If shipping liquid hazardous materials in containers that do not meet the internal hydraulic pressure requirement, repack or pack into supplementary UN specification certified containers that do meet the requirement.

A3.1.7.3. Supplementary Packaging. Pack containers holding liquids that do not meet the pressure requirement for air transport into a supplementary packaging that does meet the requirement. Separate interior containers by absorbent and/or cushioning material as required by Attachment 20. Do not pack pressurized containers in sealed metal drums. See Attachment 14 and Attachment 15 for marking/labeling requirements and Table A17.1. for certification instructions.

A3.1.8. Indicators. Valves and indicators (with protective caps when required), which are necessary to ensure safe transportation, must be installed in the shipping container. **(T-0).** Examples are relief valves (vacuum or pressure), humidity indicators, or leak indicators with adequate sensitivity to alert monitor or crew of imminent danger.

A3.1.9. Packaging for certain Class/Divisions. A packaging containing a Packing Group III material with a primary or subsidiary hazard of Class/Division 4.1, 4.2, 4.3, 5.1, or 8 must meet Packing Group II performance level. **(T-0).**

- A3.1.10. Inner Packaging. Pack, secure, and cushion inner packagings of combination packagings to prevent breakage or leakage and to control movement within the outer container. When partial contents are removed, fill voids to ensure a tight pack. Cushioning material must not react dangerously with the contents of the inner packagings. **(T-0)**. Inner packagings are required as specified by the applicable packaging paragraph. If inner packagings are not required, the packaging paragraph states that inner packagings are not necessary. See Attachment 20 for absorbent, closure, and cushioning requirements.
- A3.1.11. Outside Package/Container. The package or container must be of such size that there is adequate space to affix all markings and labels in a manner required by this manual (Attachment 14 and Attachment 15). **(T-0)**. If necessary, use overpacks to provide adequate space.
- A3.1.12. Solids in a Liquid Single Packaging. A single or composite packaging which is tested and marked for liquid hazardous materials may be filled with a solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked. In addition:
- A3.1.12.1. A single or composite packaging which is tested and marked for PG I liquid hazardous materials may be filled with:
- A3.1.12.1.1. A PG II solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked; or
- A3.1.12.1.2. A PG III solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 2.25, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.
- A3.1.12.2. A single or composite packaging which is tested and marked for PG II liquid hazardous materials may be filled with a PG III solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.
- A3.1.13. Quantity limits for UN specification Nonbulk Packagings. Unless otherwise specified, the maximum capacity allowed in a UN Specification packaging is expressed in the following table.



**Table A3.1. Quantity limits for UN specification Nonbulk Packagings.**

Packaging Type	Type Code	Maximum Capacity / Net Mass
Steel Drum	1A1, 1A2	450 L (119 gal) / 400 kg (882 lb)
Aluminum Drum	1B1, 1B2	450 L (119 gal) / 400 kg (882 lb)
Metal Drum (other than steel or aluminum)	1N1, 1N2	450 L (119 gal) / 400 kg (882 lb)
Plywood Drum	1D	250 L (66 gal) / 400 kg (882 lb)
Fiber Drum	1G	450 L (119 gal) / 400 kg (882 lb)
Plastic Drum	1H1, 1H2	450 L (119 gal) / 400 kg (882 lb)
Wooden Barrel	2C1, 2C2	250 L (66 gal) / 400 kg (882 lb)
Plastic Jerrican	3H1, 3H2	60 L (16 gal) / 120 kg (265 lb)
Aluminum and Steel Jerrican	3A1, 3A2, 3B1, 3B2	60 L (16 gal) / 120 kg (265 lb)
Aluminum, Steel, and Other Metal Box	4A, 4B, 4N	400 kg (882 lb)
Wood Box – Natural Wood, Plywood, and Reconstituted Wood	4C1, 4C2, 4D, 4F	400 kg (882 lb)
Fiberboard Box	4G	400 kg (882 lb)
Plastic Box	4H1	60 kg (132 lb)
	4H2	400 kg (882 lb)
Bags – Woven Plastic, Plastic Film,	5H1, 5H2, 5H3, 5H4,	50 kg (110 lb)

Packaging Type	Type Code	Maximum Capacity / Net Mass
Textile, and Paper	5L1, 5L2, 5L3, 5M1, 5M2	
Composite Packaging with inner plastic receptacle and outer drum	6HA1, 6HB1, 6HD1, 6HG1, 6HH1	250 L (66 gal) / 400 kg (882 lb)
Composite Packaging with inner plastic receptacle and outer box	6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2	60 L (16 gal) / 75 kg (165 lb)
Composite Packaging with inner glass porcelain or stoneware receptacles	6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PD2, 6PG1, 6PG2, 6PH1, 6PH2	60 L (16 gal) / 75 kg (165 lb)

A3.1.14. Plastics Drums and Jerricans. The period of use permitted for the transport of a hazardous material in plastics drums and jerricans is five years from the date of manufacture. Plastic jerricans used after five years must meet all requirements of 49 CFR Section 173.28 for use. **(T-0)**.

A3.1.15. Foreign Packaging. UN standard non-bulk packaging manufactured outside the United States may be shipped by military air provided packages are marked according to A14.2, when applicable, and all other requirements of this manual are complied with. Refer to A3.3.2.10. for shipping of foreign cylinders.

A3.1.16. Empty Packagings, (articles, Fuel Tanks, Containers, Cylinders, Radioactive Packages and Nonhazardous Materials). Except as specified in this paragraph, empty packagings are not subject to any other requirements of this manual.

A3.1.16.1. Empty Containers. Inspect packages that formerly contained a hazardous material covered by this manual to determine the presence or absence of hazardous material. If there is presence of hazardous material, purge the hazardous material or the package is regulated in the same manner as prescribed for the package when it was full. A container is considered empty if:

A3.1.16.1.1. A hazardous article has been removed from its container and there is no possibility of remaining residue (e.g., empty torpedo or missile containers).

A3.1.16.1.2. The container has been purged of the hazardous material it previously contained.  
**Note:** When purging equipment/facilities are not present at a given location, items must be properly packaged and certified as hazardous materials. **(T-0)**.

A3.1.16.2. Empty Cylinders. Compressed gas cylinders are empty if the pressure in the cylinder is less than 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F). Psia equals the gauge pressure plus atmospheric pressure (14.7 psi).

A3.1.16.2.1. Before shipment, inspect empty cylinders for dents, bulges, oxidation pits, or other damage. Handle faulty cylinders as required by the latest DOT regulations or DLAI

4145.25/A700-68/NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227(I), *Storage and Handling of Liquefied and Gaseous Compressed Gasses and Their Full and Empty Cylinders*.

A3.1.16.2.2. Tightly close valves of cylinders before offering for transportation. The requirements of A3.3.2.3. apply to the protection of the valves.

A3.1.16.2.3. If the cylinder contains residue of the following material, ship regulated as full cylinders, regardless of psia, unless completely cleaned and purged of residue or vapors:

A3.1.16.2.3.1. Ammonia, Anhydrous

A3.1.16.2.3.2. Division 2.2 with a subsidiary hazard (other than division 5.1)

A3.1.16.2.3.3. Contains a flammable or poisonous material

A3.1.16.3. Empty Radioactive Material Packaging. Empty the contents of the packaging as far as practical, and ensure the requirements of 49 CFR Section 173.428 and Attachment 11 are met.

A3.1.16.4. Identifying Nonregulated Material, Containers or Cylinders. An item listed in Table A4.1. may not be regulated because it does not meet the definition of the hazard class. This includes containers or articles defined as empty according to this paragraph. In this situation, when the item is determined to be nonregulated, the shipper alerts the carrier by:

A3.1.16.4.1. Annotating "NONHAZARDOUS" in the address block of the Military Shipment Label (MSL) and/or mark container "Non-Regulated". In the absence of the MSL, the shipper uses an equivalent means of notification.

A3.1.16.4.2. Ship the item as general cargo and a Shipper's Declaration for Dangerous Goods form is not required.

A3.1.16.4.3. Apply an "EMPTY" label according to Attachment 15, when applicable. A label is not required for equipment or articles unless packaged, crated, or otherwise enclosed to prevent ready identification.

A3.1.16.4.4. The "NONHAZARDOUS" entry on the MSL and the use of an "EMPTY" label is not required when the hazardous contents are completely removed from the container and there is no possibility of remaining residue, and the hazard communication markings and labels are removed or covered. Identify cylinders as empty as required by A15.3.4.

A3.1.17. Hidden Hazardous Shipment Indicators. Shippers have not always properly identified all hazardous materials prior to entering the DTS. The main reason is lack of knowledge of hazardous materials located or packed in equipment, toolboxes, parts, etc. Personnel that ship, inspect or handle cargo in DTS should be aware of potential hidden hazards. If hazards are suspected, frustrate the shipment and coordinate with the shipping activity to resolve. The following table has examples of cargo that could contain hidden hazards that may endanger the safety of aircraft.

**Table A3.2. Hidden Hazardous Shipment Indicators.**

Aircraft and Aircraft Parts	batteries, explosives, chemical oxygen generators, compressed gas cylinders (fire extinguishers)(oxygen bottles), fuel cells, fuel devices, radioactive material, secondary loads, survival kits
Breathing Apparatus/SCUBA	compressed air or compressed gasses including oxygen in cylinders
Cleaning supplies	solvents, flammable liquids, corrosive material
Containerized Loads	multiple hazards
Cryogenics: low temperature, low pressure, or non-pressurized gas	liquid argon, helium, nitrogen, oxygen
Cylinders	compressed gas
Deployment Equipment	batteries, flammable liquids, gas, or solids, fuel cells, lithium batteries, radioactive material
Electrical Equipment	batteries, lithium batteries, magnetized materials, mercury in switches or electron tubes, radioactive material
Frozen Foods	dry ice
Fuel Devices (e.g., NSN 2915013647174)	residual fuel (especially if used or unserviceable)
Generators, Engines and Ground SE	batteries, compressed gas cylinders (fire extinguishers), explosives, fuel cells, fuel devices
Household Products	paint, aerosols, bleach, radioactive material, etc.
Individual Equipment Items (GPS equipment, night vision devices, personal protection devices, sighting equipment, etc.)	aerosols, batteries, lithium batteries, flammable gas, radioactive materials
Instruments	batteries, lithium batteries, mercury, radioactive materials
Laboratory Samples	hazardous chemicals, infectious substances, radioactive material
Machinery Parts	adhesives, hazardous chemicals, paints, sealants, solvents

Medical Supplies/Equipment	batteries, lithium batteries, hazardous chemicals, radioactive materials
Pharmaceuticals, Vaccines	dry ice, hazardous chemicals
Repair Kits	adhesives, hazardous chemicals, paints, solvents, organic peroxides
Survival Kits	aerosols, batteries, compressed gas, flammable solids, lithium batteries
Tool Boxes	adhesives, cleaners, compressed gas, lubricants, paints, sealers, solvents
Uninterrupted Power Supply (UPS)	batteries, lithium ion and metal batteries, lead-acid nonspillable batteries
Vehicles and Vehicle Parts	additional fuel, air bag inflators/air bag modules, batteries, fire extinguishers, fuel cells, fuel devices, paints, radioactive material, secondary loads, shocks/struts with compressed gas
Vessels and Vessel Parts	batteries, compressed gas cylinders (fire extinguishers)(SCUBA), explosives, flares, fuel cells, fuel devices, life rafts, secondary loads

### **A3.2. General Requirements Applicable to Specific Items.**

A3.2.1. Meals Ready to Eat (MRE). Follow the requirements of paragraph 1.8. for stowing MRE's on the same aircraft pallet as hazardous material.

A3.2.1.1. Flameless Ration Heaters (FRH), containing 8 grams or less of a magnesium-iron alloy (e.g., magnesium powder), packed as a component of the MRE, regardless of the number shipped, are not regulated by this manual (see A3.3.4). Prepare FRHs shipped separately from the MRE as regulated hazardous material according to this manual.

A3.2.1.2. Do not open, handle, or activate fuel sources shipped along with the MRE's inside the aircraft.

A3.2.2. Polymerizable Material. Transportation of any liquid, solid, or gaseous material that may polymerize (combine or react with itself) or decompose so as to cause dangerous evolution of heat or gas under normal transportation conditions is prohibited. Such materials may be offered for transportation when properly stabilized or inhibited.

**A3.3. General Requirements Applicable to Hazard Class.** In addition to A3.1. and A3.2., the following general requirements apply to each hazard class:

### A3.3.1. Class 1.

A3.3.1.1. General Handling Instructions. Class 1 materials can function by detonation or combustion. Store away from fire hazards, sources of heat, ignition, or sparks, and handle carefully.

A3.3.1.1.1. Comply with safety precautions, standards, and rules in DAFMAN 91-201 (Air Force), DA PAM 385-64 (ARMY), and NAVSEA OP 5 (Navy) during handling, transportation and storage of explosives.

A3.3.1.1.2. Do not ship explosives that have been dropped any distance, are leaking, or are otherwise damaged during transportation or handling until inspected by qualified munitions/EOD personnel.

A3.3.1.1.3. Onward shipment of suspected or damaged explosives may be made provided the shipment is inspected, repacked, and certified to be in proper condition for safe transport by qualified personnel.

A3.3.1.1.4. Package all Class 1 material in packaging that meets the PG I or II performance level.

A3.3.1.1.5. Comply with A3.1.16.1.3 and A3.16.4 for Inert Certification when all explosive components have been removed from an item.

A3.3.1.2. Forbidden Explosives. Do not offer explosives listed below for air shipment:

A3.3.1.2.1. An explosive not approved according to A3.3.1.4.

A3.3.1.2.2. An explosive mixture or device containing a chlorate and also containing:

A3.3.1.2.2.1. An ammonium salt including a substituted ammonium or quaternary ammonium salt.

A3.3.1.2.2.2. An acidic substance including a salt of a weak base and a strong acid.

A3.3.1.2.3. Nitroglycerin, diethylene glycol dinitrate, or any other liquid explosives not specifically authorized by Attachment 5.

A3.3.1.2.4. A loaded firearm except as authorized by Chapter 3.

A3.3.1.2.5. Fireworks that combine an explosive and a detonator.

A3.3.1.2.6. Fireworks containing yellow or white phosphorus.

A3.3.1.2.7. A toy torpedo whose outside dimension exceeds 23 mm (0.906 in), or a toy torpedo containing a mixture of potassium chlorate, black antimony (antimony sulphide), and sulphur if the weight of the explosive material in the device exceeds 0.26 g (0.01 oz).

A3.3.1.2.8. Explosives specifically forbidden in Table A4.1.

A3.3.1.3. Chemical Munitions. Chemical munitions are dangerous materials that are found in a variety of forms such as artillery shells, mortar shells, spray tanks, aircraft bombs, grenades, candles, rockets, and containers of chemical agents with no high explosives or dispersing charges.

A3.3.1.3.1. Handling Chemical Munitions. Use maximum preferential handling. Use the same materials handling equipment for chemical munitions that is used for high explosive munitions.

A3.3.1.3.2. Reporting and Disposing of Chemical Munitions. Immediately report any leaking chemical munitions to the agency initiating the shipment. If the leak is due to causes other than faulty munitions construction, report according to paragraph 1.7. Dispose of leaking or damaged chemical munitions according to applicable service directives. The report should include the following:

A3.3.1.3.2.1. Type and amount of chemical munitions.

A3.3.1.3.2.2. Lot number.

A3.3.1.3.2.3. Date discovered.

A3.3.1.3.2.4. Detailed information concerning the nature and possible cause of leak.

A3.3.1.3.2.5. Disposition or recommendation for disposition.

A3.3.1.4. Explosives Classification Approval. Explosives, explosive devices, and munitions, including commercial and foreign, to be eligible for military air transportation, must be either assigned a DOT hazard classification obtained by the manufacturer or foreign authority, a DOD classification, or be approved by a coalition forces' Competent Authority. **(T-0)**. All explosives indexed in the Joint Hazard Classification System (JHCS) are approved for movement by military controlled aircraft. Unless listed in the JHCS, a copy of the classification approval document (e.g., DOT Hazard classification obtained by manufacturer or foreign authority or DOD Hazard Classification or Coalition Forces Competent Authority Classification) must accompany the shipment. **(T-0)**. Coalition forces' approval documentation must, at a minimum, include in English: the product's assigned PSN, UN number, Hazard Class/Division, Compatibility Group (CG), and the NEW or net explosive mass and an indication whether the mass is per article or per package. **(T-0)**. A copy of the classification approval document is not required for 1.4S munitions meeting the criteria in paragraph A3.3.1.4.7 below. Transport explosives not listed in the JHCS only under one of the following conditions:

A3.3.1.4.1. Assigned a DOD interim hazard classification (IHC) by a DOD classification authority according to TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1

A3.3.1.4.2. Assigned a DOE final or interim hazard classification (IHC).

A3.3.1.4.3. Assigned a DOT-approved final hazard classification and EX number provided the DOT classification approval document accompanies the shipment, and listed in Table A4.1., "

A3.3.1.4.4. An explosive classified as 1.4S in accordance with a foreign issued CAA or Special Approval document.

A3.3.1.4.5. Foreign troop (and hazardous materials) movements according to paragraph 1.17.

A3.3.1.4.6. Explosives and munitions transported for allied/coalition countries supporting joint operations with U.S. forces, provided appropriate coalition forces' classification approval documentation accompanies the shipment.

A3.3.1.4.7. Cartridges, small arms which are:

A3.3.1.4.7.1. Ammunition for rifle, pistol, shotgun, machine gun or tools;

A3.3.1.4.7.2. Ammunition with inert projectile, including those containing a tracer or blank ammunition; and

- A3.3.1.4.7.3. Ammunition not exceeding .50 caliber for rifle or pistol cartridges or 8 gauge for shotgun shells.
- A3.3.1.5. Explosive Components of Airdrop Deployment Systems. Explosive components of parachutes or other airdrop deployment systems prepared or “rigged” according to technical directives, and intended for use during flight, are not governed by this manual.
- A3.3.1.6. Unpackaged Explosives. Explosives must be packaged according Attachment 5 except as identified in paragraph 3.5, A3.3.1.9., and A5.2. **(T-0)**.
- A3.3.1.7. Captured Ammunition and Ammunition with Unknown Characteristics. Transport this ammunition on military aircraft only under the following provisions:
- A3.3.1.7.1. Explosive ordnance disposal (EOD) personnel must inspect the items and complete necessary action to make them safe for air shipment, and sign a certificate to this effect. **(T-0)**.
- A3.3.1.7.2. Assigned a Final or Interim Hazard Classification.
- A3.3.1.7.3. Packed and marked according to the prescribed packaging in Table A4.1., including UN performance specification packaging requirements.
- A3.3.1.8. Missiles, Rockets, and Rocket Motors. Missiles, rockets, and rocket motors may not contain liquid propellants forbidden by this manual. Shippers must provide written procedures for monitoring shipping containers equipped with leak detection indicators and also include emergency actions (to include actions necessary during flight) in the event of a leak for items containing liquid or hypergolic fuel that is corrosive and/or toxic. **(T-0)**.
- A3.3.1.9. Installed Explosive Devices. Remove installed explosive devices from aircraft systems unless removal is not required according to a technical directive or the directive identifies the explosives are permanently imbedded in the system.
- A3.3.1.9.1. Inert Certification. In accordance with T.O. 11A-1-60, General Instructions Inspection of Reusable Munitions Containers and Scrap Material Generated from Items Exposed to, or Containing Explosives, inert certification will be done when required inspections are completed and items are free of hazardous or explosive contaminants. **(T-0)**. A certifying official will issue a certificate of clearance stating item(s) were 100% inspected and are inert and/or free of explosives related materials. **(T-0)**. Ensure inert certificate is provided for item(s) prior to offering for commercial and military transportation.
- A3.3.1.9.2. When installation is authorized, comply with the technical directive and the following requirements:
- A3.3.1.9.2.1. The safety devices must be in place and secured to the maximum extent possible (including blocking or banding when advantageous) to prevent arming. **(T-0)**.
- A3.3.1.9.2.2. The aircraft system's packaging must provide reasonable security against tampering with the installed explosive items or the arming systems. **(T-0)**.
- A3.3.1.9.2.3. Mark items according to Attachment 14.
- A3.3.1.9.2.4. Complete Shipper's Declaration for Dangerous Goods according to Attachment 17.
- A3.3.1.10. Grandfathered Items. Government-owned explosives (Class 1) packaged before 1 January 1990 are exempt from UN specification requirements. Ship these items under the packaging requirements in effect at the time of packaging. Annotate key 19 of the Shipper's



Declaration for Dangerous Goods "Government-owned goods packaged before 1 January 1990." See Attachment 17 for certification instructions.

A3.3.2. Class 2.

A3.3.2.1. General Handling Instructions for All Compressed Gases. The following applies:

A3.3.2.1.1. Store compressed gases in a cool, ventilated area away from fire hazards, sources of heat, ignition, or sparks.

A3.3.2.1.2. When stored in an upright position, secure cylinders to fixed supports. Compressed gas cylinders may be palletized for shipment provided the valves are protected and cylinders are adequately secured to the pallet.

A3.3.2.1.3. Exercise care when handling compressed gases. Do not drop, jar, or slide cylinders since the gas may be toxic or asphyxiating. Ensure personnel know the importance of handling compressed gases properly.

A3.3.2.1.4. Ensure valves are always tightly closed and protected before offering for transportation.

A3.3.2.2. Cylinder Requirements. Comply with 49 CFR ( includes 173 Subpart G, 178 Subpart C, 180 Subpart C) and this manual for shipping compressed gas cylinders, including safety relief devices. Requirements covering cylinders also apply to spherical pressure vessels. Reference DLAI 4145.25/AR 700-68/ NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227\_IP for additional data on compressed gas cylinders.

A3.3.2.2.1. Cylinders or spherical pressure vessels must not contain gases or materials capable of combining chemically so as to endanger their serviceability. **(T-0)**. Make sure all cylinders, including closing devices and cushioning materials, are in good condition so that their contents are well protected during transit.

A3.3.2.2.2. Cylinder Requalification. DOT cylinders, UN pressure receptacles, or cylinders bearing a DOT-SP number offered for transportation must meet requalification and marking requirements in accordance with 49 CFR Part 180 and/or terms of the applicable special permit. **(T-0)**.

A3.3.2.2.3. Close each cylinder containing poisonous materials with a plug or valve meeting the following requirements:

A3.3.2.2.3.1. Each plug or valve must have a taper-threaded connection directly to the cylinder and be capable of withstanding the test pressure of the cylinder. **(T-0)**.

A3.3.2.2.3.2. Each valve must be of the packless type with nonperforated diaphragm, except that for corrosive materials, the valve may be of the packed type, provided the assembly is made gas-tight by means of a seal cap with gasketed joint attached to the valve body of the cylinder to prevent loss of material through or past the packing. **(T-0)**.

A3.3.2.2.3.3. Each valve outlet must be sealed by a threaded cap or threaded solid plug. **(T-0)**.

A3.3.2.2.3.4. Cylinders, valves, plugs, outlet caps, luting, and gaskets must be compatible with each other and with the material. **(T-0)**.

A3.3.2.3. Valve Protection. Protect all valves of containers charged with compressed gas by one of the following methods:

- A3.3.2.3.1. By a securely attached metal cap of sufficient strength to protect the valve from injury during transit.
- A3.3.2.3.2. By boxing or crating the cylinder or sphere to give proper protection to the valve. The outer packaging must be capable of meeting drop tests specified for Packing Group I. **(T-0)**.
- A3.3.2.3.3. By recessed valve or otherwise protected valve so that it cannot be subjected to a blow when the container is dropped on a flat surface.
- A3.3.2.3.4. The cylinder or vessel is secured as an attached component of a vehicle, equipment, trailer, or cart in a manner that prevents damage to the valve during transit.
- A3.3.2.4. Cylinder Orientation. Comply with the orientation requirements in DLAI 4145.25/A700-68/NAVSUPINST 4440.128D/MCO 10330.2D/AFMAN 23-227(I), paragraph 5-9. General Storage Requirements. Cylinders that do not have specific orientation requirements according to the above regulation may be oriented as necessary unless orientation instructions are identified elsewhere in this manual.
- A3.3.2.5. Multiple-Element Gas Container. DOT Specification and UN approved cylinders may be interconnected by a manifold in accordance with 49 CFR Sections 178.74 and 178.75, provided all valves are securely closed.
- A3.3.2.6. Pressure and Filling Requirements. Ensure the pressure in the container at 21 degrees C (70 degrees F) is not more than the service pressure for which the container is marked or designated, except as provided below.
- A3.3.2.6.1. When cylinders with a marked pressure limit are prescribed, other cylinders made under the same specification, but with a higher marked service pressure limit are authorized. For example, a cylinder marked DOT 4B500 may be used where DOT 4B300 is specified.
- A3.3.2.6.2. The pressure in the cylinder or sphere at 55 degrees C (131 degrees F) must not exceed 1 1/4 times the service pressure except cylinders of acetylene, liquefied nitrous oxide, and liquefied carbon dioxide which must not exceed the allowable charging pressure of the cylinder. **(T-0)**.
- A3.3.2.6.3. The pressure of a cylinder containing a Hazard Zone A or Hazard Zone B (poisonous material) must not exceed the service pressure of the cylinder at 55 degrees C (131 degrees F). Provide sufficient outage to ensure the cylinder is not liquid full at 55 degrees C (131 degrees F). **(T-0)**.
- A3.3.2.6.4. Use the service pressure identified for a current specification for containers made before the effective date of specifications.
- A3.3.2.6.5. Use the service pressure identified in Figure A3.1. for authorized cylinders not marked with a service pressure.

**Figure A3.1. Cylinder Specification and Service Pressures.**

Specification marking	Service Pressure psig
3	1800
3E	1800
8	250

- A3.3.2.6.6. Except for carbon dioxide, 1,1-Difluoroethylene (R-1132A), nitrous oxide, and vinyl fluoride, inhibited, the liquid portion of a liquefied gas may not completely fill the packaging at any temperature up to and including 54 degrees C (130 degrees F). The liquid portion of vinyl fluoride, inhibited, may completely fill the cylinder at 54 degrees C (130 degrees F) provided the pressure at the critical temperature does not exceed 1 1/4 times the service pressure of the cylinder (see definition for filling density).
- A3.3.2.6.7. DOT 3A, 3AX, 3AA, 3AAX, and 3T cylinders may be charged with compressed gases other than liquefied, dissolved, poisonous, or flammable gases to a pressure of 10 percent over their marked service pressure, provided the following conditions are met:
- A3.3.2.6.7.1. Equip each cylinder with frangible disc safety devices (without fusible metal backing) having a bursting pressure not over the minimum prescribed test pressure.
- A3.3.2.6.7.2. Determine the elastic expansion at the time of the last test or retest by the water-jacket method.
- A3.3.2.6.7.3. Do not exceed either the average wall stress or the maximum wall stress limitations in Figure A3.2.

**Figure A3.2. Wall-Stress Limitations.**

Type of Steel	Average Wall Stress Limitation	Maximum Wall Stress Limitation
Plain carbon steels over 0.35 carbon and medium manganese steels.	53,000	58,000
Steels of analysis and heat treatment specified in DOT Specification 3AA.	67,000	73,000
Steels of analysis and heat treatment specified in DOT Specification 3T	87,000	94,000
Plain carbon steels less than 0.35 carbon made before 1920.	45,000	48,000

A3.3.2.6.8. Filling Density.

- A3.3.2.6.8.1. Liquefied Petroleum Gases. Use Figure A3.3. for filling density requirements of Liquefied Petroleum Gases. Any filling density prescribed in Figure A3.3. may be increased by 2 percent for liquefied petroleum gas in DOT 3 cylinders (or in DOT 3A cylinders marked for 1,800 pounds or higher service pressure, subject to the bullet above).
- A3.3.2.6.8.2. Cryogenic Liquids of Argon, Helium, Neon, Nitrogen, and Oxygen. Use Figure A3.4. for filling density requirements when shipping cryogenic liquids of argon, helium, neon, nitrogen, and oxygen.
- A3.3.2.6.8.3. Hydrogen. Ship hydrogen (minimum 95 percent parahydrogen) according to Figure A3.5.

Figure A3.3. Filling Density for Liquefied Petroleum Gas.

Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container	Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container
0.271-0.289	26	0.504-0.510	42
0.290-0.306	27	0.511-0.519	43
0.307-0.322	28	0.520-0.527	44
0.323-0.338	29	0.528-0.536	45
0.339-0.354	30	0.537-0.544	46
0.355-0.371	31	0.545-0.552	47
0.372-0.398	32	0.553-0.560	48
0.399-0.425	33	0.561-0.568	49
0.426-0.440	34	0.569-0.576	50
0.441-0.452	35	0.577-0.584	51
0.453-0.462	36	0.585-0.592	52
0.463-0.472	37	0.593-0.600	53
0.473-0.480	38	0.601-0.608	54
0.481-0.488	39	0.609-0.617	55
0.489-0.495	40	0.618-0.626	56
0.496-0.503	41	0.627-0.634	57

□

Figure A3.4. Filling Density for Cryogenic Liquids Except Hydrogen.

Pressure control valve setting (maximum start-to-discharge pressure, kPa (psig))	Maximum permitted filling density (percent by weight)					
	Air	Argon	Nitrogen	Oxygen	Helium	Neon
310.3 (45)	82.5	133	76	108	12.5	109
517 (75)	80.3	130	74	105	12.5	104
724 (105)	78.4	127	72	103	12.5	100
1172 (170)	76.2	122	70	100	12.5	92
1585.8 (230)	75.1	119	69	98	12.5	85
2034 (295)	73.3	115	68	96	12.5	77
2482 (360)	70.7	113	65	93	12.5	
3103 (450)	65.9	111	61	91	12.5	
3723 (540)	62.9	107	58	88	12.5	
4309 (625)	60.1	104	55	86	12.5	
Design Service Temperature (degrees F)	-320	-320	-320	-320	-452	-411
(degrees C)	-196	-196	-196	-196	-269	-246

Figure A3.5. Filling Density for Cryogenic Liquids of Hydrogen

Column 1	Column 2
Design service temperature	Minus 253 degrees C (-423 degrees F) or colder
Maximum permitted filling density, based on cylinder capacity at -253 degrees C (-423 degrees F) (see note)	6.7 percent
The pressure control valve must be designed and set to limit the pressure in the cylinder to not more than	117 kPa (17 psig)
<b>Note:</b> The filling density for hydrogen, cryogenic liquid, is defined as the percent ratio of the weight of lading in a package to the weight of water that the packaging will hold at -253 degrees C (-423 degrees F). The volume of the packaging at -253 degrees C (-423 degrees F) is determined in cubic inches. The volume is converted to pounds of water (1 pound of water = 27.737 cubic inches). Each cylinder must be constructed, insulated, and maintained so that the total rate of venting must not be over 30 standard cubic feet (SCF) of hydrogen per hour during transportation. (T-0).	

A3.3.2.7. Cylinders Requiring an Outer Packaging. Ship DOT 2P, 2Q, 3E, 3HT, spherical type 4BA, 4D, 4DA, 4DS, and 39 cylinders in strong outer packaging. Ensure the package is capable of protecting the cylinder and all its parts from deformation or breakage resulting from a 1.2 m (4 foot) drop on a solid concrete or steel floor. DOT 4BA spherical cylinders may be securely mounted on warehouse pallets to provide protection for the spheres and any attachments.

A3.3.2.8. Mandatory Color-Code Identification. Exact color-code identification of any material contained in a compressed gas cylinder is mandatory for DOD and DLA owned cylinders and must meet MIL-STD-101, *Color Code for Pipelines and for Compressed Gas Cylinders*. (T-0).

A3.3.2.9. Unregulated Compressed Gases. Compressed gasses in the following items are not regulated:

A3.3.2.9.1. Inflated tires, when inflated to a pressure not greater than its rated inflation pressure.

A3.3.2.9.2. Inflated balls used for sports.

A3.3.2.9.3. Aerosols, containing non-flammable gas, with capacity of 50 ml or less.

A3.3.2.9.4. Carbonated beverages.

A3.3.2.9.5. Refrigerating machines, including dehumidifiers, air conditioners, and components thereof such as precharged tubing containing any of the following:

A3.3.2.9.5.1. 12 kg (25 pounds) or less of nonflammable liquefied gas,

A3.3.2.9.5.2. 12 L (3 gallons) or less of Ammonia Solution (UN2672), or

A3.3.2.9.5.3. 100 g (4 ounces) or less of a flammable, non-toxic, liquefied gas.

A3.3.2.9.6. Shipping containers and systems pressurized according to a technical directive with a non-flammable gas which has an absolute pressure of 40 psia or less inside the container at 20 degrees C (68 degrees F).

A3.3.2.9.7. Cylinders considered empty according to A3.1.16.2.

A3.3.2.9.8. Accumulators. Articles containing a non-flammable or non-toxic gas intended to function as shock absorbers that are manufactured to industry quality assurance standards; has a gas space capacity less than 1.6 L and a charge pressure not more than 280 bar where product of capacity (liters) and a charge pressure is not more than 80 (e.g., 0.5 L gas space and 160 bar charge pressure = 80); has a minimum burst pressure of 4 times the charge pressure at 20 degrees C, manufactured from a material which will not fragment; and when subject to fire is protected from rupture by degradable seal or pressure release device.

A3.3.2.9.9. Passenger Restraint Systems. A cylinder that is a component part of a passenger restraint system installed in a motor vehicle, and meeting the requirements in A6.3.6.

A3.3.2.9.10. Articles containing not more than 100 mg of an inert compressed gases (Argon, Helium, Neon, Nitrogen, and Xenon) and packaged so the quantity per package is 1 g or less.

A3.3.2.10. Non-DOT Specification Cylinders. The following non-DOT specification cylinders may be transported by military airlift.

A3.3.2.10.1. UN pressure receptacles complying with the requirements of 49 CFR Parts 173, 178. And 180.

A3.3.2.10.2. Foreign cylinder (other than UN cylinders) manufactured, inspected, and tested according to 49 CFR Part 178, or a copy of the competent authority approval of the nation manufacturing the cylinder accompanies the shipment. All other requirements of this manual also apply.

A3.3.2.10.3. Cylinders issued a DOT Special Permit or Exemption.

- A3.3.2.10.4. Cylinders marked with the prefix "ICC" (e.g., ICC-4BA240) are authorized in place of cylinders required by this manual with a "DOT" prefix. The cylinders must comply with all other applicable specification requirements for DOT cylinders. **(T-0)**.
- A3.3.2.11. Bulk Compressed Gas Tanks. Bulk compressed gas tanks must meet applicable cylinder specification requirements identified in Attachment 6, or be certified to a Competent Authority Approval (CAA), Certification of Equivalency (COE), or a DOT Special Permit (DOT-SP). **(T-0)**. If not certified to the above, the tank must be drained, purged, or otherwise considered empty. **(T-0)**. Use paragraph A3.1.16. to identify "empty" tanks.
- A3.3.2.12. Cylinders Containing Poisonous Material. Overpack cylinders containing a poisonous material, which have a wall thickness at any point of less than 2.03 mm (0.080 inch) and do not have fitted valve protection, in a strong outer container. The box must meet the requirements of A3.1. **(T-0)**. Ensure box and valve protection is of sufficient strength to protect all parts of the cylinder and valve (if it has a valve) from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a concrete or steel floor, impacting at an orientation most likely to cause damage. If the cylinder is not overpacked, equip the cylinder with a protective cap or other means of valve protection sufficient to protect the valve from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a concrete or steel floor, impacting at an orientation most likely to cause damage.
- A3.3.2.13. Mounted Cylinders and Fire Extinguishers. Cylinders, other than those identified in A3.3.2.7, containing non-flammable gases (e.g., oxygen, air, nitrogen) and fire extinguishers may be shipped secured in holders of equipment and protected from possible accidental damage with safety pin/clip installed. Package fire extinguishers not in an approved holder according to A6.7.
- A3.3.2.14. Aircraft Fire Suppression Bottles. Use description "Liquefied Gases, UN1058"; "Compressed Gas, N.O.S., UN1956"; or the hazard classification assigned by the manufacturer for DOT specification 3HT, 4D, 4DA, or 4DS (if using a 4DS, DOT SP 8439 rules apply). See paragraph A6.4.1. and Table A6.1.
- A3.3.2.15. Vehicle Fire Suppression Systems. Identify cylinders and pressure vessels which are an integral part of a vehicle fire suppression system and exceed 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F) as an accessorial hazard according to A17.5.2.
- A3.3.2.16. Cryogenic Liquids.
- A3.3.2.16.1. Container Requirements:
- A3.3.2.16.1.1. Do not load a cylinder with a cryogenic liquid colder than the design service temperature of the packaging.
- A3.3.2.16.1.2. Do not load a cylinder with any material that may combine chemically with any residue in the packaging to produce an unsafe condition.
- A3.3.2.16.1.3. The jacket covering the insulation on a cylinder used to transport any flammable cryogenic liquid must be made of steel. **(T-0)**.
- A3.3.2.16.1.4. Do not install a valve or fitting made of aluminum, with internal rubbing or abrading aluminum parts that may come in contact with oxygen in the cryogenic liquid form, on any cylinder used to transport oxygen, cryogenic liquid unless the parts are anodized according to ASTM Standard B 580.

A3.3.2.16.1.5. Do not install an aluminum valve, pipe, or fitting on any cylinder used to transport any flammable cryogenic liquid.

A3.3.2.16.1.6. Provide each cylinder with one or more pressure relief devices.

A3.3.2.16.1.7. Install each pressure relief device and locate so that the cooling effect of the contents during venting will not prevent effective operation of the device.

A3.3.2.16.1.8. The maximum weight of the contents in a cylinder with a design service temperature colder than -195.5 degrees C (-320 degrees F) may not be over the design weight marked on the cylinder.

A3.3.2.16.1.9. Each cylinder containing a cryogenic liquid must have a pressure control system that conforms to 49 CFR Section 173.316 and must be designed and installed so that it will prevent the cylinder from becoming liquid full. **(T-0)**.

A3.3.2.16.2. Venting Requirements. Protect all containers by vent openings or safety relief devices to prevent excessive pressure buildup within the containers. The shipper must provide required equipment and specific venting instructions in the additional handling information block of the Shipper's Declaration for Dangerous Goods (see A17.5.2.), unless venting procedures are provided in a separate instruction accompanying the shipment or attached to the cargo. **(T-0)**. Crew members monitor vent valves during flight. The following applies:

A3.3.2.16.2.1. Provide at least 4.6 m (15 feet) of 25.4 mm (one inch) inside diameter tubing or hose compatible with the product. Do not use rubber tubing for liquid oxygen.

A3.3.2.16.2.2. Provide sufficient clamps to attach tubing to the unit, the aircraft vent adapter, and other hoses if more than one unit is transported. Do not use sealing compound on tubing or hose connections.

A3.3.2.16.2.3. Provide T fittings and extra tubing or hose for the manifolding of two or more units to one aircraft vent. Route tubing or hose to ensure freedom from kinks, sharp bends, or restrictions that prevent free venting and cause pressure buildup in the tubing or hose.

A3.3.2.16.2.4. Small containers (net capacity of 25 liters (6.6 gallons) or less) charged with a nonflammable, nonpoisonous cryogenic liquid, are excepted from the overboard venting requirement.

A3.3.2.17. Fuel Cell Cartridges.

A3.3.2.17.1. Except for fuel cell cartridges containing hydrogen in metal hydride, each fuel cell cartridge design type including when contained in or packed with equipment, must pass a 1.2 meter (3.9 feet) drop test onto an unyielding surface in the orientation most likely to result in the failure of the containment system with no loss of contents. **(T-0)**. Fuel cell cartridges installed in or integral to a fuel cell system are regarded as contained in equipment. Fuel cell cartridges containing a Division 2.1 material must meet the following additional requirements:

A3.3.2.17.1.1. Be capable of withstanding, without leakage or bursting, a pressure of at least two times the equilibrium pressure of the contents at 55 °C (131 °F);

A3.3.2.17.1.2. Contain no more than 200 mL of liquefied flammable gas with a vapor pressure not exceeding 1,000 kPa (150 psig) at 55 °C (131 °F); and



A3.3.2.17.1.3. Pass the hot water bath test prescribed in accordance with 49 CFR Subparagraph 173.306(a)(3)(v). **(T-0)**.

A3.3.2.17.2. Fuel cell cartridges containing hydrogen in a metal hydride must conform to the following:

A3.3.2.17.2.1. Have a water capacity less than or equal to 120 mL.

A3.3.2.17.2.2. The pressure in the fuel cell cartridge must not exceed 5 MPa at 55 degrees C.

A3.3.2.17.2.3. The design must withstand, without leaking or bursting, a pressure of two times the design pressure of the cartridge at 55 degrees C or 200 kPa more than the design pressure of the design pressure of the cartridge at 55 degrees C, whichever is greater.

A3.3.2.17.2.4. Each fuel cell cartridge must be filled in accordance with the procedure provided by the manufacturer.

A3.3.2.17.2.5. Fuel cell cartridges must contain the following permanent markings:

A3.3.2.17.2.5.1. Rated charging pressure in megapascals (MPa).

A3.3.2.17.2.5.2. Manufacturers serial number or unique identification number.

A3.3.2.17.2.5.3. Date of expiration based on the maximum service life.

A3.3.2.17.2.6. Each fuel cell cartridge must pass the following design type tests:

A3.3.2.17.2.6.1. Drop test. A 1.8 m drop test onto an unyielding surface in four different orientations.

A3.3.2.17.2.6.1.1. On the vertical end containing the shut-off valve assembly.

A3.3.2.17.2.6.1.2. On the vertical end opposite to the shut-off valve assembly.

A3.3.2.17.2.6.1.3. Horizontally, onto a steel apex with a diameter of 38 mm, with the steel apex in the upward position.

A3.3.2.17.2.6.1.4. At a 45 degree angle on the end containing the shut-off valve.

A3.3.2.17.2.6.2. Fire test. The fuel cells cartridge design may include a vent and be subject to one of the following fire tests:

A3.3.2.17.2.6.2.1. The internal pressure vents to zero gauge pressure without rupture of the cartridge.

A3.3.2.17.2.6.2.2. The cartridge withstands the fire for a minimum of 20 minutes without rupture.

A3.3.2.17.2.6.3. Hydrogen cycling test. A fuel cell cartridge must be subjected to a hydrogen cycling test described in 49 CFR Subparagraph 173.230(d)(5)(iii), to ensure that the design stress limits are not exceeded during use.

A3.3.2.17.2.7. Production leak test. Each fuel cell cartridge must be tested for leaks at  $15\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$  ( $59\text{ }^{\circ}\text{F} \pm 9\text{ }^{\circ}\text{F}$ ) while pressurized to its rated charging pressure. There must be no leakage. Leakage must be determined using a soap bubble solution or other equivalent means on all possible leak locations. **(T-0)**.

A3.3.3. Class 3.

- A3.3.3.1. General Handling Instructions. Store flammable liquids in cool, well-ventilated areas. Do not store near sources of heat, flames, sparks, combustible materials, or oxidizing agents. Keep containers tightly closed to prevent the evaporation of flammable liquids. Although classed as a flammable liquid, some materials in this attachment may also be described as corrosive or toxic. In the event of leakage or spillage, use rubber gloves, goggles, aprons, and respirators.
- A3.3.3.2. Combustible Liquids. The requirements in this manual does not apply to materials classed as combustible liquids with the following **Exceptions**:
- A3.3.3.2.1. Non-bulk packages must be capable of meeting air-eligible pressure requirements specified for Class 3 Packing Group III specified in A3.1.7.1. or A3.1.7.2. **(T-0)**.
- A3.3.3.2.2. Bulk combustible liquids must be transported in UN specification packaging (e.g., IBCs) meeting air eligibility requirements of paragraph A3.1.7.2. for PG III. **(T-0)**.
- A3.3.3.2.3. Use the same fuel level requirements specified in Attachment 13 for flammable liquids when a combustible liquid is used as fuel for a vehicle, self-propelled item, or SE.
- A3.3.3.3. Fuel for Vehicles and Equipment. Transport fuel needed to operate vehicles and equipment at the deployment site in air-eligible UN specification containers listed in paragraph A7.2. If required, stow these containers in the vehicle or equipment according to paragraph 1.8. The following applies when using jerricans:
- A3.3.3.3.1. Allow sufficient ullage (outage) and tightly secure jerrican caps to prevent leakage.
- A3.3.3.3.2. Secure jerricans in permanently configured and approved holders on vehicles or equipment. If secured in this manner, they may be considered an accessorial hazard, and included in Key 19 of the Shipper's Declaration of Dangerous Goods (see A17.5.3.1.).
- A3.3.3.3.3. DOT 5L jerricans are not authorized for air shipment of fuel, and must be drained to the greatest extent possible. **(T-0)**.
- A3.3.3.3.4. UN specification jerricans (not in an approved holder) may be shipped palletized, loaded and secured on a vehicle, or floor loaded. Prepare a separate Shipper's Declaration of Dangerous Goods according to Attachment 17.
- A3.3.3.4. Fuel-in-Tank Limitations. Limit fuel in vehicles, self-propelled units, wheeled engine-powered SE, and all other types of SE to a minimum. Commanders consider availability of fuel at the destination and operational requirements for mission readiness when determining fuel levels and ship with less than the maximum allowable amount when possible. Units transported under the provisions of chapter 3 may contain additional quantities of fuel in tank according to the appropriate packaging paragraph, based on operational necessity. During redeployments, unless mission readiness is affected, limit fuel in tank to a minimum. The preparer (certifying official) ensures any unnecessary fuel is drained prior to shipment. See Attachment 17 for certification requirements.
- A3.3.3.5. Bulk Fuel. Do not transport bulk tanks which are part of servicing trucks, trailers, semitrailers, or individual bulk storage tanks containing flammable fuel, or any bulk hazardous material by air (except as authorized in paragraph A7.2.9.). Transport bulk combustible liquids in UN specification packaging (e.g., IBCs) meeting air eligibility requirements of paragraph A3.1.7.2. for PG III. The following draining/purging requirements apply:

A3.3.3.5.1. Purge bulk tanks for all liquids with a flash point below 38 degrees C (100 degrees F), regardless of whether the technical manual only requires draining.

A3.3.3.5.2. Drain, but need not purge, liquids with a flash point at or above 38 degrees C (100 degrees F), unless the technical manual specifically requires purging.

A3.3.3.5.3. Provide air circulation in the cargo compartment of pressurized aircraft.

A3.3.3.5.4. Drain and purge all fuel from the tank, stand-pipe, and internal lines of external aircraft fuel tanks to prevent leaking during transport.

A3.3.3.6. Equipment Fuel Leakers. The shipper is responsible for ensuring the maximum allowable fuel-in-tank is not exceeded, the amount of fuel is necessary to meet operational requirements for mission readiness, and the equipment is prepared properly to prevent leakage. Measure the fuel quantity on a level surface. The following items are considered fuel leakers and must be drained of fuel:

A3.3.3.6.1. MC-1A and MC-2A compressors. The MC-1A model 2MC-1A, T.O. 34Y1-56-71, CAGE 16004, part number 66950, NSN 4310-01-060-0642 is not considered a leaker and may be shipped with fuel-in-tank according to Chapter 3. Identify the item nomenclature on the Shipper's Declaration form as "2MC-1A". Units must stencil "2MC-1A" on the item.

A3.3.3.6.2. MA-3 air conditioner.

A3.3.3.6.3. H-1 heater.

A3.3.3.6.4. The USCSMK Boston Whaler boat. The United States Navy Patrol Boat Light (PBL) is not considered a leaker and may be shipped with fuel-in-tank as authorized according to this manual.

A3.3.3.6.5. The USMC River Assault Craft (RAC).

A3.3.3.6.6. All commercial SE. **(T-0)**.

A3.3.3.7. Pads and Swabs. Pads, swabs, rags, and similar items soaked with a flammable liquid and sealed in a bag are not subject to the requirements of this manual provided there is no free liquid and each bag or packet contains no more than 10 ml of a flammable liquid in PG II or PG III. If a bag or packet contains an item(s) soaked with PG I flammable liquid or soaked with more than 10 ml of a PG II or PG III flammable liquid refer to requirements for "Solids Containing Flammable Liquids, N.O.S.," UN3175.

A3.3.3.8. Alcoholic Beverages. Alcoholic beverages in packagings of five liters or less are not subject to the requirements of this manual.

A3.3.3.9. Fuel Cell Cartridges. Fuel cell cartridges design types using liquids as fuels must pass an internal pressure test at a pressure of 15 psig (100 kPa (gauge) without leakage. **(T-0)**. Each fuel cell cartridge design type must pass a 1.2 m drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss to the contents. **(T-0)**.

A3.3.4. Class 4.

A3.3.4.1. General Handling Instructions. Class/Division 4.1 material containing self-reactive substances must be protected from direct sunlight and stored in a cool and well-ventilated location, away from all sources of heat. **(T-0)**. Do not store near corrosives (Class 8). Tightly

and securely close all containers. These items may be water reactive and spontaneously combustible. Do not pack Class 4 material in the same outer packaging with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible, non-reactive absorbent material. Place the cushioned bottles in tightly closed metal containers. Material in quantities not over 118 ml (4 ounces) in securely closed metal cans can be packed for military air transport in the same compartment with other securely packed materials necessary for a complete fumigant.

A3.3.4.2. Packaging. Unless otherwise specified by a packaging paragraph, package a material identified as PG III in Table A4.1. in a container that meets the PG I or II performance level.

A3.3.4.3. Flameless Ration Heaters (FRH). FRH containing 8 grams or less of a magnesium-iron alloy (e.g., magnesium powder), packaged as a component of meals-ready-to-eat are not subject to the requirements of this manual (see paragraph A3.2.1.1). This exception does not apply to a heater that is packaged separately from a meal or that contains more than 8 grams of a magnesium-iron alloy.

A3.3.4.4. Charcoal Briquettes. Lump charcoal briquettes, packaged in a form suitable for consumer use, generally do not meet the classifying criteria of a Class 4.2 spontaneously combustible material. If the charcoal briquettes do not meet the definition of a Class 4.2 material, it is not subject to any other requirements of this manual. Ensure the specific type and form of charcoal being shipped does not meet the definition of a Class 4.2 material and passed the self-heating test for carbon (which indicates that it is not spontaneously combustible).

A3.3.4.5. Fusee. The PSN "FUSEE" is only valid for domestic movement. For international shipment use the PSN "SIGNAL DEVICES, HAND" and package the material as required by the packaging paragraph for signal devices, hand.

A3.3.4.6. Fuel Cell Cartridges.

A3.3.4.6.1. Fuel cell cartridges design types using liquids as fuels must pass an internal pressure test at a pressure of 15 psig (100 kPa (gauge) without leakage. **(T-0)**.

A3.3.4.6.2. Each fuel cell cartridge design type must pass a 1.2 m drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss to the contents. **(T-0)**.

A3.3.4.6.3. May contain an activator provided it is fitted with two independent means of preventing unintended mixing with the fuel during transport.

A3.3.5. Class 5.

A3.3.5.1. General Handling Instructions. Organic Peroxides must be protected from direct sunlight and stored in a cool and well-ventilated location, away from all sources of heat. **(T-0)**.

A3.3.5.2. Packed with Other Materials. Do not pack Class 5 materials in the same outer packaging with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible absorbent material in tightly closed metal containers. Class 5 materials in securely closed metal cans and in quantities not over 118 ml (4 ounces), are acceptable for air shipment if packed in the same compartment with other securely packed materials necessary for a complete fumigant.

A3.3.5.3. Packaging. Unless otherwise specified by a packaging paragraph, package a material identified as PG III in Table A4.1. in a container that meets the PG I or II performance level.

A3.3.5.4. Control and Emergency Temperature. Packaged items in Class 5.2 may require controlled temperature conditions during shipment. See 49 CFR (173.224 Self-Reactive Materials Table, Column 5) (173.225(c) Organic Peroxide Table column 8) for tables that lists "control temperatures" for specific organic peroxide items (by technical name), when applicable. The following applies:

A3.3.5.4.1. The control temperature is the temperature above which a material may not be offered for transportation.

A3.3.5.4.2. The emergency temperature is the temperature at which emergency procedures must be initiated due to imminent danger resulting from overheating of the shipment. **(T-0)**.

A3.3.5.4.3. Guidance for packaging medical materiel requiring temperature control during shipment is contained in DLAR (JP) 4145.21/TB MED 284/NAVSUPINST 4610.31B/AFI 41-208, *Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment*.

A3.3.6. Class 6.

A3.3.6.1. General Handling Instructions.

A3.3.6.1.1. Toxic material can react through the skin, respiratory tract, or gastrointestinal tract. In general, solid toxic material that is improperly packaged presents an ingestion hazard. Dust and mists result primarily in an inhalation hazard. Liquids may be ingested, inhaled as a vapor, or absorbed through the skin.

A3.3.6.1.2. Keep cool and away from direct rays of the sun and high temperature. Store away from sources of ignition and fire hazards. Avoid direct contact with the material. Mark storage areas with the appropriate placards.

A3.3.6.1.3. Keep away from oxidizing materials.

A3.3.6.1.4. Make sure personnel exposed to leaking materials wear a protective mask or self-contained breathing apparatus (specific recommendations can be obtained from the medical services).

A3.3.6.1.5. Store away from acids or acid fumes.

A3.3.6.1.6. Do not place any liquid toxic material on the same 463L pallet with foodstuffs or rations.

A3.3.6.1.7. Handle toxins containing infectious agents meeting the criteria for inclusion as a Division 6.2 material as Category A Infectious substances UN2814 or UN2900. Handle all other toxins extracted from living sources as UN3172 or UN3462.

A3.3.6.2. General Requirements.

A3.3.6.2.1. Solid Medical or Clinical Waste containing Category A infectious substances must use **UN3549, Medical Waste, Category A, Affecting Humans, solid** or **UN3549, Medical Waste, Category A, Affecting Animals only, solid** (*The items in italics are not part of the proper shipping name.*) Solid Category A Medical Waste refers to solid medical waste generated from humans or veterinary animals. UN3549 does not include waste from bioresearch or liquid waste nor does it permit cargo air transport unless otherwise approved in writing by the country of origin and the operator of the country of origin.

- A3.3.6.2.2. Waste materials meeting the Category A criteria do not apply to UN2814, Infectious substances, affecting humans nor UN2900, Infectious substances, affecting animals or UN3373, Biological substances, Category B. Medical or Clinical Waste containing (or has a probability of containing) infectious substances in Category B, other than cultures, is assigned to UN3291.
- A3.3.6.2.3. Category B infectious substances in cultures which are in a form capable of causing life threatening or fatal disease if exposure to it occurs are assigned to UN2814 or UN2900 as appropriate and shipped as Category A Infectious Substances.
- A3.3.6.2.4. Category B infectious substances, other than cultures, are assigned to UN3373 and are excepted from all other requirements of this manual provided:
- A3.3.6.2.4.1. The package is marked “Biological Substance, Category B.” Marking must be at least 6mm.
- A3.3.6.2.4.2. “UN3373” is contained within a square-on-point marking displayed on the outer packaging on a background of a contrasting color.
- A3.3.6.2.4.3. The completed package meets the requirements of A10.9.
- A3.3.6.2.5. Biological products known or reasonably believed to contain infectious substances that meet the criteria for inclusion in Category A or Category B are assigned to UN2814, UN2900, or UN3373, as appropriate.
- A3.3.6.2.6. A packaging containing inner packagings of Division 6.2 materials may not contain other hazardous materials except:
- A3.3.6.2.6.1. Refrigerants, such as dry ice or liquid nitrogen, as authorized under 49 CFR Section 173.196;
- A3.3.6.2.6.2. Anticoagulants used to stabilize blood or plasma; or
- A3.3.6.2.6.3. Small quantities of Class 3, Class 8, Class 9 or other material in Packing Group II or III not exceeding 30 ml or 30g per inner packaging, and 4L or 4kg per outer package, may be used to stabilize or prevent degradation of the sample. Such preservatives are not subject to requirements of this manual.
- A3.3.6.2.7. Infectious agents identified as Biological select agents and toxins (BSAT) under the 42 CFR Section 73.3, 42 CFR Section 73.4, 7 CFR Section 331.3, and 9 CFR Sections 121.3 and 121.4 must also comply with the 42 CFR, 7 CFR, 9 CFR requirements and all other applicable regulatory requirements including but not limited to those specified by the United States Department of Health and Human Services (DHHS) Centers for Disease Control and Prevention (CDC), the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS), the United States Department of Commerce, and the Department of Defense. **(T-0)**.
- A3.3.6.2.8. In addition to meeting applicable packaging standards for Division 6.2 material as required in Attachment 10, personnel transporting infectious agents, biological research material, patient specimens, genetically modified microorganisms, and other associated biological research material or samples ensure all applicable import and export permits (including intrastate permits) are obtained prior to transport of specimens. Receivers have the ultimate responsibility for ensuring all necessary permits are obtained.

A3.3.6.2.9. Personnel ensure all necessary transfer documents required by the 42 CFR, 7 CFR, 9 CFR, and applicable biosurety regulations are appropriately signed and emplaced prior to transport of specimens. Both the shipper and the receiver ensure advanced arrangements are made prior to transfer/transport of samples.

A3.3.6.2.10. A Division 6.2. packaging to be reused must be disinfected prior to reuse by any means effective for neutralizing the infectious substance the packaging previously contained. **(T-0)**. A secondary packaging or outer packaging need not be disinfected prior to reuse if no leakage from the primary receptacle has occurred.

NOTE: Need to review IFUs for packaging and appropriate disinfectant with specific dwell time must be adhered to depending on pathogen type.

A3.3.6.2.11. Body parts, organs or whole bodies believed to be contaminated with a Category A infectious agent must be packaged and shipped as UN2814 or UN2900 unless exceptions to these packaging requirements are obtained through Department of Defense channels. **(T-0)**.

A3.3.6.2.12. Radiobioassay samples, meeting the definition of Class 7 other than limited quantities, follow the requirements for radioactive materials in this manual.

A3.3.6.2.13. Forensic material known or suspected of containing an infectious substance or select agent adhere to the requirements for a Category A or B infectious substance as appropriate.

A3.3.6.3. Unregulated Infectious Material. The following are not regulated by this manual:

A3.3.6.3.1. Live animals infected or injected with an infectious substance or biological product provided they are accompanied by technically qualified escorts.

A3.3.6.3.2. Blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation.

A3.3.6.3.3. Biological products manufactured and packaged in accordance with the requirements of the appropriate national authorities and transported for the purposes of final packaging or distribution, and used for personal health care by medical professionals or individuals.

A3.3.6.3.4. Medical, biomedical, or clinical waste not containing a Category A or B infectious substance unless they meet the criteria of another hazard.

A3.3.6.3.5. Patient/diagnostic specimens not containing a Category A or B infectious substance.

A3.3.6.3.6. Used health care products meeting the requirements of Title 49 CFR Paragraph 173.134(b).

A3.3.7. Class 7.

A3.3.7.1. General Handling Instructions. Handle radioactive material carefully to ensure there is no contamination of personnel or the transport vehicle. A person may not remain unnecessarily in the immediate vicinity of any package containing radioactive material. Inform Installation Radiation Safety Officer (IRSO) of all shipments containing radioactive materials listed in Table 1 of Appendix A to 10 CFR 37.

A3.3.7.2. Unregulated Radioactive Material. The following radioactive materials are not regulated by this manual:

A3.3.7.2.1. Radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment.

A3.3.7.2.2. Natural material and ores containing naturally occurring radionuclides, which are either in their natural state or have only been processed for purposes other than for extraction of the radionuclides, and not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values for exempt materials specified in Table A11.1.

A3.3.7.2.3. Non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit specified in A3.3.7.3.3.

A3.3.7.3. Nomenclature. Radioactive materials are grouped according to their form and/or characteristics. A radioactive material may meet the definition of one or more of these groups. These groups include Special Form, Low Specific Activity (LSA), Surface Contaminated Object (SCO), Fissile, Low dispersible radioactive material, and Other form.

A3.3.7.3.1. Special Form.

A3.3.7.3.1.1. Design Requirements. Special Form radioactive material must meet all requirements in 49 CFR Sections 173.403 and 173.469. **(T-0)**.

A3.3.7.3.1.2. Approval of Special Form Radioactive Material.

A3.3.7.3.1.2.1. Each shipper of special form radioactive materials must maintain on file for at least 2 years after the latest shipment, a complete safety analysis, including documentation of any tests demonstrating that the special form material meets the requirements of 49 CFR Section 173.469. **(T-0)**. An IAEA certificate of competent authority issued for the special form material may be used to satisfy this requirement.

A3.3.7.3.1.2.2. Before the first export shipment of a special form radioactive material from the United States, each shipper must obtain a competent authority certificate for the specific material. **(T-0)**. For special form material manufactured outside the United States an IAEA certificate of component authority from the country of origin may be used to meet this requirement. For special form materials manufactured in the United States each shipper must obtain a US competent authority certificate for the specific material. **(T-0)**. Submit each petition for a US competent authority certificate according to 49 CFR Section 173.476 and include the following information:

A3.3.7.3.1.2.2.1. A detailed description of the material or, if a capsule, a detailed description of the contents. Make a particular reference to both physical and chemical states.

A3.3.7.3.1.2.2.2. If a capsule is used, a detailed statement of its design and dimensions, including complete engineering drawings and schedules of material, and methods of construction.

A3.3.7.3.1.2.2.3. A statement of tests performed and their results; evidence based on calculative methods to show that the material is able to pass the tests; or other evidence that the special form radioactive material complies with 49 CFR Section 173.469.

A3.3.7.3.1.2.3. The documentation requirements specified in the bullets above do not apply in those cases where  $A_1$  equals  $A_2$  and the material is not described on the shipping papers as "Radioactive Material, Special Form, N.O.S."



A3.3.7.3.2. Low Specific Activity (LSA) Material. LSA material is classified in one of three groups:

A3.3.7.3.2.1. LSA-I. LSA-I material is:

A3.3.7.3.2.1.1. Uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides.

A3.3.7.3.2.1.2. Solid, unirradiated natural uranium or depleted uranium or natural thorium or their solid or liquid compounds or mixtures.

A3.3.7.3.2.1.3. Radioactive material, for which the  $A_2$  value is unlimited, other than fissile material in quantities not excepted under A3.3.7.3.4.2.

A3.3.7.3.2.1.4. Other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration for exempt materials specified in Table A11.1, or 30 times the General Exemption Values in 49 CFR Section 173.433, Table 8, excluding fissile material in quantities not excepted under A3.3.7.3.4.2.

A3.3.7.3.2.2. LSA-II. LSA material is:

A3.3.7.3.2.2.1. Water with tritium concentration up to 0.8 TBq/L.

A3.3.7.3.2.2.2. Other material in which the activity is distributed throughout and the estimated average specific activity does not exceed  $10^{-4} A_2/g$  for solids and gases, and  $10^{-5} A_2/g$  for liquids.

A3.3.7.3.2.3. LSA-III. LSA-III material is a solid (e.g., consolidated wastes, activated materials), excluding powders, meeting the test requirements of 49 CFR Section 173.468 and in which:

A3.3.7.3.2.3.1. The radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.).

A3.3.7.3.2.3.2. The radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble material, so that even under loss of packaging, the loss of radioactive material per package by leaching, when placed in water for 7 calendar days, would not exceed  $0.1 A_2$ .

A3.3.7.3.2.3.3. The estimated average specific activity of the solid does not exceed  $2 \times 10^{-3} A_2/g$ .

A3.3.7.3.3. Surface Contaminated Object (SCO). SCO is classified in one of two groups; SCO-I and SCO-II.

A3.3.7.3.3.1. SCO-I. A solid object on which:

A3.3.7.3.3.1.1. The nonfixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $4 \text{ Bq/cm}^2$  ( $10^{-4}$  microcurie/ $\text{cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $0.4 \text{ Bq/cm}^2$  ( $10^{-5}$  microcurie/ $\text{cm}^2$ ) for all other alpha emitters.

A3.3.7.3.3.1.2. The fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $4 \times 10^4 \text{ Bq/cm}^2$  ( $1.0$  microcurie/ $\text{cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $4 \times 10^3 \text{ Bq/cm}^2$  ( $0.1$  microcurie/ $\text{cm}^2$ ) for all other alpha emitters.

A3.3.7.3.3.1.3. The nonfixed contamination plus the fixed contamination on the inaccessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $4 \times 10^4 \text{ Bq/cm}^2$  (1 microcurie/ $\text{cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $4 \times 10^3 \text{ Bq/cm}^2$  (0.1 microcurie/ $\text{cm}^2$ ) for all other alpha emitters.

A3.3.7.3.3.2. SCO-II. A solid object on which the limits for SCO-I are exceeded and on which:

A3.3.7.3.3.2.1. The nonfixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $400 \text{ Bq/cm}^2$  ( $10^{-2}$  microcurie/ $\text{cm}^2$ ) for beta and gamma and low toxicity alpha emitters or  $40 \text{ Bq/cm}^2$  ( $10^{-3}$  microcurie/ $\text{cm}^2$ ) for all other alpha emitters.

A3.3.7.3.3.2.2. The fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $8 \times 10^5 \text{ Bq/cm}^2$  (20 microcuries/ $\text{cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $8 \times 10^4 \text{ Bq/cm}^2$  (2 microcuries/ $\text{cm}^2$ ) for all other alpha emitters.

A3.3.7.3.3.2.3. The nonfixed contamination plus the fixed contamination on the inaccessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $8 \times 10^5 \text{ Bq/cm}^2$  (20 microcuries/ $\text{cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $8 \times 10^4 \text{ Bq/cm}^2$  (2 microcuries/ $\text{cm}^2$ ) for all other alpha emitters.

A3.3.7.3.4. Fissile Material. Fissile material includes Uranium-233, Uranium-235, Plutonium-239, Plutonium-241, or any combination of these.

A3.3.7.3.4.1. Specific Requirements for Fissile Shipments.

A3.3.7.3.4.1.1. Packages containing fissile radioactive material which are not excepted according to A3.3.7.3.4.2 must be assigned a criticality safety index (CSI) and a transport index (TI). **(T-0)**.

A3.3.7.3.4.1.2. Fissile material packages and conveyances transporting these packages must satisfy the radiation level restrictions in A3.3.7.10. **(T-0)**.

A3.3.7.3.4.1.3. Except for consignments under exclusive use, the CSI of any packages or overpack may not exceed 50. A fissile material package with CSI greater than 50 must be transported by exclusive use. **(T-0)**.

A3.3.7.3.4.1.4. For non-exclusive use shipments of fissile material packages the total sum of CSIs in a freight container or on a conveyance may not exceed 50.

A3.3.7.3.4.1.5. For exclusive use shipments of fissile material packages the total sum of CSIs in a freight container or on a conveyance may not exceed 100.

A3.3.7.3.4.1.6. Exclusive use shipments of fissile material packages must satisfy the radiation level and administrative requirements of 49 CFR Paragraph 173.441(b). **(T-0)**.

A3.3.7.3.4.1.7. Mixing fissile material packages with other types of radioactive materials, in any conveyance is authorized only if the TI of any single package does not exceed 10, the CSI of any single package does not exceed 50 and the requirements in this paragraph and in A3.3.7.10 are met.

A3.3.7.3.4.1.8. See Attachment 24 for Fissile Class III shipments.

A3.3.7.3.4.2. Fissile Material **Exception**. Fissile materials meeting one of the following are

excepted from the requirements of this manual that apply to fissile material, including the requirements of A3.3.7.3.4., but are subject to all other requirements of this manual, except as noted.

A3.3.7.3.4.2.1. An individual package containing 2 grams or less of fissile material.

A3.3.7.3.4.2.2. An individual packaging containing 15 grams or less of fissile material provided the package has at least 200 grams of solid nonfissile material for every gram of fissile material. Lead, beryllium, graphite, and hydrogenous material enriched in deuterium may be present in the package but is not included in determining the required mass for solid nonfissile material.

A3.3.7.3.4.2.3. Low concentrations of solid fissile material commingled with solid nonfissile material, provide that:

A3.3.7.3.4.2.3.1. There is at least 2000 grams of nonfissile material for every gram of fissile material, and

A3.3.7.3.4.2.3.2. There is no more than 180 grams of fissile material distributed within 360 kg of contiguous nonfissile material. Lead, beryllium, graphite, and hydrogenous material enriched in deuterium may be present in the package but is not included in determining the required mass of solid nonfissile material.

A3.3.7.3.4.2.4. Uranium enriched in uranium-235 to a maximum of 1 percent by weight, and with total plutonium and uranium-233 content of up to 1 percent of the mass of uranium-235, provided that the mass of any beryllium, graphite, and hydrogenous material enriched in deuterium constitute less than 5 percent of the uranium mass.

A3.3.7.3.4.2.5. Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 percent by mass, with a total plutonium and uranium-233 content not exceeding 0.002 percent of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2. The material must be contained in at least a DOT Type A package. **(T-0)**.

A3.3.7.3.4.2.6. Packages containing, individually, a total plutonium mass of not more than 1000 grams, of which not more than 20 percent by mass may consist of plutonium-239, plutonium-241, or any combination of these radionuclides.

A3.3.7.3.5. Low Dispersible Material. Low dispersible material is such that the radiation level at 3m from the unshielded radioactive material does not exceed 10 mSv/h.

A3.3.7.4. General Transportation Requirements.

A3.3.7.4.1. Secure each shipment of radioactive materials to prevent shifting during normal transportation conditions.

A3.3.7.4.2. Except as specifically required by a CAA, a package of radioactive materials may be carried among packaged general cargo without special stowage provisions, if one of the following is met:

A3.3.7.4.2.1. The heat output in watts is not over 0.1 times the minimum package dimension in centimeters. 49 CFR Section 173.448

A3.3.7.4.2.2. The average surface heat flux of the package is not over 15 watts per square meter ( $W/m^2$ ) and the immediately surrounding cargo is not in sacks or bags or otherwise in a form that would seriously impede air circulation for heat removal. 49 CFR Section 173.448

A3.3.7.4.3. Aircraft in which radioactive materials have been spilled may not again be placed in service or routinely occupied until radiation dose rate at any accessible surface is less than 0.005 mSv/h (0.5 mrem/h) and there is no significant removable radioactive surface contamination as determined in A3.3.7.6. When contamination is present or suspected, segregate the package and any other materials it has touched as far as practical from personnel contact until needed radiological advice or assistance is obtained. For personnel safety, take care to avoid possible inhalation, ingestion, or contact with radioactive materials that may have leaked or spilled from its package. Leave any loose radioactive materials and associated packaging materials in a segregated area pending disposal instructions from responsible radiological authorities.

A3.3.7.4.4. Do not offer for military airlift:

A3.3.7.4.4.1. Any Type B(U) or Type B(M) package with an accessible surface temperature in excess of 50 degrees C (122 degrees F).

A3.3.7.4.4.2. Any continuously vented Type B(M) packages, which require external cooling by an auxiliary cooling system or packages subject to operational controls during transport.

A3.3.7.4.4.3. Any liquid pyrophoric radioactive materials.

A3.3.7.4.5. Do not transport exclusive use shipments of packages having a surface radiation level in excess of 2 mSv/h (200 mrem/h) except by special arrangement.

A3.3.7.5. Stowage on Aircraft or Storage Incident to Transportation.

A3.3.7.5.1. Do not ship radioactive Category II-Yellow or Category III-Yellow material on the same aircraft or store in any one area, such as a transit area, terminal building, storeroom, or assembly yard, if the sum of the criticality safety indices in any individual group of packages exceeds 50. (49 CFR Sections 173.447, 173.457, and 175.702)

A3.3.7.5.2. If the total criticality safety indices for all packages, overpacks, or freight containers exceeds 50, separate the packages overpacks, or freight containers into groups. Store groups of these packages so as to maintain a spacing of at least 6 meters (20 feet) from each other group.

A3.3.7.5.3. Ensure separation of Category II-Yellow or Category III-Yellow material from packages containing undeveloped film according to the distances shown in 49 CFR Section 175.706.

A3.3.7.5.4. Radioactive Category II-Yellow and Category III-Yellow material must be separated from persons or animals by a minimum of 2 pallet positions (176 inches) at all times while on the aircraft. **(T-0)**. If the total transport index of all packages on the aircraft exceeds 50, the separation distance between the surfaces of the radioactive materials packages and the surfaces bounding the space occupied by persons or animals must be at least 9 m (30 feet). **(T-0)**.

A3.3.7.5.5. The maximum limits are as follows:

A3.3.7.5.5.1. A maximum transport index of 10 per individual package.

A3.3.7.5.5.2. A maximum criticality safety index of 100 per aircraft.

A3.3.7.5.5.3. A maximum transport index of 200 per aircraft.

A3.3.7.6. Radioactive Contamination.

A3.3.7.6.1. Contamination Control. Keep the level of nonfixed (removable) radioactive contamination on the external surfaces of each package offered for shipment as low as practical.

The level of nonfixed radioactive contamination may be determined by wiping an area of 300 cm<sup>2</sup> of the surface concerned with an absorbent material, using moderate pressure, and measuring the activity on the wiping material. Take sufficient measurements in the most appropriate locations to yield a representative assessment of the nonfixed contamination levels. The amount of radioactivity measured on any single wiping material divided by the surface area wiped and divided by the efficiency of the wipe procedure may not exceed the limits set forth in Table A3.3. at any time during transport. Other methods of assessment of equal or greater efficiency may be used.

A3.3.7.6.2. Inspecting Aircraft for Contamination. Periodically check aircraft used to routinely transport radioactive materials for radioactive contamination. Determine frequency of the checks based on the likelihood of contamination and the extent to which radioactive materials are carried aboard the aircraft. Take aircraft out of service if the radiation dose rate at any accessible surface is 0.005 mSv/h (0.5 mrem/h) or if there is significant removable radioactive surface contamination as outlined above. Table A3.3. Removable External Radioactive Contamination--Wipe Limits.

**Table A3.3. Removeable External Radioactive Contamination--Wipe Limits**

Contaminant	Maximum permissible limits		
	Bq/cm <sup>2</sup>	uCi/cm <sup>2</sup>	dpm/cm <sup>2</sup>
Beta and gamma emitters and low toxicity alpha emitters.	4	10 <sup>-4</sup>	220
All other alpha emitting radionuclides	0.4	10 <sup>-5</sup>	22

A3.3.7.7. Transport Index and Criticality Safety Index (CSI).

A3.3.7.7.1. Transport Index – Radiation Exposure Control.

A3.3.7.7.1.1. The TI for a package, overpack, or freight container is the number derived using the following procedure:

A3.3.7.7.1.1.1. Determine the maximum radiation level at a distance of 1 m from the external surfaces of the package, overpack, or freight container. If the radiation level is determined in units of millisievert per hour (mSv/h), then multiply the value by 100 to convert to units of millirem per hour (mrem/h). If the radiation level is determined in units of millirem per hour, then the value is not changed. For uranium and thorium ores and concentrates, the maximum radiation dose rate at any point 1 m from the external surface of the load may be taken as follows:

A3.3.7.7.1.1.1.1. For ores and physical concentrates of uranium and thorium - 0.4 mSv/h (40 mrem/h).

A3.3.7.7.1.1.1.2. For chemical concentrates of thorium – 0.3 mSv/h (30 mrem/h).

A3.3.7.7.1.1.1.3. For chemical concentrates of uranium, other than uranium hexafluoride – 0.02 mSv/h (2 mrem/h).

A3.3.7.7.1.1.2. For freight containers, multiply the value determined in **A3.3.7.7.1.1.1.** by the

appropriate factor from **Table A3.4**.

**Table A3.4. Multiplication Factors for Freight Containers**

<b>Largest Cross-Sectional Area of the Freight Container</b>	<b>Multiplication Factor</b>
$\leq 1 \text{ m}^2$	1
$> 1 \text{ m}^2$ to $\leq 5 \text{ m}^2$	2
$> 5 \text{ m}^2$ to $\leq 20 \text{ m}^2$	3
$> 20 \text{ m}^2$	10

A3.3.7.7.1.1.3. Round the figure obtained in A3.3.7.7.1.1.1 and A3.3.7.7.1.1.2 up to the first decimal place (e.g., 1.13 becomes 1.2), except that a value of 0.05 or less may be considered as zero.

A3.3.7.7.1.2. Transport Index – Consignment. Determine the transport index for each overpack or freight container as either the sum of the TIs of all the packages contained, or by direct measurement of radiation level, except in the case of non-rigid overpacks for which the transport index is determined as the sum of the TIs of all the packages only.

A3.3.7.7.2. Determination of Criticality Safety Index (CSI). The Criticality Safety Index (CSI) for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR Part 71. The CSI for an overpack, freight container, or consignment containing fissile material packages is the sum of the CSIs of all the fissile material packages contained within the overpack, freight container or consignment.

A3.3.7.8. General Package Design Requirements.

A3.3.7.8.1. The packaging for the transport of radioactive material must provide the following:

A3.3.7.8.1.1. Containment to prevent contamination of people and the environment.

A3.3.7.8.1.2. Protection from radiation. The type of packaging depends on the amount and type of radiation (alpha, beta, gamma, neutron).

A3.3.7.8.1.3. Prevention of criticality in fissile material.

A3.3.7.8.1.4. Protection from internal heat generation. **(T-0)**.

A3.3.7.8.2. Design each package used for shipment of radioactive materials so that:

A3.3.7.8.2.1. The package can be easily handled and properly secured during transport.

A3.3.7.8.2.2. Each lifting attachment on the package, when used in the intended manner, with a minimum safety factor of three, does not impose an unsafe stress on the structure of the package. In addition, design the lifting attachment so that failure under excessive load does not impair the ability of the package to meet all other requirements of this attachment and Attachment 11. Remove, make inoperable for transport, or design with equivalent strength for lifting each attachment or other feature on the outer surface of the packaging that could be used to lift the package.

- A3.3.7.8.2.3. The external surface, as far as practical, may be easily decontaminated.
- A3.3.7.8.2.4. The outer layer of packaging avoids, as far as practicable, pockets or crevices where water might collect.
- A3.3.7.8.2.5. Each feature that is added to the package at the time of transport, and is not a part of the package, does not reduce the safety of the package.
- A3.3.7.8.2.6. The package will be capable of withstanding the effects of any acceleration, vibration, or vibration resonance that may occur during transportation without any deterioration in the effectiveness of any of the closing devices or in the integrity of the package and without loosening or unintentionally releasing the nuts, bolts, or other securing devices. **(T-0)**.
- A3.3.7.8.2.7. The package will be capable of withstanding, without leakage, an internal pressure that produces a pressure differential of not less than the maximum normal operating pressure plus 95 kPa (14 psi). **(T-0)**.
- A3.3.7.8.2.8. The packaging materials and any components will be physically and chemically compatible with each other and the contents. **(T-0)**.
- A3.3.7.8.2.9. All valves through which the package contents could escape will be protected against unauthorized operation. **(T-0)**.
- A3.3.7.9. Additional Packaging Design Requirements for Type A and B Packages.
- A3.3.7.9.1. In addition to meeting the general design requirements each Type A packaging must also meet the design requirements of 49 CFR Section 173.412 and test requirements of 49 CFR Sections 173.461 and 173.465. **(T-0)**.
- A3.3.7.9.2. Each Type B(U) or Type B(M) package must meet the design and test requirements of 10 CFR Part 71. **(T-0)**.
- A3.3.7.9.3. Each shipper of a DOT 7A package must maintain on file for at least 1 year after the latest shipment complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that specification. **(T-0)**. Unless otherwise required, the shipper is exempt from maintaining this documentation if it is maintained by the Inventory Control Point (national stock number managing activity).
- A3.3.7.10. Radiation Level and Thermal Limitations.
- A3.3.7.10.1. Design each package of radioactive materials so that:
- A3.3.7.10.1.1. The radiation level is not more than 2 mSv/h (200 mrem/h) at any point on the external surface of the package. 49 CFR Section 173.441
- A3.3.7.10.1.2. The transport index is not over 10. 49 CFR Section 173.441
- A3.3.7.10.2. Design, construct, and load each package of radioactive material so that:
- A3.3.7.10.2.1. The heat generated within the package due to the radioactive contents will not, at any time during transportation, affect the integrity of the package under normal transportation conditions. **(T-0)**.
- A3.3.7.10.2.2. The temperature of the accessible external surfaces of the loaded package will not, assuming still air in the shade at an ambient temperature of 38 degrees C (100 degrees F), exceed

either a temperature of 50 degrees C (122 degrees F) in other than an exclusive use shipment or 85 degrees C (185 degrees F) in an exclusive use shipment. **(T-0)**.

A3.3.7.11. Types of Packaging. The types of packages used for radioactive material which are subject to the activity limits and material restrictions defined in A11.3., A11.5.8., A11.6.1., A11.7., and A11.10.1., and meet the corresponding requirements are as follows. Packages containing fissile material or uranium hexafluoride are subject to additional requirements (see A3.3.7.3.4. and A3.3.7.18.).

A3.3.7.11.1. Excepted Packages.

A3.3.7.11.2. Industrial Package, Type 1 (Type IP-1 package).

A3.3.7.11.3. Industrial Package, Type 2 (Type IP-2 package).

A3.3.7.11.4. Industrial Package, Type 3 (Type IP-3 package).

A3.3.7.11.5. Type A Packages.

A3.3.7.11.6. Type B(U) and B(M) packages.

A3.3.7.11.7. Type C Packages.

A3.3.7.12. Subsidiary hazards.

A3.3.7.12.1. With the **exception** of UN2908, UN2909, UN2910, UN2911, UN2977, and UN2978, radioactive material with a subsidiary hazard must meet the following:

A3.3.7.12.1.1. Be labeled with subsidiary hazard labels corresponding to each subsidiary hazard exhibited by the material. Affix corresponding placards to transport units in accordance with the provisions of Attachment 16.

A3.3.7.12.1.2. Be allocated to Packing Groups I, II, or III, and if appropriate, by application of the grouping criteria in A4.2.4. corresponding to the nature of the predominant subsidiary hazard.

A3.3.7.12.2. The basic description required on the Shipper's Declaration for Dangerous Goods must include a description of these subsidiary hazards (e.g., "3, 6.1"), the name of the constituents which most predominantly contribute to the subsidiary hazard(s), and where applicable, the packing group. **(T-0)**.

A3.3.7.12.3. Transport radioactive material with a subsidiary hazard of Division 4.2 (Packing Group I) in Type B packages. Radioactive material with a subsidiary hazard of Division 2.1 is forbidden from transport on passenger aircraft. Radioactive material with a subsidiary hazard of Division 2.3 is forbidden from transport on passenger and cargo aircraft without a waiver or CAA, as appropriate.

A3.3.7.13. Radioactive Material in Excepted Packages. Radioactive material in excepted Packages (UN2908 [Empty Packagings], UN2909, UN2910, and UN2911) are not regulated by this manual when prepared according to A11.5. and marked according to A14.4.6.2. If this material meets the definition and criteria of other classes/divisions, prepare and certify the material according to the applicable Identification Number (UN, NA, ID).

A3.3.7.14. Different Radionuclides in One Package. When different radionuclides are packaged together in the same package, determine the total activity in accordance with 49 CFR Paragraph 173.433(d).



A3.3.7.15. Radioactive Material Packed with Other Items. A package containing radioactive material must not contain any other items except such articles and documents necessary for the use of the radioactive material, provided there is no interaction between them and the packaging or the radioactive contents that would reduce the safety of the package. **(T-0)**. LSA and SCO, however, may be packed with other items.

A3.3.7.16. Overpacks Containing Radioactive Material. The following applies:

A3.3.7.16.1. Packages of radioactive material may be combined together in an overpack for transport, provided that each package contained inside is packaged in accordance with this manual. Fissile material, however, which exceeds a transport index of zero must not be placed in an overpack. **(T-0)**.

A3.3.7.16.2. Only the original shipper of the packages contained in an overpack is permitted to use the method of direct measurement of radiation level to determine the transport index of the overpack.

A3.3.7.17. Requirements for Foreign-Made Packages. In addition to the requirements of Attachment 11, each shipper of a foreign-made Type B(U), Type B(M), Type C, Type CF, Type H(U), Type H(M) or fissile material package for which a competent authority certificate is required by the IAEA "Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1" must meet the requirements of 49 CFR Section 173.473. **(T-0)**.

A3.3.7.18. Uranium Hexafluoride (Fissile and Low Specific Activity). In addition to any other applicable requirements of Attachment 11, package uranium hexafluoride, fissile or low specific activity, according to the requirements identified in 49 CFR Section 173.420:

A3.3.7.18.1. Clean packages before initial filling and during periodic inspection and tests.

A3.3.7.18.2. Design, fabricate, inspect, test, and mark packagings according to 49 CFR Section 173.420.

A3.3.7.18.3. Ensure uranium hexafluoride is in solid form when offered for transportation.

A3.3.7.18.4. The volume of the solid uranium hexafluoride at 20 degrees C (68 degrees F) must not exceed 61 percent of the volumetric capacity of the package. **(T-0)**.

A3.3.7.18.5. Ensure the pressure in the package at 20 degrees C (68 degrees F) is less than 101.3kPa (14.8 psig).

A3.3.7.18.6. Periodically inspect, test, and mark packages of uranium hexafluoride in accordance with 49 CFR Section 173.420.

A3.3.7.18.7. Perform repairs to package(s) of uranium hexafluoride according to 49 CFR Section 173.420.

A3.3.8. Class 8.

A3.3.8.1. General Handling Instructions for Corrosive Materials.

A3.3.8.1.1. Store corrosive materials in a cool, well ventilated area away from sources of heat and oxidizing agents.

A3.3.8.1.2. Both the vapor and the liquid are corrosive and irritating and may cause burns to the body and damage to aircraft.

A3.3.8.1.3. Properly placard the storage area.

A3.3.8.1.4. Ensure protective masks or respirators, rubber gloves, goggles, and other protective clothing as required are readily available, and worn when handling leaking packages. Contact Safety and/or Medical Services as appropriate for specific protective requirements.

A3.3.8.2. Packaging. Unless otherwise specified by a packaging paragraph, package a liquid material identified as PG III in Table A4.1 in a container that meets the PG I or II performance level.

A3.3.8.3. Packed with Other Materials. Do not pack bottles containing corrosive liquids in the same outer packaging with other hazardous materials.

A3.3.8.4. Hypochlorite Solution. Hypochlorite solution is not regulated by this manual if the chemical and physical properties, when tested, do not meet the criteria established for corrosive material. Comply with paragraph A3.1.16.4. to identify non-regulated hypochlorite solutions (e.g., liquid bleaches tested according to 49 CFR Section 173.137).

A3.3.8.5. Fuel Cell Cartridges.

A3.3.8.5.1. Fuel cell cartridges design types using liquids as fuels must pass an internal pressure test at a pressure of 15 psig [100 kPa (gauge)] without leakage. **(T-0)**.

A3.3.8.5.2. Each fuel cell cartridge design type must pass a 1.2 m drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss to the contents. **(T-0)**.

A3.3.8.5.3. A fuel cell cartridge may contain an activator provided it's fitted with two independent means of preventing unintended mixing with the fuel during transportation.

A3.3.9. Class 9.

A3.3.9.1. General Handling Instructions. Class 9 materials present a hazard during transportation but do not meet the definition of any other hazard class. Class 9 materials present a unique and equally hazardous situation during air transport. Personnel exercise care when handling this material and ensure specific handling instructions located in the packaging paragraphs are observed.

A3.3.9.2. Lithium Batteries. Lithium cells or batteries must be of a design type proven to meet the requirements of the UN Manual of Tests and Criteria that were in effect based on the date of manufacture. **(T-0)**. Manufacturers must maintain a record of satisfactory completion of these tests prior to offering the cell or battery for transport. **(T-0)**. Manufacturers retain this record for as long as that lithium battery design type is offered for transportation and for one year thereafter. Activities that assemble cells or create battery types that differ from the original tested batteries (see UN Manual of Tests and Criteria, Section 38.3.2.2), are responsible for battery testing. Those activities must maintain and make available a test summary. **(T-0)**. The test summary must meet the requirements of 49 CFR Subparagraph 173.185(a)(3). **(T-0)**.

A3.3.9.2.1. Lithium Batteries must:

A3.3.9.2.1.1. Incorporate a safety venting device or otherwise be designed in a manner that precludes a violent rupture under conditions normally incident to transportation.

A3.3.9.2.1.2. Be equipped with an effective means of preventing external short circuits.

A3.3.9.2.1.3. Be equipped with an effective means to prevent dangerous reverse current flow (e.g., diodes, fuses, etc.) if a battery contains cells or a series of cells that are connected in parallel.

A3.3.9.2.1.4. Be packed in a manner to prevent:

A3.3.9.2.1.4.1. Short circuits;

A3.3.9.2.1.4.2. Damage caused by movement or placement within the package; and,

A3.3.9.2.1.4.3. Accidental activation of the equipment. **(T-0).**

A3.3.9.2.2. Lithium Batteries identified as defective for safety reasons (e.g., manufacturer recall) or have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are prohibited from air movement.

A3.3.9.2.3. Excepted Lithium Batteries. Lithium batteries are not subject to any other requirements of this manual when prepared according to this section.

A3.3.9.2.3.1. Lithium ion cells limited to not more than 20Wh and batteries limited to not more than 100 Wh. After December 31, 2015, each lithium ion battery subject to this provision must be marked with the Watt-hour rating on the outside case. **(T-0).**

A3.3.9.2.3.2. Lithium metal or alloy cells limited to not more than 1 g and batteries limited to not more than 2 g.

A3.3.9.2.3.3. Pack cells and batteries in strong rigid outer packagings that meet the requirements of Section A3.1. and:

A3.3.9.2.3.3.1. Completely encloses the cell or battery in a manner that prevents accidental activation of the power source during transport.

A3.3.9.2.3.3.2. Except when lithium cells or batteries are packed with, or contained in, equipment, is capable of withstanding a 1.2 m drop test in any orientation without damage to the cells or batteries, shifting that allows cell to cell or battery to battery contact, or a release of the contents.

A3.3.9.2.3.3.3. Except when lithium cells or batteries are packed with, or contained in, equipment, each package must not exceed 30 kg (66 pounds) gross weight. **(T-0).**

A3.3.9.2.3.3.4. For cells and batteries installed in equipment, pack the equipment in strong rigid outer packagings constructed of suitable materials of adequate strength and design in relation to the packaging's capacity and its intended use unless the cell or battery is afforded equivalent protection by the equipment in which it is contained.

A3.3.9.2.3.3.5. Lithium cells and batteries of UN3090 and UN3480 may not exceed the limits in the following table. The limits on the maximum number of batteries and maximum net quantity of batteries in the following table may not be combined in the same package:

**Table A3.5. Package limits for Excepted Lithium Batteries**

Contents	Lithium metal cells and/or batteries with a	Lithium metal cells with a lithium content	Lithium metal batteries with a lithium	Lithium ion cells and/or batteries with a Watt-hour	Lithium ion cells with a Watt-hour rating	Lithium ion batteries with a Watt-hour
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	lithium content not more than 0.3 g	more than 0.3 g but not more than 1g	content more than 0.3 g but not more than 2 g	rating not more than 2.7 Wh	more than 2.7 Wh but not more than 20 Wh	rating more than 2.7 Wh but not more than 100 Wh
Maximum number of cells/batteries per package	No Limit	8 cells	2 batteries	No Limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a	2.5 kg	n/a	n/a

A3.3.9.2.3.4. For lithium batteries packed with, or contained in, equipment, the number of batteries in each package is limited to the minimum number required to power the piece of equipment, plus two spare sets. A “set” of cells or batteries is the number of individual cells or batteries that are required to power each piece of equipment.

A3.3.9.2.3.5. Mark each package with the lithium battery mark as required by A14.4.8.5. The mark is not required for a package containing button cell batteries installed in equipment (including circuit boards) or when no more than four lithium cells or two lithium batteries are installed in the equipment. Markings do not prohibit the movement of passengers on military or contracted cargo aircraft.

A3.3.9.2.4. A lithium cell or battery that does not conform to the provisions of this manual may be transported only under conditions approved by the competent authority.

A3.3.9.3. Magnetized Material. Any package that has a magnetic field strength of more than 0.00525 gauss measured at 4.5 m (15 ft) from any surface of the package is forbidden on military aircraft.

A3.3.9.4. Vehicles and SE.

A3.3.9.4.1. Fuel levels for vehicles, engines, equipment, and other mechanical devices are determined by the technical directive used to prepare the item for air movement. However, fuel levels cannot exceed limits established in the packaging paragraph. When technical directives do not specify fuel levels for shipment, the requirements of the packaging paragraph apply. Actual fuel levels are determined by a fuel gauge. In absence of an operational fuel gauge, use a graduated dip stick. If positive means is not available to accurately determine fuel level, drain or siphon the tank. The tank may be refilled to appropriate level in the presence of an inspector (see paragraph A28.1.2.).

A3.3.9.4.2. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment unless authorized by paragraph A5.3.

A3.3.9.4.3. Fire Suppression Systems. Vehicles and equipment integral fire suppression systems are safed, secured, or disabled to prevent accidental activation during transportation.

A3.3.9.4.4. The descriptions for engines installed in SE have changed. UN identification numbers and proper shipping names for engines or machinery internal combustion and assigned a hazard classification based on the type of fuel used.

A3.3.9.5. Unregulated Engines and Fuel Components. The following items when drained, purged, and containing no other hazardous materials are nonhazardous for transportation. Comply with paragraph A3.1.16.4.

A3.3.9.5.1. Vehicles and internal combustion engines, with or without fuel tanks attached, prepared for shipment according to applicable technical directives or standards. Fuel systems including carburetors, pumps, controls, and fuel tanks must be completely drained, purged, and sealed with appropriate pressure seal type plug and caps with gaskets and “O” rings. **(T-0)**.

A3.3.9.5.2. Aircraft engines which are drained and purged according to the responsible technical manual, and containing no other hazardous materials.

A3.3.9.5.3. Fuel tanks, and cells that are drained, purged, and sealed according to the applicable technical directive.

A3.3.9.5.4. All preserved and packed serviceable fuel assemblies, for example, carburetors, fuel pumps, filters, etc., that are drained and purged of all fuel. In addition, seal fuel assemblies with proper caps, plugs, and covers according to the applicable technical directive. Use a barrier bag to contain residual purging fluid. Mark the type of purging fluid used and the flash point on the outer container.

A3.3.9.6. Dry Ice.

A3.3.9.6.1. Properties of Carbon Dioxide, Solid. At temperatures above -78.5 degrees C (-109.3 degrees F) dry ice sublimates and releases carbon dioxide fumes. If the carbon dioxide concentration in the aircraft is over 0.5 percent, crewmembers may suffer shortness of breath. Carbon dioxide concentrations of 3.0 percent are endurable from 1/2 to 1 hour. Concentrations of 5.0 percent are dangerous from 1/2 to 1 hour and concentrations of 9.0 percent are fatal from 5 to 10 minutes. Carbon dioxide is heavier than air; therefore, the highest concentration is at or near floor level. Caution crewmembers against lying on the cargo compartment floor or remaining in the cargo compartment for a prolonged period. If symptoms of overexposure are noted, use oxygen and increased ventilation to provide rapid relief.

A3.3.9.6.2. Seat passengers forward of and separated by the greatest distance possible (minimum one full pallet position) from dry ice. EXCEPTION: KC-46A will seat passengers behind cargo pallet positions and must be separated by the greatest distance possible (minimum one full pallet position) from dry ice.

A3.3.9.6.3. Ensure passengers and crewmembers do not occupy the same pallet position as dry ice.

A3.3.9.6.4. Do not carry dry ice (exceeding passenger acceptable carry-on quantities specified in Attachment 22) in any upper deck compartment.

A3.3.9.6.5. Vent the aircraft cargo compartment to the greatest extent possible allowed by the flight profile and environmental conditions.

A3.3.9.6.6. Quantity limits specified in this paragraph apply to all personnel, other than aircrew members, who occupy the cargo compartment with dry ice. Aircrew members take precautions to

prevent oxygen deprivation (e.g., oxygen masks) when entering cargo compartments exceeding quantity limits specified in this paragraph.

A3.3.9.6.7. **Pressurized Aircraft.** For pressurized aircraft, the amount of dry ice that can be safely shipped by air regardless of the type container used depends on the sublimation rate of the ice, the volume of the aircraft, and the number of air changes per hour. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulin during shipment to the greatest extent possible. To determine the amount of dry ice that can be safely shipped by air, use the formula in Figure A3.6. The formula in Figure A3.6. does not apply to C-130 Aircraft. Aircraft specific limits for C-17 aircraft are shown in Figure A3.7 and C-5 aircraft are shown in Figure A3.8.

**Figure A3.6. Formula for Determining Dry Ice Limitations.**

$X = \frac{VA(0.47)}{32.3}$
Where:
V = Volume of aircraft
A = Air changes per hour
X = Maximum dry ice loading in pounds

**Figure A3.7. Maximum Quantities for Dry Ice Aboard C-17 Aircraft.**

	<b>Maximum Amount in Pounds</b>	<b>Maximum Amount in Kilograms</b>
Two Packs High Flow Setting at 35,000 feet	3,430	1,556
Two Packs High Flow Setting at 10,000 feet or less	2,080	943
Two Packs Normal Flow Setting at 35,000 feet	1,880	853
Two Packs Normal Flow Setting at 10,000 feet or less	1,040	472
One Pack High Flow Setting at 35,000 feet	1,720	780
One Pack High Flow Setting Holding at 10,000 feet	1,040	472
<b>Note:</b>  Above quantities are the maximum amounts for operating with no passengers in the cargo compartment. Limitation with passengers in the cargo compartment is set at 1040 pounds (472 kilograms) for both high and normal flow.		

**Figure A3.8. Maximum Quantities for Dry Ice Aboard C-5 Aircraft.**

	<b>Maximum Amount in Pounds</b>	<b>Maximum Amount in Kilograms</b>
Cruise(mach 0.5 and up)and altitudes up to 30,000 feet (Note 1)	4,700	2,132
Cruise (mach 0.6 and up) and altitudes up to 30,000 feet (Note 1)	3,120	1,415
During Non-pressurized up to 10,000 feet (Note 2)	6,500	2,948
During Ground Operations with one auxiliary power unit (Note 3)	2,950	1,338
<b>Notes:</b> 1. Operate the Environmental Control System (ECS) with “both” air conditioning units on a “Normal” flow control valve and the “Intermediate” setting on the alternative air valve. 2. Open the auxiliary vent value for this condition. 3. The air turbine motor is at idle. Open the auxiliary vent valve for this condition.		

A3.3.9.6.8. Aircraft on Minimum Air Changes. When aircraft is on minimum air changes per hour, safe loads are drastically reduced. When the aircraft is on the ground longer than 45 minutes, recalculate the safe quantity using new numbers of air changes per hour.

**Table A3.6. Dry Ice Limitations When Aircraft is on Minimum Air Changes.**

KC-135 Aircraft	Maximum Amount	
	In Pounds	In Kilograms
	200	91

A3.3.9.6.9. KC-10 Aircraft. Dry ice may be carried in the KC-10 cargo compartment under the following aircraft operating conditions:

A3.3.9.6.9.1. If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin. Turn Cargo Smoke Light on per KC-10 flight manual T.O. 1C-10(K)A-1, Section II. Include "Smoke Source is not Accessible" portion of procedure except do not put cabin pressure control in manual and do not depressurize cabin.

A3.3.9.6.9.2. Environmental curtain at station 615 or 879: If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin, turn cargo smoke light on, mixed passenger and cargo configuration per KC-10 flight manual T.O 1C-10(k) A-1, section II, except do not initiate firefighting procedures.

A3.3.9.6.9.3. During cargo loading, the following procedures apply to minimize carbon dioxide concentration:

A3.3.9.6.9.3.1. Ensure APU is running and "both" air conditioning packs are operating.

A3.3.9.6.9.3.2. Open number 4 passenger service door for additional ventilation.

A3.3.9.6.9.3.3. Open all air inlets in the aerial refueling operator's station and close aerial refueling operators hatch.

A3.3.9.6.9.3.4. Ensure environmental curtain is closed before flight.

A3.3.9.6.9.3.5. Transport maximum quantities as shown in Figure A3.9..

**Figure A3.9. Maximum Quantities for Dry Ice Aboard KC-10 Aircraft.**

	Maximum amount in Pounds	Maximum Amount in Kilograms
No environmental curtain (27 pallet all-cargo configuration):		
Both packs operating	2,295	1,041
One pack operating	1,251	568
Environmental curtain at station 615:		
Both packs operating	1,782	808
One pack operating	969	440
Environmental curtain at station 879:		
Both packs operating	1,204	546
One pack operating	653	296

A3.3.9.6.10. C-130 Aircraft. Safety Considerations. Dry ice may be transported aboard C-130 Aircraft if the following conditions are met:

A3.3.9.6.10.1. Crewmembers should be instructed to monitor themselves and others for any signs/symptoms of possible overexposure to carbon dioxide gas, to include shortness of breath, dizziness, confusion, cognitive impairment/poor decision-making, headaches, or nausea.



A3.3.9.6.10.2. Operate the Environmental Control System (ECS) with both air conditioning packs on. In the event of an air-pack failure the air exchange rate is reduced by half, which reduces the amount of allowable dry ice by half. If this occurs during flight, decrease cruise altitude to the lowest acceptable altitude for safe flight in order to enhance ventilation. Manually open the CROSS FLOW VALVE to allow maximum air interchange between the flight station and cargo compartment.

A3.3.9.6.10.3. If symptoms of CO<sub>2</sub> overexposure become evident and are not mitigated by reducing cruise altitude, the aircraft should land as soon as possible. Supplemental oxygen, using quick-don masks or similar, are to be used if necessary.

A3.3.9.6.10.4. The formula presented in Figure A3.6 does not apply to C-130 aircraft.

A3.3.9.6.10.5. C-130H Aircraft. Figure A3.11 is for C-130H variants with a quantity of two (2) 70 pound per minute air conditioning packs only.

**Table A3.7. Maximum Quantities for Dry Ice Aboard C-130H Aircraft with two (2) 70 lb/min Air Packs.**

Altitude Ceiling [ft]	Allowable Amount of Dry Ice [lb]
10,000	1,500
15,000	1,250
20,000	1,100
25,000	1,030
30,000	970

A3.3.9.6.10.6. C-130J Aircraft. Figure A3.12 is for C-130J variants only.

**Table A3.8. Maximum Quantities for Dry Ice Aboard C-130J Aircraft**

Altitude Ceiling [ft]	Allowable Amount of Dry Ice [lb]
10,000	2,470
15,000	2,080
20,000	1,830
25,000	1,710
30,000	1,620

A3.3.9.6.10.6.1. Use of wing and empennage anti-icing on C-130J aircraft deactivates the cargo compartment Environmental Control System. Refer to A3.3.9.6.10.2. when wing and empennage anti-icing is used at any time other than during taxi, takeoff and descent.

A3.3.9.6.10.7 added: For C-130 aircraft other than C-130H equipped with two (2) 70 pound per minute air conditioning packs and C-130J aircraft, the maximum allowable amount of dry ice is 600 pounds (272 kilograms) at any given altitude.

A3.3.9.6.11. KC-46 Aircraft. Safety Considerations. Dry ice may be transported aboard the KC-46 aircraft if the following conditions are met:

A3.3.9.6.11.1. Crewmembers should monitor themselves or others for any signs/symptoms of possible overexposure to carbon dioxide gas, to include shortness of breath, dizziness, confusion, cognitive impairment/poor decision making, headaches, or nausea.

A3.3.9.6.11.2. Both Air Conditioning Packs must be operational. In the event of an air conditioning pack failure in-flight, decrease altitude to FL250 or below to maintain proper air exchange rates.

A3.3.9.6.11.3 If symptoms of CO<sub>2</sub> overexposure become evident and are not mitigated by reducing cruise altitude, the aircraft should land as soon as possible. Supplemental oxygen, using quick-don masks or similar, are to be used if necessary.

**Table A3.9. Maximum Quantities for Dry Ice Aboard KC-46A Aircraft**

Aircraft Configuration	Maximum Amount in Pounds	Maximum Amount in Kilograms
Freighter or Passenger Mode	1481	672
Combi Mode (Movable Smoke Barrier at Station 676 or aft)	267	121

A3.3.9.6.12. Non-pressurized Aircraft. For non-pressurized aircraft, the amount of dry ice that can be safely shipped by air depends upon the sublimation rate and ventilation of the aircraft. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulins. Provide maximum ventilation during the shipment. With unpressurized cargo compartment, the quantity of dry ice that can be transported is unlimited if the fumes are vented overboard the aircraft.

A3.3.9.6.13. AMC Contract Aircraft. Do not transport more than 440 pounds (200 kilograms) of dry ice in a cargo compartment of AMC contract aircraft without prior approval from the individual air carrier.

A3.3.9.6.14. Packaging. Use fiberboard boxes, polystyrene foam containers, or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging. Use UN specification packaging when required by this manual.

A3.3.9.7. Consumer Commodities. Ensure inner packagings containing hazardous liquids reclassified as a Consumer Commodity are capable of meeting internal air gauge pressure requirements of A3.1.7.1.

**A3.4. Household Goods (HHG) Shipments.** DTR 4500.9-R, Part IV, *Personal Property* establishes requirements for the movement of HHG and specifies that hazardous materials are not authorized for military airlift. **Exception:** engine power-driven equipment (motorcycle, moped, lawnmower, boat, snowmobile, etc.) may be transported as HHG under the following requirements:

A3.4.1. Completely drain all fuel.

A3.4.2. Run until the engine stalls.

A3.4.3. Drain all oil and cooling fluids.

A3.4.4. Allow fuel tanks and lines to remain open for at least 24 hours prior to pickup.

- A3.4.5. Disconnect non-spillable gel-type batteries and tape the connection ends to prevent short circuit. Batteries may remain in the equipment holder, but ensure they are firmly secured and remain upright in the shipping container. Do not ship batteries with acid or alkali.
- A3.4.6. Engine power-driven equipment prepared in this manner are not regulated by this manual. A Shipper's Declaration for Dangerous Goods is not required.

## Attachment 4

### ITEMS LISTING

#### A4.1. General Requirements. This attachment contains:

- A4.1.1. An alphabetical listing of the hazardous materials subject to the requirements of this manual. See paragraph A3.1.16. for material determined to be nonhazardous.
- A4.1.2. Classification criteria for hazard classes. See Attachment 1 for definitions.
- A4.1.3. Identification of items prohibited for military air transportation.
- A4.1.4. Listing of Hazardous Substances and applicable Reportable Quantities.
- A4.1.5. Quantity limits in this manual may not follow other HMR (with state approval when required) requirements/limits.

#### A4.2. Classifying Hazardous Materials.

- A4.2.1. Hazard Class Names. The hazard class and division is a numerical identification which describes the class (type) of primary hazard involved and if appropriate, its division within the class. Use the Hazardous Material Information Resource System (HMIRS), product Safety Data Sheet, or other manufacturer's information if assistance in determining the hazard classification is needed. Figure A4.1 lists class and division numbers and the corresponding class and division names.

**Figure A4.1. Hazard Classes.**

HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME	HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME
1.1	Explosives (with mass explosion hazard)	4.1	Flammable solid
1.2	Explosives (with a projection hazard)	4.2	Spontaneously combustible material
1.3	Explosives (with predominately a fire hazard)	4.3	Dangerous when wet material
1.4	Explosives (with no significant blast hazard)	5.1	Oxidizer
1.5	Very insensitive explosives; blasting agents	5.2	Organic peroxide
1.6	Extremely insensitive detonating substances	6.1	Poisonous (toxic) material
2.1	Flammable gas	6.2	Infectious substances (etiologic agents)
2.2	Nonflammable gas	7	Radioactive material
2.3	Poisonous gas	8	Corrosive material
3	Flammable liquid	9	Miscellaneous hazardous material

A4.2.2. Items Not Specifically Listed. If a material is not specifically listed in Table A4.1., determine the PSN by comparing the characteristics of the items with the definitions of the various hazard classes in this manual. Assign a "Not Otherwise Specified" (N.O.S.) name based on the hazard class of the material. Examples are: "FLAMMABLE LIQUID, N.O.S.; CORROSIVE SOLID, N.O.S." Attachment 1 contains hazardous class definitions. Determine the appropriate technical name according to A4.5.2.

A4.2.3. Articles containing dangerous goods N.O.S. Classify articles which do not have an existing proper shipping name and which contain only one or more dangerous goods as a residue or as an integral element of the machinery or apparatus that cannot be removed for the purpose of transport as follows:

A4.2.3.1. When the article meets the provisions of UN3363, Dangerous goods in apparatus or Dangerous goods in machinery, use UN3363

A4.2.3.2. When the article cannot meet the UN3363 provision, use "articles containing \*\*\*\*" classified under the proper shipping name for the dangerous goods they contain. For the purposes of this section "article" means machinery, apparatus or other devices containing dangerous goods (or residues thereof) that are an integral element of the article, necessary for its functioning. An inner packaging is not an article.

A4.2.3.3. Articles may in addition contain batteries. Lithium batteries that are integral to the article must be of a type proven to meet the testing requirements of the UN Manual of Tests and Criteria, Part III, subsection 38.3. **(T-0)**. Pre-production prototype articles containing lithium batteries or for a small production run, consisting of not more than 100 such articles, are authorized without the running the 38.3 tests.

A4.2.3.4. This section does not apply to articles for which a more specific proper shipping name already exists in Table A4.1.

A4.2.3.5. This section does not apply to dangerous goods of Class 1, Division 6.2, Class 7 or radioactive material contained in articles.

A4.2.3.6. Assign articles containing dangerous goods to the appropriate class or division determined by the hazards present using the precedence of hazard from paragraph A4.2.4. for each of the dangerous goods contained in the article. If dangerous goods classified as Class 9 are contained within the article, all other dangerous goods present in the article are considered to present a higher hazard.

A4.2.3.7. Subsidiary hazards are representative of the primary hazard posed by the other dangerous goods contained within the article. If the article contains more than one item of dangerous goods and these could react dangerously with one another during transport, ensure each of the dangerous goods are enclosed separately.

A4.2.4. Tentative PSN Assignment. A material for which the hazard class is determined by testing, or a material that is a hazardous waste, the shipper may assign a tentative shipping name.

A4.2.4.1. Base the tentative PSN on:

A4.2.4.1.1. The defining criteria of the hazard class.

A4.2.4.1.2. The hazard precedence prescribed in **A4.2.4**.

A4.2.4.1.3. The shipper's knowledge of the material.

A4.2.4.1.4. **A3.3.1.4** for new explosives.

A4.2.4.2. For a sample of a material other than a waste, meet the following:

A4.2.4.2.1. Except when the word "Sample" already appears in the proper shipping name, ensure the word "Sample" appears as part of the proper shipping name or in association with the basic description on the Shipper's Declaration for Dangerous Goods;

A4.2.4.2.2. When the proper shipping description for a sample is assigned a "★"(star) in Column (1) of Table A4.1, and the primary constituent(s) for which the tentative classification is based are not known, the provisions requiring a technical name for the constituent(s) do not apply; and

A4.2.4.2.3. Transport samples in combination packaging that conforms to the requirements of this manual that are applicable to the tentative packing group assigned, and may not exceed a net mass of 2.5 kg (5.5 pounds) per package.

A4.2.5. Precedence of Hazard. Assign any material specifically identified and listed in **Table A4.1**, the hazard class identified in column 3 of **Table A4.1**. Use other resources identified in **A4.2.1**, to determine the appropriate hazardous material description. If required, classify a hazardous material that is not specifically identified and listed in **Table A4.1** (or is a mixture of materials), and meets the definition of more than one hazard, according to the following order of precedence:

A4.2.5.1. Class 7 (Radioactive material, other than limited quantities and shipments of UN 3507, Uranium hexafluoride, radioactive material, excepted package). When limited quantities are involved the other hazardous properties take precedence.

A4.2.5.2. Class 1 (explosives).

A4.2.5.3. Class 2.3 (poisonous gas).

A4.2.5.4. Class 2.1 (flammable gas). See also Class 9.

A4.2.5.5. Class 2.2 (nonflammable gas). See also Class 9.

A4.2.5.6. Class 5.2 (organic peroxide).

A4.2.5.7. Class 6.2 (infectious substances).

A4.2.5.8. Class 4.1 (flammable solid). Only self-reactive substances and wetted explosives.

A4.2.5.9. Class 4.2 (substances liable to spontaneous combustion). Only pyrophoric substances.

A4.2.5.10. Class 6.1 (poisonous substances), PG I, poisonous by inhalation only.

A4.2.5.11. Small quantities of compressed gas such as starter fluid (Class 2.1) or fire extinguisher (Class 2.2) installed on a vehicle do not take precedence over the flammable liquid (Class 3).

A4.2.5.12. If required, classify other hazardous materials not identified above according to 49 CFR Section 173.2a.

A4.2.6. Hazard Classification of Class 5.2 Organic Peroxides. Class 5.2 organic peroxides are categorized into one of seven "types" in a system of generic proper shipping names. The generic PSN for the organic peroxide describes the physical state of the material (e.g., liquid or solid), provides an indication of controlled temperature requirements, and includes the

"type" of the organic peroxide. The seven types of organic peroxides are described in Attachment 1. Transport all Class 5.2 material under one of the generic proper shipping names listed in Table A4.1. beginning with the words "ORGANIC PEROXIDE". Technical names are listed below each PSN in lower case letters. To determine the correct PSN:

- A4.2.6.1. Find the Technical Name in 49 CFR (173.224 Self-Reactive Materials Table, Column 5) (173.225(c) Organic Peroxide Table column 8) and select the UN identification number assigned to the technical name that best describes the item (in terms of concentration ranges, physical characteristics, etc.).
- A4.2.6.2. Turn to the "ORGANIC PEROXIDE" listed in Table A4.1. These entries constitute the "generic" organic peroxide proper shipping names.
- A4.2.6.3. Match the UN identification number for the technical name with a UN identification number associated with the generic PSN.
- A4.2.6.4. Include the "type" under which the organic peroxide falls for generic PSN associated with organic peroxides. Organic peroxide types are defined in Attachment 1.

**A4.3. Determining Degree of Hazard.** For most material, the degree of hazard is identified as the Packing Group (PG), and is assigned in column 6 of Table A4.1. PG I (great danger), PG II (medium danger), and PG III (minor danger) indicate the degree of hazard associated with the materials and are used to identify the severity of UN specification performance tests associated with the packaging for the item. Poisonous by inhalation material are assigned hazard zones (see Attachment 1) in Table A4.1. If unknown, the PG or hazard zone may be determined according to this paragraph. Hazard Classes, 1, 2, and 7 do not have packing groups.

- A4.3.1. Class 2 Hazard Zone. The hazard zone of a Class 2.3 material is given in column 7 of Table A4.1. When column 7 of Table A4.1. provides more than one hazard zone or is blank, determine the hazard zone from Figure A4.2. There are no hazard zones for Class 2.1 and 2.2.

**Figure A4.2. Determination of Hazard Zone for Class 2.3.**

Hazard Zone	Inhalation Toxicity (parts per million)
A	LC <sub>50</sub> less than or equal to 200 ppm
B	LC <sub>50</sub> greater than 200 ppm and less than or equal to 1000 ppm
C	LC <sub>50</sub> greater than 1000 ppm and less than or equal to 3000 ppm
D	LC <sub>50</sub> greater than 3000 ppm or less than or equal to 5000 ppm

- A4.3.2. Class 3 Packing Groups. When Table A4.1. lists more than one PG for a material, or indicates that the PG is to be determined on the basis of the PG criteria for Class 3, determine the PG by using Figure A4.3. To use Figure A4.3., match the initial boiling point and flash point of the material to the corresponding PG. Flash points may be determined from the safety data sheet, the Hazardous Material Information Resource System (HMIRS), the National Fire Protection Guide, or markings on the package. For example, a Class 3 material with an initial boiling point of 38 degrees C (100 degrees F) and a flash point of 25 degrees C (77 degrees F)

would be assigned a PG III. If the initial boiling point is less than or equal to 35 degrees C (95 degrees F), assign PG I. Viscous Class 3 material (e.g., paints, varnishes, enamels, lacquers, adhesives, and polishes) in PG II with a flash point of less than 23 degrees C (73 degrees F) may be grouped in PG III provided the requirements of 49 CFR Paragraph 173.121(b) are met.

**Figure A4.3. Criteria for Class 3 PG.**

<b>PG</b>	<b>Flash Point (closed-cup)</b>	<b>Initial Boiling Point</b>
<b>I</b>		less than or equal to 35°C (95°F)
<b>II</b>	less than 23°C (73°F)	greater than 35°C (95°F)
<b>III</b>	equal to or greater than 23°C (73°F) but less than or equal to 60°C (140°F)	greater than 35°C (95°F)

A4.3.3. Class 4 Packing Groups. When Table A4.1. indicates that the PG of the material is to be determined on the basis of test criteria for Class 4 material, ensure the test methods and appropriate criteria complies with 49 CFR Section 173.125.

A4.3.4. Class 5 Packing Groups. When column 5 of Table A4.1. is blank for a solid or liquid in Class 5.1, determine the PG based on the test criteria found in 49 CFR Section 173.127.

A4.3.5. Class 6 Packing Groups and Hazard Zone. When Table A4.1., column 5 provides more than one PG and hazard zone for a specific Class 6.1 material, determine the PG and hazard zone by applying the following criteria:

A4.3.5.1. Determine the PG assignment for other than inhalation of vapors by using Figure A4.4.

A4.3.5.2. Determine the PG and hazard zone assignments for inhalation of vapors by using Figure A4.5.

**Figure A4.4. PG Assignment For Other Than Inhalation of Vapors.**

<b>PG</b>	<b>Oral Toxicity LD<sub>50</sub>(mg/kg)</b>	<b>Dermal Toxicity LD<sub>50</sub> (mg/kg)</b>	<b>Inhalation Toxicity by Dusts and Mists LC<sub>50</sub> (mg/L)</b>
<b>I</b>	≤ 5	≤ 50	≤ 0.2
<b>II</b>	> 5 and ≤ 50	> 50 and ≤ 200	> 0.2 and ≤ 2.0
<b>III</b>	> 50 and ≤ 300	> 200 and ≤ 1000	> 2 and ≤ 4.0



**Figure A4.5. Inhalation Toxicity.**

Packing Group	Vapor Concentration and Toxicity
I (Hazard Zone A)	$V \geq 500 \text{ LC}_{50}$ and $\text{LC}_{50} \leq 200 \text{ mL/m}^3$
I (Hazard Zone B)	$V \geq 10 \text{ LC}_{50}$ and $\text{LC}_{50} \leq 1000 \text{ mL/m}^3$ , and the criteria for PG I, Hazard Zone A are not met
II	$V \geq \text{LC}_{50}$ and $\text{LC}_{50} \leq 3000 \text{ mL/m}^3$ , and the criteria for PG I are not met
III	$V \geq .2 \text{ LC}_{50}$ and $\text{LC}_{50} \leq 5000 \text{ mL/m}^3$ , and the criteria for PG I and PG II are not met

A4.3.5.3. "V" is the saturated vapor concentration in air of the material in  $\text{mL/m}^3$  at 20 degrees C (68 degrees F) and standard atmospheric pressure.

A4.3.5.4. When the PG determined by Figure A4.4. and Figure A4.5. is different for two or more (oral, dermal, inhalation) routes of administration, the PG assigned to the material corresponds to the route of the highest degree of toxicity identified.

A4.3.5.5. Compute the PG and hazard zone for Class 6.1 mixtures that are poisonous (toxic) by inhalation as identified in 49 CFR Paragraph 173.133(b).

A4.3.6. Class 8 Packing Groups. When Table A4.1. lists more than one PG for a material, determine the PG as follows:

A4.3.6.1. Packing Group I. Substances that cause irreversible damage to intact skin tissue within an observation period of up to 60 minutes starting after an exposure time of 3 minutes or less.

A4.3.6.2. Packing Group II. Substances that cause irreversible damage to intact skin tissue within an observation period of up to 14 calendar days starting after an exposure time of more than 3 minutes, but not more than 60 minutes.

A4.3.6.3. Packing Group III. Substances are assigned to Packing Group III if they meet one of the following:

A4.3.6.3.1. Substances that cause irreversible damage to intact skin tissue within an observation period of up to 14 calendar days starting after an exposure time of more than 60 minutes but less than 4 hours.

A4.3.6.3.2. Substances which are judged not to cause irreversible damage to intact skin tissue but which exhibit a corrosion rate on steel or aluminum surfaces exceeding 6.25 mm (1/4 inch) a year at a test temperature of 55 degrees C (130 degrees F).

A4.3.6.4. 49 CFR Section 173.137 has additional information and alternative methods for assignment of Class 8 packing groups. Those alternative methods are authorized for use but not duplicated in this manual.

**A4.4. Hazardous Substances.** Table A4.3. identifies materials that are designated hazardous substances as defined in 49 CFR, Section 172.101, Appendix A, *List of Hazardous Substances and Reportable Quantities*. See Attachment 1 for a detailed definition of a hazardous substance. Ensure review of Table A4.3 to determine if a material is a hazardous substance.

A4.4.1. Determine if the material is a hazardous substance by identifying the reportable quantity (RQ) in Table A4.3. The RQ is used to determine if material is a hazardous substance. The material is a

hazardous substance if the amount in one package equals or exceeds the RQ quantity. Table A4.3. specifies, in pounds and kilograms, the minimum quantity of the material that constitutes an RQ. For example: sodium arsenate (RQ-1.0/0.454) means the RQ is 1.0 pound or 0.454 kilograms.  
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A4.4.2. A substance or solution is a "hazardous substance" when the concentration by weight equals or exceeds the concentration listed in Figure A1.1.

A4.4.3. If the technical name of the hazardous substance appears in Table A4.1., then the technical name is the PSN. If the hazardous substance does not appear in Table A4.1. and is not a forbidden material, select an appropriate generic (N.O.S.) PSN. Specify the technical name in parenthesis after the PSN. See Attachment 17 for certification requirements.

A4.4.4. For Radionuclides, see 49 CFR Section 172.101, Appendix A.

**A4.5. Using Table A4.1.** Table A4.1. identifies "hazardous materials" for the purpose of military air transportation. To use Table A4.1. locate the proper shipping name (PSN) of the hazardous material and follow the information identified on the same line with the PSN. Use Table A4.1. to identify the following: eligibility of material for shipment, identification number, proper shipping name (PSN), hazard class and division, subsidiary hazard, packing group (PG), special provisions applicable to the material (including passenger eligibility), and packaging paragraph.

A4.5.1. Column 1: Symbols. Column 1 contains symbols that pertain to the PSN.

A4.5.1.1. The letter "D" means that the PSN applies only to domestic shipments. These items are also identified by "NA" numbers in column 4. For international shipments, select an alternate PSN that is not preceded by a "D".

A4.5.1.2. The "★" (star) identifies that a technical name is required in association with the PSN.

A4.5.1.3. The "+" (plus) fixes the proper shipping name, hazard class and packing group for that entry without regard to whether the material meets the definition of that class or packing group or meets any other hazard class definition.

A4.5.2. Column 2: Identification Number. Column 2 lists the identification number assigned to each PSN.

A4.5.2.1. Ship items identified with "UN" or "ID" (identification) numbers domestically or internationally.

A4.5.2.2. Ship items identified with "NA" (North American) numbers domestically only. Use of "UN" numbers is preferred even for domestic shipment.

A4.5.2.3. New or revised UN or NA numbers in 49 CFR Part 172, ICAO, or IATA are recognized for use with this manual.

A4.5.3. Column 3: Proper Shipping Names (PSN). PSNs are listed alphabetically in all bold capital letters in Table A4.1. Use either singular or plural wording. New and revised PSNs in 49 CFR Part 172, ICAO, or IATA are authorized PSNs under this manual, provided the packaging requirements do not change. Alternate accepted spelling may be used provided the correct associated UN/ID number is used (e.g., "UN1350, SULFUR" vice "UN1350, SULPHUR"). A

PSN modifier which appears as lower case italicized letters are descriptive words which may be used, but are not required as part of the PSN.

A4.5.3.1. Technical or Chemical Group Names. Provide a technical or chemical group name in association with the PSN when required by an “★” (star) in column 1.

A4.5.3.1.1. Organic Peroxides. Use technical names listed below the appropriate generic PSN (in lower case letters) in Table A4.1. See A4.2.5. for PSN assignment based on technical name.

A4.5.3.1.2. Mixtures and Solutions. If the hazardous material is a mixture or solution of two or more hazardous materials, enter the technical names of at least two components most contributing to the hazards of the mixture or solution in parentheses after the PSN.

A4.5.3.2. The Word "OR" in Table A4.1. The word "or" in a sequence of PSNs means that PSNs in the sequence are synonymous. Therefore, use of any one of the PSNs in the series is appropriate. Select only one PSN in the series when classifying the shipment. For Class 1 material, use the PSN listed in the JHCS.

A4.5.3.3. The Word "SEE" in Table A4.1. When one item references another item (by use of the word "see") and both names are in capital letters, use either name as the PSN. Forbidden designations and passenger restrictions applicable to the referenced entry also apply to the "see" entry.

A4.5.3.4. The Words “SOLUTION” or “MIXTURE”. Identify a mixture or solution containing a hazardous material listed by name in Table A4.1. together with one or more materials not subject to this manual by the PSN of the hazardous material. Add the qualifying word “solution” or “mixture” to the PSN. (See 49 CFR Subparagraph 172.101(c) (10))

A4.5.3.5. Concentration Ranges. When a shipping name includes a concentration range as part of the shipping description, the actual concentration shipped (if it is in the range stated) may be used in place of the concentration range. For example, ship a hydrogen peroxide solution containing 30 percent peroxide as either "Hydrogen peroxide aqueous solution (with not less than 20 percent but not more than 40 percent hydrogen peroxide)" or "Hydrogen peroxide aqueous solution (with 30 percent hydrogen peroxide)."

A4.5.3.6. Hazardous Wastes. The PSN for a hazardous material that is a hazardous waste must include the word "WASTE" preceding the name of the material (e.g., WASTE, ACETONE). **(T-0)**. Comply with all requirements of this manual identified for the hazardous material when shipped as waste.

A4.5.4. Column 4: Hazard Class/Division. Column 4 contains:

A4.5.4.1. Primary hazard class and division numbers. When this manual references hazard class, that includes any division number if appropriate. For Class 1 (explosives), the compatibility group is also given. See A4.2. for additional information on class/divisions.

A4.5.4.2. Some items that contain explosive material may be assigned to a classification other than Class 1 by DOD explosives hazard classification approval authorities due to the predominant hazard (see A3.3.4.4). Compatibility group letters assigned to non-Class 1 material do not apply to military air transportation.

- A4.5.5. Column 5: Subsidiary. Column 5 identifies the hazard class/division of any subsidiary hazard posed by a material. Subsidiary hazard may vary, depending on the applicable PG.
- A4.5.6. Column 6: Packing Group (PG). Column 6 specifies one or more packing groups assigned to each PSN and hazard class. Hazard classes 1, 2, and 7 do not have packing groups. See A4.3. for additional information on PG.
- A4.5.7. Column 7: Special Provisions. Column 7 specifies codes for special provisions that are applicable for each PSN, hazard class, and PG. Special provision codes may vary, depending on the PG. Requirements of the special provision codes are identified in Table A4.2. The codes reflect five categories: numeric codes, codes beginning with "A", codes beginning with "N", codes beginning with a "P" and codes with "IA".
- A4.5.7.1. Use codes beginning with a "P" to determine passenger eligibility for transport with hazardous materials.
- A4.5.7.2. Use all other codes to determine packaging provisions, restrictions, and exceptions from requirements for particular quantities or forms of materials.
- A4.5.7.3. When an additional packaging requirement is prescribed, the requirement is mandatory.
- A4.5.8. Column 8: Packaging Paragraph. This column lists the applicable packaging paragraph. "FORBIDDEN" items are also identified in this column. Do not transport "FORBIDDEN" items by military aircraft unless waived in accordance with paragraph 2.3.1.
- A4.5.8.1. Except when otherwise identified, prepare hazardous material shipments according to the specified packaging paragraph.
- A4.5.8.2. Packaging paragraphs in each attachment provide titles as a guide for PSNs covered by that paragraph. These titles are a guide only and are not all-inclusive.
- A4.5.8.3. If a packaging paragraph in Table A4.1. specifies packaging that is not applicable to the form of the material (e.g., the packaging specified is for a solid material and the material shipped is in liquid form) use the following guidance to select the appropriate paragraph:
- A4.5.8.3.1. Use either packaging paragraph A8.2. for liquids or A8.3. for solids (as appropriate).
- A4.5.8.3.2. Use either packaging paragraph A9.5. for liquids or A9.6. for solids (as appropriate).
- A4.5.8.3.3. Use either packaging paragraph A10.4. for liquids or A10.5. for solids (as appropriate).
- A4.5.8.3.4. Use either packaging paragraph A12.2. for liquids or A12.3. for solids (as appropriate).

Table A4.1. Alphabetical Listing of Items.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
UN/ID NUMBER							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Accellerene, see <b>p-NITROSODIMETHYLANILINE</b> (UN 1369)					
		Accumulators, electric, see <b>BATTERIES, WET, FILLED WITH ACID</b> (UN2794), <b>BATTERIES, WET, FILLED WITH ALKALI</b> (UN2795), <b>BATTERIES, WET, NON-SPILLABLE</b> (UN2800)					
		Accumulators, pressurized, hydraulic (containing nonflammable gas), see <b>ARTICLES, PRESSURIZED, HYDRAULIC</b> (UN3164)					
		Accumulators, pressurized, pneumatic, see <b>ARTICLES, PRESSURIZED, PNEUMATIC</b> (UN3164)					
	UN1088	<b>ACETAL</b>	3		II	P5	A7.2.
	UN1089	<b>ACETALDEHYDE</b>	3		I	P3	A7.2.
	UN1841	<b>ACETALDEHYDE AMMONIA</b>	9		III	P5	A13.14.
	UN2332	<b>ACETALDEHYDE OXIME</b>	3		III	P5	A7.2.
	UN2789	<b>ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION</b> , with more than 80% acid, by mass	8	3	II	P5, A3, A7, A10	A12.2.
	UN2790	<b>ACETIC ACID SOLUTION</b> , with not less than 50%, but not more than 80% acid, by mass	8		II	P5, 148, A3, A7, A10	A12.2.
	UN2790	<b>ACETIC ACID SOLUTION</b> , with more than 10%, but less than 50% acid, by mass	8		III	P5, 148	A12.2.
	UN1715	<b>ACETIC ANHYDRIDE</b>	8	3	II	P5, A3, A7, A10	A12.2.
		Acetic oxide, see <b>ACETIC ANHYDRIDE</b> (UN1715)					
		Acetoin, see <b>ACETYL METHYL CARBINOL</b> (UN2621)					
	UN1090	<b>ACETONE</b>	3		II	P5	A7.2.
	UN1541	<b>ACETONE CYANOHYDRIN, STABILIZED</b>	6.1		I	P2, 2, N34	A10.6.
	UN1091	<b>ACETONE OILS</b>	3		II	P5	A7.2.
	UN1648	<b>ACETONITRILE</b>	3		II	P5	A7.2.
		Acetyl acetone peroxide with more than 9% by mass active oxygen					FORBIDDEN
		Acetyl benzoyl peroxide, solid, or with more than 40% in solution					FORBIDDEN
	UN1716	<b>ACETYL BROMIDE</b>	8		II	P5	A12.2.
	UN1717	<b>ACETYL CHLORIDE</b>	3	8	II	P5, A3, A7, N34	A7.2.
		Acetyl cyclohexanesulphonyl peroxide, with more than 82% wetted with less than 12% water					FORBIDDEN
		Acetylene dichloride, see <b>1,2-DICHLOROETHYLENE</b> (UN1140)					
	UN1001	<b>ACETYLENE, DISSOLVED</b>	2.1			P4, N86, N88	A6.9.
		Acetylene (liquefied)					FORBIDDEN
		Acetylene silver nitrate					FORBIDDEN
	UN3374	<b>ACETYLENE, SOLVENT FREE</b>	2.1			P4, N86, N88	A6.9.
		Acetylene tetrabromide, see <b>TETRABROMOETHANE</b> (UN2504)					
		Acetylene tetrachloride; see <b>1,1,2,2-TETRACHLOROETHANE</b> (UN1702)					
	UN1898	<b>ACETYL IODIDE</b>	8		II	P5	A12.2.
	UN2621	<b>ACETYL METHYL CARBINOL</b>	3		III	P5	A7.2.
		Acetyl oxide, see <b>ACETIC ANHYDRIDE</b> (UN1715)					
		Acetyl peroxide, solid or with more than 25% in solution					FORBIDDEN
		Acid butyl phosphate, see <b>BUTYL ACID PHOSPHATE</b> (UN1718)					
		Acid, liquid, N.O.S., see <b>CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.</b> (UN3264), or <b>CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.</b> (UN3265)					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Acid mixture, hydrofluoric and sulphuric, see <b>HYDROFLUORIC AND SULPHURIC ACID MIXTURE</b> (UN1786)					
		Acid mixture, nitrating acid, see <b>NITRATING ACID MIXTURE</b> (UN1796)					
		Acid mixture, spent, nitrating acid, see <b>NITRATING ACID, MIXTURE SPENT</b> (UN1896)					
		Acid, picric, see <b>TRINITROPHENOL</b> (UN0154) or <b>PICRIC ACID</b> (UN0154)					
		Acid potassium sulphate, see <b>POTASSIUM HYDROGEN SULPHATE</b> (UN2509)					
		Acid, sludge, see <b>Sludge Acid</b> (UN1906)					
		Acraldehyde, stabilized, see <b>ACROLEIN, STABILIZED</b> (UN1092)					
	UN2713	<b>ACRIDINE</b>	6.1		III	P5	A10.5.
	UN2607	<b>ACROLEIN DIMER, STABILIZED</b>	3		III	P5	A7.2.
		Acrolein dimer, unstabilized					FORBIDDEN
	UN1092	<b>ACROLEIN, STABILIZED</b>	6.1	3	I	P1, 1	A10.6.
		Acrolein, unstabilized					FORBIDDEN
	UN2074	<b>ACRYLAMIDE, SOLID</b>	6.1		III	P5	A10.5.
	UN3426	<b>ACRYLAMIDE SOLUTION</b>	6.1		III	P5	A10.4
	UN2218	<b>ACRYLIC ACID, STABILIZED</b>	8	3	II	P5	A12.2.
		Acrylic acid, unstabilized					FORBIDDEN
	UN1093	<b>ACRYLONITRILE, STABILIZED</b>	3	6.1	I	P3	A7.2.
		Acrylonitrile, unstabilized					FORBIDDEN
		Actinolite, see <b>ASBESTOS AMPHIBOLE</b> (UN2212)					
		Activated carbon or Activated charcoal, see <b>CARBON, ACTIVATED</b> (UN1362)					
		Actuating cartridge, explosive, see <b>CARTRIDGES, POWER DEVICE</b> , (UN0275, UN0276, UN0323, UN0381).					
	UN1133	<b>ADHESIVES</b> , containing flammable liquid	3		I II III	P3 P5, 149 P5	A7.2. A7.2. A7.2.
	UN2205	<b>ADIPONITRILE</b>	6.1		III	P5	A10.4.
★	UN 3511	<b>ADSORBED GAS N.O.S.</b>	2.2			P5	A6.27
★	UN 3510	<b>ADSORBED GAS, FLAMMABLE N.O.S.</b>	2.1			P4	A6.27
★	UN 3513	<b>ADSORBED GAS, OXIDIZING N.O.S.</b>	2.2	5.1		P4	A6.27
★	UN 3516	<b>ADSORBED GAS, TOXIC CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone A</i>	2.3	8		P1, 1	A6.15
★	UN 3516	<b>ADSORBED GAS, TOXIC CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone B</i>	2.3	8		P2, 2	A6.27
★	UN 3516	<b>ADSORBED GAS, TOXIC CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone C</i>	2.3	8		P2, 3	A6.27
★	UN 3516	<b>ADSORBED GAS, TOXIC CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone D</i>	2.3	8		P2, 4	A6.27
★	UN 3514	<b>ADSORBED GAS, TOXIC FLAMMABLE N.O.S.</b> <i>Inhalation Hazard Zone A</i>	2.3	2.1		P1, 1	A6.15
★	UN 3514	<b>ADSORBED GAS, TOXIC FLAMMABLE N.O.S.</b> <i>Inhalation Hazard Zone B</i>	2.3	2.1		P2, 2	A6.27
★	UN 3514	<b>ADSORBED GAS, TOXIC FLAMMABLE N.O.S.</b> <i>Inhalation Hazard Zone C</i>	2.3	2.1		P2, 3	A6.27
★	UN 3514	<b>ADSORBED GAS, TOXIC FLAMMABLE N.O.S.</b> <i>Inhalation Hazard Zone D</i>	2.3	2.1		P2, 4	A6.27
★	UN 3517	<b>ADSORBED GAS, TOXIC FLAMMABLE, CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone A</i>	2.3	2.1, 8		P1, 1	A6.15
★	UN 3517	<b>ADSORBED GAS, TOXIC FLAMMABLE, CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone B</i>	2.3	2.1, 8		P2, 2	A6.27
★	UN 3517	<b>ADSORBED GAS, TOXIC FLAMMABLE, CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone C</i>	2.3	2.1, 8		P2, 3	A6.27
★	UN 3517	<b>ADSORBED GAS, TOXIC FLAMMABLE, CORROSIVE N.O.S.</b> <i>Inhalation Hazard Zone D</i>	2.3	2.1, 8		P2, 4	A6.27

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN 3515	ADSORBED GAS, TOXIC FLAMMABLE, OXIDIZING N.O.S. Inhalation Hazard Zone A	2.3	2.1, 5.1		P1, 1	A6.15
★	UN 3515	ADSORBED GAS, TOXIC FLAMMABLE, OXIDIZING N.O.S. Inhalation Hazard Zone B	2.3	2.1, 5.1		P2, 2	A6.27
★	UN 3515	ADSORBED GAS, TOXIC FLAMMABLE, OXIDIZING N.O.S. Inhalation Hazard Zone C	2.3	2.1, 5.1		P2, 3	A6.27
★	UN 3515	ADSORBED GAS, TOXIC FLAMMABLE, OXIDIZING N.O.S. Inhalation Hazard Zone D	2.3	2.1, 5.1		P2, 4	A6.27
★	UN 3512	ADSORBED GAS, TOXIC N.O.S. Inhalation Hazard Zone A	2.3			P1, 1	A6.15
★	UN 3512	ADSORBED GAS, TOXIC N.O.S. Inhalation Hazard Zone B	2.3			P2, 2	A6.27
★	UN 3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE N.O.S. Inhalation Hazard Zone A	2.3	5.1, 8		P1, 1	A6.15
★	UN 3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE N.O.S. Inhalation Hazard Zone B	2.3	5.1, 8		P2, 2	A6.27
★	UN 3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE N.O.S. Inhalation Hazard Zone C	2.3	5.1, 8		P2, 3	A6.27
★	UN 3518	ADSORBED GAS, TOXIC, OXIDIZING, CORROSIVE N.O.S. Inhalation Hazard Zone D	2.3	5.1, 8		P2, 4	A6.27
	UN 3512	ADSORBED GAS, TOXIC N.O.S. Inhalation Hazard Zone C	2.3			P2, 3	A6.27
	UN 3512	ADSORBED GAS, TOXIC N.O.S. Inhalation Hazard Zone D	2.3			P2, 4	A6.27
		Aeroplane flares see FLARES, AERIAL (UN0093, UN0403, UN0404, UN0420, UN0421)					
	UN1950	AEROSOLS or AEROSOLS, FLAMMABLE	2.1			P5, N82	A6.2.
		AEROSOLS, flammable, containing substances in Class 8, Packing Group I					FORBIDDEN
	UN1950	AEROSOLS, FLAMMABLE, CONTAINING SUBSTANCES IN CLASS 8, PACKING GROUP II	2.1	8			FORBIDDEN
	UN1950	AEROSOLS, FLAMMABLE, CONTAINING SUBSTANCES IN CLASS 8, PACKING GROUP III	2.1	8		P5	A6.2
	UN1950	AEROSOLS, flammable, containing substances in Division 6.1, Packing Group I					FORBIDDEN
	UN1950	AEROSOLS, flammable containing substances in Division 6.1, Packing Group II	2.1	6.1			FORBIDDEN
	UN1950	AEROSOLS, flammable containing substances in Division 6.1, Packing Group III	2.1	6.1		P5	A6.2
	UN1950	AEROSOLS, flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III	2.1	6.1, 8		P5	A6.2.
	UN1950	AEROSOLS, flammable, containing toxic gas	2.3	2.1			FORBIDDEN
	UN1950	AEROSOLS, FLAMMABLE (ENGINE STARTING FLUID) or AEROSOLS, FLAMMABLE, N.O.S. (engine starting fluid)	2.1			P5, N82	A6.2
	UN1950	AEROSOLS or AEROSOLS, NON-FLAMMABLE	2.2			P5	A6.2.
	UN1950	AEROSOLS, NON-FLAMMABLE (containing biological products or a medicinal preparation which will be deteriorated by a heat test)	2.2			P5	A6.2.
	UN1950	AEROSOLS, non-flammable, (tear gas devices)	2.2	6.1		P5	A6.2.
	UN1950	AEROSOLS, non-flammable, containing substances in Class 8, Packing Group I	2.2	8			FORBIDDEN
	UN1950	AEROSOLS, non-flammable, containing substances in Class 8, Packing Group II	2.2	8		A34	FORBIDDEN
	UN1950	AEROSOLS, non-flammable, containing substances in Class 8, Packing Group III	2.2	8		P5, A34	A6.2
	UN1950	AEROSOLS, non-flammable, containing substances in Division 6.1, Packing Group I or II					FORBIDDEN
	UN1950	AEROSOLS, non-flammable, containing substances in Division 6.1, Packing Group III	2.2	6.1		P5	A6.2

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1950	AEROSOLS, non-flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III	2.2	6.1, 8		P5	A6.2.
	UN1950	AEROSOLS, non-flammable, containing toxic gas	2.3				FORBIDDEN
	UN1950	AEROSOLS, non-flammable, oxidizing	2.2	5.1		P5	A6.2
	UN0331	AGENT, BLASTING TYPE B	1.5D			P4, 105, 106	A5.11.
	UN0332	AGENT, BLASTING TYPE E	1.5D			P4, 105, 106	A5.11.
		air bag inflators or air bag modules or seat-belt pretensioners, see SAFETY DEVICES, electrically initiated, UN3268) or SAFETY DEVICES, pyrotechnic (UN0503)					
	UN1002	AIR, COMPRESSED	2.2			P5, 78	A6.3., A6.5.
	UN1003	AIR, REFRIGERATED LIQUID (cryogenic liquid)	2.2	5.1		P4	A6.11.
	UN1003	AIR, REFRIGERATED LIQUID (cryogenic liquid) non-pressurized	2.2	5.1		P4	A6.11.
		Aircraft, see VEHICLE, FLAMMABLE GAS POWERED (UN3166) or VEHICLE FLAMMABLE LIQUID POWERED (UN3166)					
		Aircraft Engines (including turbines), see ENGINE, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED (UN3529), or ENGINES INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED (UN3528) or ENGINE INTERNAL COMBUSTION (UN3530)					
		Aircraft evacuation slides or Aircraft survival kits, see LIFE-SAVING APPLIANCES, SELF-INFLATING (UN2990) or LIFE-SAVING APPLIANCES, NOT SELF-INFLATING (UN3072)					
	UN3165	AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK (containing a mixture of anhydrous hydrazine and monomethyl hydrazine) (M86 fuel)	3	6.1, 8	I	P3, A501	A7.4.
★	UN3274	ALCOHOLATES SOLUTION, N.O.S. in alcohol	3	8	II	P5	A7.2.
		Alcohol, denatured, see ALCOHOLS, FLAMMABLE TOXIC N.O.S. (UN1986) or ALCOHOLS, N.O.S. (UN1987)					
	UN3065	ALCOHOLIC BEVERAGES	3		II III	P5, 24, 149 P5, 24, N11	A7.2. A7.2.
		Alcohol, industrial, see ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. (UN1986) or ALCOHOLS, N.O.S. (UN1987)					
★	UN1987	ALCOHOLS, N.O.S.	3		I II III	P3, 172 P5, 172 P5, 172	A7.2. A7.2. A7.2.
★	UN1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1 6.1	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
		Aldehyde, see ALDEHYDES, N.O.S. (UN1989)					
		Aldehyde ammonia, see ACETALDEHYDE AMMONIA (UN1841)					
★	UN1989	ALDEHYDES, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN1988	ALDEHYDES, FLAMMABLE, TOXIC, N.O.S	3	6.1 6.1 6.1	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
	UN2839	ALDOL	6.1		II	P5	A10.4.
★	UN3206	ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.	4.2	8 8	II III	P4, 64, A7 P5, 64, A7	A8.3. A8.3.
	UN1421	ALKALI METAL ALLOYS, LIQUID, N.O.S	4.3		I	P3, A2, A7, N34	A8.2.
	UN1389	ALKALI METAL AMALGAM, LIQUID	4.3		I	P3, A2, A7, N34	A8.2.
	UN3401	ALKALI METAL AMALGAM, SOLID	4.3		I	P3, N40	A8.3.



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1390	ALKALI METAL AMIDES	4.3		II	P5, A6, A7, A8, A19, A20	A8.3.
	UN1391	ALKALI METAL DISPERSIONS or ALKALINE EARTH METAL DISPERSIONS	4.3		I	P3, A2, A7	A8.2.
	UN3482	ALKALI METAL DISPERSIONS, FLAMMABLE or ALKALINE EARTH METAL DISPERSIONS, FLAMMABLE	4.3	3	I	P3, A2, A7	A8.2.
		Alkaline corrosive battery fluid, see BATTERY FLUID, ALKALI (UN2797)					
		Alkaline corrosive liquids, N.O.S., see CAUSTIC ALKALI LIQUIDS, N.O.S. (UN1719)					
		Alkaline corrosive solid N.O.S., see CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (UN3262) or CORROSIVE SOLID, BASIC ORGANIC, N.O.S. (UN3263)					
★	UN3205	ALKALINE EARTH METAL ALCOHOLATES, N.O.S	4.2		II III	P4, 65, A7 P5, 65, A7	A8.3. A8.3.
	UN1393	ALKALINE EARTH METAL ALLOYS, N.O.S.	4.3		II	P5, A19	A8.3.
	UN1392	ALKALINE EARTH METAL AMALGAMS LIQUID	4.3		I	P3, A19, N34, N40	A8.2.
	UN3402	ALKALINE EARTH METAL AMALGAMS SOLID	4.3		I	P3, A19, N34, N40	A8.3
★	UN3140	ALKALOIDS, LIQUID, N.O.S. or ALKALOID SALTS, LIQUID, N.O.S.	6.1		I II III	P3, A4 P5 P5	A10.4. A10.4. A10.4.
★	UN1544	ALKALOIDS, SOLID, N.O.S. or ALKALOID SALTS, SOLID, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN3145	ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues)	8		I II III	P3 P5 P5	A12.2. A12.2. A12.2.
	UN2430	ALKYLPHENOLS, SOLID, N.O.S. (including C2-C12 homologues)	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
	UN2584	ALKYLSULFONIC ACIDS, LIQUID or ARYLSULFONIC ACIDS, LIQUID with more than 5% free sulphuric acid	8		II	P5	A12.2.
	UN2586	ALKYLSULFONIC ACIDS, LIQUID or ARYLSULFONIC ACIDS, LIQUID with not more than 5% free sulfuric acid	8		III	P5	A12.2.
	UN2583	ALKYLSULFONIC ACIDS, SOLID, or ARYLSULFONIC ACIDS, SOLID, with more than 5% free sulfuric acid	8		II	P5	A12.3.
	UN2585	ALKYLSULFONIC ACIDS, SOLID, or ARYLSULFONIC ACIDS, SOLID, with not more than 5% free sulfuric acid	8		III	P5	A12.3.
	UN2571	ALKYLSULFURIC ACIDS	8		II	P4	A12.2.
		Allene, see PROPADIENE, STABILIZED (UN2200)					
		Allethrin, see PESTICIDES, LIQUID, TOXIC, N.O.S. (UN2902)					
	UN2333	ALLYL ACETATE	3	6.1	II	P4	A7.2.
	UN1098	ALLYL ALCOHOL	6.1	3	I	P2, 2	A10.6.
	UN2334	ALLYLAMINE	6.1	3	I	P2, 2	A10.6.
	UN1099	ALLYL BROMIDE	3	6.1	I	P3	A7.2.
	UN1100	ALLYL CHLORIDE	3	6.1	I	P3	A7.2.
		Allyl chlorocarbonate, see ALLYL CHLOROFORMATE (UN1722)					
	UN1722	ALLYL CHLOROFORMATE	6.1	3, 8	I	P2, 2, N41	A10.6.
	UN2335	ALLYL ETHYL ETHER	3	6.1	II	P4	A7.2.
	UN2336	ALLYL FORMATE	3	6.1	I	P3	A7.2.
	UN2219	ALLYL GLYCIDYL ETHER	3		III	P5	A7.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1723	ALLYL IODIDE	3	8	II	P5, A3, N34	A7.2.
	UN1545	ALLYL ISOTHIOCYANATE, STABILIZED	6.1	3	II	P4, 387, A3, A7	A10.4.
		<i>Allyl Isothiocyanate, unstabilized</i>					FORBIDDEN
	UN1724	ALLYLTRICHLOROSILANE, STABILIZED	8	3	II	P5, 387, A7, N34	A12.2.
		<i>Allyltrichlorosilane, unstabilized</i>					FORBIDDEN
		Aluminium alkyl halides, liquid, see ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE ★ (UN3394)					
		Aluminium alkyl halides, solid, see ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE ★ (UN3394)					
		Aluminium alkyl hydrides, see ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE ★ (UN3394)					
		Aluminium alkyls, see ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE ★ (UN3394)					
	UN2870	ALUMINIUM BOROHYDRIDE or ALUMINIUM BOROHYDRIDE IN DEVICES	4.2	4.3	I	P3	A8.5.
	UN1725	ALUMINIUM BROMIDE, ANHYDROUS	8		II	P5	A12.3.
	UN2580	ALUMINIUM BROMIDE, SOLUTION	8		III	P5	A12.2.
	UN1394	ALUMINIUM CARBIDE	4.3		II	P4, A20, N41	A8.3.
	UN1726	ALUMINIUM CHLORIDE, ANHYDROUS	8		II	P5	A12.3.
	UN2581	ALUMINIUM CHLORIDE, SOLUTION	8		III	P5	A12.2.
		Aluminum dross, see ALUMINUM SMELTING BY-PRODUCTS (UN3170) or ALUMINUM REMELTING BY-PRODUCTS (UN3170)					
		<i>Aluminum dross, wet or hot</i>					FORBIDDEN
	UN1395	ALUMINIUM FERROSILICON POWDER	4.3	6.1 6.1	II III	P4, A19 P5, A19, A20	A8.3. A8.3.
	UN2463	ALUMINIUM HYDRIDE	4.3		I	P3, A19, N40	A8.3.
		<i>Aluminum liquid or aluminum paint, see PAINT (UN1363)</i>					
D	NA9260	ALUMINUM, MOLTEN	9				FORBIDDEN
	UN1438	ALUMINIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
		<i>Aluminium phosphate solution, see CORROSIVE LIQUIDS, N.O.S. (UN1760)</i>					
	UN1397	ALUMINIUM PHOSPHIDE	4.3	6.1	I	P3, A8, A19, N40	A8.3.
	UN3048	ALUMINIUM PHOSPHIDE PESTICIDES	6.1		I	P5, A8	A10.5.
	UN1309	ALUMINIUM POWDER, COATED	4.1		II III	P5 P5	A8.3. A8.3.
	UN1396	ALUMINIUM POWDER, UNCOATED	4.3		II III	P4, A19, A20 P5, A19, A20	A8.3. A8.3.
	UN2715	ALUMINIUM RESINATE	4.1		III	P5	A8.3.
		<i>Aluminum silicon powder, coated (Not Restricted)</i>					
	UN1398	ALUMINIUM SILICON POWDER, UNCOATED	4.3		III	P5, A1, A19	A8.3.
	UN3170	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3		II III	P4 P5	A8.3. A8.3.
		<i>Amatols, see EXPLOSIVE, BLASTING, TYPE B (UN0082), (UN0331)</i>					
★	UN2733	AMINES, FLAMMABLE, CORROSIVE N.O.S. or POLYAMINES, FLAMMABLE, CORROSIVE N.O.S.	3	8 8 8	I II III	P3 P4 P4	A7.2. A7.2. A7.2.
★	UN2734	AMINES, LIQUID, CORROSIVE, FLAMMABLE N.O.S. or POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.	8	3 3	I II	P3, N34 P4	A12.2. A12.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
★	UN2735	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	8		I II III	P3, N34 P4 P5	A12.2. A12.2. A12.2.
★	UN3259	AMINES, SOLID, CORROSIVE, N.O.S. or POLYAMINES, SOLID, CORROSIVE N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
		Aminobenzene, see ANILINE (UN1547)					
		2-Amino benzotrifluoride, see 2-TRIFLUOROMETHYLANILINE (UN2942)					
		3-Amino benzotrifluoride, see 3-TRIFLUOROMETHYLANILINE (UN2948)					
		Aminobenzene, see n-BUTYLAMINE (UN1125)					
	UN2673	2-AMINO-4-CHLOROPHENOL	6.1		II	P5	A10.5.
	UN3317	2-AMINO-4, 6-DINITROPHENOL, WETTED with not less than 20% water by mass	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
	UN2946	2-AMINO-5-DIETHYLAMINOPENTANE	6.1		III	P5	A10.4.
	UN3055	2-(2-AMINOETHOXY) ETHANOL	8		III	P5	A12.2.
	UN2815	N-AMINOETHYLPIPERAZINE	8	6.1	III	P5	A12.2.
		1-Amino-2-nitrobenzene or 1-Amino-3-nitrobenzene or 1-Amino-4-nitrobenzene, see NITROANILINES (UN1661)					
	UN2512	AMINOPHENOLS (o-; m-; p-)	6.1		III	P5	A10.5.
		Aminopropylldiethanolamine or n-Aminopropylmorpholine, see AMINES, LIQUID, CORROSIVE, N.O.S.★ (UN2735)					
	UN2671	AMINOPYRIDINES (o-; m-; p)	6.1		II	P5	A10.5.
D	UN1005	AMMONIA, ANHYDROUS	2.2			P2, 13	A6.4.
	UN1005	AMMONIA, ANHYDROUS	2.3	8		P2, 4, 13, N87	A6.4.
D	UN3318	AMMONIA SOLUTION, relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia	2.2			P2, 13	A6.4.
	UN3318	AMMONIA SOLUTION, relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia	2.3	8		P2, 4, N87	A6.4.
	UN2672	AMMONIA SOLUTION, relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10%, but not more than 35% ammonia	8		III	P5, 336	A12.2.
	UN2073	AMMONIA SOLUTION, relative density less than 0.880 at 15 degrees C in water, with more than 35%, but not more than 50% ammonia	2.2			P5, N87	A6.3., A6.4.
	UN1546	AMMONIUM ARSENATE	6.1		II	P5	A10.5.
		Ammonium azide					FORBIDDEN
		Ammonium bichromate, see AMMONIUM DICHROMATE (UN1439)					
		Ammonium bifluoride, solid, see AMMONIUM HYDROGENDIFLUORIDE, SOLID (UN1727)					
		Ammonium bifluoride, solution, see AMMONIUM HYDROGENDIFLUORIDE, SOLUTION (UN2817)					
		Ammonium bisulphate, see AMMONIUM HYDROGEN SULPHATE (UN2506)					
		Ammonium bisulphite solution or bisulfite, see BISULFITES or -BISULPHITES, AQUEOUS SOLUTION, N.O.S. ★ (UN2693)					
		Ammonium bromate					FORBIDDEN
		Ammonium chlorate					FORBIDDEN
	UN1439	AMMONIUM DICHROMATE	5.1		II	P5	A9.6.
	UN1843	AMMONIUM DINITRO-O-CRESOLATE, SOLID	6.1		II	P5	A10.5.
	UN3424	AMMONIUM DINITRO-O-CRESOLATE, SOLUTION	6.1		II III	P5 P5	A10.4 A10.4
	UN2505	AMMONIUM FLUORIDE	6.1		III	P5	A10.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN2854	AMMONIUM FLUROSILICATE	6.1		III	P5	A10.5.
		<i>Ammonium fulminate</i>					FORBIDDEN
		<i>Ammonium hexafluorosilicate, see AMMONIUM FLUROSILICATE (UN2854)</i>					
		<i>Ammonium hydrate, see AMMONIA SOLUTION, (UN2073, UN2672, UN3318)</i>					
	UN2506	AMMONIUM HYDROGEN SULPHATE	8		II	P5	A12.3.
	UN1727	AMMONIUM HYDROGENDIFLUORIDE, SOLID	8		II	P5, N34	A12.3.
	UN2817	AMMONIUM HYDROGENDIFLUORIDE, SOLUTION	8	6.1 6.1	II III	P4, N34 P5, N3	A12.2. A12.2.
		<i>Ammonium hydrosulphide solution, see AMMONIUM SULPHIDE SOLUTION (UN2683)</i>					
		<i>Ammonium hydroxide, see AMMONIA SOLUTION, (UN2073, UN2672, UN3318)</i>					
		<i>Ammonium hydroxide, see AMMONIA SOLUTION, etc.</i>					
	UN2859	AMMONIUM METAVANADATE	6.1		II	P5	A10.5.
	UN0222	AMMONIUM NITRATE, with more than 0.2% combustible substances, including any organic substance calculated as carbon to the exclusion of any other added substance	1.1D			P4, 370	A5.7.
	UN1942	AMMONIUM NITRATE, with not more than 0.2% total combustible material, including any organic substance calculated as carbon, to the exclusion of any other added substance	5.1		III	P5, 148, A1, A29	A9.6.
	UN2067	AMMONIUM NITRATE BASED FERTILIZER	5.1		III	P5, 34, 52, 148, 150	A9.6.
	UN2071	AMMONIUM NITRATE BASED FERTILIZER	9		III	P5, 34, 132, 150	A13.2.
	UN3375	AMMONIUM NITRATE EMULSION, or AMMONIUM NITRATE SUSPENSION, or AMMONIUM NITRATE GEL, intermediate for blasting explosives	5.1		II	147, 148, 163	FORBIDDEN
	UN2426	AMMONIUM NITRATE, LIQUID (hot concentrated solution)	5.1				FORBIDDEN
		<i>Ammonium nitrate explosives, see EXPLOSIVE, BLASTING, TYPE B (UN0082, UN0331)</i>					
D	NA0331	AMMONIUM NITRATE-FUEL OIL MIXTURE (containing only prilled Ammonium Nitrate and fuel oil)	1.5D			P4, 148	A5.11.
	UN2426	AMMONIUM NITRATE LIQUID, hot concentrated solution	5.1			148	FORBIDDEN
		<i>Ammonium nitrite</i>					FORBIDDEN
	UN0402	AMMONIUM PERCHLORATE	1.1D			P4, 107	A5.7.
	UN1442	AMMONIUM PERCHLORATE	5.1		II	P5, 107, A9	A9.6.
		<i>Ammonium Permanganate</i>					FORBIDDEN
	UN1444	AMMONIUM PERSULPHATE	5.1		III	P5, A1, A29	A9.6.
	UN0004	AMMONIUM PICRATE, dry or wetted with less than 10% water, by mass	1.1D			P4	A5.6.
	UN1310	AMMONIUM PICRATE, WETTED with not less than 10% water, by mass	4.1		I	P4, 23, A2, N41	A8.3.
	UN2818	AMMONIUM POLYSULPHIDE, SOLUTION	8	6.1 6.1	II III	P4 P5	A12.2. A12.2.
	UN2861	AMMONIUM POLYVANADATE	6.1		II	P5	A10.5.
		<i>Ammonium silicofluoride, see AMMONIUM FLUROSILICATE (UN2854)</i>					
	UN2683	AMMONIUM SULPHIDE SOLUTION	8	6.1, 3	II	P4	A12.2.
		<i>Ammonium tetrachloromercurate, see MERCURY AMMONIUM CHLORIDE (UN1630)</i>					
		<i>Ammunition, blank, see CARTRIDGES FOR WEAPONS, BLANK (UN0014, UN0326, UN0327, UN0338, UN0413)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Ammunition, fixed, semi-fixed or separate loading; see <b>CARTRIDGES FOR WEAPONS</b> (UN0005, UN0006, UN0007, UN0321, UN0348, UN0412)					
	UN0171	<b>AMMUNITION, ILLUMINATING</b> , with or without burster, expelling charge or propelling charge	1.2G			P4	A5.12.
	UN0254	<b>AMMUNITION, ILLUMINATING</b> , with or without burster, expelling charge or propelling charge	1.3G			P4	A5.12.
	UN0297	<b>AMMUNITION, ILLUMINATING</b> , with or without burster, expelling charge or propelling charge	1.4G			P5	A5.12.
	UN0247	<b>AMMUNITION, INCENDIARY</b> liquid or gel, with burster, expelling charge or propelling charge	1.3J			P3	A5.12.
		Ammunition, incendiary (water-activated contrivances) with burster, expelling charge or propelling charge; see <b>CONTRIVANCES, WATER-ACTIVATED</b> . (UN0248, UN0249)					
	UN0243	<b>AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS</b> , with burster expelling charge or propelling charge	1.2H			P3	A5.12.
	UN0244	<b>AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS</b> , with burster expelling charge or propelling charge	1.3H			P3	A5.12.
	UN0009	<b>AMMUNITION, INCENDIARY</b> , with or without burster, expelling charge, or propelling charge	1.2G			P4	A5.12.
	UN0010	<b>AMMUNITION, INCENDIARY</b> , with or without burster, expelling charge, or propelling charge	1.3G			P4	A5.12.
	UN0300	<b>AMMUNITION, INCENDIARY</b> , with or without burster, expelling charge, or propelling charge	1.4G			P5	A5.12.
		Ammunition, industrial, see <b>CARTRIDGES, POWER DEVICE</b> (UN0275, UN0276, UN0323, UN0381) or <b>CARTRIDGES, OIL WELL</b> (UN0277, UN0278)					
		Ammunition, lachrymatory, see <b>AMMUNITION, TEAR-PRODUCING</b> (UN0018, UN0019, UN0301)					
	UN0362	<b>AMMUNITION, PRACTICE</b>	1.4G			P5	A5.12.
	UN0488	<b>AMMUNITION, PRACTICE</b>	1.3G			P4	A5.12.
	UN0363	<b>AMMUNITION, PROOF</b>	1.4G			P5	A5.12.
		Ammunition, rocket, see <b>WARHEADS, ROCKET</b> (UN0286, UN0287, UN0369, UN0370, UN0371)					
		Ammunition, SA (small arms), see <b>CARTRIDGES FOR WEAPONS INERT PROJECTILE</b> (UN0012, UN0328, UN0339, UN0417)					
		Ammunition, smoke (water-activated contrivances), white phosphorus, with burster, expelling charge or propelling charge; see <b>CONTRIVANCES, WATER-ACTIVATED</b> (UN0248)					
		Ammunition, smoke (water-activated contrivances), without white phosphorus or phosphides, with burster, expelling charge or propelling charge; see <b>CONTRIVANCES, WATER-ACTIVATED</b> (UN0249)					
	UN0015	<b>AMMUNITION, SMOKE</b> , with or without burster, expelling charge or propelling charge	1.2G			P4	A5.12.
	UN0016	<b>AMMUNITION, SMOKE</b> , with or without burster, expelling charge or propelling charge	1.3G			P4	A5.12.
	UN0303	<b>AMMUNITION, SMOKE</b> , with or without burster, expelling charge or propelling charge	1.4G			P5	A5.12.
	UN0245	<b>AMMUNITION, SMOKE, WHITE PHOSPHORUS</b> , with burster, expelling charge, or propelling charge	1.2H			P3	A5.12.
	UN0246	<b>AMMUNITION, SMOKE, WHITE PHOSPHORUS</b> , with burster, expelling charge, or propelling charge	1.3H			P3	A5.12.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Ammunition, sporting, see CARTRIDGES FOR WEAPONS, INERT PROJECTILE (UN0012, UN0328, UN0339, UN0417)</i>					
	UN2017	<b>AMMUNITION, TEAR-PRODUCING, NONEXPLOSIVE</b> , without burster or expelling charge, non-fuzed	6.1	8	II	P4	A10.5.
	UN0018	<b>AMMUNITION, TEAR-PRODUCING</b> , with burster expelling charge or propelling charge	1.2G	8, 6.1		P4	A5.12.
	UN0019	<b>AMMUNITION, TEAR-PRODUCING</b> , with burster expelling charge or propelling charge	1.3G	8, 6.1		P4	A5.12.
	UN0301	<b>AMMUNITION, TEAR-PRODUCING</b> , with burster expelling charge or propelling charge	1.4G	8, 6.1		P5	A5.12.
★	UN0020	<b>AMMUNITION, TOXIC</b> , with burster, expelling charge, or propelling charge	1.2K	6.1		P1	A5.3.
★	UN0021	<b>AMMUNITION, TOXIC</b> , with burster, expelling charge, or propelling charge	1.3K	6.1		P1	A5.3.
		<i>Ammunition, toxic (water-activated contrivances), with burster, expelling charge or propelling charge; see CONTRIVANCES, WATER-ACTIVATED, ★ (UN0248, UN0249)</i>					
	UN2016	<b>AMMUNITION, TOXIC, NON-EXPLOSIVE</b> , without burster or expelling charge, nonfuzed	6.1		II	P2	A10.5.
		<i>Amorces, see FIREWORKS (UN0333, UN0336, UN0337)</i>					
		<i>Amosite, or Amphibole asbestos, see ASBESTOS AMPHIBOLE, ★ (UN2212)</i>					
	UN1104	<b>AMYL ACETATES</b>	3		III	P5	A7.2.
	UN2819	<b>AMYL ACID PHOSPHATE</b>	8		III	P5	A12.2.
		<i>Amyl alcohols, see PENTANOLS (UN1105)</i>					
		<i>Amyl aldehyde, see VALERALDEHYDE (UN2058)</i>					
	UN1106	<b>AMYLAMINES</b>	3	8	II	P5	A7.2.
	UN2620	<b>AMYL BUTYRATES</b>	3	8	III	P5	A7.2.
	UN1107	<b>AMYL CHLORIDE</b>	3		II	P5	A7.2.
	UN1108	<b>n-AMYLENE</b>	3		I	P3	A7.2.
	UN1109	<b>AMYL FORMATES</b>	3		III	P5	A7.2.
	UN1111	<b>AMYL MERCAPTAN</b>	3		II	P5, A3	A7.2.
	UN1110	<b>n-AMYL METHYL KETONE</b>	3		III	P5	A7.2.
	UN1112	<b>AMYL NITRATE</b>	3		III	P5	A7.2.
	UN1113	<b>AMYL NITRITE</b>	3		II	P5	A7.2.
		<i>tert-Amylperoxy-3,5,5-trimethylhexanoate, see ORGANIC PEROXIDE TYPE D, LIQUID, ★ (UN3105)</i>					
	UN1728	<b>AMYLTRICHLOROSILANE</b>	8		II	P5, A7, N34	A12.2.
		<i>Anaesthetic ether, see DIETHYL ETHER (UN1155)</i>					
		<i>Anhydrous ammonia, see AMMONIA, ANHYDROUS, (UN1005)</i>					
		<i>Anhydrous hydrazine, see HYDRAZINE, ANHYDROUS (UN2029)</i>					
		<i>Anhydrous hydriodic acid, see HYDROGEN IODIDE, ANHYDROUS, (UN2197)</i>					
		<i>Anhydrous hydrofluoric acid, see HYDROGEN FLUORIDE, ANHYDROUS, (UN1052)</i>					
+	UN1547	<b>ANILINE</b>	6.1		II	P5	A10.4.
		<i>Aniline chloride, see ANILINE HYDROCHLORIDE, (UN1548)</i>					
	UN1548	<b>ANILINE HYDROCHLORIDE</b>	6.1		III	P5	A10.5.
		<i>Aniline oil, see ANILINE, (UN1547)</i>					
		<i>Aniline salt, see ANILINE HYDROCHLORIDE, (UN1548)</i>					
	UN2431	<b>ANISIDINES</b>	6.1		III	P5	A10.4.
	UN2222	<b>ANISOLE</b>	3		III	P5	A7.2.
	UN1729	<b>ANISOYL CHLORIDE</b>	8		II	P5	A12.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Anti-freeze liquid, see <b>FLAMMABLE LIQUIDS, N.O.S. ★</b> (UN1993)					
		Anti-knock compound, mixture, see <b>MOTOR FUEL ANTI-KNOCK MIXTURES</b> (UN1649)					
		Antimonious chloride, see <b>ANTIMONY TRICHLORIDE</b> (UN1733)					
		Anthophyllite, see <b>ASBESTOS AMPHIBOLE ★</b> (UN2212)					
★	UN3141	<b>ANTIMONY COMPOUNDS, INORGANIC, LIQUID, N.O.S.</b>	6.1		III	P5	A10.4.
★	UN1549	<b>ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.</b>	6.1		III	P5, 35	A10.5.
		Antimony hydride, see <b>STIBINE</b> (UN2676)					
		Antimony (III) lactate, see <b>ANTIMONY LACTATE</b> (UN1550)					
	UN1550	<b>ANTIMONY LACTATE</b>	6.1		III	P5	A10.5.
		Antimony oxide, see <b>ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S. ★</b> (UN1549)					
	UN1730	<b>ANTIMONY PENTACHLORIDE, LIQUID</b>	8		II	P5	A12.2.
	UN1731	<b>ANTIMONY PENTACHLORIDE, SOLUTIONS</b>	8		II III	P5 P5	A12.2. A12.2.
	UN1732	<b>ANTIMONY PENTAFLUORIDE</b>	8	6.1	II	P4, A3, A7, A10, N3, N36	A12.2.
		Antimony pentasulphide, see <b>ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S. ★</b> (UN1549)					
		Antimony perchloride, liquid, see <b>ANTIMONY PENTACHLORIDE, LIQUID</b> (UN1730)					
	UN1551	<b>ANTIMONY POTASSIUM TARTRATE</b>	6.1		III	P5	A10.5.
	UN2871	<b>ANTIMONY POWDER</b>	6.1		III	P5	A10.5.
		Antimony sulphide and chlorate, mixture of					FORBIDDEN
		Antimony sulphide, solid, see <b>ANTIMONY COMPOUNDS, INORGANIC, N.O.S. ★</b> (UN1549)					
	UN1733	<b>ANTIMONY TRICHLORIDE, LIQUID</b>	8		II	P5	A12.2.
	UN1733	<b>ANTIMONY TRICHLORIDE, SOLID</b>	8		II	P5	A12.3.
		Antu, see <b>NAPHTHYLTHIOUREA</b> (UN1651)					
		Aqua ammonia, see <b>AMMONIA SOLUTION</b> (UN2073, UN2672, UN3318)					
	UN1006	<b>ARGON, COMPRESSED</b>	2.2			P5	A6.3., A6.5.
	UN1951	<b>ARGON, REFRIGERATED LIQUID</b> (cryogenic liquid)	2.2		I	P4	A6.11.
		Aromatic liquids, see <b>EXTRACTS, AROMATIC, LIQUID (UN1169) or EXTRACTS, FLAVOURING, LIQUID (UN1197)</b>					
		Arsenate of lead, see <b>LEAD ARSENATES</b> (UN1617)					
		Arsenates N.O.S., see <b>ARSENIC COMPOUND, LIQUID, N.O.S. (UN1556) or ARSENIC COMPOUND, SOLID (UN1557)</b>					
	UN1558	<b>ARSENIC</b>	6.1		II	P5	A10.5.
	UN1553	<b>ARSENIC ACID, LIQUID</b>	6.1		I	P3	A10.4.
	UN1554	<b>ARSENIC ACID, SOLID</b>	6.1		II	P5	A10.5.
	UN1555	<b>ARSENIC BROMIDE</b>	6.1		II	P5	A10.5.
	UN1562	<b>ARSENICAL DUST</b>	6.1		II	P5	A10.5.
★	UN2760	<b>ARSENICAL PESTICIDES, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C</b>	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2994	<b>ARSENICAL PESTICIDES, LIQUID, TOXIC</b>	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN2993	ARSENICAL PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2759	ARSENICAL PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Arsenious acid, solid, see ARSENIC TRIOXIDE (UN1561)					
		Arsenious and mercuric iodide solution, see ARSENIC COMPOUNDS, LIQUID, N.O.S. (UN1556)					
	UN1555	ARSENIC BROMIDE	6.1		II	P5	A10.5.
		Arsenic (III) bromide, see ARSENIC BROMIDE (UN1555)					
		Arsenic chloride, see ARSENIC TRICHLORIDE (UN1560)					
★	UN1556	ARSENIC COMPOUNDS, LIQUID, N.O.S. inorganic, including Arsenates, N.O.S., Arsenites, N.O.S., Arsenic sulphides, N.O.S., and Organic compounds of arsenic, N.O.S.	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN1557	ARSENIC COMPOUNDS, SOLID, N.O.S., including Arsenates, N.O.S., Arsenites, N.O.S., Arsenic sulphides, N.O.S., and Organic compounds of arsenic, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Arsenic, fuming liquid, see ARSENIC TRICHLORIDE (UN1560)					
		Arsenic hydride, see ARSINE (UN2188)					
		Arsenic (III) oxide, ARSENIC TRIOXIDE (UN1561)					
		Arsenic (V) oxide, see ARSENIC PENTOXIDE (UN1559)					
	UN1559	ARSENIC PENTOXIDE	6.1		II	P5	A10.5.
		Arsenic sulphide and a chlorate, mixtures of					FORBIDDEN
		Arsenic sulphides, N.O.S., see, ARSENIC COMPOUND, LIQUID, N.O.S. (UN1556) or ARSENIC COMPOUND SOLID N.O.S. (UN1557)					
	UN1560	ARSENIC TRICHLORIDE	6.1		I	P2, 2	A10.6.
	UN1561	ARSENIC TRIOXIDE	6.1		II	P5	A10.5.
		Arsenic, white, solid, see ARSENIC TRIOXIDE (UN1561)					
		Arsenious chloride, see ARSENIC TRICHLORIDE (UN1560)					
		Arsenites, N.O.S., see ARSENIC COMPOUND LIQUID, N.O.S. ★ (UN1556) or ARSENIC COMPOUND, SOLID, N.O.S. ★ (UN1557)					
		Arsenous and mercuric iodide solution, see ARSENIC COMPOUND LIQUID, N.O.S. ★ (UN1556)					
		Arsenous chloride, see ARSENIC TRICHLORIDE (UN1560)					
	UN2188	ARSINE	2.3	2.1		P1, 1	A6.15.
	UN3522	ARSINE, ADSORBED	2.3	2.1		P1, 1	A6.15.
★	UN3542	ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.	4.2			131, 391	FORBIDDEN
★	UN3543	ARTICLES CONTAINING A SUBSTANCE WHICH EMITS FLAMMABLE GAS IN CONTACT WITH WATER, N.O.S.	4.3			131, 391	FORBIDDEN
★	UN3547	ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.	8			P5, 391	A12.6
★	UN3537	ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.	2.1			P4, 391	A6.28
★	UN3540	ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.	3			P5, 391	A7.12
★	UN3541	ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.	4.1			P5, 391	A8.15



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3548	ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS, N.O.S.	9			P5, 391	A13.5
★	UN3538	ARTICLES CONTAINING NON FLAMMABLE, NON TOXIC GAS, N.O.S.	2.2			P5, 391	A6.28
★	UN3545	ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.	5.2			131, 391	FORBIDDEN
★	UN3544	ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.	5.1			131, 391	FORBIDDEN
★	UN3539	ARTICLES CONTAINING TOXIC GAS, N.O.S.	2.3			131, 391	FORBIDDEN
★	UN3546	ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.	6.1			P5, 391	A10.13
★	UN0486	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE <i>or</i> ARTICLES, EEI	1.6N			P5	A5.3.
★	UN0349	ARTICLES, EXPLOSIVE, N.O.S.	1.4S			P5, 101, 148, 347, 382	A5.3.
★	UN0350	ARTICLES, EXPLOSIVE, N.O.S.	1.4B			P5, 101	A5.3.
★	UN0351	ARTICLES, EXPLOSIVE, N.O.S.	1.4C			P5, 101	A5.3.
★	UN0352	ARTICLES, EXPLOSIVE, N.O.S.	1.4D			P5, 101	A5.3.
★	UN0353	ARTICLES, EXPLOSIVE, N.O.S.	1.4G			P5, 101	A5.3.
★	UN0354	ARTICLES, EXPLOSIVE, N.O.S.	1.1L			P3, 101	A5.3.
★	UN0355	ARTICLES, EXPLOSIVE, N.O.S.	1.2L			P3, 101	A5.3.
★	UN0356	ARTICLES, EXPLOSIVE, N.O.S.	1.3L			P3, 101	A5.3.
★	UN0462	ARTICLES, EXPLOSIVE, N.O.S.	1.1C			P4, 101	A5.3.
★	UN0463	ARTICLES, EXPLOSIVE, N.O.S.	1.1D			P4, 101	A5.3.
★	UN0464	ARTICLES, EXPLOSIVE, N.O.S.	1.1E			P4, 101	A5.3.
★	UN0465	ARTICLES, EXPLOSIVE, N.O.S.	1.1F			P4, 101	A5.3.
★	UN0466	ARTICLES, EXPLOSIVE, N.O.S.	1.2C			P4, 101	A5.3.
★	UN0467	ARTICLES, EXPLOSIVE, N.O.S.	1.2D			P4, 101	A5.3.
★	UN0468	ARTICLES, EXPLOSIVE, N.O.S.	1.2E			P4, 101	A5.3.
★	UN0469	ARTICLES, EXPLOSIVE, N.O.S.	1.2F			P4, 101	A5.3.
★	UN0470	ARTICLES, EXPLOSIVE, N.O.S.	1.3C			P4, 101	A5.3.
★	UN0471	ARTICLES, EXPLOSIVE, N.O.S.	1.4E			P5, 101	A5.3.
★	UN0472	ARTICLES, EXPLOSIVE, N.O.S.	1.4F			P5, 101	A5.3.
	UN3164	ARTICLES, PRESSURIZED, PNEUMATIC <i>or</i> ARTICLES, PRESSURIZED, HYDRAULIC <i>or</i> hydraulic containing nonflammable gas	2.2			P5, 371	A6.4., A6.5., A6.8.
	UN0380	ARTICLES, PYROPHORIC	1.2L			P3	A5.3.
	UN0428	ARTICLES, PYROTECHNIC <i>for technical purposes</i>	1.1G			P4	A5.18.
	UN0429	ARTICLES, PYROTECHNIC <i>for technical purposes</i>	1.2G			P4	A5.18.
	UN0430	ARTICLES, PYROTECHNIC <i>for technical purposes</i>	1.3G			P4	A5.18.
	UN0431	ARTICLES, PYROTECHNIC <i>for technical purposes</i>	1.4G			P5	A5.18.
	UN0432	ARTICLES, PYROTECHNIC <i>for technical purposes</i>	1.4S			P5	A5.18.
	UN2586	ARYLSULPHONIC ACIDS. LIQUID, with 5% or less free sulphuric acid	8		III	P5	A12.2.
	UN2584	ARYLSULPHONIC ACIDS. LIQUID, with more than 5% free sulphuric acid	8		II	P5	A12.2.
	UN2585	ARYLSULPHONIC ACIDS. SOLID, with 5% or less free sulphuric acid	8		III	P5	A12.3.
	UN2583	ARYLSULPHONIC ACIDS. SOLID, with more than 5% free sulphuric acid	8		II	P5	A12.3.
D	NA2212	ASBESTOS	9		III	P5, 156	A13.15
★	UN2212	ASBESTOS, AMPHIBOLE <i>amosite, tremolite, actinolite, anthophyllite, or crocidolite</i>	9		II	P5, 156	A13.15
		<i>Asbestos blue or Asbestos brown, see ASBESTOS AMPHIBOLE ★ (UN2212)</i>					
	UN2590	ASBESTOS, CHRYSOTILE	9		III	P5, 156	A13.15
		<i>Asbestos, white, see ASBESTOS, CHRYSOTILE (UN2590)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Ascaridole (organic peroxide)					FORBIDDEN
		Asphalt, cut back, see <b>TARS, LIQUID</b> (UN1999)					
		Automobile, see <b>VEHICLE, FLAMMABLE LIQUID POWERED</b> (UN3166), or <b>VEHICLE, FLAMMABLE GAS POWERED</b> (UN3166), or <b>BATTERY-POWERED VEHICLE</b> (UN3171)					
D	NA1999	<b>ASPHALT</b> , at or above its flashpoint	9		III		FORBIDDEN
		Asphalt, cut back; see <b>TARS, LIQUID</b> , (UN1999)					
		Automobile, motorcycle, tractor, other self-propelled vehicle, engine, or other mechanical apparatus, see <b>VEHICLES</b> (UN3166) or <b>BATTERY</b> , (UN3292, UN3028, UN3496, UN3496, UN2794, UN2795, UN2800, UN2796, UN2797, UN3171).					
★	UN3334	<b>AVIATION REGULATED LIQUID, N.O.S.</b>	9			P5, A35, A189	A13.14.
★	UN3335	<b>AVIATION REGULATED SOLID, N.O.S.</b>	9			P5, A35	A13.14.
		Azaurolic Acid (salt of) (dry)					FORBIDDEN
		Azidodithiocarbonic acid					FORBIDDEN
		Azidoethyl nitrate					FORBIDDEN
		Azido guanidine picrate (dry)					FORBIDDEN
		5-Azido-1-hydroxy tetrazole					FORBIDDEN
		Azido hydroxy tetrazole (mercury and silver salts)					FORBIDDEN
		3-Azido-1, 2-propylene glycol dinitrate					FORBIDDEN
		1-Aziridinylphosphine oxide-(tris), see <b>TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE, SOLUTION</b> (UN2501)					
	UN3242	<b>AZODICARBONAMIDE</b>	4.1		II	38	FORBIDDEN
		Azodicarbonamide formulation type b, temperature controlled					FORBIDDEN
		2,2'-Azodi-(2,4-dimethyl-4-methoxyvaleronitrile) see <b>SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED</b> (UN3236)					
		2,2'-Azodi-(2,4 dimethylvaleronitrile) see <b>SELF-REACTIVE SOLID TYPE D TEMPERATURE CONTROLLED</b> (UN3236)					
		1,1'-Azodi-(hexahydrobenzonitrile) see <b>SELF-REACTIVE SOLID TYPE D</b> (UN3226)					
		Azodiisobutyronitrile, see <b>SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED</b> (UN3234)					
		2,2'-Azodi-(2-methylbutyronitrile), see <b>SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED</b> (UN3236)					
		Azotetrazole (dry)					FORBIDDEN
		Bag charges, see <b>CHARGES, PROPELLING, FOR CANNON</b> , (UN0242, UN0279, UN0414)					
		Ballistite, see <b>POWDER, SMOKELESS</b> , (UN0160, UN0161)					
		Bangalore torpedoes, see <b>MINES</b> , (UN0136, UN0137, UN0138, UN0294)					
	UN1400	<b>BARIUM</b>	4.3		II	P4, A19	A8.3.
		Barium alloys, see <b>ALKALINE EARTH METAL ALLOY, N.O.S.</b> (UN1393)					
	UN1854	<b>BARIUM ALLOYS, PYROPHORIC</b>	4.2		I	P3	A8.5.
	UN0224	<b>BARIUM AZIDE</b> , dry or wetted with less than 50% water, by mass	1.1A	6.1		P3, 111, 117	A5.4.
	UN1571	<b>BARIUM AZIDE</b> , wetted with not less than 50% water, by mass	4.1	6.1	I	P4, 162, A2	A8.10.
		Barium dioxide, see <b>BARIUM PEROXIDE</b> (UN1449)					
	UN2719	<b>BARIUM BROMATE</b>	5.1	6.1	II	P4	A9.6.
	UN1445	<b>BARIUM CHLORATE, SOLID</b>	5.1	6.1	II	P4, A9, N34	A9.6.
	UN3405	<b>BARIUM CHLORATE SOLUTION</b>	5.1	6.1 6.1	II III	P4, A9, N34 P4, A9, N34	A9.5. A9.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN1564	<b>BARIUM COMPOUNDS, N.O.S.</b>	6.1		II III	P5 P5	A10.5. A10.5.
	UN1565	<b>BARIUM CYANIDE</b>	6.1		I	P3, N74, N75	A10.5.
		<i>Barium binoxide, see BARIUM PEROXIDE (UN1449)</i>					
	UN2741	<b>BARIUM HYPOCHLORITE</b> with more than 22% available chlorine	5.1	6.1	II	P5, A7, A9, N34	A9.6.
	UN1446	<b>BARIUM NITRATE</b>	5.1	6.1	II	P5	A9.6.
	UN1884	<b>BARIUM OXIDE</b>	6.1		III	P5	A10.5.
	UN1447	<b>BARIUM PERCHLORATE, SOLID</b>	5.1	6.1	II	P5	A9.6.
	UN3406	<b>BARIUM PERCHLORATE, SOLUTION</b>	5.1	6.1 6.1	II III	P5 P5	A9.5. A9.5.
	UN1448	<b>BARIUM PERMANGANATE</b>	5.1	6.1	II	P5	A9.6.
	UN1449	<b>BARIUM PEROXIDE</b>	5.1	6.1	II	P5, A9	A9.6.
		<i>Barium selenate see SELENATES or SELENITES ★ (UN2630)</i>					
		<i>Barium selenite, see SELENATES or SELENITES</i>					
		<i>Barium sulphate, (Not Regulated)</i>					
		<i>Barium superoxide, see BARIUM PEROXIDE (UN1449)</i>					
	UN3292	<b>BATTERIES, CONTAINING SODIUM</b>	4.3			P5	A8.18.
		<i>Batteries, Dry , not regulated</i>				130	
	UN3028	<b>BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE SOLID, electric storage</b>	8			P5	A12.4.
		<i>Batteries, lithium, see LITHIUM METAL BATTERIES (UN3090) or LITHIUM ION BATTERIES (UN3480)</i>					
	UN3496	<b>BATTERIES, NICKEL-METAL HYDRIDE</b>	9			P5, 130, 340	
	UN2794	<b>BATTERIES, WET, FILLED WITH ACID, electric storage</b>	8			P5, A51	A12.4.
	UN2795	<b>BATTERIES, WET, FILLED WITH ALKALI, electric storage</b>	8			P5, A51	A12.4.
	UN2800	<b>BATTERIES, WET, NON-SPILLABLE, electric storage</b>	8			P5,	A12.4.
	UN2796	<b>BATTERY FLUID, ACID</b>	8		II	P5, A3, A7, N6, N34	A12.2., A12.4.
	UN2797	<b>BATTERY FLUID, ALKALI</b>	8		II	P5, N6	A12.2., A12.4.
	UN3171	<b>BATTERY-POWERED EQUIPMENT</b>	9			P5, 134, 135, 182, 360	A13.6.
	UN3171	<b>BATTERY-POWERED VEHICLE</b>	9			P5, 134, 135, 182, 360	A13.6.
		<i>Battery, wet filled with acid or alkali with vehicle or mechanical equipment containing an internal combustion engine, see VEHICLE, etc. or ENGINES, INTERNAL COMBUSTION, (UN3528, UN3529) or VEHICLE, FLAMMABLE GAS POWERED or VEHICLE, FLAMMABLE LIQUID POWERED, (UN3166)</i>					
		<i>Benzal chloride, see BENZYLIDENE CHLORIDE (UN1886)</i>					
+	UN1990	<b>BENZALDEHYDE</b>	9		III	P5	A13.2.
	UN1114	<b>BENZENE</b>	3		II	P5	A7.2.
		<i>Benzene diazonium chloride (dry)</i>					FORBIDDEN
		<i>Benzene diazonium nitrate (dry)</i>					FORBIDDEN
		<i>Benzene-1,3-disulpho hydrazide, not more than 52% as a paste see SELF- REACTIVE SOLID TYPE D (UN3226)</i>					
		<i>Benzene-1,3-disulphonyl hydrazide, more than 52% as a paste</i>					FORBIDDEN
		<i>Benzene phosphorus dichloride; see PHENYLPHOSPHORUS DICHLORIDE (UN2798)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Benzene phosphorus thiodichloride, see</i> <b>PHENYLPHOSPHORUS THIODICHLORIDE</b> (UN2799)					
	UN2225	<b>BENZENESULPHONYL CHLORIDE</b> <i>Benzenesulphonyl hydrazide, see SELF-REACTIVE SOLID TYPE D</i> (UN3226)	8		III	P5	A12.2.
		<i>Benzenethiol, see</i> <b>PHENYL MERCAPTAN</b> (UN2337)					
		<i>Benzene triozone</i>					FORBIDDEN
	UN1885	<b>BENZIDINE</b> <i>1,3,2-Benzodioxaborole</i>	6.1		II	P5	A10.5.
		<i>Benzol, see</i> <b>BENZENE</b> (UN1114)				A210	FORBIDDEN
		<i>Benzolene, see</i> <b>PETROLEUM DISTILLATES, N.O.S.</b> (UN1268)					
	UN2224	<b>BENZONITRILE</b>	6.1		II	P5	A10.4.
	UN2587	<b>BENZOQUINONE</b> <i>Benzosulphochloride, see</i> <b>BENZENESULPHONYL CHLORIDE</b> (UN2225)	6.1		II	P5	A10.5.
	UN2226	<b>BENZOTRICHLORIDE</b>	8		II	P5	A12.2.
	UN2338	<b>BENZOTRIFLUORIDE</b> <i>Benzoxidiazoles (dry)</i>	3		II	P5	A7.2.
		<i>Benzoyl azide</i>					FORBIDDEN
	UN1736	<b>BENZOYL CHLORIDE</b>	8		II	P5	A12.2.
	UN1737	<b>BENZYL BROMIDE</b>	6.1	8	II	P4, A3, A7, N33, N34	A10.4.
	UN1738	<b>BENZYL CHLORIDE</b>	6.1	8	II	P4, A3, A7, N33, N42	A10.4.
	UN1738	<b>BENZYL CHLORIDE, unstabilized</b> <i>Benzyl chlorocarbonate, see</i> <b>BENZYL CHLOROFORMATE</b> (UN1739)	6.1	8	II	P4, A3, A7, N33, N34, N43	A10.4.
	UN1739	<b>BENZYL CHLOROFORMATE</b> <i>Benzyl cyanide, see</i> <b>PHENYLACETONITRILE, LIQUID</b> (UN2470)	8		I	P3, N41	A12.2.
	UN2619	<b>BENZYLDIMETHYLAMINE</b> <i>4-(benzyl(ethylamino)-3-ethoxybenzenediazonium zinc chloride see</i> <b>SELF-REACTIVE SOLID TYPE D ★</b> (UN3226)	8	3	II	P5	A12.2.
	UN1886	<b>BENZYLIDENE CHLORIDE</b>	6.1		II	P5	A10.4.
	UN2653	<b>BENZYL IODIDE</b> <i>4-(benzyl(methylamino)3-ethoxybenzenediazonium zinc chloride see</i> <b>SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED ★</b> (UN3236)	6.1		II	P5	A10.4.
★	UN1566	<b>BERYLLIUM COMPOUNDS, N.O.S.</b>	6.1		II III	P5 P5	A10.5. A10.5.
	UN2464	<b>BERYLLIUM NITRATE</b>	5.1	6.1	II	P5	A9.6.
	UN1567	<b>BERYLLIUM, POWDER</b> <i>Beverage extract (concentrate), see</i> <b>CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. ★</b> (UN3264)	6.1	4.1	II	P5	A10.5.
	UN 1327	<b>BHUSA</b>	4.1			See IATA A2, A198	FORBIDDEN
	UN2251	<b>BICYCLO [2,2,1] HEPTA-2-5-DIENE, STABILIZED or 2,5-NORBORNADIENE, STABILIZED</b> <i>Bifluorides, solid, n.o.s. see</i> <b>HYDROGENDIFLUORIDES, SOLID, N.O.S.</b> (UN1740)	3		II	P5, 387	A7.3
		<i>Bifluorides n.o.s., see</i> <b>HYDROGENDIFLUORIDES, SOLUTION, N.O.S.</b> (UN3471)					

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Biological products, known or reasonably believed to contain infectious substances and which meet the criteria for inclusion in Category A or Category B and which do not meet the criteria of IATA 3.6.2.3.1(a), see <b>INFECTIOUS SUBSTANCE, AFFECTING HUMANS ★</b> (UN2814) or <b>INFECTIOUS SUBSTANCE, AFFECTING ANIMALS ★</b> (UN2900) or <b>BIOLOGICAL SUBSTANCE, CATEGORY B</b> , (UN3373)					
		Biological products, manufactured and packaged in accordance with the requirements of national governmental health authorities and transported for the purposes of final packaging or distribution, and use for personal health care by medical professionals or individuals. (NOT REGULATED)					
	UN3373	<b>BIOLOGICAL SUBSTANCE, CATEGORY B</b>	6.2			P5, A508	A10.9
	UN3291	<b>BIOMEDICAL WASTE, N.O.S.</b>	6.2		II	P5, 337, A13	A10.10.
		<i>Biphenyl triozonide</i>					FORBIDDEN
★	UN2782	<b>BIPYRIDILIUM PESTICIDES, LIQUID, FLAMMABLE, TOXIC</b> , flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3016	<b>BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC</b>	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3015	<b>BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC, FLAMMABLE</b> , flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
		<i>Bis (Aminopropyl) piperazine</i> , see <b>CORROSIVE LIQUID N.O.S. ★</b> (UN1760)					
★	UN2781	<b>BIPYRIDILIUM PESTICIDES, SOLID, TOXIC</b>	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2837	<b>BISULFATES, AQUEOUS SOLUTION</b>	8		II III	P5, A7, N34 P5, A7, N34	A12.2. A12.2.
	UN2693	<b>BISULFITES, AQUEOUS SOLUTIONS, N.O.S.</b>	8		III	P5	A12.2.
	UN0027	<b>BLACK POWDER</b> or <b>GUNPOWDER</b> , granular or as a meal	1.1D			P4	A5.8.
	UN0028	<b>BLACK, POWDER, COMPRESSED</b> or <b>GUNPOWDER, COMPRESSED</b> or <b>BLACK POWDER, IN PELLETS</b> or <b>GUNPOWDER, IN PELLETS</b>	1.1D			P4	A5.8.
	NA0027	<b>BLACK POWDER FOR SMALL ARMS</b>	4.1		I	70	FORBIDDEN
		<i>Blasting agent</i> , N.O.S., see <b>EXPLOSIVES, BLASTING</b> (UN0081, UN0082, UN0331, UN0083, UN0084, UN0241, UN0332)					
		<i>Blasting cap, assemblies</i> ; see <b>DETONATOR ASSEMBLIES NON-ELECTRIC</b> , for blasting (UN0360, UN0361, UN0500)					
		<i>Blasting caps, electric</i> , see <b>DETONATORS, ELECTRIC</b> , for blasting (UN0030, UN0255, UN0456)					
		<i>Blasting caps, nonelectric</i> , see <b>DETONATORS, NON-ELECTRIC</b> , for blasting (UN0029, UN0267, UN0455)					
		<i>Bleach, bleach liquor or Bleach solutions</i> , see <b>HYPOCHLORITE SOLUTION</b> (UN1791)					
		<i>Bleaching powder</i> , see <b>CALCIUM HYPOCHLORITE MIXTURES, DRY</b> (UN1748, UN2208)					
	UN0033	<b>BOMBS</b> , with bursting charge	1.1F			P4	A5.12.
	UN0034	<b>BOMBS</b> , with bursting charge	1.1D			P4	A5.12.
	UN0035	<b>BOMBS</b> , with bursting charge	1.2D			P4	A5.12.
	UN0291	<b>BOMBS</b> , with bursting charge	1.2F			P4	A5.12.

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Bombs, illuminating or Bombs, target identification, see AMMUNITION, ILLUMINATING (UN0171, UN0254, UN0297)</i>					
	UN0038	<b>BOMBS, PHOTO-FLASH</b>	1.1D			P4	A5.12.
	UN0037	<b>BOMBS, PHOTO-FLASH</b>	1.1F			P4	A5.12.
	UN0039	<b>BOMBS, PHOTO-FLASH</b>	1.2G			P4	A5.12.
	UN0299	<b>BOMBS, PHOTO-FLASH</b>	1.3G			P4	A5.12.
	UN2028	<b>BOMBS, SMOKE, NON-EXPLOSIVE, with corrosive liquid, without initiating device</b>	8		II	P4	A12.5.
	UN0399	<b>BOMBS WITH FLAMMABLE LIQUID, with bursting charge</b>	1.1J			P3	A5.3.
	UN0400	<b>BOMBS WITH FLAMMABLE LIQUID, with bursting charge</b>	1.2J			P3	A5.3.
	UN0042	<b>BOOSTERS, without detonator</b>	1.1D			P4, 148	A5.15.
	UN0283	<b>BOOSTERS, without detonator</b>	1.2D			P4	A5.15.
	UN0225	<b>BOOSTERS WITH DETONATOR</b>	1.1B			P4, 115	A5.16.
	UN0268	<b>BOOSTERS WITH DETONATOR</b>	1.2B			P4, 115	A5.16.
		<i>Borate and chlorate mixture, see CHLORATE AND BORATE MIXTURE (UN1458)</i>					
	UN1312	<b>BORNEOL</b>	4.1		III	P5, A1	A8.3.
+	UN2692	<b>BORON TRIBROMIDE</b>	8	6.1	I	P2, 2, N34	A12.11.
	UN1741	<b>BORON TRICHLORIDE</b>	2.3	8		P2, 3	A6.4.
	UN1008	<b>BORON TRIFLUORIDE</b>	2.3	8		P2, 2, 238	A6.5.
	UN1742	<b>BORON TRIFLUORIDE ACETIC ACID COMPLEX, LIQUID</b>	8		II	P4	A12.2.
	UN3419	<b>BORON TRIFLUORIDE ACETIC ACID COMPLEX, SOLID</b>	8		II	P5	A12.4.
	UN3519	<b>BORON TRIFLUORIDE, ADSORBED</b>	2.3	8		P2, 2	A6.5.
	UN2604	<b>BORON TRIFLUORIDE DIETHYL ETHERATE</b>	8	3	I	P3, A19	A12.2.
	UN2851	<b>BORON TRIFLUORIDE DIHYDRATE</b>	8		II	P5	A12.3.
	UN2965	<b>BORON TRIFLUORIDE DIMETHYL ETHERATE</b>	4.3	8, 3	I	P3, A19	A8.2.
	UN1743	<b>BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, LIQUID</b>	8		II	P4	A12.2.
	UN3420	<b>BORON TRIFLUORIDE PROPIONIC ACID COMPLEX, SOLID</b>	8		II	P5	A12.4.
		<i>Box toe gum, see NITROCELLULOSE (UN0341)</i>					
★	UN1450	<b>BROMATES, INORGANIC, N.O.S.</b>	5.1		II	P5, 350	A9.6.
★	UN3213	<b>BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.</b>	5.1		II III	P4, 350 P4, 350	A9.5. A9.5.
+	UN1744	<b>BROMINE or BROMINE SOLUTIONS</b>	8	6.1	I	P1, 1, A3, A6, N34, N43	A12.11.
		<i>Bromine azide</i>					FORBIDDEN
	UN2901	<b>BROMINE CHLORIDE</b>	2.3	5.1, 8		P2, 2, N86	A6.4.
+	UN1745	<b>BROMINE PENTAFLUORIDE</b>	5.1	6.1, 8	I	P1, 1	A9.9.
+	UN1746	<b>BROMINE TRIFLUORIDE</b>	5.1	6.1, 8	I	P2, 2	A9.9.
	UN3425	<b>BROMOACETIC ACID, SOLID</b>	8		II	P5, A7, N34	A12.3.
	UN1938	<b>BROMOACETIC ACID, SOLUTION</b>	8		II III	P4, A7 P5	A12.2. A12.2.
+	UN1569	<b>BROMOACETONE</b>	6.1	3	II	P2, 2	A10.3.
		<i>omega-Bromoacetophenone, see PHENACYL BROMIDE (UN2645)</i>					
	UN2513	<b>BROMOACETYL BROMIDE</b>	8		II	P5	A12.2.
	UN2514	<b>BROMOBENZENE</b>	3		III	P5	A7.2.
		<i>p-Bromobenzyl cyanide (NOT REGULATED)</i>					
	UN1694	<b>BROMOBENZYL CYANIDES, LIQUID</b>	6.1		I	P3	A10.4.
	UN3449	<b>BROMOBENZYL CYANIDES, SOLID</b>	6.1		I	P5	A10.5.
	UN1126	<b>1-BROMOBUTANE</b>	3		II	P5	A7.2.
	UN2339	<b>2-BROMOBUTANE</b>	3		II	P5	A7.2.
	UN1887	<b>BROMOCHLOROMETHANE</b>	6.1		III	P5	A10.4.
	UN2688	<b>1-BROMO-3-CHLOROPROPANE</b>	6.1		III	P5	A10.4.
		<i>4-Bromo-1, 2-dinitrobenzene</i>					FORBIDDEN

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>1-Bromo-2,3-epoxypropane, see EPIBROMOHYDRIN (UN2558)</i>					
		<i>Bromoethane, see ETHYL BROMIDE (UN1891)</i>					
	UN2340	<b>2-BROMOETHYL ETHYL ETHER</b>	3		II	P5	A7.2.
	UN2515	<b>BROMOFORM</b>	6.1		III	P5	A10.4.
		<i>Bromoethane, see METHYL BROMIDE (UN1062)</i>					
	UN2341	<b>1-BROMO-3-METHYLBUTANE</b>	3		III	P5	A7.2.
	UN2342	<b>BROMOMETHYLPROPANES</b>	3		II	P5	A7.2.
	UN3241	<b>2-BROMO-2-NITROPROPANE-1,3,-DIOL</b>	4.1		III	P5, 46	A8.3.
		<i>1Bromo-3-Nitrobenzene (unstable at 56 degrees C)</i>					FORBIDDEN
	UN2343	<b>2-BROMOPENTANE</b>	3		II	P5	A7.2.
	UN2344	<b>BROMOPROPANES</b>	3		II III	P5 P5	A7.2. A7.2.
	UN2345	<b>3-BROMOPROPYNE</b>	3		II	P5	A7.2.
		<i>Bromosilane</i>					FORBIDDEN
		<i>Bromotoluene-alpha; see BENZYL BROMIDE (UN1737)</i>					
	UN2419	<b>BROMOTRIFLUOROETHYLENE</b>	2.1			P4	A6.4.
	UN1009	<b>BROMOTRIFLUOROMETHANE (R13B1)</b>	2.2			P5	A6.3., A6.4.
	UN1570	<b>BRUCINE</b>	6.1		I	P3	A10.5.
	UN0043	<b>BURSTERS, explosive</b>	1.1D			P4	A5.16.
	UN1010	<b>BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, containing more than 40% butadienes</b>	2.1			P4	A6.3., A6.4.
	UN1010	<b>BUTADIENES, STABILIZED</b>	2.1			P4, 387	A6.3., A6.4.
		<i>Butadienes, unstabilized</i>					FORBIDDEN
	UN1011	<b>BUTANE, see also PETROLEUM GASES, LIQUEFIED</b>	2.1			P4	A6.3., A6.6.
		<i>Butane, butane mixtures and mixtures having similar properties in cartridges each not exceeding 500 grams see RECEPTACLES, SMALL, CONTAINING GAS, (UN2037)</i>					
	UN2346	<b>BUTANEDIONE</b>	3		II	P5	A7.2.
		<i>Butane-1-thiol, see BUTYL MERCAPTAN (UN2347)</i>					
		<i>1,2,4-Butanetriol trinitrate</i>					FORBIDDEN
		<i>1-Butanol, see BUTANOLS (UN1120)</i>					
		<i>Butan-2-ol or 1-Butanol, see BUTANOLS (UN11020)</i>					
	UN1120	<b>BUTANOLS</b>	3		II III	P5 P5	A7.2. A7.2.
		<i>Butanol, secondary or Butanol tertiary, see BUTANOLS (UN1120)</i>					
		<i>Butanone, see ETHYL METHYL KETONE (UN1193)</i>					
		<i>2-Butenal, see CROTONALDEHYDE or CROTONALDEHYDE, STABILIZED (UN 1143)</i>					
		<i>Butene, see BUTYLENE (UN1012)</i>					
		<i>But-1-ene-3-one, see METHYL VINYL KETONE STABILIZED (UN1251)</i>					
		<i>1,2-Buteneoxide, see 1,2-BUTYLENE OXIDE, STABILIZED (UN3022)</i>					
		<i>2-Buten-1-ol, see METHALLYL ALCOHOL (UN2614)</i>					
		<i>Tert-Butoxycarbonyl azide</i>					FORBIDDEN
		<i>Butter of antimony, see ANTIMONY TRICHLORIDE (UN1733)</i>					
		<i>Butter of arsenic, see ARSENIC TRICHLORIDE (UN1560)</i>					
		<i>Butyl acetate, iso, see BUTYL ACETATES</i>					
	UN1123	<b>BUTYL ACETATES</b>	3		II III	P5 P5	A7.2. A7.2.
		<i>Butyl acetates, secondary, see BUTYL ACETATES (UN1123)</i>					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1718	BUTYL ACID PHOSPHATE	8		III	P5	A12.2.
	UN2348	BUTYL ACRYLATES, STABILIZED	3		III	P5, 387	A7.2.
		<i>Butyl alcohols, see BUTANOLS (UN1120)</i>					
		<i>Butyl alcohol, secondary, see BUTANOLS (UN1120)</i>					
		<i>Butyl alcohol, tertiary, see BUTANOLS (UN1120)</i>					
	UN1125	N-BUTYLAMINE	3	8	II	P5	A7.2.
	UN2738	N-BUTYLANILINE	6.1		II	P5	A10.4.
		<i>sec-Butylbenzene, see BUTYLBENZENES (UN2709)</i>					
	UN2709	BUTYL BENZENES	3		III	P5	A7.2.
		<i>n-Butyl bromide, see 1-BROMOBUTANE (UN1126)</i>					
		<i>n-Butyl chloride, see CHLOROBUTANES (UN1127)</i>					
	UN2743	N-BUTYL CHLOROFORMATE	6.1	8, 3	I	P2, 2	A10.6.
	UN2747	TERT-BUTYLCYCLOHEXYL-CHLOROFORMATE	6.1		III	P5	A10.4.
	UN1012	BUTYLENE	2.1			P4,	A6.6.
	UN3022	1,2-BUTYLENE OXIDE, STABILIZED	3		II	P5, 387	A7.2.
		<i>Butyl ethers, see DIBUTYL ETHERS (UN1149)</i>					
		<i>Butyl ethyl ether, see ETHYL BUTYL ETHER (UN1179)</i>					
	UN1128	N-BUTYL FORMATE	3		II	P5	A7.2.
		<i>tert-Butyl Hydroperoxide, more than 90% with water</i>					FORBIDDEN
	UN3255	TERT-BUTYL HYPOCHLORITE	4.2	8	I	P3	A8.3.
	UN2690	N-n-BUTYL IMIDAZOLE	6.1		II	P5	A10.4.
		<i>N-n-Butyl iminazole see N,n- BUTYLIMIDAZOLE (UN2690)</i>					
	UN2484	tert-BUTYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
	UN2485	n-BUTYL ISOCYANATE	6.1	3	I	P2, 2	A10.6.
	UN2347	BUTYL MERCAPTAN	3		II	P5, A3	A7.2.
	UN2227	n-BUTYL METHACRYLATE, STABILIZED	3		III	P5, 387	A7.2.
	UN2350	BUTYL METHYL ETHER	3		II	P5	A7.2.
		<i>tert-Butyl menoperoxymaleate, more than 52%</i>					FORBIDDEN
		<i>tert-Butyl monoperoxyphthalate</i>					FORBIDDEN
	UN2351	BUTYL NITRITES	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		<i>tert-Butyl peroxyacetate, more than 52% and less than 77%, when with more than 23% diluent type B</i>					FORBIDDEN
		<i>tert-Butyl peroxyisobutyrate, more than 52% and less or equal to 77%, when with more than or equal to 23% diluent type B</i>					FORBIDDEN
		<i>tert-Butyl peroxy acetate, with more than 75% in solution</i>					FORBIDDEN
		<i>n-Butyl peroxydicarbonate with more than 52% in solution</i>					FORBIDDEN
		<i>tert- Butyl peroxyisobutyrate with more than 77% in solution→&gt;52% and ≤ 77%, when with ≥ 23% diluent Type B</i>					FORBIDDEN
		<i>Butylphenols, liquid, see ALKYLPHENOLS, LIQUID, N.O.S. (UN3145)</i>					
		<i>Butylphenols, solid, see ALKYLPHENOLS, SOLID, N.O.S. (UN2430)</i>					
		<i>Butyl phosphoric acid, see BUTYL ACID PHOSPHATE (UN1718)</i>					
	UN1914	BUTYL PROPIONATES	3		III	P5	A7.2.
		<i>p-tert-Butyl-toluene, see BUTYLTOLUENES (UN2667)</i>					
	UN2667	BUTYLTOLUENES	6.1		III	P5	A10.4.
	UN1747	BUTYLTRICHLOROSILANE	8	3	II	P4, A7, N34	A12.2.
	UN2956	5-TERT-BUTYL-2,4,6-TRINITRO-M-XYLENE or MUSK XYLENE	4.1		III	P5, 159	A8.4.
	UN2352	BUTYL VINYL ETHER, STABILIZED	3		II	P5, 387	A7.2.
		<i>Butyl vinyl ether, unstabilized</i>					FORBIDDEN



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>But-1-yne, see ETHYLACETYLENE, STABILIZED (UN2452)</i>					
		<i>2-Butyne-1,4-diol, see 1,4-BUTYNEDIOL (UN2716)</i>					
	UN2716	<b>1,4-BUTYNEDIOL</b>	6.1		III	P5, A1	A10.5.
	UN1129	<b>BUTYRALDEHYDE</b>	3		II	P5	A7.2.
	UN2840	<b>BUTYRALDOXIME</b>	3		III	P5	A7.2.
	UN2820	<b>BUTYRIC ACID</b>	8		III	P5	A12.2.
	UN2739	<b>BUTYRIC ANHYDRIDE</b>	8		III	P5	A12.2.
		<i>Butyrene, see DIPROPYL KETONE (UN2710)</i>					
	UN2411	<b>BUTYRONITRILE</b>	3	6.1	II	P4	A7.2.
		<i>Butyryl chloride, see BUTYRYL CHLORIDE (UN2353)</i>					
	UN2353	<b>BUTYRYL CHLORIDE</b>	3	8	II	P5	A7.2.
		<i>Cable cutters, explosive, see CUTTERS, CABLE, EXPLOSIVE (UN0070)</i>					
	UN1572	<b>CACODYLIC ACID</b>	6.1		II	P5	A10.5.
★	UN2570	<b>CADMIUM COMPOUNDS</b>	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1407	<b>CAESIUM</b> or <i>CESIUM</i>	4.3		I	P3, A19, N34, N40	A8.3.
		<i>Caffeine, see ALKALOIDS, SOLID, N.O.S. ★ (UN1544) or ALKALOIDS, LIQUID, N.O.S. ★ (UN3140)</i>					
		<i>Cajeputene, see DIPENTENE (UN2052)</i>					
	UN2682	<b>CAESIUM HYDROXIDE</b>	8		II	P5	A12.3.
	UN2681	<b>CAESIUM HYDROXIDE SOLUTION</b>	8		II III	P5 P5	A12.2. A12.2.
	UN1451	<b>CAESIUM NITRATE</b> or <b>CESIUM NTIRATE</b>	5.1		III	P5, A1, A29	A9.6.
	UN1401	<b>CALCIUM</b>	4.3		II	P5	A8.3.
		<i>Calcium alloys, see ALKALINE EARTH METAL ALLOY, N.O.S. (UN1393)</i>					
	UN1855	<b>CALCIUM ALLOYS, PYROPHORIC</b>	4.2		I	P3	A8.11.
	UN1573	<b>CALCIUM ARSENATE</b>	6.1		II	P5	A10.5.
	UN1574	<b>CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURES, SOLID</b>	6.1		II	P5	A10.5.
		<i>Calcium bisulfite solutions, see BISULFITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S. or BISULPHITES, AQUEOUS SOLUTION, N.O.S. ★ (UN2693)</i>					
	UN1402	<b>CALCIUM CARBIDE</b>	4.3		I II	P3, A1, A8, N34 P5, A1, A8, N34	A8.3. A8.3.
	UN1452	<b>CALCIUM CHLORATE</b>	5.1		II	P5, A9, N34	A9.6.
	UN2429	<b>CALCIUM CHLORATE, AQUEOUS SOLUTION</b>	5.1		II III	P5, A2, N41 P5, A2, N41	A9.5. A9.5.
	UN1453	<b>CALCIUM CHLORITE</b>	5.1		II	P5, A9, N34	A9.6.
	UN1403	<b>CALCIUM CYANAMIDE</b> with more than 0.1% of calcium carbide	4.3		III	P5, A1, A19	A8.3.
		<i>Calcium with 0.1% or less calcium carbide (Not Restricted)</i>					
	UN1575	<b>CALCIUM CYANIDE</b>	6.1		I	P5, N79	A10.5.
	UN1923	<b>CALCIUM DITHIONITE</b> or <b>CALCIUM HYDROSULPHITE</b>	4.2		II	P5, A19, A20	A8.3.
	UN1404	<b>CALCIUM HYDRIDE</b>	4.3		I	P3, A19, N40	A8.3.
		<b>CALCIUM HYDROSULPHITE, see CALCIUM DITHIONITE</b>					
	UN1748	<b>CALCIUM HYPOCHLORITE, DRY</b> or <b>CALCIUM HYPOCHLORITE MIXTURES, DRY</b> with more than 39% available chlorine (8.8% available oxygen)	5.1		II III	P5, 165, 166, A7, A9, N34 P5, 171, A7, A9, N34	A9.6. A9.6.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN3485	<b>CALCIUM HYPOCHLORITE, DRY, CORROSIVE</b> or <b>CALCIUM HYPOCHLORITE MIXTURES, DRY, CORROSIVE</b> with more than 39% available chlorine (8.8% available oxygen)	5.1	8	II	P5, 165, 166, A7, A9, N34	A9.6.
	UN2880	<b>CALCIUM HYPOCHLORITE, HYDRATED</b> or <b>CALCIUM HYPOCHLORITE, HYDRATED MIXTURES</b> , with not less than 5.5% but not more than 16% water	5.1		II III	P5, 165 P5, 165, 171	A9.6. A9.6.
	UN3487	<b>CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE</b> or <b>CALCIUM HYPOCHLORITE, HYDRATED MIXTURES, CORROSIVE</b> with not less than 5.5% but not more than 16% water	5.1	8	II III	P5, 165 P5, 165	A9.6. A9.6.
	UN2208	<b>CALCIUM HYPOCHLORITE MIXTURES, DRY</b> with more than 10%, but not more than 39% available chlorine	5.1		III	P5, 165, A1, A29, N34	A9.6.
	UN3486	<b>CALCIUM HYPOCHLORITE MIXTURE, DRY, CORROSIVE</b> with > 10% but ≤ 39% available chlorine	5.1	8	III	P5, 165	A9.6
	UN2844	<b>CALCIUM MANGANESE SILICON</b>	4.3		III	P5, A1, A19	A8.3.
	UN1454	<b>CALCIUM NITRATE</b>	5.1		III	P5, 34	A9.6.
	UN1910	<b>CALCIUM OXIDE</b>	8		III	P5	A12.3.
	UN1455	<b>CALCIUM PERCHLORATE</b>	5.1		II	P5	A9.6.
	UN1456	<b>CALCIUM PERMANGANATE</b>	5.1		II	P5	A9.6.
	UN1457	<b>CALCIUM PEROXIDE</b>	5.1		II	P5	A9.6.
	UN1360	<b>CALCIUM PHOSPHIDE</b>	4.3	6.1	I	P3, A8, A19, N40	A8.3.
	UN1855	<b>CALCIUM, PYROPHORIC</b> or <b>CALCIUM ALLOYS, PYROPHORIC</b>	4.2		I	P3	A8.11.
	UN1313	<b>CALCIUM RESINATE</b>	4.1		III	P5, A1, A19	A8.3.
	UN1314	<b>CALCIUM RESINATE, FUSED</b>	4.1		III	P5, A1, A19	A8.3.
		Calcium selenate or selenite; see <b>SELENATES</b> or <b>SELENITES</b> (UN2630)					
	UN1405	<b>CALCIUM SILICIDE</b>	4.3		II III	P5, A19 P5, A1, A19	A8.3. A8.3.
		Calcium silicon, see <b>CALCIUM SILICIDE</b> (UN1405)					
		Calcium superoxide, see <b>CALCIUM PEROXIDE</b> (UN1457)					
		Calor gas, see <b>HYDROCARBON GAS MIXTURE, COMPRESSED, N.O.S. ★</b> (UN1964) or <b>HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. ★</b> (UN1965)					
		Camphanone, see <b>CAMPHOR</b> (UN2717)					
	UN2717	<b>CAMPHOR</b> , synthetic	4.1		III	P5, A1	A8.3.
	UN1130	<b>CAMPHOR OIL</b>	3		III	P5	A7.2.
		Camping gas, see <b>RECEPTACLES, SMALL, CONTAINING GAS</b> (UN2037)					
		Candles, gas, see <b>LIGHTERS</b> (UN1057)					
		Cannon primers, see <b>PRIMERS, TUBULAR</b> (UN0319) (UN0320) (UN0376)					
	UN3508	<b>CAPACITOR, ASYMMETRIC</b> with an energy storage capacity greater than 0.3 Wh	9			P5	A13.19.
	UN3499	<b>CAPACITOR, ELECTRIC DOUBLE LAYER</b> with an energy storage capacity greater than 0.3 Wh	9			P5	A13.19.
	UN2829	<b>CAPROIC ACID</b>	8		III	P5	A12.2.
		Caps, blasting, see <b>DETONATORS, ELECTRIC</b> (UN0030, UN0255, UN0456)					
		Caps, prime, see <b>PRIMERS, CAP TYPE</b> (UN0044, UN0377, UN0378)					
		Caps, toy, see <b>FIREWORKS</b> (UN0333, UN0336, UN0337)					
★	UN2758	<b>CARBAMATE PESTICIDES, LIQUID, FLAMMABLE, TOXIC</b> , flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN2992	CARBAMATE PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2991	CARBAMATE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2757	CARBAMATE PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Carbolic acid, see PHENOL, SOLID, (UN1671) or PHENOL, MOLTEN (UN2312)					
		Carbolic acid solutions, see PHENOL SOLUTIONS (UN2821)					
	UN1361	CARBON, animal or vegetable origin	4.2		II III	P5 P5	A8.3. A8.3.
	UN1362	CARBON, ACTIVATED	4.2		III	P5	A8.3.
		Carbon bisulfide, see CARBON DISULFIDE (UN1131)					
		Carbon black (animal or vegetable origin); see CARBON (UN1361)					
	UN1013	CARBON DIOXIDE	2.2			P5	A6.3., A6.4., A6.5.
		Carbon dioxide and ethylene oxide mixture, see ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, (UN1041, UN1952, UN3300)					
	UN2187	CARBON DIOXIDE, REFRIGERATED LIQUID (cryogenic liquid)	2.2			P5	A6.3., A6.11.
	UN1845	CARBON DIOXIDE, SOLID or DRY ICE	9			P5	A13.10.
	UN1131	CARBON DISULFIDE	3	6.1	I		FORBIDDEN
		Carbonic anhydride, see CARBON DIOXIDE (UN1013)					
	UN1016	CARBON MONOXIDE, COMPRESSED	2.3	2.1		P2, 4	A6.5.
		Carbon, non-activated, mineral origin (Not Restricted)					
		Carbon oxysulfide, see CARBONYL SULPHIDE (UN2204)					
		Carbon paper, see PAPER, UNSATURATED OIL TREATED (UN1379)					
D	NA9202	CARBON MONOXIDE, REFRIGERATED LIQUID (cryogenic liquid)	2.3	2.1		P2, 4	A6.11.
	UN2516	CARBON TETRABROMIDE	6.1		III	P5	A10.5.
	UN1846	CARBON TETRACHLORIDE	6.1		II	P5, N36	A10.4.
		Carbonyl chloride, see PHOSGENE (UN1076)					
	UN2417	CARBONYL FLUORIDE	2.3	8		P2, 2	A6.5.
	UN2204	CARBONYL SULFIDE	2.3	2.1		P2, 3	A6.4.
		Cartridge cases, empty primed, see CASES, CARTRIDGE, EMPTY WITH PRIMER (UN0055, UN0379)					
		Cartridges, actuating for aircraft ejector seat catapult, fire extinguisher, canopy removal or apparatus, see CARTRIDGES, POWER DEVICE (UN0275, UN0276, UN0323, UN0381)					
		Cartridges, explosive, see CHARGES, DEMOLITION (UN0048)					
	UN0049	CARTRIDGES, FLASH	1.1G			P4	A5.18.
	UN0050	CARTRIDGES, FLASH	1.3G			P4	A5.18.
	UN0005	CARTRIDGES FOR WEAPONS, with bursting charge	1.1F			P4	A5.12.
	UN0007	CARTRIDGES FOR WEAPONS, with bursting charge	1.2F			P4	A5.12.
	UN0348	CARTRIDGES FOR WEAPONS, with bursting charge	1.4F			P5	A5.12.
	UN0412	CARTRIDGES FOR WEAPONS, with bursting charge	1.4E			P5	A5.12.

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN0006	CARTRIDGES FOR WEAPONS, with bursting charge	1.1E			P4	A5.12.
	UN0321	CARTRIDGES FOR WEAPONS, with bursting charge	1.2E			P4	A5.12.
	UN0326	CARTRIDGES FOR WEAPONS, BLANK	1.1C			P4	A5.12.
	UN0413	CARTRIDGES FOR WEAPONS, BLANK	1.2C			P4	A5.12.
	UN0327	CARTRIDGES FOR WEAPONS, BLANK; or CARTRIDGES, SMALL ARMS, BLANK	1.3C			P4	A5.12.
	UN0338	CARTRIDGES FOR WEAPONS, BLANK; or CARTRIDGES, SMALL ARMS, BLANK	1.4C			P5	A5.12.
	UN0014	CARTRIDGES FOR WEAPONS, BLANK; or CARTRIDGES, SMALL ARMS, BLANK; or CARTRIDGES FOR TOOLS, BLANK	1.4S			P5	A5.12.
	UN0328	CARTRIDGES FOR WEAPONS, INERT PROJECTILE	1.2C			P4	A5.12.
	UN0417	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.3C			P4	A5.12.
	UN0339	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.4C			P5	A5.12.
	UN0012	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.4S			P5	A5.12.
		Cartridges, illuminating, see AMMUNITION ILLUMINATING, (UN0171, UN0254, UN0297)					
	UN0277	CARTRIDGES, OIL WELL	1.3C			P4	A5.17.
	UN0278	CARTRIDGES, OIL WELL	1.4C			P5	A5.17.
	UN0275	CARTRIDGES, POWER DEVICE	1.3C			P4	A5.17.
	UN0276	CARTRIDGES, POWER DEVICE	1.4C			P5, 110	A5.17.
	UN0381	CARTRIDGES, POWER DEVICE	1.2C			P4	A5.17.
	UN0323	CARTRIDGES, POWER DEVICE	1.4S			P5, 110, 347	A5.17.
		Cartridges, safety, blank, see CARTRIDGES FOR WEAPONS, BLANK (UN0014)					
		Cartridges, safety, see CARTRIDGES, FOR WEAPONS, INERT PROJECTILES, (UN0012) or CARTRIDGES, SMALL ARMS, (UN0012) or CARTRIDGES POWER DEVICE, (UN0323)					
	UN0054	CARTRIDGES, SIGNAL	1.3G			P4	A5.18.
	UN0312	CARTRIDGES, SIGNAL	1.4G			P5	A5.18.
	UN0405	CARTRIDGES, SIGNAL	1.4S			P5	A5.18.
	UN0417	CARTRIGES, SMALL ARMS	1.3C				FORBIDDEN
	UN0339	CARTRIGES, SMALL ARMS	1.4C			P3	
	UN0012	CARTRIGES, SMALL ARMS	1.4S			P5	
	UN0327	CARTRIGES, SMALL ARMS, BLANK	1.3C				FORBIDDEN
	UN0338	CARTRIGES, SMALL ARMS, BLANK	1.4C			P3	
	UN0014	CARTRIGES, SMALL ARMS, BLANK	1.4S			P5	
		Cartridges, sporting, see CARTRIDGES FOR WEAPONS, INERT PROJECTILE, (UN0012) or CARTRIDGES, SMALL ARMS (UN0012)					
		Cartridges, starter, jet engine, see CARTRIDGES, POWER DEVICE (UN075, UN0276, UN0323, UN0381)					
		Case oil, see MOTOR SPIRIT (UN1203) or PETROLEUM DISTILLATES, N.O.S. (UN1268)					
	UN0379	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4C			P5	A5.19.
	UN0055	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4S			P5	A5.19.
	UN0447	CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER	1.3C			P4	A5.19.
	UN0446	CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER	1.4C			P5	A5.19.
		Casinghead gasoline, see MOTOR SPIRITS, or GASOLINE or PETROL (UN1203)					
	UN2969	CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE	9		II	P5	A13.2.
		Catecholborane				A210	FORBIDDEN

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN1719	CAUSTIC ALKALI LIQUIDS, N.O.S.	8		II III	P4 P5	A12.2. A12.2.
		Caustic antimony, see <b>ANTIMONY TRICHLORIDE SOLID</b> or <b>ANTIMONY TRICHLORIDE LIQUID</b> (UN1733),					
		Caustic arsenic chloride, see <b>ARSENIC TRICHLORIDE</b> (UN1560)					
		Caustic oil of arsenic, see <b>ARSENIC TRICHLORIDE</b> (UN1560)					
		Caustic potash, see <b>POTASSIUM HYDROXIDE, SOLUTION</b> , (UN1814)					
		Caustic soda, see <b>SODIUM HYDROXIDE, SOLID</b> (UN1823) or <b>SODIUM HYDROXIDE SOLUTION</b> (UN1824)					
		Caustic soda liquor, see <b>SODIUM HYDROXIDE SOLUTION</b> (UN1824)					
		Cellosolve, see <b>ETHYLENE GLYCOL MONOETHYL ETHER</b> (UN1171)					
		Cellosolve acetate, see <b>ETHYLENE GLYCOL MONOETHYL ETHER ACETATE</b> (UN1172)					
	UN3292	<b>CELLS, CONTAINING SODIUM</b>	4.3		II	P4	A8.18.
	UN2000	<b>CELLULOID</b> , in blocks, rods, rolls, sheets, tubes, etc. except scrap	4.1		III	P5	A8.3.
	UN2002	<b>CELLULOID, SCRAP</b>	4.2		III	P5	A8.3.
		Cement flammable, see <b>ADHESIVES</b> containing flammable liquid (UN1133)					
	UN1333	<b>CERIUM</b> , slabs, ingots, or rods	4.1		II	P5, N34	A8.3.
	UN3078	<b>CERIUM</b> , turnings or gritty powder	4.3		II	P5, A1	A8.3.
		Cer mischmetall, see <b>FERROCERIUM</b> (UN1323)					
	UN1407	<b>CESIUM</b> or <b>CAESIUM</b>	4.3		I	P3, A7, A19, N34, N40	A8.3.
	UN1451	<b>CESIUM NITRATE</b> or <b>CAESIUM NITRATE</b>	5.1		III	P5, A1, A29	A9.6.
		Charcoal activated, see <b>CARBON ACTIVATED</b> (UN1362)					
		Charcoal non-activated, see <b>CARBON</b> (UN1361)					
		Charcoal screenings, wet					FORBIDDEN
		Charcoal, wet					FORBIDDEN
D	NA1361	<b>CHARCOAL briquettes, shell, screenings, wood, etc.</b>	4.2		III	P5	A8.3.
		Charcoal, wet					FORBIDDEN
	UN0457	<b>CHARGES, BURSTING, PLASTICS BONDED</b>	1.1D			P4	A5.12.
	UN0458	<b>CHARGES, BURSTING, PLASTICS BONDED</b>	1.2D			P4	A5.12.
	UN0459	<b>CHARGES, BURSTING, PLASTICS BONDED</b>	1.4D			P5	A5.12.
	UN0460	<b>CHARGES, BURSTING, PLASTICS BONDED</b>	1.4S			P5, 347	A5.12.
	UN0048	<b>CHARGES, DEMOLITION</b>	1.1D			P4	A5.12.
	UN0056	<b>CHARGES, DEPTH</b>	1.1D			P4	A5.12.
		Charges, expelling, explosive, for fire extinguishers, see <b>CARTRIDGES, POWER DEVICE</b> (UN0275, UN0276, UN0323, UN0381)					
	UN0442	<b>CHARGES, EXPLOSIVE, COMMERCIAL</b> without detonator	1.1D			P4	A5.20.
	UN0443	<b>CHARGES, EXPLOSIVE, COMMERCIAL</b> without detonator	1.2D			P4	A5.20.
	UN0444	<b>CHARGES, EXPLOSIVE, COMMERCIAL</b> without detonator	1.4D			P5	A5.20.
	UN0445	<b>CHARGES, EXPLOSIVE, COMMERCIAL</b> without detonator	1.4S			P5, 347	A5.20.
	UN0271	<b>CHARGES, PROPELLING</b>	1.1C			P4	A5.26.
	UN0415	<b>CHARGES, PROPELLING</b>	1.2C			P4	A5.26.
	UN0272	<b>CHARGES, PROPELLING</b>	1.3C			P4	A5.26.
	UN0491	<b>CHARGES, PROPELLING</b>	1.4C			P5	A5.26.
	UN0279	<b>CHARGES, PROPELLING, FOR CANNON</b>	1.1C			P4	A5.12.
	UN0414	<b>CHARGES, PROPELLING, FOR CANNON</b>	1.2C			P4	A5.12.
	UN0242	<b>CHARGES, PROPELLING, FOR CANNON</b>	1.3C			P4	A5.12.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN0059	CHARGES, SHAPED, <i>without detonator</i>	1.1D			P4	A5.20.
	UN0439	CHARGES, SHAPED, <i>without detonator</i>	1.2D			P4	A5.20.
	UN0440	CHARGES, SHAPED, <i>without detonator</i>	1.4D			P5	A5.20.
	UN0441	CHARGES, SHAPED, <i>without detonator</i>	1.4S			P5, 347	A5.20.
	UN0288	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.1D			P4	A5.21.
	UN0237	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.4D			P5	A5.21.
	UN0060	CHARGES, SUPPLEMENTARY, EXPLOSIVE	1.1D			P4	A5.15.
	UN3316	CHEMICAL KIT	9			P5, 15	A13.18.
	UN3315	CHEMICAL SAMPLE, TOXIC	2.2				FORBIDDEN
★	UN3500	CHEMICAL UNDER PRESSURE, N.O.S.	2.2			P5, 362	A6.22.
★	UN3503	CHEMICAL UNDER PRESSURE, CORROSIVE, N.O.S.	2.2	8		P4, 362	A6.22.
★	UN3505	CHEMICAL UNDER PRESSURE, FLAMMABLE, CORROSIVE, N.O.S.	2.1	8		P4, 362	A6.22.
★	UN3501	CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S.	2.1			P4, 362	A6.22.
★	UN3504	CHEMICAL UNDER PRESSURE, FLAMMABLE, TOXIC, N.O.S.	2.1	6.1		P4, 362	A6.22.
★	UN3502	CHEMICAL UNDER PRESSURE, TOXIC, N.O.S.	2.2	6.1		P4, 362	A6.22.
		<i>Chile saltpeter, see SODIUM NITRATE (UN1498)</i>					
	UN2075	CHLORAL, ANHYDROUS, STABILIZED	6.1		II	P5	A10.5.
		<i>Chloral, anhydrous, unstabilized</i>					FORBIDDEN
	UN1458	CHLORATE AND BORATE MIXTURES	5.1		II III	P5, A9, N34 P5, A9, N34	A9.6. A9.6.
	UN1459	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID	5.1		II III	P5, A9, N34 P5, A9, N34	A9.6. A9.6.
	UN3407	CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION	5.1		II III	P5, A9, N34 P5, A9, N34	A9.5. A9.5.
		<i>Chlorate of potash, see POTASSIUM CHLORATE (UN1485)</i>					
		<i>Chlorate of soda, see SODIUM CHLORATE (UN1495)</i>					
	UN1461	CHLORATES, INORGANIC, N.O.S.	5.1		II	P5, 351, A9, N34	A9.6.
	UN3210	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II III	P5, 351 P5, 351	A9.5. A9.5.
	UN2626	CHLORIC ACID, AQUEOUS SOLUTION, <i>with not more than 10% chloric acid</i>	5.1		II		FORBIDDEN
		<i>Chloric acid, aqueous solution with more than 10% chloric acid</i>					FORBIDDEN
		<i>Chloride of phosphorous, see PHOSPHORUS TRICHLORIDE (UN1809)</i>					
		<i>Chloride of sulphur, see SULPHUR CHLORIDE (UN1828)</i>					
		<i>Chlorinated lime, see CALCIUM HYPOCHLORITE MIXTURES or CALCIUM HYPOCHLORITE, DRY (UN1748) or CALCIUM HYPOCHLORITE HYDRATED (UN2880)</i>					
	UN1017	CHLORINE	2.3	5.1, 8		P2, 2, N86	A6.4.
	UN3520	CHLORINE, ADSORBED	2.3	5.1, 8		P2, 2, N86	A6.4.
		<i>Chlorine azide</i>					FORBIDDEN
		<i>Chlorine dioxide (not hydrate)</i>					FORBIDDEN
D	NA9191	CHLORINE DIOXIDE HYDRATE, FROZEN	5.1	6.1			FORBIDDEN
	UN2548	CHLORINE PENTAFLUORIDE	2.3	5.1, 8		P1, 1, N86	A6.15.
	UN1749	CHLORINE TRIFLUORIDE	2.3	5.1, 8		P2, 2, N86	A6.4.
	UN1908	CHLORITE SOLUTION	8		II III	P5, A3, A7, N34 P5, A3, A7, N34	A12.2. A12.2.
		<i>Chloroacetaldehyde, see 2-CHLOROETHANAL (UN2232)</i>					
	UN1462	CHLORITES, INORGANIC, N.O.S.	5.1		II	P5, 352, A7, N34	A9.6.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN2517	1-CHLORO-1, 1-DIFLUOROETHANES <i>or</i> REFRIGERANT GAS R142B	2.1			P4	A6.3., A6.4.
	UN2236	3-CHLORO-4-METHYLPHENYL ISOCYANATE, LIQUID	6.1		II	P5	A10.4.
	UN3428	3-CHLORO-4-METHYLPHENYL ISOCYANATE, SOLID	6.1		II	P5	A10.5
		1-Chloro-2-methylpropane, <i>see</i> CHLOROBUTANES (UN1127)					
		2-Chloro-2-methylpropane, <i>see</i> CHLOROBUTANES (UN1127)					
		3-Chloro-2-methylprop-1-ene, <i>see</i> METHYLALLYL CHLORIDE (UN2554)					
	UN1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE <i>or</i> REFRIGERANT GAS R124	2.2			P5	A6.3., A6.4.
	UN1579	4-CHLORO-O-TOLUIDINE HYDROCHLORIDE, SOLID	6.1		III	P5	A10.5.
	UN3410	4-CHLORO-O-TOLUIDINE HYDROCHLORIDE, SOLUTION	6.1		III	P5	A10.4
	UN1983	1-CHLORO-2,2,2-TRIFLUOROETHANE <i>or</i> REFRIGERANT GAS R133A	2.2			P5	A6.3., A6.4.
	UN3250	CHLOROACETIC ACID, MOLTEN	6.1	8	II		FORBIDDEN
	UN1751	CHLOROACETIC ACID, SOLID	6.1	8	II	P5, A3, A7, N34	A10.5.
	UN1750	CHLOROACETIC ACID, SOLUTION	6.1	8	II	P4, A7, N34	A10.4.
	UN1695	CHLOROACETONE, STABILIZED	6.1	3, 8	I	P5, 2, N12, N32, N34	A10.6.
		Chloroacetone (unstabilized)					FORBIDDEN
+	UN2668	CHLOROACETONITRILE	6.1	3	II	P2, 2	A10.6.
	UN3416	CHLOROACETOPHENONE, LIQUID (CN)	6.1		II	P5, A3, N12, N32, N33	A10.4.
	UN1697	CHLOROACETOPHENONE, SOLID (CN)	6.1		II	P5, A3, N12, N32, N33, N34	A10.5.
	UN1752	CHLOROACETYL CHLORIDE	6.1	8	I	P2, 2, A7, N34, N43	A12.11.
	UN2019	CHLOROANILINES, LIQUID	6.1		II	P5	A10.4.
	UN2018	CHLOROANILINES, SOLID	6.1		II	P5	A10.5.
	UN2233	CHLOROANISIDINES	6.1		III	P5	A10.5.
	UN1134	CHLOROBENZENE	3		III	P5	A7.2.
		Chlorobenzol, <i>see</i> CHLOROBENZENE (UN1134)					
	UN2234	CHLOROBENZOTRIFLUORIDES	3		III	P5	A7.2.
	UN2235	CHLOROBENZYL CHLORIDES, LIQUID	6.1		III	P5	A10.4.
	UN3427	CHLOROBENZYL CHLORIDES, SOLID	6.1		III		A10.5
		Chlorobromomethane, <i>see</i> BROMOCHLOROMETHANE (UN1887)					
		1-Chloro-3-bromopropane, <i>see</i> 1-BROMO-3-CHLOROPROPANE (UN2688)					
		1-Chlorobutane <i>or</i> 2-Chlorobutane, <i>see</i> CHLOROBUTANES (UN1127)					
	UN2688	1-CHLORO-3-BROMOPROPANE	6.1		III	P5	A10.4.
	UN1127	CHLOROBUTANES	3		II	P5	A7.2.
	UN3437	CHLOROCRESOLS, SOLID	6.1		II	P5	A10.4.
	UN2669	CHLOROCRESOLS, SOLUTION	6.1		II III	P5 P5	A10.6. A10.6.
		3-Chloro-4-diethylaminobenzenediazonium zinc chloride, <i>see</i> SELF-REACTIVE SOLID TYPE D (UN3226)					
	UN1974	CHLORODIFLUOROBROMOMETHANE <i>or</i> REFRIGERANT GAS R12B1	2.2			P5	A6.3., A6.4.
	UN1018	CHLORODIFLUOROMETHANE <i>or</i> REFRIGERANT GAS R22	2.2			P5	A6.3., A6.4.

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1973	<b>CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE</b> or <b>REFRIGERANT GAS R502</b> with fixed boiling point, with approximately 49% chlorodifluoromethane	2.2			P5	A6.3., A6.4.
		3-Chloro-1,2-dihydroxypropane, see <b>GLYCEROL ALPHA-MONOCHLOROHYDRIN</b> (UN2689)					
		Chlorodimethyl, see <b>METHYL CHLOROMETHYL ETHER</b> (UN1239)					
+	UN1577	<b>CHLORODINITROBENZENES, LIQUID</b>	6.1		II	P5	A10.4.
+	UN3441	<b>CHLORODINITROBENZENES, SOLID</b>	6.1		II	P5	A10.5.
		Chlorodinitrobenzol, see <b>CHLORODINITROBENZENES LIQUID</b> or <b>SOLID</b> (UN1577, UN3441)					
	UN2232	<b>2-CHLOROETHANAL</b>	6.1		I	P2, 2	A10.6.
		Chloroethane, see <b>ETHYL CHLORIDE</b> (UN1037)					
		Chloroethane nitrile, see <b>CHLOROACETONITRILE</b> (UN2668)					
		2-Chloroethanol, see <b>ETHYLENE CHLOROHYDRIN</b> (UN1135)					
	UN1888	<b>CHLOROFORM</b>	6.1		III	P5, N36	A10.4.
★	UN3277	<b>CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.</b>	6.1	8	II	P3	A10.4.
	UN2742	<b>CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.</b>	6.1	8, 3	II	P2, 5	A10.4.
		Chloromethane, see <b>METHYL CHLORIDE</b> (UN1063)					
		1-Chloro-3-methylbutane, see <b>AMYL CHLORIDE</b> (UN1107)					
		2-Chloro-2-methylbutane, see <b>AMYL CHLORIDE</b> (UN1107)					
	UN2745	<b>CHLOROMETHYL CHLOROFORMATE</b>	6.1	8	II	P4	A10.4.
		Chloromethyl cyanide, see <b>CHLOROACETONEITRILE</b> (UN2668)					
	UN2354	<b>CHLOROMETHYL ETHYL ETHER</b>	3	6.1	II	P4	A7.2.
		Chloromethyl methyl ether, see <b>METHYL CHLOROMETHYL ETHER</b> (UN1239)					
	UN2237	<b>CHLORONITROANILINES</b>	6.1		III	P5	A10.5.
+	UN3409	<b>CHLORONITROBENZENES, LIQUID</b>	6.1		II	P4	A10.4.
+	UN1578	<b>CHLORONITROBENZENES, SOLID</b> , meta or para,	6.1		II	P5	A10.5.
	UN2433	<b>CHLORONITROTOLUENES, LIQUID</b>	6.1		III	P5	A10.4.
	UN3457	<b>CHLORONITROTOLUENES, SOLID</b>	6.1		III	P5	A10.5.
	UN1020	<b>CHLOROPENTAFLUOROETHANE</b> or <b>REFRIGERANT GAS R115</b>	2.2			P5	A6.3., A6.4.
		3-Chloroperoxybenzoic acid, not less than 57% and no more than 86%, when with more or equal to ≥ 14% inert.					FORBIDDEN
	UN2904	<b>CHLOROPHENOLATES, LIQUID, or PHENOLATES, LIQUID</b>	8		III	P5	A12.2.
	UN2905	<b>CHLOROPHENOLATES, SOLID or PHENOLATES SOLID</b>	8		III	P5	A12.3.
	UN2021	<b>CHLOROPHENOLS, LIQUID</b>	6.1		III	P5	A10.4.
	UN2020	<b>CHLOROPHENOLS, SOLID</b>	6.1		III	P5	A10.5.
	UN1753	<b>CHLOROPHENYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
+	UN1580	<b>CHLOROPICRIN</b>	6.1		I	P2, 2	A10.6.
	UN1581	<b>CHLOROPICRIN AND METHYL BROMIDE MIXTURES</b> with more than 2% chloropicrin	2.3			P2, 2, N86	A6.16.
	UN1582	<b>CHLOROPICRIN AND METHYL CHLORIDE MIXTURES</b>	2.3			P2, 2, N86	A6.16.
		Chloropicrin mixture, flammable (pressure not exceeding 14.7 psia at 115 degrees F flashpoint below 100 degrees F); see <b>TOXIC LIQUIDS, FLAMMABLE</b> , etc (UN2929)					



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1583	CHLOROPICRIN MIXTURES, N.O.S.	6.1		I II III	P2, 5 P3 P5	A10.4. A10.4. A10.4.
D	NA9263	CHLOROPIVALOYL CHLORIDE	6.1	8	I	P2, 2	A10.6.
	UN2507	CHLOROPLATINIC ACID, SOLID	8		III	P5	A12.3.
	UN1991	CHLOROPRENE, STABILIZED	3	6.1	I	P3, 387	A7.2.
		<i>Chloroprene, unstabilized or uninhibited</i>					FORBIDDEN
	UN1278	1-CHLOROPROPANE	3		II	P5, N34	A7.2.
	UN2356	2-CHLOROPROPANE	3		I	P3, N36	A7.2.
		<i>3-Chloro-propanediol-1,2, see GLYCEROL ALPHA-MONOCHLOROHYDRIN (UN2689)</i>					
	UN2849	3-CHLOROPROPANOL-1	6.1		III	P5	A10.4.
		<i>3-Chloropropene or 3-Chloroprop-1-ene, see ALLYL CHLORIDE (UN1100)</i>					
	UN2456	2-CHLOROPROPENE	3		I	P3, N36	A7.2.
	UN2511	2-CHLOROPROPIONIC ACID	8		III	P5	A12.2 A12.3
	UN2822	2-CHLOROPYRIDINE	6.1		II	P5	A10.4.
	UN2987	CHLOROSILANES, CORROSIVE N.O.S.	8		II	P4	A12.15.
	UN2986	CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.	8	3	II	P4	A12.15.
	UN2985	CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	3	8	II	P4	A7.10.
	UN3361	CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	6.1	8	II	P5	A10.11.
	UN3362	CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE N.O.S.	6.1	3, 8	II	P5	A10.11.
	UN2988	CHLOROSILANES, WATER REACTIVE, CORROSIVE, FLAMMABLE N.O.S.	4.3	3, 8	I	P3, A2	A8.2.
+	UN1754	CHLOROSULPHONIC ACID ( <i>with or without sulphur trioxide</i> )	8	6.1	I	P2, 2	A12.11.
	UN1021	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE or REFRIGERANT GAS R124	2.2			P5	A6.3., A6.4.
	UN2238	CHLOROTOLUENES	3		III	P5	A7.2.
	UN3429	CHLOROTOLUIDINES, LIQUID	6.1		III	P5	A10.4
	UN2239	CHLOROTOLUIDINES, SOLID	6.1		III	P5	A10.4., A10.5.
		<i>Chlorotrifluoroethylene, see TRIFLUOROCHLOROETHYLENE, STABILIZED (UN1082)</i>					
	UN1022	CHLOROTRIFLUOROMETHANE or REFRIGERANT GAS R13	2.2			P5	A6.3., A6.4.
	UN2599	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE or REFRIGERANT GAS R503 with approximately 60% Chlorotrifluoromethane	2.2			P5	A6.3., A6.4.
		<i>Chromic acid, solid, see CHROMIUM TRIOXIDE, ANHYDROUS (UN1463)</i>					
	UN1755	CHROMIC ACID, SOLUTION	8		II III	P5 P5	A12.2. A12.2.
		<i>Chromic anhydride, see CHROMIUM TRIOXIDE, ANHYDROUS (UN1463)</i>					
	UN1756	CHROMIC FLUORIDE, SOLID	8		II	P5	A12.3.
	UN1757	CHROMIC FLUORIDE, SOLUTION	8		II III	P5 P5	A12.2. A12.2.
		<i>Chromic nitrate, see CHROMIUM NITRATE (UN2720)</i>					
		<i>Chromic trioxide, see CHROMIUM TRIOXIDE ANHYDROUS (UN1463)</i>					
		<i>Chromium (III) fluoride, solid, see CHROMIC FLUORIDE, SOLID (UN1756)</i>					
		<i>Chromium (III) nitrate, see CHROMIUM NITRATE (UN2720)</i>					
	UN2720	CHROMIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN1758	CHROMIUM OXYCHLORIDE	8		I	P3, A7, N34	A12.2.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1463	<b>CHROMIUM TRIOXIDE, ANHYDROUS</b> <i>Chromium (VI) dichloride dioxide, see CHROMIUM OXYCHLORIDE (UN1758)</i>	5.1	6.1, 8	II	P5	A9.6.
	UN2240	<b>CHROMOSULFURIC ACID</b> <i>Chromyl chloride, see CHROMIUM OXYCHLORIDE (UN1758)</i>	8		I	P3, A7, N34	A12.2.
		<i>Chrysotile, see ASBESTOS, CHRYSOTILE (UN2590)</i>					
		<i>Cigar and cigarette lighter fluid, see FLAMMABLE LIQUID, N.O.S. (UN1993)</i>					
		<i>Cigar and cigarette lighters, charged with fuel, see LIGHTERS, or LIGHTER REFILLS containing flammable gas. (UN1057)</i>					
		<i>Cinene, see DIPENTENE (UN2052)</i>					
		<i>Cinnabar (not restricted)</i>					
		<i>Cinnamene or Cinnamol, see STYRENE MONOMER, STABILIZED (UN2055)</i>					
		<i>Cleaning fluid or liquid, see FLAMMABLE LIQUID, TOXIC, N.O.S. (UN1992) or FLAMMABLE LIQUID, N.O.S. (UN1993) or FLAMMABLE LIQUID, CORROSIVE, N.O.S. (UN2924)</i>					
	UN3291	<b>CLINICAL WASTE, UNSPECIFIED, N.O.S.</b>	6.2		II	P5	A10.10.
		<i>Coal briquettes, hot</i>					FORBIDDEN
	UN1023	<b>COAL GAS, COMPRESSED</b> <i>Coal tar, crude and solvent, see PETROLEUM, PRODUCTS, N.O.S. (UN1268)</i>	2.3	2.1		P2, 3	A6.5.
	UN1136	<b>COAL TAR DISTILLATES, FLAMMABLE</b> <i>Coal tar dye, corrosive, liquid N.O.S., see DYE, LIQUID, CORROSIVE, N.O.S. (UN2801) SOLID N.O.S. (UN2801) or DYE INTERMEDIATE, LIQUID, or SOLID, CORROSIVE N.O.S. (UN2801)</i>	3		II III	P5 P5	A7.2. A7.2.
		<i>Coal tar naphtha, see PETROLEUM DISTILLATES, N.O.S. (UN1268) or PETROLEUM PRODUCTS, N.O.S. (UN1268)</i>					
		<i>Coal tar oil, see COAL TAR DISTILLATES, FLAMMABLE (UN1136)</i>					
	UN1139	<b>COATING SOLUTION</b> (includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining) <i>Cobalt catalyst, see METAL CATALYST, WETTED (UN1378) or METAL CATALYST, DRY (UN2881)</i>	3		I II III	P3 P5, 149, 383 P5	A7.2. A7.2. A7.2.
	UN3550	<b>COBALT DIHYDROXIDROXIDE POWDER</b> , containing not less than 10% respirable particles	6.1		I	P4, 1, 13, A5	A10.1.
	UN2001	<b>COBALT NAPHTHENATES, POWDER</b>	4.1		III	P5, A19	A8.3.
	UN1318	<b>COBALT RESINATE, PRECIPITATED</b>	4.1		III	P5, A1, A19	A8.3.
		<i>Cocculus, see TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID★ (UN3172) or TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID SOLID, N.O.S. ★ (UN3462)</i>					
		<i>Coir, see FABRICS, VEGETABLE, N.O.S. (UN1373) or FIBERS FIBRES, VEGETABLE, N.O.S. (UN1373)</i>					
		<i>Coke, hot</i>					FORBIDDEN
		<i>Collodion cottons, see NITROCELLULOSE, (UN0340) or NITROCELLULOSE MIXTURE WITH PLASTICIZER, WITHOUT PIGMENT (UN2557) or NITROCELLULOSE MIXTURE WITH PLASTICIZER, WITH PIGMENT (UN2557)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Cologne spirits, see <b>PERFUMERY PRODUCTS</b> (UN1266)					
D	NA1993	<b>COMBUSTIBLE LIQUID N.O.S.</b>	COMBUSTIBLE LIQUID		III	P5, 148	A7.2.
★	UN0461	<b>COMPONENTS, EXPLOSIVE TRAIN, N.O.S.</b>	1.1B			P4, 101	A5.3.
★	UN0382	<b>COMPONENTS, EXPLOSIVE TRAIN, N.O.S.</b>	1.2B			P4, 101	A5.3.
★	UN0383	<b>COMPONENTS, EXPLOSIVE TRAIN, N.O.S.</b>	1.4B			P5, 101	A5.3.
★	UN0384	<b>COMPONENTS, EXPLOSIVE TRAIN, N.O.S.</b>	1.4S			P5, 101, 347	A5.3.
		Composition B, see <b>HEXOLITE</b> or <b>HEXOTOL</b> (UN0118)					
		Compound, anti-freeze, see <b>FLAMMABLE LIQUID, N.O.S.</b> ★ (UN1993)					
★	NA1760	<b>COMPOUNDS, CLEANING LIQUID</b>	8		I II III	P3, A7 P5, N37 P5, N37	A12.2. A12.2. A12.2.
	NA1993	<b>COMPOUNDS, CLEANING LIQUID</b>	3		I II III	P3 P5 P5	A12.2 A12.2 A12.2
		Compound, cleaning liquid, see <b>CORROSIVE LIQUID, N.O.S.</b> ★ (UN1760)					
		Compound, cleaning liquid, flammable, see <b>FLAMMABLE LIQUID, N.O.S.</b> ★ (UN1993)					
		Compounds, enamel, see <b>PAINT</b> , (UN1263)					
★	NA1760	<b>COMPOUNDS, TREE KILLING, LIQUID</b> or <b>COMPOUNDS WEED KILLING, LIQUID</b>	8		I II III	P3, A7 P5, N37 P5, N37	A12.2. A12.2. A12.2.
★	NA1993	<b>COMPOUNDS, TREE KILLING LIQUID</b> or <b>COMPOUNDS, WEED KILLING, LIQUID</b>	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	NA2810	<b>COMPOUNDS, TREE KILLING LIQUID</b> or <b>COMPOUNDS, WEED KILLING, LIQUID</b>	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN1956	<b>COMPRESSED GAS, N.O.S.</b>	2.2			P5	A6.3., A6.5.
		Compressed gas and hexaethyl tetraphosphate mixture, see <b>HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE</b> (UN1612)					
★	UN1954	<b>COMPRESSED GAS, FLAMMABLE, N.O.S.</b>	2.1			P4	A6.3., A6.5.
★	UN3156	<b>COMPRESSED GAS, OXIDIZING, N.O.S.</b>	2.2	5.1		P5, A14	A6.3., A6.5.
★	UN1955	<b>COMPRESSED GAS, TOXIC, N.O.S., Inhalation Hazard Zone A</b>	2.3			P1, 1	A6.15.
★	UN1955	<b>COMPRESSED GAS, TOXIC, N.O.S., Inhalation Hazard Zone B</b>	2.3			P2, 2	A6.5.
★	UN1955	<b>COMPRESSED GAS, TOXIC, N.O.S., Inhalation Hazard Zone C</b>	2.3			P2, 3	A6.5.
★	UN1955	<b>COMPRESSED, GAS, TOXIC, N.O.S., Inhalation Hazard Zone D</b>	2.3			P2, 4	A6.5.
★	UN3304	<b>COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. Inhalation Hazard Zone A</b>	2.3	8		P1, 1	A6.15.
★	UN3304	<b>COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. Inhalation Hazard Zone B</b>	2.3	8		P2, 2	A6.5.
★	UN3304	<b>COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. Inhalation Hazard Zone C</b>	2.3	8		P2, 3	A6.5.
★	UN3304	<b>COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. Inhalation Hazard Zone D</b>	2.3	8		P2, 4	A6.5.
★	UN3305	<b>COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. Inhalation Hazard Zone A</b>	2.3	2.1, 8		P1, 1	A6.15.
★	UN3305	<b>COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. Inhalation Hazard Zone B</b>	2.3	2.1, 8		P2, 2	A6.5.
★	UN3305	<b>COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. Inhalation Hazard Zone C</b>	2.3	2.1, 8		P2, 3	A6.5.
★	UN3305	<b>COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. Inhalation Hazard Zone D</b>	2.3	2.1, 8		P2, 4	A6.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., Inhalation Hazard Zone A	2.3	2.1		P1, 1	A6.15.
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., Inhalation Hazard Zone B	2.3	2.1		P2, 2	A6.5.
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., Inhalation Hazard Zone C	2.3	2.1		P2, 3	A6.5.
★	UN1953	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., Inhalation Hazard Zone D	2.3	2.1		P2, 4	A6.5.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. Inhalation Hazard Zone A	2.3	5.1, 8		P1, 1	A6.15.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. Inhalation Hazard Zone B	2.3	5.1, 8		P2, 2	A6.5.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. Inhalation Hazard Zone C	2.3	5.1, 8		P2, 3	A6.5.
★	UN3306	COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S. Inhalation Hazard Zone D	2.3	5.1, 8		P2, 4	A6.5.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. Inhalation Hazard Zone A	2.3	5.1		P1, 1	A6.15.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. Inhalation Hazard Zone B	2.3	5.1		P2, 2	A6.5.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. Inhalation Hazard Zone C	2.3	5.1		P2, 3	A6.5.
★	UN3303	COMPRESSED, GAS, TOXIC, OXIDING, N.O.S. Inhalation Hazard Zone D	2.3	5.1		P2, 4	A6.5.
	ID8000	CONSUMER COMMODITY	9			P5, A503	A13.3.
★	UN0248	CONTRIVANCES, WATER-ACTIVATED, with burster, expelling charge or propelling charge	1.2L			P3	A5.27.
★	UN0249	CONTRIVANCES, WATER-ACTIVATED, with burster, expelling charge or propelling charge	1.3L			P3	A5.27.
	UN1585	COPPER ACETOARSENITE	6.1		II	P5	A10.5.
		Copper acetylide					FORBIDDEN
		Copper amine azide					FORBIDDEN
	UN1586	COPPER ARSENITE	6.1		II	P5	A10.5.
★	UN2776	COPPER BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3009	COPPER BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3010	COPPER BASED PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN2775	COPPER BASED PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2721	COPPER CHLORATE	5.1		II	P5, A1	A9.6.
	UN2802	COPPER CHLORIDE	8		III	P5	A12.3.
	UN1587	COPPER CYANIDE	6.1		II	P5	A10.5.
		Copper (II) arsenite, see COPPER ARSENITE (UN1586)					
		Copper (II) chlorate, see COPPER CHLORATE (UN2721)					
		Copper orthoarsenite, see COPPER ARSENITE (UN1586)					
		Copper selenate, see SELENATES or SELENITES (UN2630)					
		Copper selenites, see SELENATES or SELENITES (UN2630)					
		Copper tetramine nitrate					FORBIDDEN
	UN1363	COPRA	4.2		III		FORBIDDEN
	UN0065	CORD, DETONATING, flexible	1.1D			P4, 102, 148	A5.22.
	UN0289	CORD, DETONATING, flexible	1.4D			P5, 148	A5.22.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN0102	CORD, DETONATING or FUSE, DETONATING, metal clad	1.2D			P4	A5.22.
	UN0290	CORD, DETONATING or FUSE, DETONATING, metal clad	1.1D			P4	A5.22.
	UN0104	CORD, DETONATING, MILD EFFECT or FUSE, DETONATING, MILD EFFECT, metal clad	1.4D			P5	A5.22.
	UN0066	CORD, IGNITER	1.4G			P5	A5.23.
		Cordeau detonant fuse, see CORD, DETONATING, or FUSE DETONATING METAL CLAD, (UN0102, UN0290) or CORD, DETONATING, flexible (UN0065, UN0289)					
		Cordite, see POWDER, SMOKELESS, (UN0160, UN0161)					
		Corrosive battery fluid, see BATTERY FLUID, ACID (UN2796) or BATTERY FLUID, ALKALI (UN2797)					
★	UN1760	CORROSIVE LIQUID, N.O.S.	8		I II III	P3, A7 P4 P5	A12.2. A12.2. A12.2.
★	UN3264	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	8		I II III	P3 P4 P5	A12.2. A12.2. A12.2.
★	UN3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8		I II III	P3 P4, 148 P5, 386	A12.2. A12.2. A12.2.
★	UN3266	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	8		I II III	P3 P4 P5	A12.2. A12.2. A12.2.
★	UN3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	8		I II III	P3 P4 P5	A12.2. A12.2. A12.2.
★	UN3301	CORROSIVE LIQUID, SELF-HEATING, N.O.S.	8	4.2 4.2	I II	P3 P4	A12.2. A12.2.
★	UN2920	CORROSIVE LIQUIDS, FLAMMABLE, N.O.S.	8	3 3	I II	P3 P4	A12.2. A12.2.
★	UN3093	CORROSIVE LIQUIDS, OXIDIZING, N.O.S.	8	5.1 5.1	I II	P3, A7 P4, A6, A7	A12.2. A12.2.
★	UN2922	CORROSIVE LIQUIDS, TOXIC N.O.S.	8	6.1 6.1 6.1	I II III	P3, A7 P4 P5	A12.2. A12.2. A12.2.
★	UN3094	CORROSIVE LIQUIDS, WATER-REACTIVE, N.O.S.	8	4.3 4.3	I II	P3, A7 P4, A6, A7	A12.2. A12.2.
★	UN3260	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3262	CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3263	CORROSIVE SOLID, BASIC, ORGANIC, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN2921	CORROSIVE SOLIDS, FLAMMABLE, N.O.S.	8	4.1 4.1	I II	P3 P4	A12.3. A12.3.
★	UN1759	CORROSIVE SOLIDS, N.O.S.	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3084	CORROSIVE SOLIDS, OXIDIZING, N.O.S.	8	5.1 5.1	I II	P5 P5	A12.3. A12.3.
★	UN3095	CORROSIVE SOLIDS, SELF-HEATING, N.O.S.	8	4.2 4.2	I II	P5 P5	A12.3. A12.3.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
★	UN2923	CORROSIVE SOLIDS, TOXIC N.O.S.	8	6.1 6.1 6.1	I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3096	CORROSIVE SOLIDS, WATER-REACTIVE, N.O.S.	8	4.3 4.3	I II	P3 P4	A12.3. A12.3.
		Cosmetics, corrosive, liquid, N.O.S., see <b>CORROSIVE LIQUID, N.O.S.</b> (UN1760)					
		Cosmetics, corrosive solid, N.O.S., see <b>CORROSIVE SOLID, N.O.S.</b> (UN1759)					
		Cosmetics, flammable, liquid, N.O.S., see <b>PERFUMERY PRODUCTS</b> (UN1266) or <b>FLAMMABLE LIQUID, N.O.S.</b> (UN1993)					
		Cosmetics, flammable, solid, N.O.S., see <b>FLAMMABLE SOLID, ORGANIC, N.O.S.</b> (UN1325) or <b>FLAMMABLE SOLID, INORGANIC, N.O.S.</b> (UN3178)					
		Cosmetics, N.O.S., in small inner packagings containing flammable aerosol and/or non-flammable aerosol and/or flammable liquid, N.O.S., see <b>CONSUMER COMMODITY</b> (ID8000)					
		Cosmetics, oxidizing material, liquid, N.O.S., see <b>OXIDIZING LIQUID, N.O.S.</b> (UN3139)					
		Cosmetics, oxidizing material, solid, N.O.S., see <b>OXIDIZING SOLID, N.O.S.</b> (UN1479)					
		Cotton seed, cut linters, hull fibers, pulp, waste and shavings, with animal or vegetable oil, see <b>FABRICS VEGETABLE, N.O.S.</b> (UN1373) or <b>FIBERS, VEGETABLE, N.O.S.</b> (UN1373)					
	NA1365	<b>COTTON</b>	9			P5, 137	A27.
	UN1364	<b>COTTON WASTE, OILY</b>	4.2		III	P5	A8.3.
	UN1365	<b>COTTON, WET</b>			III		FORBIDDEN
★	UN3024	COUMARIN DERIVATIVE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, flashpoint not less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3026	COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN3025	COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, flashpoint less than 23 degrees C	6.1	3 3 3	I II III	P3 P5 P5	A10.4. A10.4. A10.4.
★	UN3027	COUMARIN DERIVATIVE PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Creosote, see <b>TOXIC, LIQUID, ORGANIC, N.O.S.</b> (UN2810)					
		Creosote salts, see <b>NAPHTHALENE, CRUDE</b> (UN1334) or <b>REFINED</b> (UN1334)					
	UN2076	<b>CRESOLS, LIQUID</b>	6.1	8	II	P5	A10.4.
	UN3455	<b>CRESOLS, SOLID</b>	6.1	8	II	P5	A10.5.
	UN2022	<b>CRESYLIC ACID</b>	6.1	8	II	P5	A10.4.
		Crocidolite, see <b>ASBESTOS AMPHIBOLE</b> (UN2212)					
	UN1143	<b>CROTONALDEHYDE</b> or <b>CROTONALDEHYDE STABILIZED</b>	6.1	3	I	P2, 2, 175, 387	A10.6.
		Crotonaldehyde, unstabilized					FORBIDDEN
	UN3472	<b>CROTONIC ACID, LIQUID</b>	8		III	P5	A12.2
	UN2823	<b>CROTONIC ACID, SOLID</b>	8		III	P5	A12.3.
		Crotonic aldehyde, stabilized, see <b>CROTONALDEHYDE</b> (UN1143) or <b>CROTONALDEHYDE, STABILIZED</b> (UN1143)					
	UN1144	<b>CROTONYLENE</b>	3		I	P3	A7.2.
		Crude naphtha, see <b>PETROLEUM DISTILLATES, N.O.S.</b> (UN1268)					
		Cryogenic liquid, see entry for specific gas					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Cumene</i> , see <b>ISOPROPYLBENZENE</b> (UN1918)					
		<i>Cupric chlorate</i> , see <b>COPPER CHLORATE</b> (UN2721)					
		<i>Cupric cyanide</i> , see <b>COPPER CYANIDE</b> (UN1587)					
	UN1761	<b>CUPRIETHYLENEDIAMINE SOLUTION</b>	8	6.1 6.1	II III	P4 P5	A12.2. A12.2.
	UN0070	<b>CUTTERS, CABLE, EXPLOSIVE</b>	1.4S			P5	A5.17.
		<i>Cyanide of calcium</i> , see <b>CALCIUM CYANIDE</b> (UN1575)					
		<i>Cyanide of potassium</i> , see <b>POTASSIUM CYANIDE SOLID</b> (UN1680) or <b>POTASSIUM CYANIDE SOLUTION</b> (UN3413)					
		<i>Cyanide of sodium</i> , see <b>SODIUM CYANIDE, SOLID</b> (UN1689) OR <b>SODIUM CYANIDE SOLUTION</b> (UN3414) <b>CYANIDES, INORGANIC, SOLID, N.O.S.</b> (UN1588)					
		<i>Cyanide or cyanide mixtures, dry</i> , see <b>CYANIDES, INORGANIC, SOLID N.O.S.</b> (UN1588)					
★	UN1588	<b>CYANIDES, INORGANIC, SOLID N.O.S.</b>	6.1		I II III	P5, N74, N75 P5, N74, N75 P5, N74, N75	A10.5. A10.5. A10.5.
	UN1935	<b>CYANIDE SOLUTIONS, N.O.S.</b>	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
		<i>Cyanides, organic, flammable, toxic, N.O.S.</i> , see <b>NITRILES, FLAMMABLE, N.O.S.</b> (UN3273)					
		<i>Cyanides, organic, toxic, N.O.S.</i> , see <b>NITRILES, LIQUID, TOXIC</b> (UN3276) or <b>NITRILES, SOLID, TOXIC N.O.S.</b> (UN3439)					
		<i>Cyanides, organic, toxic, flammable, N.O.S.</i> , see <b>NITRILES, TOXIC, FLAMMABLE, N.O.S.</b> (UN3275)					
		<i>Cyanoacetonitrile</i> , see <b>MALONONITRILE</b> (UN2647)					
	UN1026	<b>CYANOGEN</b>	2.3	2.1		P2, 2	A6.15.
	UN1889	<b>CYANOGEN BROMIDE</b>	6.1	8	I	P3, A6, A8	A10.5.
	UN1589	<b>CYANOGEN CHLORIDE, STABILIZED</b>	2.3	8		P1, 1, 387	A6.15.
		<i>Cyanogen Chloride, unstabilized</i>					FORBIDDEN
	UN2670	<b>CYANURIC CHLORIDE</b>	8		II	P5	A12.3.
		<i>Cyanuric triazide</i>					FORBIDDEN
	UN2601	<b>CYCLOBUTANE</b>	2.1			P4	A6.3., A6.4.
	UN2744	<b>CYCLOBUTYL CHLOROFORMATE</b>	6.1	3, 8	II	P4	A10.4.
	UN2518	<b>1,5,9-CYCLODODECATRIENE</b>	6.1		III	P5	A10.4.
	UN2241	<b>CYCLOHEPTANE</b>	3		II	P5	A7.2.
		<i>1,3,5-Cycloheptatriene</i> , see <b>CYCLOHEPTATRIENE</b> (UN2603)					
	UN2603	<b>CYCLOHEPTATRIENE</b>	3	6.1	II	P5	A7.2.
	UN2242	<b>CYCLOHEPTENE</b>	3		II	P5	A7.2.
		<i>1,4-Cyclohexadienedione</i> , see <b>BENZOQUINONE</b> (UN2587)					
	UN1145	<b>CYCLOHEXANE</b>	3		II	P5	A7.2.
		<i>Cyclohexanethiol</i> , see <b>CYCLOHEXYL MERCAPTAN</b> (UN3054)					
	UN1915	<b>CYCLOHEXANONE</b>	3		III	P5	A7.2.
	UN2256	<b>CYCLOHEXENE</b>	3		II	P5	A7.2.
	UN1762	<b>CYCLOHEXENYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
	UN2243	<b>CYCLOHEXYL ACETATE</b>	3		III	P5	A7.2.
	UN2488	<b>CYCLOHEXYL ISOCYANATE</b>	6.1	3	I	P2, 2	A10.6.
	UN3054	<b>CYCLOHEXYL MERCAPTAN</b>	3		III	P5	A7.2.
	UN2357	<b>CYCLOHEXYLAMINE</b>	8	3	II	P5	A12.2.
	UN1763	<b>CYCLOHEXYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<b>CYCLONITE AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURES, WETTED or DESENSITIZED</b> <i>see</i> RDX (UN0391) AND HMX MIXTURES, WETTED (UN0226) or DESENSITIZED (UN0484) <i>etc.</i>	1.1D				FORBIDDEN
		<b>CYCLONITE AND HMX MIXTURES, WETTED or DESENSITIZED</b> <i>see</i> RDX (UN0391) AND HMX MIXTURES, WETTED (UN0226) or DESENSITIZED (UN0484) <i>etc.</i>	1.1D				FORBIDDEN
		<b>CYCLONITE and OCTOGEN MIXTURES, WETTED or DESENSITIZED</b> <i>see</i> RDX (UN0391) AND HMX MIXTURES, WETTED (UN0226) or DESENSITIZED (UN0484) <i>etc.</i>	1.1D				FORBIDDEN
		<b>CYCLONITE, <i>see</i> CYCLOTRIMETHYLENETRINITRAMINE, (UN0391) <i>etc.</i></b>	1.1D				FORBIDDEN
		<b>CYCLOOCTADIENE PHOSPHINES, <i>see</i> 9-PHOSPHABICYCLONONANES</b>					
	UN2520	<b>CYCLOOCTADIENES</b>	3		III	P5	A7.2.
	UN2358	<b>CYCLOOCTATETRAENE</b>	3		II	P5	A7.2.
	UN1146	<b>CYCLOPENTANE</b>	3		II	P5	A7.2.
		<i>Cyclopentane, methyl, <i>see</i> METHYLCYCLOPENTANE (UN2298)</i>					
	UN2244	<b>CYCLOPENTANOL</b>	3		III	P5	A7.2.
	UN2245	<b>CYCLOPENTANONE</b>	3		III	P5	A7.2.
	UN2246	<b>CYCLOPENTENE</b>	3		II	P5	A7.2.
	UN1027	<b>CYCLOPROPANE</b>	2.1			P4	A6.3., A6.4.
		<i>Cyclotetramethylene tetranitramine (dry or unphlegmatized) (HMX)</i>					FORBIDDEN
	UN0484	<b>CYCLOTETRAMETHYLENETETRANITRAMINE, DESENSITIZED, or OCTOGEN, DESENSITIZED, or HMX, DESENSITIZED</b>	1.1D			P4	A5.6.
	UN0226	<b>CYCLOTETRAMETHYLENETETRANITRAMINE, WETTED, or HMX, WETTED or OCTOGEN, WETTED with not less than 15% water, by mass</b>	1.1D			P4	A5.6.
		<b>CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURES, WETTED or DESENSITIZED</b> <i>see</i> RDX AND HMX MIXTURES, WETTED or DESENSITIZED <i>etc.</i>					
		<b>CYCLOTRIMETHYLENETRINITRAMINE AND HMX MIXTURES, WETTED or DESENSITIZED</b> <i>see</i> RDX AND HMX MIXTURES, WETTED or DESENSITIZED <i>etc.</i>					
		<b>CYCLOTRIMETHYLENENITRAMINE AND OCTOGEN, MIXTURES, WETTED or DESENSITIZED</b> <i>see</i> RDX AND HMX MIXTURES, WETTED or DESENSITIZED <i>etc.</i>					
	UN0483	<b>CYCLOTRIMETHYLENETRINITRAMINE, DESENSITIZED, or CYCLONITE, DESENSITIZED, or HEXOGEN, DESENSITIZED, or RDX, DESENSITIZED</b>	1.1D			P4	A5.6
	UN0072	<b>CYCLOTRIMETHYLENETRINITRAMINE, WETTED, or CYCLONITE, WETTED, or HEXOGEN, WETTED, or RDX, WETTED, with not less than 15 percent water by mass</b>	1.1D			P4	A5.6.
	UN2940	<b>CYCLOOCTADIENE PHOSPHINES</b>	4.2		II	P5, A19	A8.3.
		<i>Cyclotetramethylenetetranitramine (dry)</i>					FORBIDDEN



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN0391	CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, DESENSITIZED <i>with not less than 10% phlegmatizer by mass</i>	1.1D			P4	A5.6.
	UN0391	CYCLOTRIMETHYLENETRINITRAMINE AND CYCLOTETRAMETHYLENE-TETRANITRAMINE MIXTURE, WETTED <i>with not less than 15% water by mass</i>	1.1D			P4	A5.6.
	UN2046	CYMENES	3		III	P5	A7.2.
		<i>Cymol, see CYMEMES (UN2046)</i>					
	UN3363	DANGEROUS GOODS IN APPARATUS <i>or</i> DANGEROUS GOODS IN MACHINERY <i>or</i> DANGEROUS GOODS IN ARTICLES, Dangerous goods in excepted quantities, see Attachment A19	9			P5, 136, A105	A13.13., A19
		<i>Dead oil, see TARS, LIQUID (UN1999)</i>					
		<i>Deanol, see 2-DIMETHYLAMINOETHANOL (UN2051)</i>					
	UN1868	DECABORANE	4.1	6.1	II	P5, A19, A20	A8.3.
	UN1147	DECAHYDRONAPHTHALENE	3		III	P5	A7.2.
		<i>Decalin, see DECAHYDRONAPHTHALENE (UN1147)</i>					
	UN2247	n-DECANE	3		III	P5	A7.2.
	UN0132	DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	1.3C			P4	A5.9.
		<i>De-icing fluid, see FLAMMABLE LIQUID, N.O.S. (UN1993)</i>					
		<i>Delay electric igniter, see IGNITERS (UN0121, UN0314, UN0315, UN0325, UN0454)</i>					
D	NA1987	DENATURED ALCOHOL	3		II III	P4, 172 P5, 172	A7.2. A7.2.
		<i>Depth Charges, see CHARGES DEPTH (UN0056)</i>					
	UN3379	DESENSITIZED EXPLOSIVE, LIQUID, N.O.S.	3		I	164	FORBIDDEN
	UN3380	DESENSITIZED EXPLOSIVE, SOLID, N.O.S.	4.1		I	164, 197	FORBIDDEN
		<i>Detonating relays, see DETONATORS NON-ELECTRIC (UN0029, UN0267, UN0455) or DETONATORS ASSEMBLIES NON-ELECTRIC (UN0360, UN0361, UN0500)</i>					
	UN0360	DETONATOR ASSEMBLIES, NON-ELECTRIC <i>for blasting</i>	1.1B			P4	A5.14.
	UN0361	DETONATOR ASSEMBLIES, NON-ELECTRIC <i>for blasting</i>	1.4B			P5, 148	A5.14.
	UN0500	DETONATOR ASSEMBLIES, NON-ELECTRIC <i>for blasting</i>	1.4S			P5, 148, 347	A5.14.
	UN0030	DETONATORS, ELECTRIC, <i>for blasting</i>	1.1B			P4, 148	A5.13.
	UN0255	DETONATORS, ELECTRIC, <i>for blasting</i>	1.4B			P5, 148	A5.13.
	UN0456	DETONATORS, ELECTRIC, <i>for blasting</i>	1.4S			P5, 148, 347	A5.13.
	UN0511	DETONATORS, ELECTRIC <i>programmable for blasting</i>	1.1B			P4, 148	A5.13
	UN0512	DETONATORS, ELECTRIC <i>programmable for blasting</i>	1.4B			P5	A5.13
	UN0513	DETONATORS, ELECTRIC <i>programmable for blasting</i>	1.4S			P5, 148, 347	A5.13
	UN0073	DETONATORS FOR AMMUNITION	1.1B			P4	A5.16.
	UN0364	DETONATORS FOR AMMUNITION	1.2B			P4	A5.16.
	UN0365	DETONATORS FOR AMMUNITION	1.4B			P5	A5.16.
	UN0366	DETONATORS FOR AMMUNITION	1.4S			P5, 347	A5.16.
	UN0029	DETONATORS, NON-ELECTRIC, <i>for blasting</i>	1.1B			P4	A5.14.
	UN0267	DETONATORS, NON-ELECTRIC, <i>for blasting</i>	1.4B			P5	A5.14.
	UN0455	DETONATORS, NON-ELECTRIC, <i>for blasting</i>	1.4S			P5, 347	A5.14.
	UN1957	DEUTERIUM, COMPRESSED	2.1			P4, N89	A6.3., A6.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN3150	DEVICES, SMALL, HYDROCARBON GAS POWERED or HYDROCARBON GAS REFILLS FOR SMALL DEVICES with release device	2.1			P5	A6.3., A6.4.
	UN2841	DI-N-AMYLAMINE	3	6.1	III	P5	A7.2.
		<i>p</i> -Diazidobenzene					FORBIDDEN
		1,2-Diazidoethane					FORBIDDEN
		Diazoaminotetrazole (dry)					FORBIDDEN
		Diazodinitrophenol (dry)					FORBIDDEN
		1,1'-Diazoaminonaphthalene					FORBIDDEN
		Di-2,4-Dichlorobenzoyl peroxide, with more than 75% with water					FORBIDDEN
	UN2372	1,2-DI-(DIMETHYLAMINO) ETHANE	3		II	P5	A7.2.
		Di-2-ethylhexyl phosphoric acid, see DIISOCTYL ACID PHOSPHATE (UN1902)					
		Di-(naphthoyl) peroxide					FORBIDDEN
		<i>a,a</i> -Di-(nitroxy) methyether					FORBIDDEN
		Di-(beta-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN1148	DIACETONE ALCOHOL	3		II III	P5 P5	A7.2. A7.2.
		Diacetone alcohol peroxides, with more than 57 percent in solution with more than 9 percent hydrogen peroxide, less than 26 percent diacetone alcohol and less than 9 percent water; total active oxygen content more than 9 percent by mass					FORBIDDEN
		Diacetyl, see BUTANEDIONE (UN2346)					
		Diacetyl peroxide, solid, or with more than 25 percent in solution					FORBIDDEN
		Diagnostic specimens, see BIOLOGICAL SUBSTANCES, CATEGORY B (UN3373)					
	UN2359	DIALLYLAMINE	3	6.1, 8	II	P4	A7.2.
	UN2360	DIALLYL ETHER	3	6.1	II	P4, N12	A7.2.
		<i>m</i> -Diaminobenzene, see PHENYLENEDIAMINES (UN1673, UN1604)					
	UN2651	4,4'-DIAMINODIPHENYL METHANE	6.1		III	P5	A10.5.
		1,2-Diaminoethane, see PHENYLENEDIAMINES (UN1673) or ETHYLENEDIAMINE (UN1604)					
		Diaminopropylamine, see 3,3'-IMINODIPROPYLAMINE (UN2269)					
		Di-(aminopropyl)-piperazine, see AMINES, LIQUID, CORROSIVE, N.O.S. (UN2735)					
	UN0074	DIAZODINITROPHENOL, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1.1A			P4, 111, 117	A5.4.
		Diazodiphenylmethane					FORBIDDEN
		2-Diazo-1-naphthal sulphonic acid ester mixture type d, see SELF-REACTIVE SOLID TYPE D (UN3226)					
		2-Diazo-1-naphthol-5-sulphonyl chloride					FORBIDDEN
		2-Diazo-1-naphthol-4-sulphonyl chloride					FORBIDDEN
		Diazonium nitrates (dry)					FORBIDDEN
		Diazonium perchlorates (dry)					FORBIDDEN
		1,3-Diazopropane					FORBIDDEN
		Dibenzopyridine, see ACRIDINE (UN2713)					
		Dibenzoyl peroxide, with more than 51% when with less than or equal 48% inert solid					FORBIDDEN
		Dibenzoyl peroxide, with more than 77% and with less than 94% when with more or equal 6% water					FORBIDDEN
	UN2434	DIBENZYL DICHLOROSILANE	8		II	P5	A12.2.
		Dibenzyl peroxydicarbonate, with more than 87 percent with water					FORBIDDEN
		Dibenzyl peroxydicarbonate, not more than 87% when with 13% or more water					FORBIDDEN
	UN1911	DIBORANE	2.3	2.1		P1, 1, N89	A6.15.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D	NA1911	<b>DIBORANE MIXTURES</b>	2.1				FORBIDDEN
		<i>Dibromoacetylene</i>					FORBIDDEN
	UN2648	<b>1,2-DIBROMOBUTAN-3-ONE</b>	6.1		II	P5	A10.4.
		<i>1,2-Dibromo-3-chloropropane, see DIBROMOCHLOROPROPANES (UN2872)</i>					
	UN2872	<b>DIBROMOCHLOROPROPANES</b>	6.1		II III	P5 P5	A10.4. A10.4.
	UN1941	<b>DIBROMODIFLUOROMETHANE, R12B2</b>	9		III	P5	A13.2.
		<i>1,2-Dibromoethane, see ETHYLENE DIBROMIDE (UN1065)</i>					
	UN2664	<b>DIBROMOMETHANE</b>	6.1		III	P5	A10.4.
		<i>Dibromotetrafluoroethane (Not Restricted)</i>					
		<i>2,5-Dibutoxy-4 (4-morpholinyl)-benzenediazonium, tetrachlorozincate (2:1), see SELF-REACTIVE SOLID TYPE E ★ (UN3228)</i>					
	UN2248	<b>DI-N-BUTYLAMINE</b>	8	3	II	P5	
		<i>2-Dibutylaminoethanol, see DIBUTYLAMINOETHANOL (UN2873)</i>					
		<i>N,N-Di-n-butylaminoethanol, see DIBUTYLAMINOETHANOL (UN2873)</i>					
	UN2873	<b>DIBUTYLAMINOETHANOL</b>	6.1		III	P5	A10.4.
	UN1149	<b>DIBUTYL ETHERS</b>	3		III	P5	A7.2.
		<i>2,2-Di-(tert-butylperoxy) butane, more than 55% in solution</i>					FORBIDDEN
		<i>Di-(tert-butylperoxy) phthalate, more than 55% in solution</i>					FORBIDDEN
		<i>2,2-Di-(4,4-tert-butylperoxycyclohexyl) propane, with more than 42 percent with inert solid</i>					FORBIDDEN
		<i>1,1-Di-(tert-butylperoxy) cyclohexane, more than 80%</i>					FORBIDDEN
		<i>Di-n-butyl peroxydicarbonate, more than 52% in solution</i>					FORBIDDEN
		<i>1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclo hexane, more than 90%</i>					FORBIDDEN
		<i>N,N'-Dichlorazodicarbonamidine (salts of) (dry)</i>					FORBIDDEN
D	NA9264	<b>3,5 DICHLORO-2,4,6 TRIFLUOROPYRIDINE</b>	6.1		I	P2, 2	A10.6.
	UN1764	<b>DICHLOROACETIC ACID</b>	8		II	P5, A3, A7, N34	A12.2.
	UN2649	<b>1,3-DICHLOROACETONE</b>	6.1		II	P5	A10.5.
	UN1765	<b>DICHLOROACETYL CHLORIDE</b>	8		II	P5, A3, A7, N34	A12.2.
		<i>Dichloroacetylene</i>					FORBIDDEN
+	UN1590	<b>DICHLOROANILINES, LIQUID</b>	6.1		II	P5	A10.4.
	UN3442	<b>DICHLOROANILINES, SOLID</b>	6.1		II	P5	A10.5.
+	UN1591	<b>o-DICHLOROBENZENE</b>	6.1		III	P5	A10.4.
		<i>Di-4-chlorobenzoyl peroxide, less than or equal to 77%, when with greater or equal to 23% water</i>					FORBIDDEN
	UN1916	<b>2,2'-DICHLORODIETHYL ETHER</b>	6.1	3	II	P5, N33, N34	A10.4.
	UN1028	<b>DICHLORODIFLUOROMETHANE or REFRIGERANT GAS R12</b>	2.2			P5	A6.3., A6.4.
	UN2602	<b>DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE or REFRIGERANT GAS R500 with approximately 74% dichlorodifluoromethane</b>	2.2			P5	A6.3., A6.4.
		<i>Dichlorodifluoromethane and ethylene oxide mixtures, see ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE (UN3070)</i>					
	UN2249	<b>DICHLORODIMETHYL ETHER, SYMMETRICAL</b>	6.1	3	I	P3	A10.4.
	UN2362	<b>1,1-DICHLOROETHANE</b>	3		II	P5	A7.2.
		<i>1,2-Dichloroethane, see ETHYLENE DICHLORIDE (UN1184)</i>					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1150	<b>1,2-DICHLOROETHYLENE</b>	3		II	P5	A7.2.
		<i>Di(2-chlorethyl) ether, see 2-2'-DICHLORODIETHYL ETHER (UN1916)</i>					
		<i>Dichloroethyl sulphide</i>					FORBIDDEN
		<i>1,1-Dichloro- 1-fluoroethane (R141b) (Not Restricted)</i>					
	UN1029	<b>DICHLOROFLUOROMETHANE or REFRIGERANT GAS R21</b>	2.2			P5	A6.3., A6.4.
		<i>Alpha-Dichlorohydrin, see 1,3-DICHLOROPROPANOL-2 (UN2750)</i>					
		<i>Dichloroisocyanuric acid, as dehydrated sodium salt (Not Restricted)</i>					
	UN2465	<b>DICHLOROISOCYANURIC ACID, DRY or DICHLOROISOCYANURIC ACID SALTS</b>	5.1		II	P5, 28	A9.6.
	UN2490	<b>DICHLOROISOPROPYL ETHER</b>	6.1		II	P5	A10.4.
	UN1593	<b>DICHLOROMETHANE</b>	6.1		III	P5, N36	A10.4.
	UN2650	<b>1,1-DICHLORO-1-NITROETHANE</b>	6.1		II	P5	A10.4.
	UN1152	<b>DICHLOROPENTANES</b>	3		III	P5	A7.2.
		<i>Dichlorophenols, see CHLOROPHENOLS, SOLID (UN2020) or CHLOROPHENOLS, LIQUID (UN2021)</i>					
	UN2250	<b>DICHLOROPHENYL ISOCYANATES</b>	6.1		II	P5	A10.5.
	UN1766	<b>DICHLOROPHENYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
	UN1279	<b>1,2-DICHLOROPROPANE</b>	3		II	P5, N36	A12.2.
	UN2750	<b>1,3-DICHLOROPROPANOL-2</b>	6.1		II	P5	A10.4.
		<i>1,3-Dichloro-2-propanone, see, 1,3-DICHLOROACETONE (UN2649)</i>					
		<i>Dichloropropene and propylene dichloride mixture, see 1,2-DICHLOROPROPANE (UN1279)</i>					
	UN2047	<b>DICHLOROPROPENES</b>	3		II III	P5 P5	A7.2. A7.2.
	UN2189	<b>DICHLOROSILANE</b>	2.3	2.1, 8		P2, 2	A6.4.
		<i>Dichloro-s-triazine-2,4,6-trione, see DICHLOROISOCYANURIC ACID SALTS or ACID DRY, (UN2465)</i>					
	UN1958	<b>1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE or REFRIGERANT GAS R114</b>	2.2			P5	A6.3., A6.4.
		<i>Dichlorovinylchloroarsine</i>					FORBIDDEN
		<i>Dicycloheptadiene, see BICYCLO[2,2,1] HEPTA-2,5-DIENE,STABILIZED (UN2251)</i>					
		<i>1,4-Dicyanobutane, see ADIPONITRILE (UN2205)</i>					
		<i>dicycloheptadiene, see 2,5-NORBORNADIENE STABILIZED (UN2251) or BICYCLO [2,2,1] HEPTA-2-5-DIENE, STABILIZED (UN2251)</i>					
	UN2565	<b>DICYCLOHEXYLAMINE</b>	8		III	P5	A12.2.
		<i>Dicyclohexylaminenitrite, see DICYCLOHEXYLAMMONIUM NITRITE (UN2687)</i>					
	UN2687	<b>DICYCLOHEXYLAMMONIUM NITRITE</b>	4.1		III	P5	A8.3.
		<i>Dicyclohexyl peroxydicarbonate more than 91%</i>					FORBIDDEN
	UN2048	<b>DICYCLOPENTADIENE</b>	3		III	P5	A7.2.
		<i>2,2-Di-(4,4-di-tert-butylperoxycyclohexyl) propane, more than 42% with inert solid</i>					FORBIDDEN
		<i>Di-2,4-dichlorobenzoyl peroxide, less than 77%, when with 23% or more water</i>					FORBIDDEN
	UN2372	<b>1,2-DI-(DIMETHYLAMINO) ETHANE</b>	3		II	P5	A7.2.
	UN1465	<b>DIDYMIUM NITRATE</b>	5.1		III	P5, A1	A9.6.
D	NA1993	<b>DIESEL FUEL</b>	3		III	P5, 144	A7.2.
	UN1202	<b>DIESEL FUEL</b>	3		III	P5, 144	A7.2.
		<i>Diethanol nitrosamine dinitrate (dry)</i>					FORBIDDEN
		<i>1,1-Diethoxyethane, see ACETAL (UN1088)</i>					
		<i>1,2-Diethoxyethane, see ETHYLENE GLYCOL DIETHYL ETHER (UN1153)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN2373	<b>DIETHOXYMETHANE</b>	3		II	P5	A7.2.
		2,5-Diethoxy-4-morpholinobenzenediazonium zinc chloride, see <b>SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED</b> (UN3236)					
		2,5-Diethoxy-4-(4-morpholinyl)-benzenediazonium sulfate, see <b>SELF-REACTIVE SOLID TYPE D</b> (UN3226)					
	UN2374	<b>3,3-DIETHOXYPROPENE</b>	3		II	P5	A7.2.
		Diethyl acetal, see <b>ACETAL</b> (UN1088)					
	UN2366	<b>DIETHYL CARBONATE</b>	3		III	P5	A7.2.
		Diethyl cellosolve, see <b>ETHYLENE GLYCOL DIETHYL ETHER</b> (UN1153)					
	UN1155	<b>DIETHYL ETHER</b> or <b>ETHYL ETHER</b>	3		I	P3	A7.2.
	UN1156	<b>DIETHYL KETONE</b>	3		II	P5	A7.2.
		Diethyl peroxydicarbonate, more than 27% in solution					FORBIDDEN
	UN1594	<b>DIETHYL SULPHATE</b>	6.1		II	P5	A10.4.
	UN2375	<b>DIETHYL SULFIDE</b>	3		II	P5	A7.2.
	UN1154	<b>DIETHYLAMINE</b>	3	8	II	P4, A3, N34	A7.2.
		Diethylaminoethanol, see <b>2-DIETHYLAMINOETHANOL</b> (UN2686)					
	UN2686	<b>2-DIETHYLAMINOETHANOL</b>	8	3	II	P5	A12.2.
	UN2684	<b>3-DIETHYLAMINOPROPYLAMINE</b>	3	8	III	P5	A7.2.
+	UN2432	<b>N,N-DIETHYLANILINE</b>	6.1		III	P5	A10.4.
	UN2049	<b>DIETHYLBENZENE</b>	3		III	P5	A7.2.
		Diethylcarbinol, see <b>PENTANOLS</b> (UN1105)					
	UN1767	<b>DIETHYLDICHLOROSILANE</b>	8	3	II	P4, A7, N34	A12.2.
		Diethyldimethyl lead mixture, see <b>MOTOR FUEL ANTI-KNOCK MIXTURE</b> (UN1649)					
		Diethylenediamine, see <b>PIPERAZINE</b> (UN2579)					
	UN0075	<b>DIETHYLENEGLYCOL DINITRATE, DESENSITIZED</b> with not less than 25% non-volatile water-insoluble phlegmatizer, by mass	1.1D				FORBIDDEN
		Diethylene dinitrate, desensitized, with less than 25% phlegmatizer					FORBIDDEN
		Diethyleneglycol dinitrate (dry)					FORBIDDEN
		Diethylene oxide, see <b>DIOXANE</b> (UN1165)					
	UN2079	<b>DIETHYLENETRIAMINE</b>	8		II	P5	A12.2.
		N,N-Diethylethanamine, see <b>2-DIETHYLAMINOETHANOL</b> (UN2686)					
	UN2685	<b>N,N-DIETHYLETHYLENEDIAMINE</b>	8	3	II	P5	A12.2.
		Diethylgold bromide					FORBIDDEN
		Di-(2-ethylhexyl) phosphoric acid, see <b>DIISOCTYL ACID PHOSPHATE</b> (UN1902)					
	UN2751	<b>DIETHYLTHIOPHOSPHORYL CHLORIDE</b>	8		II	P5	A12.3.
		2,4-Difluorochloroethane, see <b>1-CHLORO-1,1-DIFLUOROETHANE</b> (UN2517)					
		-Difluorochloroethane, 2,4-Difluoroaniline, see <b>FLUOROANILINES</b> (UN2941)					
		Diethylzinc, see <b>ORANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE ★</b> (UN3394)					
		Difluorochloroethanes, see <b>1-CHLORO-1,1-DIFLUOROETHANES</b> (UN2517)					
	UN1030	<b>1,1-DIFLUOROETHANE</b> or <b>REFRIGERANT GAS R152A</b>	2.1			P4	A6.3., A6.4.
	UN1959	<b>1,1-DIFLUOROETHYLENE</b> or <b>REFRIGERANT GAS R1132A</b>	2.1			P4	A6.3., A6.4.
	UN3252	<b>DIFLUOROMETHANE</b> or <b>REFRIGERANT GAS R32</b>	2.1			P4	A6.3., A6.4.
		Difluoromethane, pentafluoromethane and 1,1,1,2 tetrafluoroethane azeotropic mixture with approximately 10% difluoromethane and 70% pentafluoroethane, see <b>REFRIGERANT GAS R 407B</b> (UN3339)					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Difluoromethane, pentafluoromethane and 1,1,1,2 tetrafluoroethane azeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane, see <b>REFRIGERANT GAS R 407A</b> (UN3338)					
		Difluoromethane, pentafluoromethane and 1,1,1,2 tetrafluoroethane azeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane, see <b>REFRIGERANT GAS R 407C</b> (UN3340)					
	UN1768	<b>DIFLUOROPHOSPHORIC ACID, ANHYDROUS</b>	8		II	P5, A7, N5, N34	A12.2.
		2,2-Dihydroperoxypropane, not more than 27% when with 73% or more inert solid					FORBIDDEN
	UN2376	<b>2,3-DIHYDROPYRAN</b>	3		II	P5	A7.2.
		1,8-Dihydroxy-2,4,5,7-tetranitroanthraquinone (chrysamminic acid)					FORBIDDEN
		Di-(1-hydroxytetrazole) (dry)					FORBIDDEN
		Diiodoacetylene					FORBIDDEN
	UN1157	<b>DIISOBUTYL KETONE</b>	3		III	P5	A7.2.
		Diisobutyl peroxide, more than 32% and less than 52%, when with 48% or more diluent type A or B					FORBIDDEN
	UN2361	<b>DIISOBUTYLAMINE</b>	3	8	III	P5	A7.2.
		Alpha-Diisobutylene or beta-Diisobutylene, see <b>DIISOBUTYLENE, ISOMERIC COMPOUNDS</b> (UN2050)					
	UN2050	<b>DIISOBUTYLENE, ISOMERIC COMPOUNDS</b>	3		II	P5	A7.2.
	UN1902	<b>DIISOCTYL ACID PHOSPHATE</b>	8		III	P5	A12.2.
	UN1159	<b>DIISOPROPYL ETHER</b>	3		II	P5	A7.2.
		Diisopropyl oxide, see <b>DIISOPROPYL ETHER</b> (UN1159)					
		Diisopropyl peroxydicarbonate, more than 52%					FORBIDDEN
	UN1158	<b>DIISOPROPYLAMINE</b>	3	8	II	P4	A7.2.
		Diisopropylbenzene hydroperoxide, with more than 72 percent solution					FORBIDDEN
	UN2521	<b>DIKETENE, STABILIZED</b>	6.1	3	I	P2, 2, 387	A10.6.
		Diketene, Unstabilized					FORBIDDEN
	UN2377	<b>1,1-DIMETHOXYETHANE</b>	3		II	P3	A7.2.
	UN2252	<b>1,2-DIMETHOXYETHANE</b>	3		II	P3	A7.2.
		Dimethoxymethane, see <b>METHYLAL</b> (UN1234)					
		Dimethosystyrychnine, see <b>BRUCINE</b> (UN1570)					
	UN1161	<b>DIMETHYL CARBONATE</b>	3		II	P5	A7.2.
		Dimethyl chlorothiophosphate, see <b>DIMETHYL THIOPHOSPHORYL CHLORIDE</b>					
	UN2381	<b>DIMETHYL DISULFIDE</b>	3		II	P5	A7.2.
		Dimethylethanamine, see <b>2-DIMETHYLAMINOETHANOL</b> (UN2051)					
	UN1033	<b>DIMETHYL ETHER</b>	2.1			P4	A6.3., A6.4.
	UN2266	<b>DIMETHYL-N-PROPYLAMINE</b>	3	8	II	P5	A7.2.
	UN1595	<b>DIMETHYL SULPHATE</b>	6.1	8	I	P2, 2	A10.6.
	UN1164	<b>DIMETHYL SULPHIDE</b>	3		II	P5	A7.2.
	UN2267	<b>DIMETHYL THIOPHOSPHORYL CHLORIDE</b>	6.1	8	II	P5	A10.4.
		Dimethylzinc, see <b>ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE ★</b> (UN3394)					
		Di-(1-naphthoyl) peroxide					FORBIDDEN
	UN1032	<b>DIMETHYLAMINE, ANHYDROUS</b>	2.1			P4, N87	A6.4.
	UN1160	<b>DIMETHYLAMINE SOLUTION</b>	3	8	II	P4	A7.2.
	UN2378	<b>2-DIMETHYLAMINOACETONITRILE</b>	3	6.1	II	P4	A7.2.
		4-(Dimethylamino)-benzenediazonium trichlorozincate (-1), see <b>SELF-REACTIVE SOLID TYPE E</b> , (UN3228)					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		4-dimethylamino-6-(2-dimethylaminoethoxy) toluene-2-diazonium zinc chloride; see <b>SELF-RELATIVE SOLID TYPE D, TEMPERATURE CONTROLLED</b> (UN3236)					
	UN2051	<b>2-DIMETHYLAMINOETHANOL</b>	8	3	II	P5	A12.2.
	UN3302	<b>2-DIMETHYLAMINOETHYL ACRYLATE, STABILIZED</b>	6.1		II	P5, 387	A10.4.
	UN2522	<b>2-DIMETHYLAMINOETHYL METHACRYLATE</b>	6.1		II	P5	A10.4.
	UN2253	<b>N,N-DIMETHYLANILINE</b>	6.1		II	P5	A10.4.
		Dimethylarsenic acid, see <b>CACODYLIC ACID</b> (UN1572)					
		Dimethyl benzene, see <b>XYLENES</b> (UN1307)					
		Di-(2-methylbenzol) peroxide, not more than 87% when with 13% or more water					FORBIDDEN
		N,N-Dimethylbenzylamine, see <b>BENZYLDIMETHYLAMINE</b> (UN2619)					
	UN2457	<b>2,3-DIMETHYLBUTANE</b>	3		II	P5	A7.2.
	UN2379	<b>1,3-DIMETHYLBUTYLAMINE</b>	3	8	II	P5	A7.2.
	UN2262	<b>DIMETHYLCARBAMOYL CHLORIDE</b>	8		II	P5	A12.2.
	UN2263	<b>DIMETHYLCYCLOHEXANES</b>	3		II	P5	A7.2.
	UN2264	<b>N,N-DIMETHYLCYCLOHEXYLAMINE</b>	8	3	II	P5	A12.2.
		2,5-Dimethyl-2,5-di-(benzoylperoxy)hexane, more than 82%					FORBIDDEN
		2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3 more than 86%					FORBIDDEN
	UN1162	<b>DIMETHYLDICHLOROSILANE</b>	3	8	II	P5	A7.2.
	UN2380	<b>DIMETHYLDIETHOXSILANE</b>	3		II	P5	A7.2.
		2,5-Dimethyl-2,5-dihydroperoxy hexane, more than 82% with water					FORBIDDEN
		2,5-Dimethyl-1,4-dioxane, see <b>DIMETHYLDIOXANES</b> (UN2707)					
		4,4-Dimethyldioxane-1,3, see <b>DIMETHYLOXANES</b> (UN2707)					
	UN2707	<b>DIMETHYLDIOXANES</b>	3		II III	P5 P5	A7.2. A7.2.
	UN2265	<b>N,N-DIMETHYFORMAMIDE</b>	3		III	P5	A7.2.
		Dimethylhexane dihydroperoxide (dry)					FORBIDDEN
		Dimethylhexane dihydroperoxide, more than 82% with water					FORBIDDEN
		1,1-Dimethylhydrazine, see <b>DIMETHYLHYDRAZINE, UNSYMMETRICAL</b> (UN1163)					
	UN2382	<b>DIMETHYLHYDRAZINE, SYMMETRICAL</b>	6.1	3	I	P2, 2, A7	A10.6.
	UN1163	<b>DIMETHYLHYDRAZINE, UNSYMMETRICAL</b>	6.1	3, 8	I	P2, 2	A10.6.
		N,N-Dimethyl-4-nitroaniline, see <b>p-NITROSODIMETHYLANILINE</b> , (UN1369)					
	UN2044	<b>2,2-DIMETHYLPROPANE</b>	2.1			P4	A6.3., A6.4.
		Dimethylzinc see <b>ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE</b> (UN3394)					
	UN0489	<b>DINGU or DINITROGLYCULURIL</b>	1.1D			P4	A5.7.
	UN1598	<b>DINITRO-O-CRESOL, SOLID or DINITRO-O-CRESOL, SOLUTION</b>	6.1		II	P5	A10.4., A10.5.
		1,3-Dinitro-5,5-dimethylhydantoin					FORBIDDEN
		Dinitro-7,8-dimethylglycoluril (dry)					FORBIDDEN
		1,3-Dinitro-4,5-dinitrosobenzene					FORBIDDEN
		1,4-Dinitro-1,1,4,4-tetramethylolbutanetetrinitrate (dry)					FORBIDDEN
		2,4-Dinitro-1,3,5-trimethylbenzene					FORBIDDEN
		1,2-Dinitroethane					FORBIDDEN
		1,1-Dinitroethane (dry)					FORBIDDEN
	UN1596	<b>DINITROANILINES</b>	6.1		II	P5	A10.5.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1597	DINITROBENZENES, LIQUID	6.1		II III	P5 P5	A10.4 A10.4
	UN3443	DINITROBENZENES, SOLID	6.1		II	P5	A10.6
		<i>Dinitrochlorobenzenes, see CHLORODINITROBENZENE LIQUID (UN1577) or CHLORODINITROBENZENE SOLID (UN3441)</i>					
	UN1067	DINITROGEN TETROXIDE	2.3	5.1, 8			FORBIDDEN
	UN0489	DINITROGLYCULURIL or DINGU	1.1D			P4	A5.7.
		<i>Dinitromethane</i>					FORBIDDEN
	UN0076	DINITROPHENOL, dry or wetted with less than 15% water, by -weight	1.1D	6.1		P4	A5.6.
	UN1599	DINITROPHENOL SOLUTIONS	6.1		II III	P5 P5	A10.4. A10.4.
	UN1320	DINITROPHENOL, WETTED with not less than 15% water, by mass	4.1	6.1	I	P4, 23, A8, A19, A20, N41	A8.3.
	UN0077	DINITROPHENOLATES, alkali metals, dry or wetted with less than 15% water, by mass	1.3C	6.1		P4	A5.9.
	UN1321	DINITROPHENOLATES, WETTED with not less than 15% water, by mass	4.1	6.1	I	P4, 23, A8, A19, A20, N41	A8.3.
		<i>Dinitropropylene glycol</i>					FORBIDDEN
	UN0078	DINITRORESORCINOL, dry or wetted with less than 15% water, by mass	1.1D			P4	A5.6.
		<i>2,4-Dinitroresorcinol (heavy metal salts of) (dry)</i>					FORBIDDEN
		<i>4,6-Dinitroresorcinol (heavy metal salts of) (dry)</i>					FORBIDDEN
	UN1322	DINITRORESORCINOL, WETTED with not less than 15% water, by mass	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		<i>3,5-Dinitrosalicylic acid (lead salt) (dry)</i>					FORBIDDEN
	UN0406	DINITROSOBENZENE	1.3C			P4	A5.9.
		<i>Dinitrosobenzylamidine and salts of (dry)</i>					FORBIDDEN
		<i>N,N'-Dinitroso-N,N'-dimethyl terephthalamide, 72% or less as a paste, see SELF-REACTIVE SOLID TYPE C (UN3224)</i>					
		<i>N,N'-Dinitrosopentamethylene tetramine, 82% or less with phlegmatizer, see SELF-REACTIVE SOLID TYPE C (UN3224)</i>					
		<i>2,2-Dinitrostilbene</i>					FORBIDDEN
		<i>1,4-Dinitro-1,1,4,4-tetramethylolbutane tetranitrate (dry)</i>					FORBIDDEN
		<i>Dinitrotoluene mixed with sodium chlorate, see EXPLOSIVE, BLASTING, TYPE C (UN0083)</i>					
	UN2038	DINITROTOLUENES, LIQUID	6.1		II	P5	A10.4.
	UN1600	DINITROTOLUENES, MOLTEN					FORBIDDEN
	UN3454	DINITROTOLUENES, SOLID	6.1		II	P5	A10.5.
		<i>2,4-Dinitro-1,3,5-trimethylbenzene</i>					FORBIDDEN
		<i>Di-(beta-nitroxyethyl)ammonium nitrate</i>					FORBIDDEN
		<i>a,a-Di-(nitroxy) methylether</i>					FORBIDDEN
		<i>1,9-Dinitroxy pentamethylene-2,4,6,8-tetramine (dry)</i>					FORBIDDEN
	UN1165	DIOXANE	3		II	P5	A7.2.
	UN1166	DIOXOLANE	3		II	P5	A7.2.
	UN2052	DIPENTENE	3		III	P5	A7.2.
		<i>Di-(2-phenoxyethyl) peroxydicarbonate, more than 85%</i>					FORBIDDEN
	UN1698	DIPHENYLAMINE CHLOROARSINE	6.1		I	P3	A10.4.
	UN1699	DIPHENYLCHLOROARSINE, LIQUID	6.1		I	P3, A8, N33, N34	A10.4.
	UN3450	DIPHENYLCHLOROARSINE, SOLID	6.1		I	P3, A8, N33, N34	A10.5.
	UN1769	DIPHENYLDICHLOROSILANE	8		II	P4, A7, N34	A12.2.
		<i>Diphenylmethane-4,4'-diisocyanate, liquid ( NOT RESTRICTED)</i>					



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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Diphenylmethane-4,4'-diisocyanate, solid ( NOT RESTRICTED)</i>					
	UN1770	<b>DIPHENYLMETHYL BROMIDE</b>	8		II	P5	A12.3.
		<i>Diphenyloxide-4,4'-disulphonyl hydrazide, see SELF-REACTIVE SOLID TYPE D ★ (UN3226)</i>					
	UN0401	<b>DIPICRYL SULPHIDE</b> , dry or wetted with less than 10% water, by mass	1.1D			P4	A5.6.
	UN2852	<b>DIPICRYL SULPHIDE, WETTED</b> with not less than 10% water, by mass	4.1		I	P4, A2, N41, N84	A8.3.
	UN0079	<b>DIPICRYLAMINE or HEXANITRODIPHENYLAMINE</b>	1.1D			P4	A5.6.
		<i>Dipropionyl peroxide, with more than 28 percent in solution</i>					FORBIDDEN
	UN2384	<b>DI-N-PROPYL ETHER</b>	3		II	P5	A7.2.
	UN2710	<b>DIPROPYL KETONE</b>	3		III	P5	A7.2.
	UN2383	<b>DIPROPYLAMINE</b>	3	8	II	P4	A7.2.
		<i>4-Dipropylaminobenzenediazonium zinc chloride, see SELF-REACTIVE SOLID TYPE D ★ (UN3226)</i>					
		<i>Dipropylene triamine, see 3,3'-IMINODIPROPYLAMINE (UN2269)</i>					
★	UN1903	<b>DISINFECTANTS, LIQUID, CORROSIVE, N.O.S</b>	8		I II III	P3, A7 P5 P5	A12.2. A12.2. A12.2.
★	UN3142	<b>DISINFECTANTS, LIQUID, TOXIC, N.O.S.</b>	6.1		I II III	P3, A4 P5 P5	A10.4. A10.4. A10.4.
★	UN1601	<b>DISINFECTANTS, SOLID, TOXIC, N.O.S.</b>	6.1		I II III	P3 P5 P5	A10.5 A10.5. A10.5.
	UN3253	<b>DISODIUM TRIOXOSILICATE</b>	8		III	P5	A12.3.
★		<i>Dispersant gas, n.o.s. see REFRIGERANT GASES, N.O.S. (UN1078), (NA1954) or COMPRESSED GAS , TOXIC, FLAMMABLE, N.O.S. ★ (UN1953) or COMPRESSED GAS , FLAMMABLE, N.O.S. ★ (UN1954) or COMPRESSED GAS , TOXIC, N.O.S. ★ (UN1955) or COMPRESSED GAS, N.O.S. ★ (UN1956) or COMPRESSED GAS , OXIDIZING, N.O.S. ★ (UN3156) or LIQUIFIED GAS, OXIDIZING, N.O.S. ★ (UN3157) LIQUIFIED GAS, TOXIC, FLAMMABLE, N.O.S. ★ (UN3160) or LIQUIFIED GAS, FLAMMABLE, N.O.S. ★ (UN3161) or LIQUIFIED GAS, TOXIC, N.O.S. ★ (UN3162) or LIQUEFIED GAS N.O.S. ★ (UN3163) or COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S. ★ (UN3303) or COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. ★ (UN3304) or COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. ★ (UN3305) or COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. ★ (UN3306) or LIQUIFIED GAS, TOXIC, OXIDIZING, N.O.S. ★ (UN3307) or LIQUIFIED GAS, TOXIC, CORROSIVE, N.O.S. ★ (UN3308) or LIQUIFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. ★ (UN3309) or LIQUIFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. ★ (UN3310)</i>					
		<i>Disuccinic acid peroxide 72% or more</i>					FORBIDDEN
		<i>Dithiocarbamate pesticide, etc., see THIOCARBAMATE PESTICIDE, SOLID, TOXIC ★ (UN2771) or THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC ★ (UN2772) or THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE ★ (UN3005) or THIOCARBAMATE PESTICIDE, LIQUID, TOXIC ★ (UN3006)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1167	<b>DIVINYL ETHER, STABILIZED</b>	3		I	P3, 387, A7	A7.2.
		<i>Divinyl ether, unstabilized</i>					FORBIDDEN
		<i>DNOC, see DINITRO-O-CRESOL (UN1598)</i>					
		<b>SOLID or DINITRO-O-CRESOL, SOLUTION</b>					
	UN1771	<b>DODECYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
		<i>Dressing leather, see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)</i>					
		<i>Driers, paint or varnish liquid, N.O.S., see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)</i>					
		<i>Driers, paint, varnish solid, N.O.S., see FLAMMABLE SOLID, ORGANIC N.O.S. ★ (UN1325) or FLAMMABLE SOLID, INORGANIC N.O.S. ★ (UN3178)</i>					
		<i>Drugs, corrosive, liquid or solid N.O.S., see CORROSIVE LIQUID, N.O.S. ★ (UN1760) or CORROSIVE SOLID N.O.S. ★ (UN1759)</i>					
		<i>Drugs, flammable, liquid N.O.S., see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)</i>					
		<i>Drugs, flammable, solid, N.O.S., see FLAMMABLE, SOLID, ORGANIC ★ (UN1325) or FLAMMABLE, SOLID, INORGANIC, N.O.S. ★ (UN3178)</i>					
		<i>Drugs, N.O.S., in small inner packagings containing flammable aerosol and/or non-flammable aerosol and/or flammable liquid and/or toxic substance N.O.S., see CONSUMER COMMODITY (ID8000)</i>					
		<i>Drugs, oxidizing, liquid or solid N.O.S., see OXIDIZING LIQUID N.O.S. ★ (UN3139) or OXIDIZING SOLID N.O.S. ★ (UN1479)</i>					
		<i>Drugs, toxic, liquid or solid, N.O.S., see MEDICINE, LIQUID, TOXIC, N.O.S. ★ (UN1851) or MEDICINE, LIQUID, FLAMMABLE, TOXIC SOLID, N.O.S. ★ (UN3248)</i>					
		<i>Drug, toxic, solid, n.o.s. see MEDICINE, SOLID, TOXIC, N.O.S. ★ (UN3249)</i>					
	UN1845	<b>DRY ICE or CARBON DIOXIDE SOLID</b>	9			P5	A13.10.
		<i>Dye dye intermediate, n.o.s., Flammable liquid, see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)</i>					
★	UN2801	<b>DYES, LIQUID, CORROSIVE, N.O.S., or DYE INTERMEDIATES, LIQUID, CORROSIVE, N.O.S.</b>	8		I II III	P5, 11 P5, 11 P5, 11	A12.2. A12.2. A12.2.
★	UN1602	<b>DYES, LIQUID, TOXIC, N.O.S., or DYE INTERMEDIATES, LIQUID, TOXIC, N.O.S.</b>	6.1		I II III	P4 P4 P5	A10.4 A10.4 A10.4.
★	UN3147	<b>DYES, SOLID, CORROSIVE, N.O.S., or DYE INTERMEDIATES, SOLID, CORROSIVE N.O.S.</b>	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
★	UN3143	<b>DYE, SOLID, TOXIC, N.O.S., or DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.</b>	6.1		I II III	P5, A5 P5 P5	A10.5. A10.5. A10.5.
		<i>Dynamite, see EXPLOSIVE, BLASTING, TYPE A (UN0081)</i>					
		<i>Electric squibs, see IGNITERS, (UN0325, UN0454)</i>					
		<i>Electric storage batteries, see BATTERIES, WET, FILLED WITH ACID (UN2794) or BATTERIES, WET, FILLED WITH ALKALI (UN2795) or BATTERIES, WET, NON-SPILLABLE (UN2800) or BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE, SOLID (UN3028)</i>					
		<i>Electrolyte (acid or alkali) for batteries, see BATTERY FLUID, ACID (UN2796) or BATTERY FLUID, ALKALI (UN2797)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Electron tubes containing mercury, see <b>MERCURY CONTAINED IN MANUFACTURED ARTICLES</b> (UN3506)					
★	UN3257	<b>ELEVATED TEMPERATURE LIQUID, N.O.S., at or above 100 C, and below its flashpoint (including molten metals, molten salts, etc.)</b>					FORBIDDEN
★	UN3256	<b>ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S., with flashpoint above 60C 38.8C, at or above its flashpoint</b>					FORBIDDEN
★	UN3258	<b>ELEVATED TEMPERATURE SOLID, N.O.S., at or above 240 C</b>					FORBIDDEN
	UN3529	<b>ENGINE, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED or ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or MACHINERY, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED or MACHINERY, FUEL CELL, FLAMMABLE GAS POWERED</b>	2.1			P5, 135	A6.27
	UN3528	<b>ENGINE, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED or ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED or MACHINERY, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED or MACHINERY, FUEL CELL, FLAMMABLE LIQUID POWERED</b>	3			P5, 135	A7.11
	UN3530	<b>ENGINE, INTERNAL COMBUSTION or MACHINERY, INTERNAL COMBUSTION</b>	9			P5, 135	A13.20
		<i>Engines, rocket, see <b>ROCKET MOTORS</b> (UN0186, UN0280, UN0281) or <b>ROCKET MOTORS WITH HYPERGOLIC LIQUIDS</b> (UN0250, UN0322) or <b>ROCKET, MOTORS, LIQUID FUELLED</b> (UN0395, UN0396)</i>					
★	UN3082	<b>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.</b>	9		III	P5, 8, 146, 173, 335, 384, 441	A13.2.
★	UN3077	<b>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.</b>	9		III	P5, 8, 146, 335, 384, 441, A112, N20, N91	A13.2.
	UN2558	<b>EPIBROMOHYDRIN</b>	6.1	3	I	P3	A10.4.
+	UN2023	<b>EPICHLOROHYDRIN</b>	6.1	3	II	P5	A10.4.
		<i>1,2-Epoxybutane, stabilized, see <b>1,2-BUTYLENE OXIDE, STABILIZED</b> (UN3022)</i>					
		<i>Epoxyethane, see <b>ETHYLENE OXIDE</b> (UN1040)</i>					
	UN2752	<b>1,2-EPOXY-3-ETHOXYPROPANE</b>	3		III	P5	A7.2.
		<i>2,3-Epoxy-1-propanal, see <b>GLYCILALDEHYDE</b> (UN2622)</i>					
		<i>2,3-epoxypropyl ethyl ether, see <b>1,2-EPOXY-3-ETHOXYPROPANE</b> (UN2752)</i>					
★	UN3272	<b>ESTERS, N.O.S.</b>	3		II III	P5 P5	A7.2. A7.2.
		<i>Etching acid, liquid, N.O.S., see <b>HYDROFLUORIC ACID</b>, (UN1790)</i>					
	UN1035	<b>ETHANE</b>	2.1			P4	A6.3., A6.4.
D	NA1961	<b>ETHANE-PROPANE MIXTURE, REFRIGERATED LIQUID</b>	2.1				FORBIDDEN
	UN1961	<b>ETHANE, REFRIGERATED LIQUID</b>	2.1				FORBIDDEN
		<i>Ethanethiol, see <b>ETHYL MERCAPTAN</b> (UN2363)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1170	ETHANOL <i>or</i> ETHANOL SOLUTIONS <i>or</i> ETHYL ALCOHOL <i>or</i> ETHYL ALCOHOL SOLUTIONS	3		II III	P5 P5	A7.2. A7.2.
	UN3475	ETHANOL AND GASOLINE MIXTURE <i>or</i> ETHANOL AND MOTOR SPIRIT MIXTURE <i>or</i> ETHANOL AND PETROL MIXTURE ( <i>with more than 10% ethanol</i> )	3		II	P5, 144	A7.2
	UN2491	ETHANOLAMINE <i>or</i> ETHANOLAMINE SOLUTIONS	8		III	P5	A12.2.
		<i>Ethanol amine dinitrate</i>					FORBIDDEN
		<i>Ether, see DIETHYL ETHER (UN1155)</i>					
		<i>Ether acetate, see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE (UN1172)</i>					
		<i>Ether, ethyl, see DIETHYL ETHER (UN1155)</i>					
★	UN3271	ETHERS, N.O.S.	3		II III	P5 P5	A7.2. A7.2.
		<i>2-Ethoxyethanol, see ETHYLENE GLYCOL MONOETHYL ETHER (UN1171)</i>					
		<i>2-Ethoxyethyl acetate, see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE (UN1172)</i>					
		<i>Ethoxypropane-1, see ETHYL PROPYL ETHER (UN2615)</i>					
	UN1173	ETHYL ACETATE	3		II	P5	A7.2.
	UN2452	ETHYLACETYLENE, STABILIZED	2.1			P4, 387, N88	A6.4
		<i>Ethylacetylene, unstabilized</i>					FORBIDDEN
	UN1917	ETHYL ACRYLATE, STABILIZED	3		II	P5, 387	A7.2.
		<i>Ethyl acrylate, unstabilized</i>					FORBIDDEN
	UN1170	ETHYL ALCOHOL <i>see</i> ETHANOL					
		<i>Ethyl aldehyde, see ACETALDEHYDE (UN1089)</i>					
	UN1036	ETHYLAMINE	2.1			P4, N87	A6.14.
	UN2270	ETHYLAMINE, AQUEOUS SOLUTIONS <i>with not less than 50%, but not more than 70% ethylamine</i>	3	8	II	P5	A7.2.
	UN2271	ETHYL AMYL KETONE	3		III	P5	A7.2.
	UN2272	N-ETHYLANILINE	6.1		III	P5	A10.4.
	UN2273	2-ETHYLANILINE	6.1		III	P5	A10.4.
	UN1175	ETHYLBENZENE	3		II	P5	A7.2.
	UN2274	N-ETHYL-N-BENZYLANILINE	6.1		III	P5	A10.4.
	UN2753	N-ETHYLBENZYL TOLUIDINES LIQUID	6.1		III	P5	A10.4.
	UN3460	N-ETHYLBENZYL TOLUIDINES SOLID	6.1		III	P5	A10.5
	UN2275	2-ETHYLBUTANOL	3		III	P5	A7.2.
	UN1177	2-ETHYLBUTYL ACETATE	3		III	P5	A7.2.
	UN1178	2-ETHYLBUTYRALDEHYDE	3		II	P5	A7.2.
	UN1176	ETHYL BORATE	3		II	P5	A7.2.
	UN1891	ETHYL BROMIDE	3	6.1	II	P5	A10.4.
	UN1603	ETHYL BROMOACETATE	6.1	3	II	P4	A10.4.
	UN1179	ETHYL BUTYL ETHER	3		II	P5	A7.2.
	UN1180	ETHYL BUTYRATE	3		III	P5	A7.2.
	UN1037	ETHYL CHLORIDE ( <i>Ampoules in boxes</i> ) <i>or</i> ( <i>cylinders</i> )	2.1			P4, N86	A6.12.
	UN1181	ETHYL CHLOROACETATE	6.1	3	II	P5	A10.4.
		<i>Ethyl chlorocarbonate, see ETHYL CHLOROFORMATE (UN1182)</i>					
	UN1182	ETHYL CHLOROFORMATE	6.1	3, 8	I	P3, 2, N34	A10.6.
		<i>Ethyl-alpha-chloropropionate, see ETHYL 2-CHLOROPROPIONATE (UN2935)</i>					
	UN2935	ETHYL 2-CHLOROPROPIONATE	3		III	P5	A7.2.
+	UN2826	ETHYL CHLOROTHIOFORMATE	8	3, 6.1	II	P2, 2	A12.11.
	UN1862	ETHYL CROTONATE	3		II	P5	A7.2.
	UN1892	ETHYLDICHLOROARSINE	6.1		I	P2, 2	A10.6.
	UN1183	ETHYLDICHLOROSILANE	4.3	3, 8 3	I	P3, A2, A7, N34	A8.2.
		ETHYL ETHER, <i>see</i> DIETHYL ETHER (UN1155)					
	UN1155	ETHYL ETHER	3		I	P3	A7.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Ethyl fluid, see MOTOR FUEL ANTI-KNOCK MIXTURE (UN1649)</i>					
	UN2453	<b>ETHYL FLUORIDE or REFRIGERANT GAS R161</b>	2.1			P4	A6.3., A6.4.
	UN1190	<b>ETHYL FORMATE</b>	3		II	P5	A7.2.
	UN2385	<b>ETHYL ISOBUTYRATE</b>	3		II	P5	A7.2.
+	UN2481	<b>ETHYL ISOCYANATE</b>	6.1	3	I	P1, 1, A7	A10.6.
	UN1192	<b>ETHYL LACTATE</b>	3		III	P5	A7.2.
	UN2363	<b>ETHYL MERCAPTAN</b>	3		I	P3	A7.2.
	UN2277	<b>ETHYL METHACRYLATE, STABILIZED</b>	3		II	P5, 387	A7.2.
	UN1039	<b>ETHYL METHYL ETHER</b>	2.1			P4	A6.21.
	UN1193	<b>ETHYL METHYL KETONE or METHYL ETHYL KETONE</b>	3		II	P5	A7.2.
		<i>Ethyl nitrate</i>					FORBIDDEN
		<i>Ethyl nitrite</i>					FORBIDDEN
	UN1194	<b>ETHYL NITRITE SOLUTIONS</b>	3	6.1			FORBIDDEN
	UN2524	<b>ETHYL ORTHOFORMATE</b>	3		III	P5	A7.2.
	UN2525	<b>ETHYL OXALATE</b>	6.1		III	P5	A10.4.
		<i>Ethyl perchlorate</i>					FORBIDDEN
D	NA2927	<b>ETHYL PHOSPHONOTHIOIC DICHLORIDE, ANHYDROUS</b>	6.1	8	I	P2, 2	A10.6.
D	NA2845	<b>ETHYL PHOSPHONOUS DICHLORIDE, ANHYDROUS pyrophoric liquid</b>	6.1	4.2	I	P2, 2	A10.6.
D	NA2927	<b>ETHYL PHOSPHORODICHLORIDATE</b>	6.1	8	I	P2, 2	A10.6.
	UN1195	<b>ETHYL PROPIONATE</b>	3		II	P5	A7.2.
	UN2615	<b>ETHYL PROPYL ETHER</b>	3		II	P5	A7.2.
		<i>Ethyl silicate, see TETRAETHYL SILICATE (UN1292)</i>					
		<i>Ethyl sulphate, see DIETHYL SULPHATE (UN1594)</i>					
		<i>Ethylsulphuric acid, see ALKYL SULPHURIC ACIDS (UN2571)</i>					
	UN2452	<b>ETHYLACETYLENE, STABILIZED</b>	2.1			P4, 387, N88	A6.4.
		<i>Ethylacetylene, unstabilized</i>					FORBIDDEN
	UN1962	<b>ETHYLENE</b>	2.1			P4	A6.3., A6.4.
	UN3138	<b>ETHYLENE, ACETYLENE AND PROPYLENE IN MIXTURES, REFRIGERATED LIQUID (cryogenic liquids) with at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene</b>	2.1				FORBIDDEN
	UN1135	<b>ETHYLENE CHLOROHYDRIN</b>	6.1	3	I	P2, 2	A10.6.
		<i>Ethylene diamine diperchlorate</i>					FORBIDDEN
	UN1604	<b>ETHYLENEDIAMINE</b>	8	3	II	P5	A12.2.
	UN1605	<b>ETHYLENE DIBROMIDE</b>	6.1		I	P2, 2	A10.6.
		<i>Ethylene diobromide and methyl bromide liquid mixtures, see METHYL BROMIDE AND ETHYLENE DIBROMIDE, LIQUID MIXTURES or MIXTURE, LIQUID (UN1647)</i>					
	UN1184	<b>ETHYLENE DICHLORIDE</b>	3	6.1	II	P4	A7.2.
	UN1153	<b>ETHYLENE GLYCOL DIETHYL ETHER</b>	3		II III	P5 P5	A7.2. A7.2.
		<i>Ethylene glycol dinitrate</i>					FORBIDDEN
	UN1171	<b>ETHYLENE GLYCOL MONOETHYL ETHER</b>	3		III	P5	A7.2.
	UN1172	<b>ETHYLENE GLYCOL MONOETHYL ETHER ACETATE</b>	3		III	P5	A7.2.
	UN1188	<b>ETHYLENE GLYCOL MONOMETHYL ETHER</b>	3		III	P5	A7.2.
	UN1189	<b>ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE</b>	3		III	P5	A7.2.
	UN1040	<b>ETHYLENE OXIDE, or ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPA (10 bar) at 50 degrees C</b>	2.3	2.1		P2, 4, 342	A6.13.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1041	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURES with more than 9% but not more than 87% ethylene oxide	2.1			P4	A6.3., A6.4.
	UN1952	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURES with not more than 9% ethylene oxide	2.2			P5	A6.3., A6.4.
	UN3300	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURES with more than 87% ethylene oxide	2.3	2.1		P2, 4	A6.4.
	UN3297	ETHYLENE OXIDE AND CHLOROTETRAFLUOROETHANE MIXTURE with not more than 8.8% ethylene oxide	2.2			P5	A6.3., A6.4.
	UN3070	ETHYLENE OXIDE AND DICHLORODIFLUOROMETHANE MIXTURE with not more than 12.5% ethylene oxide	2.2			P5	A6.3., A6.4.
	UN3298	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE with not more than 7.9% ethylene oxide	2.2			P5	A6.3., A6.4.
	UN2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURES, not more than 30% ethylene oxide	3	6.1	I	P2, 5, A11, N4, N34	A7.2.
		Ethylene oxide and propylene oxide mixture, more than 30% ethylene oxide					FORBIDDEN
	UN3299	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE with not more than 5.6% ethylene oxide	2.2			P5	A6.3., A6.4.
	UN1038	ETHYLENE, REFRIGERATED LIQUID (cryogenic liquid)	2.1			P3	A6.11.
	UN1604	ETHYLENEDIAMINE	8	3	II	P5	A12.2.
	UN1185	ETHYLENEIMINE, STABILIZED	6.1	3	I	P1, 1, 387, N25, N32	A10.6.
		Ethyleneimine, unstabilized					FORBIDDEN
		Ethylhexaldehyde, see OCTYL ALDEHYDES, (UN1191) etc.					
	UN2748	2-ETHYLHEXYL CHLOROFORMATE	6.1	8	II	P5	A10.4.
		Ethyl hydroperoxide					FORBIDDEN
		Ethylidene chloride, see 1,1-DICHLOROETHANE (UN2362)					
	UN2276	2-ETHYLHEXYLAMINE	3	8	III	P5	A7.2.
	UN2435	ETHYLPHENYLDICHLOROSILANE	8		II	P5, A7, N34	A12.2.
		Ethyl phosphonous dichloride, anhydrous, see PYROPHORIC LIQUID, ORGANIC, N.O.S. ★ (UN2845)					
	UN2386	1-ETHYLPIPERIDINE	3	8	II	P5	A7.2.
	UN2754	N-ETHYLTOLUIDINES	6.1		II	P5	A10.4.
	UN1196	ETHYLTRICHLOROSILANE	3	8	II	P4, A7, N34	A7.2.
		Ethyl trimethyl lead mixture lead mixture, see MOTOR FUEL ANTI-KNOCK MIXTURE (UN1649)					
		Etiologic agent, see INFECTIOUS SUBSTANCES, AFFECTING HUMANS ★ (UN2814) or INFECTIOUS SUBSTANCES, AFFECTING ANIMALS ★ (UN2900)					
		Explosive articles, see ARTICLES, EXPLOSIVE, N.O.S., ★ (UN0349, UN0350, UN0351, UN0352, UN0353, UN0354, UN0355, UN0356, UN0462, UN0463, UN0464, UN0465, UN0466, UN0467, UN0468, UN0469, UN0470, UN0471, UN0472)					
	UN0081	EXPLOSIVE, BLASTING, TYPE A	1.1D			P4, 148	A5.11.
	UN0082	EXPLOSIVE, BLASTING, TYPE B	1.1D			P4	A5.11.
	UN0331	EXPLOSIVE, BLASTING, TYPE B or AGENT BLASTING TYPE B	1.5D			P4, 105, 106, 148	A5.11.
	UN0083	EXPLOSIVE, BLASTING, TYPE C	1.1D			P4, 123	A5.11.
	UN0084	EXPLOSIVE, BLASTING, TYPE D	1.1D			P4	A5.11.
	UN0241	EXPLOSIVE, BLASTING, TYPE E	1.1D			P4, 148	A5.11.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN0332	<b>EXPLOSIVE, BLASTING, TYPE E or AGENT BLASTING TYPE E</b>	1.5D			P4, 105, 106, 148	A5.11.
		<i>Explosive, emulsion or slurry, see <b>EXPLOSIVE, BLASTING, TYPE E</b> (UN0241, UN0332)</i>					
		<i>Explosive seismic, see <b>EXPLOSIVE, BLASTING, TYPE A</b> (UN0081) or <b>TYPE B</b> (UN0082, UN0331) or <b>TYPE C</b> (UN0083)</i>					
		<i>Explosive substances, see <b>SUBSTANCES, EXPLOSIVE, N.O.S. ★</b> (UN0357, UN0358, UN0359, UN0473, UN0474, UN0475, UN0476, UN0477, UN0478, UN0479, UN0480, UN0481, UN0485)</i>					
		<i>Explosives, water gels, see <b>EXPLOSIVE, BLASTING, TYPE E</b> (UN0241, UN0332)</i>					
		<i>Extract, aromatic or flavoring, not falling under the definitions of classes 1-8, see <b>AVIATION REGULATED LIQUID, N.O.S. ★</b> (UN3334) or <b>AVIATION REGULATED SOLID N.O.S. ★</b> (UN3335)</i>					
	UN1169	<b>EXTRACTS, AROMATIC, LIQUID</b>	3		II III	P5, 149 P5	A7.2. A7.2.
	UN1197	<b>EXTRACTS, FLAVORING, LIQUID</b>	3		II III	P5, 149 P5	A7.2. A7.2.
		<i>Fabric with animal or vegetable oil, see <b>FIBERS</b> (UN1373) or <b>FABRICS</b>, (UN1373) etc.</i>					
	UN1606	<b>FERRIC ARSENATE</b>	6.1		II	P5	A10.5.
	UN1607	<b>FERRIC ARSENITE</b>	6.1		II	P5	A10.5.
	UN1773	<b>FERRIC CHLORIDE, ANHYDROUS</b>	8		III	P5	A12.3.
	UN2582	<b>FERRIC CHLORIDE, SOLUTION</b>	8		III	P5	A12.2.
	UN1466	<b>FERRIC NITRATE</b>	5.1		III	P5, A1, A29	A9.6.
	UN1323	<b>FERROCERIUM</b>	4.1		II	P5, A19	A8.3.
	UN1408	<b>FERROSILICON</b> , with 30% or more, but less than 90% silicon	4.3	6.1	III	P5, A1, A19	A8.3.
		<i>Ferrosilicon, with less than 30% or more than 90% silicon (not restricted)</i>					
	UN1608	<b>FERROUS ARSENATE</b>	6.1		II	P5	A10.5.
D	NA1759	<b>FERROUS CHLORIDE, SOLID</b>	8		II	P5	A12.3
D	NA1760	<b>FERROUS CHLORIDE, SOLUTION</b>	8		II	P5	A12.2
	UN2793	<b>FERROUS METAL BORINGS, or FERROUS METAL SHAVINGS or FERROUS METAL TURNINGS or FERROUS METAL CUTTINGS in a form liable to self-heating</b>	4.2		III	P5, A1, A19	A8.3.
	UN1043	<b>FERTILIZER AMMONIATING SOLUTION</b> with free ammonia	2.2			P5, N87	A6.3., A6.4.
		<i>Fertilizers ammonium nitrate based, see <b>AMMONIUM NITRATE BASED FERTILIZER</b> (UN2067, UN2071)</i>					
		<i>Fiberglass repair kit, see <b>POLYESTER RESIN KIT</b> (UN3269)</i>					
	UN1372	<b>FIBERS, ANIMAL or FIBRES, VEGETABLE</b> burnt, wet or damp	4.2		III		FORBIDDEN
	UN3360	<b>FIBERS, or FIBRES VEGETABLE, DRY</b>	4.1		III	P5, 137	A8.3.
	UN1373	<b>FIBERS or FABRES ANIMAL or VEGETABLE, or SYNTHETIC N.O.S. with animal or vegetable oil</b>	4.2		III	P5, 137	A8.3.
	UN1353	<b>FIBERS or FABRES or FIBER IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S</b>	4.1		III	P5, A1	A8.3.
	UN1324	<b>FILMS, NITROCELLULOSE BASE</b> , gelatine coated (except scrap)	4.1		III	P5	A8.12.
		<i>Filler, liquid, see <b>PAINT</b> (UN1263)</i>					
		<i>Films, nitrocellulose base, from which gelatine has been removed, film scrap, see <b>CELLULOID SCRAP</b> (UN2002)</i>					
	UN1774	<b>FIRE EXTINGUISHER CHARGES</b> , corrosive liquid	8		II	P5, N41	A12.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Fire extinguisher charges, expelling, explosive, see CARTRIDGES, POWER DEVICE, (UN0275, UN0276, UN0323, UN0381)</i>					
	UN1044	<b>FIRE EXTINGUISHERS</b> containing compressed or liquefied gas	2.2			P5, 110	A6.7
	UN2623	<b>FIRELIGHTERS, SOLID</b> with flammable liquid	4.1		III	P5, A1, A19	A8.3.
	UN0333	<b>FIREWORKS</b>	1.1G			P4, 108	A5.18.
	UN0334	<b>FIREWORKS</b>	1.2G			P4, 108	A5.18.
	UN0335	<b>FIREWORKS</b>	1.3G			P4, 108	A5.18.
	UN0336	<b>FIREWORKS</b>	1.4G			P5, 108, 200	A5.18.
	UN0337	<b>FIREWORKS</b>	1.4S			P5, 108	A5.18.
	UN3316	<b>FIRST AID KIT</b>	9			P5, 15	A13.18.
	UN2216	<b>FISH MEAL, STABILIZED</b> or <b>FISH SCRAP, STABILIZED</b>	9		III	P5, 155	A13.2
	UN1374	<b>FISH MEAL, UNSTABILIZED, or FISH SCRAP, UNSTABILIZED</b>	4.2		II	P5, 155, A1, A19	A8.3.
		<i>Flammable compressed gas, see COMPRESSED GAS FLAMMABLE N.O.S. ★ (UN1954) or LIQUEFIED GAS, FLAMMABLE N.O.S. ★ (UN3161)</i>					
		<i>Flammable compressed gas (small receptacles not fitted with a dispersion device, not refillable), see RECEPTACLES, RECEPTICLES, SMALL, CONTAINING GAS (UN2037)</i>					
		<i>Flammable gas in lighters, see LIGHTERS (UN1057) or LIGHTER REFILLS, cigarettes, containing flammable gas UN1057)</i>					
★	UN3286	<b>FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.</b>	3	6.1, 8 6.1, 8	I II	P3 P4	A7.2. A7.2.
★	UN1993	<b>FLAMMABLE LIQUIDS, N.O.S.</b>	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN2924	<b>FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.</b>	3	8 8 8	I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		<i>Flammable liquid preparations, n.o.s., see FLAMMABLE LIQUID N.O.S. ★ (UN1993)</i>					
★	UN1992	<b>FLAMMABLE LIQUIDS, TOXIC, N.O.S.</b>	3	6.1 6.1 6.1	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
★	UN3180	<b>FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.</b>	4.1	8 8	II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN3178	<b>FLAMMABLE SOLID, INORGANIC, N.O.S.</b>	4.1		II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN3176	<b>FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.</b>					FORBIDDEN
★	UN3097	<b>FLAMMABLE SOLID, OXIDIZING, N.O.S.</b>	4.1	5.1	II III	131 131	FORBIDDEN FORBIDDEN
★	UN3179	<b>FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.</b>	4.1	6.1 6.1	II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN2925	<b>FLAMMABLE SOLIDS, CORROSIVE, ORGANIC, N.O.S.</b>	4.1	8 8	II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN1325	<b>FLAMMABLE SOLIDS, ORGANIC, N.O.S.</b>	4.1		II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN2926	<b>FLAMMABLE SOLIDS, TOXIC, ORGANIC, N.O.S.</b>	4.1	6.1 6.1	II III	P5, A1 P5, A1	A8.3. A8.3.
	UN0420	<b>FLARES, AERIAL</b>	1.1G			P4	A5.18.
	UN0421	<b>FLARES, AERIAL</b>	1.2G			P4	A5.18.
	UN0093	<b>FLARES, AERIAL</b>	1.3G			P4	A5.18.
	UN0403	<b>FLARES, AERIAL</b>	1.4G			P5	A5.18.
	UN0404	<b>FLARES, AERIAL</b>	1.4S			P5	A5.18.
		<i>Flares, airplane, see FLARES, AERIAL (UN0093, UN0403, UN0404, UN0420, UN0421)</i>					



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Flares, distress, small, see <b>SIGNAL DEVICES HAND</b> (UN0191, UN0373)					
		Flares, signal, see <b>CARTRIDGES, SIGNAL</b> (UN0054, UN0312, UN0405)					
		Flares, highway or railway, see <b>SIGNAL DEVICES, HAND</b> (UN0191, UN0373)					
	UN0418	<b>FLARES, SURFACE</b>	1.1G			P4	A5.18.
	UN0419	<b>FLARES, SURFACE</b>	1.2G			P4	A5.18.
	UN0092	<b>FLARES, SURFACE</b>	1.3G			P4	A5.18.
		Flares, water-activated, see <b>CONTRIVANCES, WATER-ACTIVATED</b> , (UN0248, UN0249)					
	UN0094	<b>FLASH POWDER</b>	1.1G			P4	A5.8.
	UN0305	<b>FLASH POWDER</b>	1.3G			P4	A5.8.
		Flavoring liquids, see <b>EXTRACTS, LIQUID</b> (UN1197)					
		Flue dusts, toxic, see <b>ARSENICAL DUST</b> (UN1562)					
		Fluoric acid, see <b>HYDROFLUORIC ACID</b> , (UN1790)					
	UN1045	<b>FLUORINE, COMPRESSED</b>	2.3	5.1, 8		P1, 1, N86	A6.15.
	UN2642	<b>FLUOROACETIC ACID</b>	6.1		I	P5	A10.5.
		2-Fluoroaniline or 4-Fluoroaniline or p-Fluoroaniline or o-Fluoroaniline, see <b>FLUOROANILINES</b> (UN2941)					
	UN2941	<b>FLUOROANILINES</b>	6.1		III	P5	A10.4.
	UN2387	<b>FLUOROBENZENE</b>	3		II	P5	A7.2.
	UN1775	<b>FLUOROBORIC ACID</b>	8		II	P5, A7, N3, N34	A12.2.
		Fluoroethane, see <b>ETHYL FLUORIDE</b> (UN2453)					
		Fluoroform, see <b>TRIFLUOROMETHANE</b> (UN1984)					
		Fluoromethane, see <b>METHYL FLUORIDE</b> (UN2454)					
	UN1776	<b>FLUOROPHOSPHORIC ACID, ANHYDROUS</b>	8		II	P5, A7, N3, N34	A12.2.
	UN2856	<b>FLUOROSILICATES, N.O.S.</b>	6.1		III	P5	A10.5.
	UN1778	<b>FLUOROSILICIC ACID</b>	8		II	P5, A7, N3, N34	A12.2.
	UN1777	<b>FLUOROSULFONIC ACID</b>	8		I	P3, A7, A10, N3	A12.2.
	UN2388	<b>FLUOROTOLUENES</b>	3		II	P5	A7.2.
	UN2209	<b>FORMALDEHYDE SOLUTIONS</b> with not less than 25% formaldehyde	8		III	P5	A12.2.
	UN1198	<b>FORMALDEHYDE SOLUTIONS, FLAMMABLE</b>	3	8	III	P5, 176	A7.2.
		Formaldehyde solution with less than 25% more and no more than 25% formaldehyde, see <b>AVIATION REGULATED LIQUID, N.O.S. ★</b> (UN3334)					
		Formalin, see <b>FORMALDEHYDE, SOLUTIONS, FLAMMABLE</b> (UN1198) or <b>FORMALDEHYDE SOLUTIONS</b> (UN2209)					
		Formamidine sulphinic acid, see <b>THIOUREA DIOXIDE</b> (UN3341)					
	UN3412	<b>FORMIC ACID</b> with not less than 10% but no more than 85% acid by mass	8		II	P5	A12.2.
	UN3412	<b>FORMIC ACID</b> with not less than 5% but less than 10% acid by mass	8		III	P5	A12.2.
	UN1779	<b>FORMIC ACID</b> with more than 85% acid by mass	8	3	II	P5	A12.2.
		Formic aldehyde, see <b>FORMALDEHYDE, SOLUTIONS, FLAMMABLE</b> (UN1198) or <b>FOMALDEHYDE SOLUTION</b> (UN2209)					
		Formic ether, see <b>ETHYL FORMATE</b> (UN1190)					
		2-Formyl-3,4-dihydro-2H-pyran, see <b>ACROLEIN DIMER, STABILIZED</b> (UN2607)					
	UN0099	<b>FRACTURING DEVICES, EXPLOSIVE</b> , without detonators for oil wells	1.1D			P4	A5.17.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Freon, see appropriate chemical name or see listing under the appropriate "Refrigerant gas" proper shipping name</i>					
	UN1863	<b>FUEL, AVIATION, TURBINE ENGINE</b>	3		I II III	P3, 144 P5, 144 P5, 144	A7.2. A7.2. A7.2.
	UN3473	<b>FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT</b> containing flammable liquids	3		II	P5, 328	A7.7., A7.8., A7.9.
	UN3479	<b>FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT</b> containing hydrogen in metal hydride	2.1		II	P5, 328	A6.23., A6.24., A6.25.
	UN3478	<b>FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT</b> containing liquefied flammable gas	2.1		II	P5, 328	A6.23., A6.24., A6.25.
	UN3476	<b>FUEL CELL CARTRIDGES or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT</b> containing water- reactive substances	4.3		II	P5, 328	A8.20., A8.21., A8.22.
	UN3477	<b>FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT or FUEL CELL CARTRIDGES PACKED WITH EQUIPMENT</b> containing corrosive substances	8		II	P5, 328	A12.12., A12.13., A12.14.
		<i>Fuel system components(including fuel control units (FCU), carburetors, fuel lines, fuel pumps), see DANGEROUS GOODS IN APPARATUS (UN3363) or DANGEROUS GOODS IN MACHINERY (UN3363) or DANGEROUS GOODS IN ARTICLES (UN3363)</i>					
		<i>Fuel oil, see GAS OIL (UN1202)</i>					
D	NA1993	<b>FUEL OIL</b> (No. 1, 2, 3, 4, 5, or 6)	3		III	P5, 144	A7.2.
		<i>Fulminate of mercury (dry)</i>					FORBIDDEN
		<i>Fulminate of mercury, wet, see MERCURY FULMINATE, WETTED (UN0135)</i>					
		<i>Fulminating gold</i>					FORBIDDEN
		<i>Fulminating mercury</i>					FORBIDDEN
		<i>Fulminating platinum</i>					FORBIDDEN
		<i>Fulminating silver</i>					FORBIDDEN
		<i>Fulminic acid</i>					FORBIDDEN
		<i>Fumaroyl dichloride, see FUMARYL CHLORIDE (UN1780)</i>					
	UN1780	<b>FUMARYL CHLORIDE</b>	8		II	P5	A12.2.
		<i>Fuming liquid arsenic, see ARSENIC TRICHLORIDE (UN1560)</i>					
		<i>Fumigant, or fungicide, see appropriate pesticide</i>					
	UN3359	<b>FUMIGATED CARGO TRANSPORT UNIT</b>					FORBIDDEN
	UN1199	<b>FURALDEHYDE</b>	6.1	3	II	P2	A10.4.
	UN2389	<b>FURAN</b>	3		I	P3	A7.2.
	UN2874	<b>FURFURYL ALCOHOL</b>	6.1		III	P5	A10.4.
	UN2526	<b>FURFURYLAMINE</b>	3	8	III	P5	A7.2.
		<i>Furyl carbinol, see FURFURYL ALCOHOL (UN2874)</i>					
		<b>FUSE, DETONATING, mild effect, metal clad, see CORD, DETONATING MILD EFFECT, metal clad</b>					
	UN0290	<b>FUSE, DETONATING, metal clad</b>	1.1D			P4	A5.22.
	UN0102	<b>FUSE, DETONATING, metal clad</b>	1.2D			P4	A5.22.
	UN0104	<b>FUSE DETONATING, MILD EFFECT, metal clad</b>	1.4D			P5	A5.22.
	UN0103	<b>FUSE, IGNITER, tubular metal clad</b>	1.4G			P5	A5.23.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN0101	<b>FUSE, NON-DETONATING</b> ( <i>instantaneous or quickmatch</i> )	1.3G			P4	A5.23.
	UN0105	<b>FUSE, SAFETY</b>	1.4S			P5	A5.23.
		<i>Fusee, matches, see MATCHES, FUSEE (UN2254)</i>					
		<i>Fuses, railway or highway, explosive, see SIGNAL DEVICES, HAND (UN0191, UN0373)</i>					
D	NA1325	<b>FUSEE</b> ( <i>railway or highway</i> )	4.1		II	P5	A8.13.
	UN1201	<b>FUSEL OIL</b>	3		II III	P5 P5	A7.2. A7.2.
		<i>Fuses, tracer, see TRACERS FOR AMMUNITION (UN0212, UN0306)</i>					
		<i>Fuzes, combination, percussion and time, see FUZES, DETONATING (UN0257, UN0367) or FUZES, IGNITING (UN0317, UN0368)</i>					
	UN0106	<b>FUZES, DETONATING</b>	1.1B			P4	A5.24.
	UN0107	<b>FUZES, DETONATING</b>	1.2B			P4	A5.24.
	UN0257	<b>FUZES, DETONATING</b>	1.4B			P5, 116	A5.24.
	UN0367	<b>FUZES, DETONATING</b>	1.4S			P5, 116, 347	A5.24.
	UN0408	<b>FUZES, DETONATING</b> , <i>with protective features</i>	1.1D			P4	A5.24.
	UN0409	<b>FUZES, DETONATING</b> , <i>with protective features</i>	1.2D			P4	A5.24.
	UN0410	<b>FUZES, DETONATING</b> , <i>with protective features</i>	1.4D			P5, 116	A5.24.
	UN0316	<b>FUZES, IGNITING</b>	1.3G			P4	A5.24.
	UN0317	<b>FUZES, IGNITING</b>	1.4G			P5	A5.24.
	UN0368	<b>FUZES, IGNITING</b>	1.4S			P5	A5.24.
		<i>Galactan trinitrate</i>					FORBIDDEN
	UN2803	<b>GALLIUM</b>	8		III	P3	A12.7.
		<i>Gas candles, charged with flammable gas, see DEVICES, SMALL, HYDROCARBON GAS POWERED (UN3150)</i>					
	UN2037	<b>GAS CARTRIDGE</b> , ( <i>flammable</i> ) <i>without a release device, non-refillable</i>	2.1			P4	A6.3., A6.4.
	UN2037	<b>GAS CARTRIDGES</b> , ( <i>non-flammable</i> ) <i>without release device, non-refillable</i>	2.2			P5	A6.3., A6.4.
	UN2037	<b>GAS CARTRIDGES</b> , ( <i>oxidizing</i> ) <i>without a release device, non-refillable</i>	2.2	5.1		P5	A6.3., A6.4.
	UN2037	<b>GAS CARTRIDGES</b> , ( <i>toxic</i> ) <i>without a release device, non-refillable</i>	2.3				FORBIDDEN
	UN2037	<b>GAS CARTRIDGES</b> , ( <i>toxic and corrosive</i> ) <i>without a release device, non-refillable</i>	2.3	8			FORBIDDEN
	UN2037	<b>GAS CARTRIDGES</b> , ( <i>toxic and flammable</i> ) <i>without a release device, non-refillable</i>	2.3	2.1			FORBIDDEN
	UN2037	<b>GAS CARTRIDGES</b> , ( <i>toxic and oxidizing</i> ) <i>without a release device, non-refillable</i>	2.3	5.1			FORBIDDEN
	UN2037	<b>GAS CARTRIDGES</b> , ( <i>toxic, flammable and corrosive</i> ) <i>without a release device non-refillable</i>	2.3	2.1, 8			FORBIDDEN
	UN2037	<b>GAS CARTRIDGES</b>	2.3	5.1, 8			FORBIDDEN
		<i>Gas generator assemblies (aircraft), containing a nonflammable, nontoxic gas and a propellant cartridge, see LIFE SAVING APPLIANCES, SELF INFLATING</i>					
D	NA9035	<b>GAS IDENTIFICATION SET</b>	2.3			P2, 6	A6.16.
		<i>Gas compressed, see COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S. ★ (UN1953) or COMPRESSED GAS, FLAMMABLE, N.O.S. ★ (UN1954) or COMPRESSED GAS, N.O.S. ★ (UN1956) or COMPRESSED GAS, TOXIC, N.O.S. ★ (UN1955) or COMPRESSED GAS, OXIDIZING N.O.S. ★ (UN3156) or COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S. ★ (UN3303) or COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. ★ (UN3304) or COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. ★ (UN3305) or COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. ★ (UN3306)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Gas drips, hydrocarbon, <i>see</i> <b>HYDROCARBONS, LIQUID, N.O.S. ★</b> (UN3295)					
		Gas Liquefied <i>see</i> , <b>LIQUEFIED GAS, OXIDIZING, N.O.S. ★</b> (UN3157) <i>or</i> <b>LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S. ★</b> (UN3160) <i>or</i> <b>LIQUEFIED GAS, FLAMMABLE, N.O.S. ★</b> (UN3161) <i>or</i> <b>LIQUEFIED GAS N.O.S. ★</b> (UN3163) <i>or</i> <b>LIQUEFIED GAS, TOXIC, N.O.S. ★</b> (UN3162) <i>or</i> <b>LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S. ★</b> (UN3307) <i>or</i> <b>LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S. ★</b> (UN3308) <i>or</i> <b>LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. ★</b> (UN3309) <i>or</i> <b>LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. ★</b> (UN3310)					
	UN1202	<b>GAS OIL</b> <i>or</i> <b>DIESEL FUEL</b> <i>or</i> <b>HEATING OIL, LIGHT</b>	3		III	P5, 144	A7.2.
★	UN3158	<b>GAS, REFRIGERATED LIQUID, N.O.S.</b> ( <i>cryogenic liquid</i> )	2.2			P4	A6.11.
★	UN3312	<b>GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.</b> ( <i>cryogenic liquid</i> )	2.1			P3	A6.11.
★	UN3311	<b>GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.</b> ( <i>cryogenic liquid</i> )	2.2	5.1		P4	A6.11.
	UN3167	<b>GAS SAMPLE, NON-PRESSURIZED, FLAMMABLE, N.O.S., not refrigerated liquid</b>	2.1			P4	A6.3., A6.4., A6.5.
	UN3169	<b>GAS SAMPLE, NON-PRESSURIZED, TOXIC, N.O.S., not refrigerated liquid</b>	2.3			P4, 6	A6.3., A6.4., A6.5.
	UN3168	<b>GAS SAMPLE, NON-PRESSURIZED, TOXIC, FLAMMABLE, N.O.S., not refrigerated liquid</b>	2.3	2.1		P3	A6.3., A6.4.
		Gas turbine engines, <i>see</i> <b>ENGINES, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED</b> (UN3528)					
D	NA1203	<b>GASOHOL</b> gasoline mixed with ethyl alcohol, with not more than 10 percent alcohol	3		II	P5, 177	A7.2.
	UN1203	<b>GASOLINE</b> includes gasoline mixed with ethyl alcohol, with not more than 10 percent alcohol	3		II	P5, 144, 177	A7.2.
		Gasoline, casinghead, <i>see</i> <b>GASOLINE</b> (UN1203) <i>or</i> <b>MOTOR SPIRIT</b> (UN1203) <i>or</i> <b>PETROL</b> (UN1203)					
		Gelatine, blasting, <i>see</i> <b>EXPLOSIVE, BLASTING, TYPE A</b> (UN0081)					
		Gelatine dynamites, <i>see</i> <b>EXPLOSIVE, BLASTING, TYPE A</b> (UN0081)					
	UN3245	<b>GENETICALLY MODIFIED MICRO-ORGANISMS</b> <i>or</i> <b>GENETICALLY MODIFIED ORGANISMS</b>	9			P5	A10.8
	UN2192	<b>GERMANE</b>	2.3	2.1		P2, 2	A6.15.
	UN3523	<b>GERMANE, ADSORBED</b>	2.3	2.1		P2, 2	A6.15.
		Germanium hydride, <i>see</i> <b>GERMANE</b> (UN2192)					
		Glycerol-1,3-dichlorohydrin, <i>see</i> <b>1,3-DICHLOROPROPANOL-2</b> (UN2750)					
		Glycerol-1,3-dinitrate					FORBIDDEN
		Glycerol gluconate trinitrate					FORBIDDEN
		Glycerol lactate trinitrate					FORBIDDEN
	UN2689	<b>GLYCEROL ALPHA-MONOCHLOROHYDRIN</b>	6.1		III	P5	A10.4.
		Glyceryl trinitrate, <i>see</i> <b>NITROGLYCERIN, DESENSITIZED</b> (UN0143)					
	UN2622	<b>GLYCIDALDEHYDE</b>	3	6.1	II	P5	A7.2.
	UN0284	<b>GRENADES, hand or rifle, with bursting charge</b>	1.1D			P4	A5.24.
	UN0285	<b>GRENADES, hand or rifle, with bursting charge</b>	1.2D			P4	A5.24.
	UN0292	<b>GRENADES, hand or rifle, with bursting charge</b>	1.1F			P4	A5.24.
	UN0293	<b>GRENADES, hand or rifle, with bursting charge</b>	1.2F			P4	A5.24.
		Grenades, illuminating, <i>see</i> <b>AMMUNITION, ILLUMINATING</b> , (UN0171, UN0254, UN029)					
	UN0372	<b>GRENADES, PRACTICE, hand or rifle</b>	1.2G			P4	A5.24.
	UN0318	<b>GRENADES, PRACTICE, hand or rifle</b>	1.3G			P4	A5.24.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN0452	<b>GRENADDES, PRACTICE</b> , <i>hand or rifle</i>	1.4G			P5	A5.24.
	UN0110	<b>GRENADDES, PRACTICE</b> , <i>hand or rifle</i>	1.4S			P5	A5.24.
		<i>Grenades, smoke, see AMMUNITION, SMOKE, etc. (UN0015) (UN0016) (UN0303)</i>					
	UN1467	<b>GUANIDINE NITRATE</b>	5.1		III	P5, A1	A9.6.
		<i>Guanyl nitrosaminoguanylidene hydrazine (dry)</i>					FORBIDDEN
	UN0113	<b>GUANYL NITROSAMINO GUANYLIDENE HYDRAZINE, WETTED</b> with not less than 30% water, by mass	1.1A			P3, 111, 117	A5.4.
		<i>Guanyl nitrosaminoguanylidene hydrazine, wetted with less than 30% water</i>					FORBIDDEN
		<i>Guanyl nitrosaminoguanyltetrazene (dry)</i>					FORBIDDEN
	UN0114	<b>GUANYL NITROSAMINO GUANYLTETRAZENE, WETTED</b> , or <b>TETRAZENE, WETTED</b> with not less than 30% water, or mixture of alcohol and water, by mass	1.1A			P3, 111, 117	A5.4.
		<i>Guanyl nitrosaminoguanyltetrazene, wetted with less than 30% water or mixture of alcohol and water</i>					FORBIDDEN
		<b>GUNPOWDER, COMPRESSED</b> or <b>GUNPOWDER IN PELLETS</b> , <i>see BLACK POWDER (UN0028)</i>					
	UN0027	<b>GUNPOWDER</b> , <i>granular or as meal</i>	1.1D			P4	A5.8.
	UN0028	<b>GUNPOWDER, COMPRESSED</b> or <b>GUNPOWDER, IN PELLETS</b>	1.1D			P4	A5.8.
		<i>Gutta percha solution, see RUBBER SOLUTION (UN1287)</i>					
	UN2545	<b>HAFNIUM POWDER, DRY</b>	4.2		I II III	P3 P5, A19, A20, N34 P5	A8.3. A8.3. A8.3.
	UN1326	<b>HAFNIUM POWDER, WETTED</b> with not less than 25% water ( <i>a visible excess of water must be present</i> ) ( <i>a</i> ) mechanically produced, particle size less than 53 microns; ( <i>b</i> ) chemically produced, particle size less than 840 microns	4.1		II	P5, A6, A19, A20, N34	A8.3.
		<i>Hair, wet, see FIBERS or FIBRES, SYNTHETIC, N.O.S. ★ (UN1373) or FIBERS or FIBRES, ANIMAL, N.O.S. ★ (UN1373) or FIBERS, or FIBRES, VEGETABLE, N.O.S. ★ (UN1373)</i>					
	UN3151	<b>HALOGENATED MONOMETHYLDIPHENYLMETHANES, LIQUID</b>	9		II	P5	A13.2
	UN3152	<b>HALOGENATED MONOMETHYLDIPHENYLMETHANES, SOLID</b>	9		II	P5	A13.2
		<i>Hand signal device, see SIGNAL DEVICES, HAND (UN0191, UN0373)</i>					
		<i>Hazardous substances, liquid or solid, N.O.S., see ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID N.O.S., ★ (UN3082) or ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. ★ (UN3077)</i>					
D ★	NA3082	<b>HAZARDOUS WASTE, LIQUID, N.O.S.</b>	9		III	P5, A189	A13.2.
D ★	NA3077	<b>HAZARDOUS WASTE, SOLID, N.O.S.</b>	9		III	P5	A13.2.
	UN1327	<b>HAY</b>	4.1			A520, A524	FORBIDDEN
	UN1202	<b>HEATING OIL, LIGHT</b>	3		III	P5	A7.2.
		<i>Heat producing article battery operated equipment, such as underwater torches or soldering equipment, which, if accidentally activated, will generate extreme heat and cause fire</i>	9				FORBIDDEN

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Heavy hydrogen, see <b>DEUTERIUM, COMPRESSED</b> (UN1957)					
	UN1046	<b>HELIUM, COMPRESSED</b>	2.2			P5	A6.3., A6.5.
		<i>Helium, liquid, non-pressurized</i>					FORBIDDEN
	UN1963	<b>HELIUM, REFRIGERATED LIQUID</b> (cryogenic liquid)	2.2			P5	A6.11.
	UN3296	<b>HEPTAFLUOROPROPANE or REFRIGERANT GAS R227</b>	2.2			P5	A6.3., A6.4.
	UN3056	<b>N-HEPTALDEHYDE</b>	3		III	P5	A7.2.
		<i>n-Heptanal; see N-HEPTALDEHYDE</i> (UN3056)					
	UN1206	<b>HEPTANES</b>	3		II	P5	A7.2.
		<i>4-Hepatanone, see DIPROPYL KETONE</i> (UN2710)					
	UN2278	<b>N-HEPTENE</b>	3		II	P5	A7.2.
	UN2661	<b>HEXACHLOROACETONE</b>	6.1		III	P5	A10.4.
	UN2729	<b>HEXACHLOROBENZENE</b>	6.1		III	P5	A10.4.
		<i>Hexachloro-1,3-butadiene, see HEXACHLOROBUTADIENE</i> (UN2279)					
	UN2279	<b>HEXACHLOROBUTADIENE</b>	6.1		III	P5	A10.4.
	UN2646	<b>HEXACHLOROCYCLOPENTADIENE</b>	6.1		I	P2, 2	A10.6.
	UN2875	<b>HEXACHLOROPHENE</b>	6.1		III	P5	A10.5.
		<i>Hexachloro-2-propanone, see HEXACHLOROACETONE</i> (UN2661)					
	UN1781	<b>HEXADECYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
	UN2458	<b>HEXADIENES</b>	3		II	P5	A7.2.
	UN1612	<b>HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURE</b>	2.3			P2, 3	A6.18.
	UN1611	<b>HEXAETHYL TETRAPHOSPHATE, LIQUID or HEXAETHYL TETRAPHOSPHATE, SOLID</b>	6.1		II	P5, N76	A10.4., A10.5.
	UN2420	<b>HEXAFLUOROACETONE</b>	2.3	8		P2, 2	A6.4.
	UN2552	<b>HEXAFLUOROACETONE HYDRATE, LIQUID</b>	6.1		II	P5	A10.4.
	UN3436	<b>HEXAFLUOROACETONE HYDRATE, SOLID</b>	6.1		II	P5	A10.5.
	UN2193	<b>HEXAFLUOROETHANE or REFRIGERANT GAS R116</b>	2.2			P5	A6.3., A6.4.
	UN1782	<b>HEXAFLUOROPHOSPHORIC ACID</b>	8		II	P5, A7, N3, N34	A12.2.
	UN1858	<b>HEXAFLUOROPROPYLENE, COMPRESSED or REFRIGERANT GAS R1216</b>	2.2			P5	A6.3., A6.4.
		<i>Hexahydrobenzene, see CYCLOHEXANE</i> (UN1145)					
		<i>Hexahydrocresol or Hexahydromethyl phenol, see METHYLCYCLOHEXANOLS</i> (UN2617)					
		<i>Hexahydrotoluene, see METHYLCYCLOHEXANE</i> (UN2296)					
	UN1207	<b>HEXALDEHYDE</b>	3		III	P5	A7.2.
		<i>Hexamethylene, see CYCLOHEXANE</i> (UN1145)					
	UN2281	<b>HEXAMETHYLENE DIISOCYANATE</b>	6.1		II	P5	A10.4.
	UN2280	<b>HEXAMETHYLENEDIAMINE, SOLID</b>	8		III	P5	A12.3.
	UN1783	<b>HEXAMETHYLENEDIAMINE SOLUTION</b>	8		II	P5	A12.2.
					III	P5	A12.2.
	UN2493	<b>HEXAMETHYLENEIMINE</b>	3	8	II	P5	A7.2.
	UN1328	<b>HEXAMETHYLENETETRAMINE</b>	4.1		III	P5, A1	A8.3.
		<i>Hexamethylene triperoxide diamine (dry)</i>					FORBIDDEN
		<i>Hexamethylol benzene hexanitrate</i>					FORBIDDEN
		<i>3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane, more than 52%</i>					FORBIDDEN
		<i>Hexamine, see HEXAMETHYLENETETRAMINE</i> (UN1328)					
	UN1208	<b>HEXANES</b>	3		II	P5	A7.2.
		<i>Hexanitroazoxy benzene</i>					FORBIDDEN
		<i>2,2,4,4,6,6-Henaniro-3,3-dihydroxyazobenzene (dry)</i>					FORBIDDEN
	UN0079	<b>HEXANITRODIPHENYLAMINE or DIPICRYLAMINE or HEXYL</b>	1.1D			P4	A5.6.
		<i>2,3,4,4,6,6-Henanirodiphenylether</i>					FORBIDDEN
		<i>N,N'-(Hexanitrodiphenyl) ethylene dinitramine (dry)</i>					FORBIDDEN

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		2,2,3,4,4,6- Hexanitrodiphenylamine					FORBIDDEN
		Hexanitrodiphenyl urea					FORBIDDEN
		Hexanitroethane					FORBIDDEN
		Hexanitrooxanilide					FORBIDDEN
	UN0392	<b>HEXANITROSTILBENE</b>	1.1D			P4	A5.6.
		Hexanoic acid, see <b>CAPROIC ACID</b> or <b>CORROSIVE LIQUIDS, N.O.S.</b> (UN2829)					
	UN2282	<b>HEXANOLS</b>	3		III	P5	A7.2.
	UN2370	<b>1-HEXENE</b>	3		II	P5	A7.2.
	UN0391	<b>HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, DESENSITIZED</b> with not less than 10% phlegmatizer, by mass	1.1D			P4	A5.6.
	UN0391	<b>HEXOGEN AND CYCLOTETRAMETHYLENETETRANITRAMINE MIXTURE, WETTED</b> with not less than 15% water, by mass	1.1D			P4	A5.6.
	UN0483	<b>HEXOGEN, DESENSITIZED</b>	1.1D			P4	A5.6.
	UN0072	<b>HEXOGEN, WETTED</b> , with not less than 15% water, by weight	1.1D			P4	A5.6.
	UN0118	<b>HEXOLITE</b> , or <b>HEXOTOL</b> dry or wetted with less than 15% water, by mass	1.1D			P4	A5.6.
	UN0393	<b>HEXOTONAL</b>	1.1D			P4	A5.6.
	UN0079	<b>HEXYL</b> or <b>HEXANITRODIPHENYLAMINE</b> or <b>DIPICRYLAMINE</b>	1.1D			P4	A5.6.
	UN1784	<b>HEXYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
		High explosives, see individual explosives' entries					
	UN0484	<b>HMX, DESENSITIZED</b>	1.1D			P4	A5.6.
		Hmx (dry or unphlegmatized)					FORBIDDEN
	UN0226	<b>HMX, WETTED</b> , with not less than 15% water, by weight	1.1D			P4	A5.6.
	UN2029	<b>HYDRAZINE, ANHYDROUS</b>	8	3, 6.1	I	P3, A7, A10	A12.2.
		Hydrazine azide					FORBIDDEN
		Hydrazine chlorate					FORBIDDEN
		Hydrazine dicarbonic acid diazide					FORBIDDEN
	UN3293	<b>HYDRAZINE, AQUEOUS SOLUTION</b> with not more than 37% hydrazine, by mass	6.1		III	P5	A10.4.
	UN2030	<b>HYDRAZINE AQUEOUS SOLUTION</b> , with more than 37% hydrazine by mass	8	6.1 6.1 6.1	I II III	P3, A510 P4, A510 P4	A12.2 A12.2 A12.2
	UN3484	<b>HYDRAZINE AQUEOUS SOLUTION, FLAMMABLE</b> with more than 37% hydrazine by mass	8	3, 6.1	I	P3	A12.2
		Hydrazine dicarbonic acid diazide					FORBIDDEN
		Hydrazine perchlorate					FORBIDDEN
		Hydrazine selenate					FORBIDDEN
		Hydrides, metal, water-reactive, N.O.S., see <b>METAL HYDRIDES, WATER-REACTIVE, N.O.S. ★</b> (UN1409)					
	UN1787	<b>HYDRIODIC ACID</b>	8		II III	P5, A3, N41 P5	A12.2. A12.2.
		Hydriodic acid, anhydrous, see <b>HYDROGEN IODIDE, ANHYDROUS</b> (UN2197)					
		Hydrobromic acid, anhydrous, see <b>HYDROGEN BROMIDE, ANHYDROUS</b> (UN1048)					
	UN1788	<b>HYDROBROMIC ACID</b> with more than 49% hydrobromic acid	8		II III	P4, N41 P5	A12.2. A12.2.
	UN1788	<b>HYDROBROMIC ACID</b> with not more than 49% hydrobromic acid	8		III I	P5, A3, N41 P5	A12.2. A12.2.
		Hydrobromic, acid, anhydrous, see <b>HYDROGEN BROMIDE, ANHYDROUS</b>					

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Hydrobromic ether, see ETHYL BROMIDE (UN1891)</i>					
★	UN1964	<b>HYDROCARBON GAS, MIXTURES COMPRESSED, N.O.S.</b>	2.1			P4	A6.3., A6.5.
★	UN1965	<b>HYDROCARBON GAS, MIXTURES, LIQUEFIED, N.O.S.</b>	2.1			P4	A6.3., A6.4.
		<i>Hydrocarbon gas-powered small devices, see DEVICES, SMALL, HYDROCARBON GAS POWERED (UN3150)</i>					
	UN3150	<b>HYDROCARBON GAS REFILLS FOR SMALL DEVICES, with release devices</b>	2.1			P5	A6.3., A6.4.
	UN3295	<b>HYDROCARBONS, LIQUID, N.O.S.</b>	3		I II III	P3, 144 P5, 144 P5, 144	A7.2. A7.2. A7.2.
	UN1789	<b>HYDROCHLORIC ACID</b>	8		II III	P4, A3, N41 P5, A3	A12.2. A12.2.
		<i>Hydrochloric acid, anhydrous, see HYDROGEN CHLORIDE, ANHYDROUS (UN1050)</i>					
		<i>Hydrocyanic acid, anhydrous, see HYDROGEN CYANIDE, STABILIZED (UN1051, UN1614)</i>					
	UN1613	<b>HYDROCYANIC ACID, AQUEOUS SOLUTIONS or HYDROGEN CYANIDE, AQUEOUS SOLUTIONS not more than 20% hydrogen cyanide</b>	6.1		I		FORBIDDEN
		<i>Hydrocyanic acid, aqueous solution, more than 20% hydrogen cyanide</i>					FORBIDDEN
		<i>Hydrofluoboric acid, see FLUOROBORIC ACID (UN1775)</i>					
D	NA1613	<b>HYDROCYANIC ACID, AQUEOUS SOLUTIONS with less than 5% hydrogen cyanide</b>					FORBIDDEN
		<b>HYDROCYANIC ACID (PRUSSIC) UNSTABILIZED</b>					FORBIDDEN
	UN1790	<b>HYDROFLUORIC ACID, with more than 60% strength</b>	8	6.1	I	P3, A7, N5, N34	A12.2.
	UN1790	<b>HYDROFLUORIC ACID, with not more than 60% strength</b>	8	6.1	II	P4, A7, N5, N34	A12.2.
	UN1786	<b>HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURES</b>	8	6.1	I	P3, A7, N5, N34	A12.2.
		<i>Hydrofluoric acid, anhydrous, see HYDROGEN FLUORIDE, ANHYDROUS (UN1052)</i>					
		<i>Hydrofluosilicic acid, see FLUOROSILICIC ACID (UN1778)</i>					
	UN2034	<b>HYDROGEN AND METHANE MIXTURES, COMPRESSED</b>	2.1			P4, N89	A6.3., A6.5.
		<i>Hydrogen arsenide, see ARSINE (UN2188)</i>					
	UN1048	<b>HYDROGEN BROMIDE, ANHYDROUS</b>	2.3	8		P2, 3, N86, N89	A6.4.
		<i>Hydrogen bromide solution, see HYDROBROMIC ACID (UN1788)</i>					
	UN1050	<b>HYDROGEN CHLORIDE, ANHYDROUS</b>	2.3	8		P2, 3, N86, N89	A6.4.
	UN2186	<b>HYDROGEN CHLORIDE, REFRIGERATED LIQUID</b>	2.3	8			FORBIDDEN
	UN1049	<b>HYDROGEN, COMPRESSED</b>	2.1			P4, N89	A6.3., A6.5.
	UN3294	<b>HYDROGEN CYANIDE, SOLUTION IN ALCOHOL, with not more than 45% of hydrogen cyanide</b>	6.1	3	I		FORBIDDEN
	UN1051	<b>HYDROGEN CYANIDE, STABILIZED, with less than 3% water</b>	6.1	3	I		FORBIDDEN
	UN1614	<b>HYDROGEN CYANIDE, STABILIZED, containing less than 3% water and absorbed in a porous inert material</b>	6.1		I		FORBIDDEN



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Hydrogen cyanide, unstabilized</i>					FORBIDDEN
	UN1052	<b>HYDROGEN FLUORIDE, ANHYDROUS</b>	8	6.1	I	P2, 3, N86	A12.8.
		<i>Hydrogen fluoride solution, see HYDROFLUORIC ACID (UN1790)</i>					
	UN3468	<b>HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM CONTAINED IN EQUIPMENT or HYDROGEN IN A METAL HYDRIDE STORAGE SYSTEM PACKED WITH EQUIPMENT</b>	2.1			P4, 167	A6.26
	UN2197	<b>HYDROGEN IODIDE, ANHYDROUS</b>	2.3	8		P2, 3, N86, N89	A6.4.
		<i>Hydrogen iodide solution, see HYDRIODIC ACID, SOLUTION (UN1787)</i>					
		<i>Hydrogen liquid, see HYDROGEN, REFRIGERATED LIQUID (UN1966)</i>					
	UN3149	<b>HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED with acids, water and not more than 5% peroxyacetic acid,</b>	5.1	8	II	P5, 145, A2, A3	A9.5.
	UN2014	<b>HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with more than 40%, but not more than 60% hydrogen peroxide (stabilized as necessary)</b>	5.1	8	II	12, A60	FORBIDDEN
	UN2014	<b>HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with not less than 20%, but not more than 40% hydrogen peroxide (stabilized as necessary)</b>	5.1	8	II	P5, A2, A3	A9.5.
	UN2984	<b>HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with not less than 8%, but less than 20% hydrogen peroxide (stabilized as necessary)</b>	5.1		III	P5, A1	A9.5.
	UN2015	<b>HYDROGEN PEROXIDE, STABILIZED or HYDROGEN PEROXIDE AQUEOUS SOLUTIONS, STABILIZED with more than 60% hydrogen peroxide</b>	5.1	8			FORBIDDEN
		<i>Hydrogen phosphide, see PHOSPHINE (UN2199)</i>					
		<i>Hydrogen peroxide, aqueous solution with less than 8% hydrogen peroxide (stabilized as necessary) (Not Restricted)</i>					
	UN1966	<b>HYDROGEN, REFRIGERATED LIQUID (cryogenic liquid)</b>	2.1			P3	A6.11.
	UN2202	<b>HYDROGEN SELENIDE, ANHYDROUS</b>	2.3	2.1			FORBIDDEN
	UN3526	<b>HYDROGEN SELENIDE, ADSORBED</b>	2.3	2.1			FORBIDDEN
		<i>Hydrogen silicide, see SILANE (UN2203)</i>					
		<i>Hydrogen sulfate, see SULFURIC ACID (UN1830)</i>					
	UN1053	<b>HYDROGEN SULFIDE</b>	2.3	2.1		P2, 2, N89	A6.4.
		<i>Hydroselenic acid, see HYDROGEN SELENIDE (UN2202)</i>					
		<i>Hydrosilicofluoric acid, see FLUOROSILICIC ACID (UN1778)</i>					
		<i>Hydroxybenzene, see PHENOL, SOLID (UN1671)</i>					
		<i>3-Hydroxybutan-2-one, see ACETYL METHYL CARBINOL (UN2621)</i>					
		<i>3-(2-Hydroxyethoxy)-4-pyrrolidin-1-ylbenzenediazonium zinc chloride, see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED (UN3236)</i>					
		<i>Hydroxyl Amine iodide</i>					FORBIDDEN
	UN1740	<b>HYDROGENDIFLUORIDES, SOLID N.O.S.</b>	8		II III	P5, N3, N34 P5, N3, N34	A12.3. A12.3.
	UN3471	<b>HYDROGENDIFLUORIDES, SOLUTION N.O.S.</b>	8	6.1	II III	P5, N3, N34 P5, N3, N34	A12.2. A12.2.
		<i>Hydrosilicofluoric acid, see FLUOROSILICIC ACID (UN1778)</i>					
	UN2865	<b>HYDROXYLAMINE SULFATE</b>	8		III	P5	A12.3.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		1-Hydroxy-3-methyl-2-penten-4-yne, see <b>1-PENTOL</b> (UN2705)					
		3-Hydroxyphenol, see <b>RESORCINOL</b> (UN2876)					
	UN0508	<b>1-HYDROXYBENZOTRIAZOLE ANHYDROUS</b> dry or wetted with less than 20%, by mass					FORBIDDEN
	UN3474	<b>1-HYDROXYBENZOTRIAZOLE ANHYDROUS, MONOHYDRATE</b>	4.1		I	P4, N90	A8.3.
	UN1791	<b>HYPOCHLORITE SOLUTIONS</b>	8		II III	P5, 148, A7, N34 P5, 386, N34	A12.2. A12.2.
★	UN3212	<b>HYPOCHLORITES, INORGANIC, N.O.S.</b>	5.1		II	P5, 349, A9	A9.6.
		<i>Hyponitrous acid</i>					FORBIDDEN
		<i>Igniter fuse, metal clad, see FUSE, IGNITER, tubular, metal clad</i> (UN0103)					
	UN0121	<b>IGNITERS</b>	1.1G			P4	A5.25.
	UN0314	<b>IGNITERS</b>	1.2G			P4	A5.25.
	UN0315	<b>IGNITERS</b>	1.3G			P5	A5.25.
	UN0325	<b>IGNITERS</b>	1.4G			P5	A5.25.
	UN0454	<b>IGNITERS</b>	1.4S			P5	A5.25.
		<i>Ignition element for lighter, containing pyrophoric liquid</i>					FORBIDDEN
	UN2269	<b>3,3'-IMINODIPROPYLAMINE</b>	8		III	P5	A12.2.
		<i>Indiarubber, see RUBBER SOLUTION</i> (UN1287)					
★	UN2900	<b>INFECTIOUS SUBSTANCES, AFFECTING ANIMALS, liquid or solid</b>	6.2			P3, A117	A10.8
★	UN2814	<b>INFECTIOUS SUBSTANCES, AFFECTING HUMANS, liquid or solid</b>	6.2			P1, A117, A502	A10.8
		<i>Inflammable, see FLAMMABLE,</i>					
		<i>Ink, Printer's, Flammable, see PRINTING INK</i> (UN1210)					
		<i>Initiating explosives (dry)</i>					FORBIDDEN
		<i>Inositol hexanitrate (dry)</i>					FORBIDDEN
	UN1967	<b>INSECTICIDE GAS, TOXIC, N.O.S.</b>	2.3				FORBIDDEN
★	UN1968	<b>INSECTICIDE GASES, N.O.S., (aerosols in boxes) or (cylinders)</b>	2.2			P5	A6.3., A6.5.
★	UN3354	<b>INSECTICIDE GASES, FLAMMABLE, N.O.S</b>	2.1			P4	A6.3., A6.5.
★	UN3355	<b>INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.</b>	2.3	2.1			FORBIDDEN
	UN3355	<b>INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S Inhalation hazard Zone A</b>	2.3	2.1			FORBIDDEN
★	UN3355	<b>INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S Inhalation hazard Zone B</b>	2.3	2.1			FORBIDDEN
★	UN3355	<b>INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S Inhalation hazard Zone C</b>	2.3	2.1			FORBIDDEN
★	UN3355	<b>INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S Inhalation hazard Zone D</b>	2.3	2.1			FORBIDDEN
		<i>Inulin trinate (dry)</i>					FORBIDDEN
		<i>Iodine azide (dry)</i>					FORBIDDEN
+	UN3495	<b>IODINE</b>	8	6.1	III	P5	A12.3.
	UN3498	<b>IODINE MONOCHLORIDE, LIQUID</b>	8		II	P4, N41	A12.2.
	UN1792	<b>IODINE MONOCHLORIDE, SOLID</b>	8		II	P4, N41	A12.3.
	UN2495	<b>IODINE PENTAFLUORIDE</b>	5.1	6.1, 8	I	P3	A9.7.
	UN2390	<b>2-IODOBUTANE</b>	3		II	P5	A7.2.
		<i>Iodomethane, see METHYL IODIDE</i> (UN2644)					
	UN2391	<b>IODOMETHYLPROPANES</b>	3		II	P5	A7.2.
	UN2392	<b>IODOPROPANES</b>	3		III	P5	A7.2.
		<i>alpha-Iodotoluene, see BENZYL IODIDE</i> (UN2653)					
		<i>Iodoxy compounds (dry)</i>					FORBIDDEN
		<i>IDPI, see ISOPHORONE DIISOCYANATE</i> (UN2290)					
		<i>Iridium nitratopentamine iridium nitrate</i>					FORBIDDEN
		<i>Iron arsenate, see FERROUS ARSENATE</i> (UN1608)					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Iron chloride anhydrous, see FERRIC CHLORIDE ANHYDROUS (UN1773)</i>					
		<i>Iron chloride solution, see FERRIC CHLORIDE SOLUTION (UN2582)</i>					
		<i>Iron (III) chloride, anhydrous, see FERRIC CHLORIDE, ANHYDROUS (UN1773)</i>					
	UN1376	<b>IRON OXIDE, SPENT, or IRON SPONGE, SPENT</b> obtained from coal gas purification	4.2		III		FORBIDDEN
	UN1994	<b>IRON PENTACARBONYL</b>	6.1	3	I	P1, 1	A10.6.
		<i>Iron perchloride, anhydrous, see FERRIC CHLORIDE, ANHYDROUS (UN1773)</i>					
		<i>Iron powder, pyrophoric, see PYROPHORIC METAL, N.O.S. or PYROPHORIC ALLOY, N.O.S. (UN1383)</i>					
		<i>Iron sesquichloride, see FERRIC CHLORIDE (UN1773)</i>					
		<i>Iron swarf, see FERROUS METAL SHAVINGS or FERROUS METAL or FERROUS METAL TURNINGS CUTTINGS or FERROUS METAL BORINGS (UN2793)</i>					
		<i>Irritating agents or materials, see TEAR GAS SUBSTANCE LIQUID (UN1693) or TEAR GAS SUBSTANCE, SOLID, N.O.S. (UN3448)</i>					
	UN1969	<b>ISOBUTANE or PETROLEUM GASES, LIQUEFIED</b>	2.1			P4,	A6.3., A6.4.
	UN1212	<b>ISOBUTANOL or ISOBUTYL ALCOHOL</b>	3		III	P5	A7.2.
		<i>Isobutene, see ISOBUTYLENE (UN1055)</i>					
	UN1213	<b>ISOBUTYL ACETATE</b>	3		II	P5	A7.2.
	UN2527	<b>ISOBUTYL ACRYLATE, STABILIZED</b>	3		III	P5, 387	A7.2.
		<i>Isobutyl Alcohol, see ISOBUTANOL</i>					
		<i>Isobutyl Aldehyde, see ISOBUTYRALDEHYDE (UN2045)</i>					
	UN2045	<b>ISOBUTYL ALDEHYDE or ISOBUTYRALDEHYDE</b>	3		II	P5	A7.2.
	UN2393	<b>ISOBUTYL FORMATE</b>	3		II	P5	A7.2.
	UN2528	<b>ISOBUTYL ISOBUTYRATE</b>	3		III	P5	A7.2.
+	UN2486	<b>ISOBUTYL ISOCYANATE</b>	6.1	3	I	P1, 1	A10.6.
	UN2283	<b>ISOBUTYL METHACRYLATE, STABILIZED</b>	3		III	P5	A7.2.
	UN2394	<b>ISOBUTYL PROPIONATE</b>	3		III	P5	A7.2.
	UN1214	<b>ISOBUTYLAMINE</b>	3	8	II	P5	A7.2.
	UN1055	<b>ISOBUTYLENE or PETROLEUM GASES, LIQUEFIED</b>	2.1			P4	A6.3., A6.4.
	UN2529	<b>ISOBUTYRIC ACID</b>	3	8	III	P5	A7.2.
	UN2284	<b>ISOBUTYRONITRILE</b>	3	6.1	II	P5	A7.2.
	UN2395	<b>ISOBUTYRYL CHLORIDE</b>	3	8	II	P5	A7.2.
		<i>Isocrotonic acid, see CROTONIC ACID, LIQUID (UN3472)</i>					
★	UN2478	<b>ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTIONS, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C</b>	3	6.1	II III	P2, 5, A3, A7 P4, 5, A3, A7	A7.2.
★	UN3080	<b>ISOCYANATES, TOXIC, FLAMMABLE N.O.S. or ISOCYANATE SOLUTIONS, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C but not more than 61 degrees C and boiling point less than 300 degrees C</b>	6.1	3	II	P4	A10.4.
★	UN2206	<b>ISOCYANATES, TOXIC N.O.S. or ISOCYANATE SOLUTIONS, TOXIC N.O.S., flashpoint more than 61 degrees C and boiling point less than 300 degrees C</b>	6.1		II III	P4 P4	A10.4. A10.4.
	UN2285	<b>ISOCYANATOBENZOTRIFLUORIDES</b>	6.1	3	II	P2, 5	A10.4.
		<i>3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate, see ISOPHORONE DIISOCYANATE (UN2290)</i>					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Isododecane, see PENTAMETHYLHEPTANE (UN2286)</i>					
	UN2287	<b>ISOHEPTENES</b>	3		II	P5	A7.2.
	UN2288	<b>ISOHEXENES</b>	3		II	P5	A7.2.
		<i>Isooctane, see OCTANES (UN1262)</i>					
	UN1216	<b>ISOOCTENES</b>	3		II	P5	A7.2.
		<i>Isonpentane, see PENTANES (UN1265)</i>					
		<i>Isopentanoic acid, see CORROSIVE LIQUIDS N.O.S. (UN1760)</i>					
	UN2371	<b>ISOPENTENES</b>	3		I	P3	A7.2.
		<i>Isopentyl nitrite, see AMYL NITRITE (UN1113)</i>					
		<i>Isopentylamine, see AMYLAMINE (UN1106)</i>					
	UN2290	<b>ISOPHORONE DIISOCYANATE</b>	6.1		III	P5	A10.4.
	UN2289	<b>ISOPHORONEDIAMINE</b>	8		III	P5	A12.2.
	UN1218	<b>ISOPRENE, STABILIZED</b>	3		I	P3, 387	A7.2.
		<i>Isoprene, unstabilized</i>					FORBIDDEN
	UN1219	<b>ISOPROPANOL or ISOPROPYL ALCOHOL</b>	3		II	P5	A7.2.
	UN2403	<b>ISOPROPENYL ACETATE</b>	3		II	P5	A7.2.
	UN2303	<b>ISOPROPENYLBENZENE</b>	3		III	P5	A7.2.
	UN1220	<b>ISOPROPYL ACETATE</b>	3		II	P5	A7.2.
	UN1793	<b>ISOPROPYL ACID PHOSPHATE</b>	8		III	P5	A12.3.
		<i>Isopropyl Alcohol, see ISOPROPANOL ((UN1219)</i>					
	UN2405	<b>ISOPROPYL BUTYRATE</b>	3		III	P5	A7.2.
		<i>Isopropyl chloride, see 2-CHLOROPROPANE (UN2356)</i>					
	UN2947	<b>ISOPROPYL CHLOROACETATE</b>	3		III	P5	A7.2.
	UN2407	<b>ISOPROPYL CHLOROFORMATE</b>	6.1	3, 8	I	P2, 2	A10.6.
		<i>Isopropyl-alpha-chloropropionate, see ISOPROPYL 2-CHLOROPROPIONATE (UN2934)</i>					
	UN2934	<b>ISOPROPYL 2-CHLOROPROPIONATE</b>	3		III	P5	A7.2.
		<i>Isopropylcumyl hydroperoxide, more than 72% in solution</i>					FORBIDDEN
		<i>Isopropyl ether, see DIISOPROPYL ETHER (UN1159)</i>					
		<i>Isopropylethylene, see 3-METHYL-1-BUTENE (UN2561)</i>					
		<i>Isopropyl formate, see PROPYL FORMATES (UN1281)</i>					
	UN2406	<b>ISOPROPYL ISOBUTYRATE</b>	3		II	P5	A7.2.
+	UN2483	<b>ISOPROPYL ISOCYANATE</b>	6.1	3	I	P1, 1	A10.6.
		<i>Isopropyl mercaptan, see PROPANETHIOLS (UN2402)</i>					
	UN1222	<b>ISOPROPYL NITRATE</b>	3		II	P5	A7.2.
		<i>Isopropyl phosphoric acid, see ISOPROPYL ACID PHOSPHATE (UN1793)</i>					
	UN2409	<b>ISOPROPYL PROPIONATE</b>	3		II	P5	A7.2.
		<i>Isopropyltoluene or Isopropyltoluol, see CYMENES (UN2046)</i>					
	UN1221	<b>ISOPROPYLAMINE</b>	3	8	I	P3	A7.2.
	UN1918	<b>ISOPROPYLBENZENE</b>	3		III	P5	A7.2.
		<i>Isopropyl bromide, see BROMOPROPANES</i>					
		<i>Isopropyl sec-butyl peroxydicarbonate, not more than 52%, with di-sec-butyl peroxydicarbonate, not more than 28%, with di-isopropyl peroxydicarbonate, not more than 22%</i>					FORBIDDEN
	UN2907	<b>ISOSORBIDE DINITRATE MIXTURE</b> with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate	4.1		II	P5	A8.3.
		<i>Isosorbide dinitrate mixture with less than 60% lactose, mannose, starch or calcium hydrogen phosphate</i>					FORBIDDEN
	UN3251	<b>ISOSORBIDE-5-MONONITRATE</b>	4.1		III	P5, 66, 159	A8.3.
		<i>Isothiocyanic acid</i>					FORBIDDEN

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Isovaleraldehyde, see VALERADEHYDE (UN2058)</i>					
		<i>Jet fuel, see FUEL, AVIATION, TURBINE ENGINE (UN1863)</i>					
D	NA0124	<b>JET PERFORATING GUNS, CHARGED</b> oil well, with detonator	1.1D			55, 56	FORBIDDEN
D	NA0494	<b>JET PERFORATING GUNS, CHARGED</b> oil well, with detonator	1.4D			P5, 55, 56	A5.3.
	UN0124	<b>JET PERFORATING GUNS, CHARGED</b> oil well, without detonator	1.1D			55, 56	FORBIDDEN
	UN0494	<b>JET PERFORATING GUNS, CHARGED</b> oil well, without detonator	1.4D			P5, 55, 56, 114	A5.3.
		<i>Jet perforators, see CHARGES, SHAPED, (UN0059, UN0439, UN0440, UN0441)</i>					
		<i>Jet tappers, without detonator, see CHARGES, SHAPED, (UN0059, UN0439, UN0440, UN0441)</i>					
		<i>Jet thrust igniters, for rocket motors or Jato, see IGNITERS, (UN0121, UN0314, UN0315, UN0325, UN0454)</i>					
		<i>Jet thrust unit (Jato), see ROCKET MOTORS (UN0186, UN0280, UN0281)</i>					
		<i>Jute or Kapok, see FIBERS, ANIMAL, N.O.S. (UN1373)</i>					
	UN1223	<b>KEROSENE</b>	3		III	P5, 144	A7.2.
		<i>Ketone oils, see ACETONE OILS (UN1091)</i>					
★	UN1224	<b>KETONES, LIQUID, N.O.S.</b>	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN3497	<b>KRILL MEAL</b>	4.2		II III	P5, 155 P5, 155	A8.3. A8.3.
	UN1056	<b>KRYPTON, COMPRESSED</b>	2.2			P5	A6.3., A6.5.
	UN1970	<b>KRYPTON, REFRIGERATED LIQUID</b> (cryogenic liquid)	2.2			P4	A6.11.
		<i>Lacquer base or lacquer chips, nitrocellulose, dry, see NITROCELLULOSE, MIXTURE WITH PLASTICIZER, WITHOUT PIGMENT (UN2557) or NITROCELLULOSE, MIXTURE WITHOUT PLASTICIZER, WITH PIGMENT (UN2557) or NITROCELLULOSE, MIXTURE WITH PLASTICIZER, WITH PIGMENT (UN2557)</i>					
		<i>Lacquer base or lacquer chips, plastic, wet with alcohol or solvent, lacquer liquids see NITROCELLULOSE SOLUTION, FLAMMABLE (UN2056) or see NITROCELLULOSE WITH WATER (UN2055) or PAINT, (UN1263)(UN3066)</i>					
		<i>Lamp black, see CARBON (UN1361)</i>					
	UN1616	<b>LEAD ACETATE</b>	6.1		III	P5	A10.5.
	UN1617	<b>LEAD ARSENATES</b>	6.1		II	P5	A10.5.
	UN1618	<b>LEAD ARSENITES</b>	6.1		II	P5	A10.5.
		<i>Lead azide (dry)</i>					FORBIDDEN
	UN0129	<b>LEAD AZIDE</b> , wetted with not less than 20% water or mixture of alcohol and water, by mass	1.1A			P3, 111, 117	A5.4.
		<i>Lead azide, wetted, with less than 20% water or mixture of alcohol and water</i>					FORBIDDEN
		<i>Lead chloride, solid, see LEAD COMPOUND, SOLUBLE, N.O.S. ★ (UN2291)</i>					
★	UN2291	<b>LEAD COMPOUNDS, SOLUBLE, N.O.S.</b>	6.1		III	P5, 138	A10.5.
	UN1620	<b>LEAD CYANIDE</b>	6.1		II	P5	A10.5.
	UN1872	<b>LEAD DIOXIDE</b>	5.1		III	P5, A1	A9.6.
		<i>Lead (II) acetate, see LEAD ACETATE (UN1616)</i>					
		<i>Lead (II) cyanide, see LEAD CYANIDE (UN1620)</i>					
		<i>Lead dross, see LEAD SULFATE, with more than 3% free acid (UN1794)</i>					
		<i>Lead (II) nitrate, see LEAD NITRATE (UN1469)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Lead (II) perchlorate, see <b>LEAD PERCHLORATE, SOLID</b> (UN1470) or <b>LEAD PERCHLORATE SOLUTION</b> (UN3408)					
	UN1469	<b>LEAD NITRATE</b>	5.1	6.1	II	P5	A9.6.
		Lead nitroresorcinate (dry)					FORBIDDEN
	UN1470	<b>LEAD PERCHLORATE SOLID</b>	5.1	6.1	II	P5	A9.6.
	UN3408	<b>LEAD PERCHLORATE SOLUTION</b>	5.1	6.1	II III	P5 P5	A9.5. A9.5.
		Lead peroxide, see <b>LEAD DIOXIDE</b> (UN1872)					
	UN2989	<b>LEAD PHOSPHITE, DIBASIC</b>	4.1		II III	P5 P5	A8.3. A8.3.
		Lead picrate (dry)					FORBIDDEN
		Lead styphnate (dry)					FORBIDDEN
	UN0130	<b>LEAD STYPHNATE, WETTED</b> or <b>LEAD TRINITRORESORCINATE, WETTED</b> with not less than 20% water or mixture of alcohol and water, by mass	1.1A			P3, 111, 117	A5.4.
		Lead styphnate, wetted with less than 20% water or mixture of alcohol and water					FORBIDDEN
	UN1794	<b>LEAD SULFATE</b> with more than 3% free acid	8		II	P5	A12.3.
		Lead tetraethyl or Lead tetramethyl, see <b>MOTOR FUEL ANTI-KNOCK MIXTURE</b> (UN1649)					
		Lead trinitroresorcinate (dry)					FORBIDDEN
		<b>LEAD TRINITRORESORCINATE</b> , see <b>LEAD STYPHNATE</b> , etc.					
		Leather bleach or dressing, see <b>FLAMMABLE LIQUID, TOXIC, N.O.S. ★</b> (UN1992) or <b>FLAMMABLE LIQUID, N.O.S. ★</b> (UN1993) or <b>FLAMMABLE LIQUID, CORROSIVE, N.O.S. ★</b> (UN2924)					
	UN3072	<b>LIFE-SAVING APPLIANCES, NOT SELF INFLATING</b> containing dangerous goods as equipment	9			P5, 182	A13.12.
	UN2990	<b>LIFE-SAVING APPLIANCES, SELF INFLATING</b>	9			P5, 338	A13.12.
		Lighter flints, see <b>FERROCERIUM</b> (UN1323)					
		Lighter fluid, see <b>FLAMMABLE LIQUID, N.O.S. ★</b> (UN1993)					
	UN1057	<b>LIGHTER REFILLS</b> containing flammable gas no more than 4 fluid ounces (7.22 cubic inches) and 65 grams of flammable gas	2.1			P5, 169	A6.10.
		Lighter replacement cartridges containing liquefied petroleum gases see <b>LIGHTER REFILL</b> refills containing flammable gas, (UN1057)					
		Lighters (cigarettes), with lighter fluids					FORBIDDEN
	UN1057	<b>LIGHTERS</b> containing flammable gas	2.1			P5, 168	A6.10.
		Lighters (cigarettes), containing pyrophoric liquid					FORBIDDEN
D	NA1057	<b>LIGHTERS</b> , non-pressurized containing flammable liquid	3		II	168	
	UN0131	<b>LIGHTERS, FUSE</b>	1.4S			P5	A5.25.
		Lime-nitrogen, see <b>CALCIUM CYANAMIDE</b> (UN1403)					
		Lime, unslaked, see <b>CALCIUM OXIDE</b> (UN1910)					
		Limonene, inactive, see <b>DIPENTENE</b> (UN2052)					
		Linoleates, see <b>FLAMMABLE LIQUID, N.O.S. ★</b> (UN1993)					
★	UN3163	<b>LIQUEFIED GAS, N.O.S</b>	2.2			P5	A6.3., A6.4.
★	UN3157	<b>LIQUEFIED GAS OXIDIZING, N.O.S</b>	2.2	5.1		P5, A14	A6.3., A6.4.
★	UN3308	<b>LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, Inhalation Hazard Zone A</b>	2.3	8		P1, 1	A6.15.
★	UN3308	<b>LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, Inhalation Hazard Zone B</b>	2.3	8		P2, 2	A6.4.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, Inhalation Hazard Zone C	2.3	8		P2, 3	A6.4.
★	UN3308	LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S, Inhalation Hazard Zone D	2.3	8		P2, 4	A6.4.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, Inhalation Hazard Zone A	2.3	2.1, 8		P1, 1	A6.15.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, Inhalation Hazard Zone B	2.3	2.1, 8		P2, 2	A6.4.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, Inhalation Hazard Zone C	2.3	2.1, 8		P2, 3	A6.4.
★	UN3309	LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S, Inhalation Hazard Zone D	2.3	2.1, 8		P2, 4	A6.4.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, Inhalation Hazard Zone A	2.3	2.1		P1, 1	A6.15.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, Inhalation Hazard Zone B	2.3	2.1		P2, 2	A6.4.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, Inhalation Hazard Zone C	2.3	2.1		P2, 3	A6.4.
★	UN3160	LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S, Inhalation Hazard Zone D	2.3	2.1		P2, 4	A6.4.
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, Inhalation Hazard Zone A	2.3			P1, 1	A6.15.
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, Inhalation Hazard Zone B	2.3			P2, 2	A6.4.
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, Inhalation Hazard Zone C	2.3			P2, 3	A6.4.
★	UN3162	LIQUEFIED GAS, TOXIC, N.O.S, Inhalation Hazard Zone D	2.3			P2, 4	A6.4.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, Inhalation Hazard Zone A	2.3	5.1, 8		P1, 1	A6.15.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, Inhalation Hazard Zone B	2.3	2.1, 8		P2, 2	A6.4.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, Inhalation Hazard Zone C	2.3	2.1, 8		P2, 3	A6.4.
★	UN3310	LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S, Inhalation Hazard Zone D	2.3	2.1, 8		P2, 4	A6.4.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, Inhalation Hazard Zone A	2.3	5.1		P1, 1	A6.15.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, Inhalation Hazard Zone B	2.3	5.1		P2, 2	A6.4.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, Inhalation Hazard Zone C	2.3	5.1		P2, 3	A6.4.
★	UN3307	LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S, Inhalation Hazard Zone D	2.3	5.1		P2, 4	A6.4.
	UN1058	LIQUEFIED GASES, nonflammable charged with nitrogen, carbon dioxide or air	2.2			P5	A6.3., A6.4.
★	UN3161	LIQUEFIED GASES, FLAMMABLE, N.O.S.	2.1			P4	A6.3., A6.4.
		Liquefied hydrocarbon gas, see <b>HYDROCARBON GAS MIXTURE, LIQUIFIED N.O.S. ★</b> (UN1965)					
		Liquefied natural gas, see <b>METHANE, REFRIGERATED LIQUID</b> (UN1972) or <b>NATURAL GAS, REFRIGERATED LIQUID</b> (UN1972)					
		Liquefied petroleum gas, see <b>PETROLEUM GASES, LIQUEFIED</b> (UN1075)					
		Liquids, other than those classified as flammable, corrosive, or toxic, charged with nitrogen, carbon, dioxide or air, see <b>COMPRESSED GAS, N.O.S. ★</b> (UN1956)					
		Liquor, see <b>ALCOHOLIC BEVERAGES</b> (UN3065)					
	UN1415	<b>LITHIUM</b>	4.3		I	P3, A7, A19, N45	A8.3.
		Lithium acetylide ethylenediamine complex, see <b>WATER-REACTIVE SOLID, N.O.S. ★</b> (UN2813)					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Lithium alkyls, liquid, <i>see</i> <b>ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE ★</b> (UN3394)					
		Lithium alkyls, solid, <i>see</i> <b>ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE ★</b> (UN3393)					
	UN1410	<b>LITHIUM ALUMINIUM HYDRIDE</b>	4.3		I	P3, A19	A8.3.
	UN1411	<b>LITHIUM ALUMINIUM HYDRIDE, ETHEREAL</b>	4.3	3	I	P3, A2, A11, N34	A8.2.
		<i>Lithium amide, see</i> <b>ALKALI METAL AMIDES</b> (UN1390)					
	UN3536	<b>LITHIUM BATTERIES INSTALLED IN A CARGO TRANSPORT UNIT</b> <i>lithium ion batteries or lithium metal batteries</i>	9			P5, 389	A13.8
	UN1413	<b>LITHIUM BOROHYDRIDE</b>	4.3		I	P3, A19, N40	A8.3.
	UN2830	<b>LITHIUM FERROSILICON</b>	4.3		II	P5, A19	A8.3.
	UN1414	<b>LITHIUM HYDRIDE</b>	4.3		I	P3, A19, N40	A8.3.
	UN2805	<b>LITHIUM HYDRIDE, FUSED SOLID</b>	4.3		II	P5, A8, A19, A20	A8.3.
	UN2680	<b>LITHIUM HYDROXIDE</b>	8		II	P5	A12.3.
	UN2679	<b>LITHIUM HYDROXIDE, SOLUTION</b>	8		II III	P5 P5	A12.2. A12.2.
	UN1471	<b>LITHIUM HYPOCHLORITE, DRY</b> <i>or</i> <b>LITHIUM HYPOCHLORITE MIXTURE</b>	5.1		II III	P5, A9, N34 P5, N34	A9.6. A9.6
		<i>Lithium in cartridges or cartouches; see</i> <b>LITHIUM</b> (UN1415)					
	UN3480	<b>LITHIUM ION BATTERIES</b> <i>including lithium polymer batteries</i>	9			P5, 388, 422, A54	A13.7.
	UN3481	<b>LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT</b> <i>including lithium polymer batteries</i>	9			P5, 181, 360, 388, 422, A54	A13.8.
	UN3481	<b>LITHIUM ION BATTERIES PACKED WITH EQUIPMENT</b> <i>including lithium polymer batteries</i>	9			P5, 181, 360, 388, 422, A54	A13.9.
	UN3090	<b>LITHIUM METAL BATTERIES</b> <i>including lithium alloy batteries</i>	9			P4, 388, 422, A54, A101	A13.7.
	UN3091	<b>LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT</b> <i>including lithium alloy batteries</i>	9			P4, 181, 360, 388, 422, A54 101	A13.8.
	UN3091	<b>LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT</b> <i>including lithium alloy batteries</i>	9			P4, 181, 360, 388, 422, A54, A101	A13.9
	UN2722	<b>LITHIUM NITRATE</b>	5.1		III	P5, A1	A9.6.
	UN2806	<b>LITHIUM NITRIDE</b>	4.3		I	P3, A19, N40	A8.3.
	UN1472	<b>LITHIUM PEROXIDE</b>	5.1		II	P5, A9, N34	A9.6.
		<i>Lithium silicide, see</i> <b>LITHIUM SILICON</b>					
	UN1417	<b>LITHIUM SILICON</b>	4.3		II	P5, A19, A20	A8.3.
		<i>LNG, see</i> <b>NATURAL GAS, REFRIGERATED LIQUID</b> (UN1972) <i>or</i> <b>METHANE, REFRIGERATED LIQUID</b> (UN1972)					
	UN1621	<b>LONDON PURPLE</b>	6.1		II	P5	A10.5.
		<i>LPG, see</i> <b>PETROLEUM GASES, LIQUEFIED</b> (UN1075)					
		<i>Lye solid, see</i> <b>SODIUM HYDROXIDE, SOLID</b> (UN1823)					
		<i>Lye solution, see</i> <b>SODIUM HYDROXIDE, SOLUTIONS</b> (UN1824)					
		<i>Lythene, see</i> <b>PETROLEUM DISTILLATES, N.O.S. ★</b> (UN1268)					
	UN3529	<b>MACHINERY, FUEL CELL, FLAMMABLE GAS POWERED, or MACHINERY, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED, see</b> <b>ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or ENGINE, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED</b>	2.1			P5, 135, A200	A6.27



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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN3528	MACHINERY, FUEL CELL, FLAMMABLE LIQUID POWERED, or MACHINERY, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED, see ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED or ENGINE, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED	3			P5, 135, A200	A7.11
	UN3530	MACHINERY, INTERNAL COMBUSTION, see ENGINE, INTERNAL COMBUSTION	9			P5, 135, A200	A13.20
	UN1869	MAGNESIUM or MAGNESIUM ALLOYS with more than 50% magnesium in pellets, turnings or ribbons	4.1		III	P5, A1	A8.3.
		Magnesium alloys with 50% or less magnesium in pellets, turnings or ribbons (Not Restricted)					
		Magnesium Alkyls, see ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE ★ (UN3394)					
	UN1419	MAGNESIUM ALUMINIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N34, N40	A8.3.
+	UN1622	MAGNESIUM ARSENATE	6.1		II	P5	A10.5.
		Magnesium bisulfite solution, see BISULFITES AQUEOUS SOLUTIONS, N.O.S. ★ (UN2693)					
	UN1473	MAGNESIUM BROMATE	5.1		II	P5, A1	A9.6.
	UN2723	MAGNESIUM CHLORATE	5.1		II	P5	A9.6.
		Magnesium chloride and chlorate mixture, see CHLORATE AND MAGNESIUM CHLORIDE MIXTURE, SOLID (UN1459) or CHLORATE AND MAGNESIUM CHLORIDE MIXTURE SOLUTION (UN3407)					
	UN2004	MAGNESIUM DIAMIDE	4.2		II	P5, A8, A19, A20	A8.3.
		MAGNESIUM DIPHENYL see ORGANOMETALLIC, SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE ★ (UN3393)					
		Magnesium dross, wet or hot					FORBIDDEN
	UN2853	MAGNESIUM FLUOROSILICATE	6.1		III	P5	A10.5.
	UN2950	MAGNESIUM GRANULES, COATED, particle size not less than 149 Microns	4.3		III	P5, A1, A19	A8.3.
	UN2010	MAGNESIUM HYDRIDE	4.3		I	P3, A19, N40	A8.3.
	UN1474	MAGNESIUM NITRATE	5.1		III	P5, 332, A1	A9.6.
	UN1475	MAGNESIUM PERCHLORATE	5.1		II	P5	A9.6.
	UN1476	MAGNESIUM PEROXIDE	5.1		II	P5	A9.6.
	UN2011	MAGNESIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
	UN1418	MAGNESIUM, POWDER or MAGNESIUM ALLOYS, POWDER	4.3	4.2 4.2 4.2	I II III	P3, A19 P5, A19 P5, A19	A8.3. A8.3. A8.3.
		Magnesium scrap, see MAGNESIUM or MAGNESIUM ALLOYS (UN1869)					
	UN2624	MAGNESIUM SILICIDE	4.3		II	P5, A19, A20	A8.3.
		Magnesium silicofluoride, see MAGNESIUM FLUOROSILICATE (UN2853)					
	UN2807	MAGNETIZED MATERIAL	9			P5	A13.11.
	UN2215	MALEIC ANHYDRIDE	8		III	P5	A12.3.
	UN2215	MALEIC ANHYDRIDE, MOLTEN	8				FORBIDDEN
		Malonic dinitrile or Malonodinitrile, see MALONONITRILE (UN2647)					
	UN2647	MALONONITRILE	6.1		II	P5	A10.5.
		Mancozeb (manganese, ethylenebisdithiocarbamate complex with zinc) see MANEB (UN2210)					
	UN2210	MANEB or MANEB PREPARATIONS with not less than 60% maneb	4.2	4.3	III	P5, 54, 57, A1, A19	A8.3.

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN2968	MANEB STABILIZED or MANEB PREPARATIONS, STABILIZED against self-heating	4.3		III	P5, 54, 57, A1, A19	A8.3.
		Manganese ethylene-di-dithiocarbamate or Manganese ethylene-1,2-di-dithiocarbamate, see MANEB (UN2210) or MANEB PREPARATION (UN2210) or MANEB, STABILIZED (UN2968) or MANEB PREPARATION, STABILIZED (UN2968)					
		Manganese (II) nitrate, see MANGANESE NITRATE (UN2724)					
	UN2724	MANGANESE NITRATE	5.1		III	P5, A1	A9.6.
	UN1330	MANGANESE RESINATE	4.1		III	P5, A1	A8.3.
		Manganous nitrate, see MANGANESE NITRATE (UN2724)					
		Mannitan tetranitrate					FORBIDDEN
		Mannitol hexanitrate (dry)					FORBIDDEN
	UN0133	MANNITOL HEXANITRATE, WETTED or NITROMANNITE, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1.1D			P4	A5.6.
		Marine pollutants, liquid, or solid, N.O.S., see ENVIRONMENTALLY HAZARDOUS SUBSTANCES LIQUID, N.O.S. (UN3082) or ENVIRONMENTALLY HAZARDOUS SUBSTANCES SOLID N.O.S. (UN3077)					
		Mannitol hexanitrate, wetted with less than 40% water or mixture of alcohol and water					FORBIDDEN
		Matches, block, see MATCHES, STRIKE ANYWHERE (UN1331)					
	UN2254	MATCHES, FUSEE	4.1		III	P4	A8.14.
		Matches, Safety, see MATCHES, STRIKE ANYWHERE (UN1331) or MATCHES SAFETY (UN1944)					
	UN1944	MATCHES, SAFETY (book, card or strike on box)	4.1		III	P5	A8.14
	UN1331	MATCHES, STRIKE ANYWHERE	4.1		III	P4	A8.14
		Matches trick, see FIREWORKS (UN0333, UN0334, UN0335, UN0336, UN0337)					
	UN1945	MATCHES, WAX, VESTA	4.1		III	P5	A8.14
		Matting Acid, see SULFURIC ACID (UN1830, UN2796)					
	UN3291	MEDICAL WASTE, N.O.S.	6.2		II	P5	A10.10.
	UN3549	MEDICAL WASTE, Category A, affecting animals only, solid	6.2			P1, 131, 430, A117, A502	FORBIDDEN
	UN3549	MEDICAL WASTE, Category A, affecting humans solid	6.2			P1, 131, 430, A117, A502	FORBIDDEN
		Medicine, N.O.S. in small inner packagings containing flammable aerosol and/or non-flammable aerosol and/or flammable liquid and/or toxic substance, N.O.S., see CONSUMER COMMODITY (ID8000)					
	UN3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1	II III	P4 P5	A7.2. A7.2.
	UN1851	MEDICINE, LIQUID TOXIC, N.O.S.	6.1		II III	P5 P5	A10.4. A10.4.
	UN3249	MEDICINE, SOLID, TOXIC, N.O.S.	6.1		II III	P5 P5	A10.5. A10.5.
		Mentetrahedrophthalic anhydride, see CORROSIVE LIQUIDS, N.O.S. (UN1760)					
		p-Mentha-1,8-diene, see DIPENTENE (UN2052)					
★	UN3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN1228	MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S. or MERCAPTAN MIXTURES, LIQUID, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1	II III	P4 P5	A7.2. A7.2.
★	UN3071	MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	3	II	P5	A10.4.
		2-Mercaptoethanol see THIOGLYCOL (UN2966)					
		2-Mercaptopropionic acid, see THIOLACTIC ACID (UN2936)					
	UN0448	5-MERCAPTOTETRAZOL-1-ACETIC ACID	1.4C			P5	A5.9.
	UN1623	MERCURIC ARSENATE	6.1		II	P5	A10.5.
	UN1624	MERCURIC CHLORIDE	6.1		II	P5	A10.5.
		Mercuric compound, see MERCURY COMPOUNDS LIQUID, N.O.S. ★ (UN2024) or MERCURY COMPOUNDS SOLID, N.O.S. ★ (UN2025)					
	UN1625	MERCURIC NITRATE	6.1		II	P5, N73	A10.5.
+	UN1626	MERCURIC POTASSIUM CYANIDE	6.1		I	P5, N74, N75	A10.5.
		Mercuric salt, see MERCURY COMPOUND, LIQUID, N.O.S. ★ (UN2024) or MERCURY COMPOUND SOLID, N.O.S. ★ (UN2025)					
		THIOCYANATE (UN1646)					
		Mercuric sulphate or sulfate, see MERCURY SULPHATE or SULFATE (UN1645)					
		Mercuriol, see MERCURY NUCLEATE (UN1639)					
		Mercurous azide					FORBIDDEN
		Mercurous bisulphate, see MERCURY SULPHATE (UN1645)					
		Mercurous chloride, see MERCURY COMPOUND, SOLID, N.O.S. ★ (UN2025)					
		Mercurous compound, see MERCURY COMPOUND LIQUID N.O.S. ★ (UN2024) or MERCURY COMPOUND SOLID, N.O.S. (UN2025)					
	UN1627	MERCUROUS NITRATE	6.1		II	P5	A10.5.
		Mercurous sulfate, see MERCURY SULPHATE or SULFATE (UN1645)					
	UN2809	MERCURY	8	6.1	III	P5, 365	A12.9.
	UN1629	MERCURY ACETATE	6.1		II	P5	A10.5.
		Mercury acetylde					FORBIDDEN
	UN1630	MERCURY AMMONIUM CHLORIDE	6.1		II	P5	A10.5.
★	UN2778	MERCURY BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2
★	UN3012	MERCURY BASED PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3011	MERCURY BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23 degrees C	6.1	3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2777	MERCURY BASED PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1631	MERCURY BENZOATE	6.1		II	P5	A10.5.
		Mercury bichloride, see MERCURIC CHLORIDE (UN1624)					
		Mercury bisulphate, or bisulfate, see MERCURY SULPHATE, or SULFATE (UN1645)					
	UN1634	MERCURY BROMIDES	6.1		II	P5	A10.5.
	UN2024	MERCURY COMPOUNDS, LIQUID, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN2025	MERCURY COMPOUNDS, SOLID, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN3506	MERCURY CONTAINED IN MANUFACTURED ARTICLES	8	6.1	III	P5, A191	A12.9
	UN1636	MERCURY CYANIDE	6.1		II	P5, N74, N75	A10.5.
	UN0135	MERCURY FULMINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1A			P3, 111, 117	A5.4.
		<i>Mercury fulminate, wetted with less than 20% water or mixture of alcohol and water</i>					FORBIDDEN
	UN1637	MERCURY GLUCONATE	6.1		II	P5	A10.5.
	UN1638	MERCURY IODIDE, SOLUTION or MERCURY IODIDE, SOLID	6.1		II	P5	A10.4., A10.5.
		<i>Mercury iodine aquabasic ammonobasic (Iodide of Millon's base)</i>					FORBIDDEN
		<i>Mercury Nitride</i>					FORBIDDEN
	UN1639	MERCURY NUCLEATE	6.1		II	P5	A10.5.
	UN1640	MERCURY OLEATE	6.1		II	P5	A10.5.
	UN1641	MERCURY OXIDE	6.1		II	P5	A10.5.
	UN1642	MERCURY OXYCYANIDE, DESENSITIZED	6.1		II	P5	A10.5.
		<i>Mercury oxycyanide, not desensitized</i>					FORBIDDEN
	UN1643	MERCURY POTASSIUM IODIDE	6.1		II	P5	A10.5.
	UN1644	MERCURY SALICYLATE	6.1		II	P5	A10.5.
+	UN1645	MERCURY SULFATES	6.1		II	P5	A10.5.
	UN1646	MERCURY THIOCYANATE	6.1		II	P5	A10.5.
		<i>Mercury vapour tubes, see MERCURY CONTAINED IN MANUFACTURED ARTICLES (UN3506)</i>					
		<i>Mesitylene, see 1,3,5-TRIMETHYLBENZENE (UN2325)</i>					
	UN1229	MESITYL OXIDE	3		III	P5	A7.2.
★	UN3281	METAL CARBONYLS, LIQUID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.4. A10.4. A10.4.
	UN3466	METAL CARBONYLS, SOLID, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.5 A10.5 A10.5
★	UN2881	METAL CATALYST, DRY	4.2		I II III	P3, N34 P5, N34 P5, N34	A8.11. A8.11. A8.11.
	UN1378	METAL CATALYST, WETTED with a visible excess of liquid	4.2		II	P5, A2, A8, N34	A8.3.
		<i>Metal catalyst, wetted without a visible excess of liquid</i>					FORBIDDEN
	UN1332	METALDEHYDE	4.1		III	P5, A1	A8.3.
★	UN3182	METAL HYDRIDES, FLAMMABLE, N.O.S.	4.1		II III	P5, A1 P5, A1	A8.3. A8.3.
★	UN1409	METAL HYDRIDES, WATER-REACTIVE, N.O.S.	4.3		I II	P3, A19, N34, N40 P5, A19, N34, N40	A8.3. A8.3.
★	UN3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3		I II III	P3, A7 P5, A7 P5, A7	A8.3. A8.3. A8.3.
★	UN3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	4.2 4.2 4.2	I II III	P3, A7 P4, A7 P5, A7	A8.3. A8.3. A8.3.
	UN3089	METAL POWDERS, FLAMMABLE, N.O.S.	4.1		II III	P5 P5	A8.3. A8.3.
★	UN3189	METAL POWDER, SELF-HEATING, N.O.S.	4.2		II III	P5 P5	A8.3. A8.3.
		<i>Metal salts of methyl nitramine (dry)</i>					FORBIDDEN

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3181	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	4.1		II III	P4, A1 P4, A1	A8.3. A8.3.
	UN1332	METALDEHYDE	4.1		III	P5, A1	A8.3.
★	UN3208	METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.	4.3		I II III	P3, A7 P5, A7 P5, A7	A8.3. A8.3. A8.3.
★	UN3209	METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	4.2 4.2 4.2	I II III	P3, A7 P4, A7 P5, A7	A8.3. A8.3. A8.3.
	UN2396	METHACRYLALDEHYDE, STABILIZED	3	6.1	II	P5, 387	A7.2.
	UN2531	METHACRYLIC ACID, STABILIZED	8		III	P5, 45, 387	A12.2.
		<i>Methacrylic acid, unstabilized</i>					FORBIDDEN
+	UN3079	METHACRYLONITRILE, STABILIZED	6.1	3	I	P2, 2, 387	A10.6.
	UN2614	METHALLYL ALCOHOL	3		III	P5	A7.2.
		<i>Methanal, see FORMALDEHYDE SOLUTION, FLAMMABLE (UN1198) or FORMALDEHYDE SOLUTION (UN2209)</i>					
		<i>Methane and hydrogen mixtures, see HYDROGEN AND METHANE, MIXTURES, COMPRESSED (UN2034)</i>					
	UN1971	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED (with high methane content)	2.1			P4	A6.3., A6.5.
	UN1972	METHANE, REFRIGERATED LIQUID(cryogenic liquid) or NATURAL GAS, REFRIGERATED LIQUID (cryogenic liquid, with high methane content)	2.1			P3	A6.11.
	UN3246	METHANESULPHONYL CHLORIDE	6.1	8	I	P2, 2	A10.6.
D	UN1230	METHANOL	3		II	P4	A7.2.
+	UN1230	METHANOL	3	6.1	II	P4	A7.2.
		<i>Methazoic acid</i>					FORBIDDEN
		<i>2-Methoxyethyl acetate, see ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE (UN1189)</i>					
	UN2293	4-METHOXY-4-METHYLPENTAN-2-ONE	3		III	P5	A7.2.
		<i>1-Methoxy-2-nitrobenzene or 1-Methoxy-3-nitrobenzene or 1-Methoxy-4-nitrobenzene, see NITROANISOLE, LIQUID (UN2730) or NITROANISOLE, SOLID (UN3458)</i>					
	UN3092	1-METHOXY-2-PROPANOL	3		III	P5	A7.2.
+	UN2605	METHOXYMETHYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
	UN1231	METHYL ACETATE	3		II	P5	A7.2.
		<i>Methylacetylene and propadiene mixture, non-stabilized</i>					FORBIDDEN
	UN1060	METHYL ACETYLENE AND PROPADIENE MIXTURES, STABILIZED	2.1			P4, 387, N88	A6.3., A6.4.
		<i>beta-Methyl acrolein, see CROTONALDEHYDE (UN1143) or CROTONALDEHYDE, STABILIZED (UN1143)</i>					
	UN1919	METHYL ACRYLATE, STABILIZED	3		II	P5, 387	A7.2.
		<i>Methyl acrylate, unstabilized</i>					FORBIDDEN
		<i>Methyl Alcohol, see METHANOL (UN1230)</i>					
		<i>Methylallyl alcohol, see METHALLYL ALCOHOL (UN2614)</i>					
	UN1234	METHYLAL	3		II	P5	A7.2.
	UN2554	METHYLALLYL CHLORIDE	3		II	P5	A7.2.
		<i>Methyl amyl ketone, see n-AMYL METHYL KETONE (UN1110)</i>					
	UN1061	METHYLAMINE, ANHYDROUS	2.1			P4, N87	A6.3., A6.4.
	UN1235	METHYLAMINE, AQUEOUS SOLUTION	3	8	II	P4	A7.2.
		<i>Methylamine dinitramine and dry salts thereof</i>					FORBIDDEN
		<i>Methylamine nitroform</i>					FORBIDDEN
		<i>Methylamine perchlorate (dry)</i>					FORBIDDEN
	UN1233	METHYLAMYL ACETATE	3		III	P5	A7.2.
		<i>Methyl amyl alcohol, see METHYLISOBUTYL CARBINOL (UN2053)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN2294	N-METHYLANILINE	6.1		III	P5	A10.4.
		Methylated spirit, see ALCOHOLS, FLAMMABLE, TOXIC, N.O.S. ★ (UN1986) or ALCOHOLS, N.O.S. ★ (UN1987)					
	UN2937	ALPHA-METHYLBENZYL ALCOHOL, LIQUID	6.1		III	P5	A10.4.
	UN3438	ALPHA-METHYLBENZYL ALCOHOL, SOLID	6.1		III	P5	A10.5
		Mine rescue equipment containing carbon dioxide, see CARBON DIOXIDE (UN1013)					
	UN1062	METHYL BROMIDE with not more than 2% chloropicrin	2.3			P2, 3, N86	A6.16.
		Methyl bromide and chloropicrin mixture, see CHLOROPICRIN AND METHYL BROMIDE MIXTURE (UN1581)					
	UN1647	METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURES, LIQUID	6.1		I	P2, 2, N65	A10.6.
	UN2643	METHYL BROMOACETATE	6.1		II	P5	A10.4.
	UN3371	2-METHYLBUTANAL	3		II	P5	A7.2.
	UN2397	3-METHYLBUTAN-2-ONE	3		II	P5	A7.2.
	UN2459	2-METHYL-1-BUTENE	3		I	P3	A7.2.
	UN2460	2-METHYL-2-BUTENE	3		II	P5	A7.2.
	UN2561	3-METHYL-1-BUTENE	3		I	P3	A7.2.
	UN2945	N-METHYLBUTYLAMINE	3	8	II	P4	A7.2.
	UN2398	METHYL-TERT-BUTYL ETHER	3		II	P5	A7.2.
	UN1237	METHYL BUTYRATE	3		II	P5	A7.2.
	UN1063	METHYL CHLORIDE or REFRIGERANT GAS R40	2.1			P4, N86	A6.3., A6.4.
		Methyl chloride and chloropicrin mixtures, see CHLOROPICRIN AND METHYL CHLORIDE MIXTURES (UN1582)					
	UN1912	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2.1			P4, N86	A6.3., A6.4.
	UN2295	METHYL CHLOROACETATE	6.1	3	I	P5	A10.4.
		Methyl chlorocarbonate, see METHYL CHLOROFORMATE (UN1238)					
		Methyl chloroform, see 1,1,1-TRICHLOROETHANE (UN2831)					
	UN1238	METHYL CHLOROFORMATE	6.1	3, 8	I	P1, 1, N34	A10.6.
		Methyl bromide and chloropicrin mixtures see CHLOROPICRIN AND METHYL BROMIDE MIXTURES					
	UN1239	METHYL CHLOROMETHYL ETHER	6.1	3	I	P1, 1	A10.6.
		Methyl-alpha-chloropropionate, see METHYL 2-CHLOROPROPIONATE (UN2933)					
	UN2933	METHYL-2-CHLOROPROPIONATE	3		III	P5	A7.2.
	UN2534	METHYLCHLOROSILANE	2.3	2.1, 8		P2, 2, A2, A7, N34	A6.19.
		Methyl Cyanide, see ACETONITRILE (UN1648)					
	UN2296	METHYLCYCLOHEXANE	3		II	P5	A7.2.
	UN2617	METHYLCYCLOHEXANOLS, flammable	3		III	P5	A7.2.
		Methylcyclohexanols, flash point more than 60 degrees C (Not Restricted)					
	UN2297	METHYLCYCLOHEXANONE	3		III	P5	A7.2.
	UN2298	METHYLCYCLOPENTANE	3		II	P5	A7.2.
	UN2299	METHYL DICHLOROACETATE	6.1		III	P5	A10.4.
		Methyldichloroarsine					FORBIDDEN
D	NA1556	METHYLDICHLOROARSINE	6.1		I	P2, 2	A10.2
	UN1242	METHYLDICHLOROSILANE	4.3	3, 8	I	P3, A2, A7, N34	A8.2.
		Methylene bromide, see DIBROMETHANE (UN2664)					
		Methylene chloride, see DICHLOROMETHANE (UN1593)					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Methylene chloride and methyl chloride mixture, see <b>METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE</b> (UN1912)					
		Methylene cyanide, see <b>MALONONITRILE</b> (UN2647)					
		<i>p,p'</i> -Methylene dianiline, see <b>4,4'-DIAMINODIPHENYLMETHANE</b> (UN2651)					
		Methylene dibromide, see <b>DIBROMOMETHANE</b> (UN2664)					
		2,2-methylene-di-(3,4,6-trichlorophenol), see <b>HEXACHLOROPHENE</b> (UN2875)					
		Methylene glycol dinitrate					FORBIDDEN
		Methyl ethyl ether, see <b>ETHYL METHYL ETHER</b> (UN1039)					
	UN1193	<b>METHYL ETHYL KETONE, or ETHYL METHYL KETONE</b>	3		II	P5	A7.2.
		Methyl ethyl ketone peroxide(s), 48% or more if available oxygen above 10% and not more than 10.7% with or without water					FORBIDDEN
		Methyl ethyl ketone peroxide(s), not more than 52% when with 48% or more diluent type A					FORBIDDEN
	UN2300	<b>2-METHYL-5-ETHYLPYRIDINE</b>	6.1		III	P5	A10.4.
	UN2454	<b>METHYL FLUORIDE or REFRIGERANT GAS R41</b>	2.1			P4	A6.3., A6.4.
	UN1243	<b>METHYL FORMATE</b>	3		I	P3	A7.2.
	UN2301	<b>2-METHYLFURAN</b>	3		II	P5	A7.2.
		<i>α</i> -Methylglucoside Tetranitrate					FORBIDDEN
		<i>α</i> -Methylglycerol Trinitrate					FORBIDDEN
		Methyl glycol, see <b>ETHYLENE GLYCOL MONOMETHYL ETHER</b> (UN1188)					
		Methyl glycol acetate, see <b>ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE</b> (UN1189)					
	UN3023	<b>2-METHYL-2-HEPTANETHIOL</b>	6.1	3	I	P2, 2	A10.6.
	UN2302	<b>5-METHYLHEXAN-2-ONE</b>	3		III	P5	A7.2.
		Methyl hydrate, see <b>METHANOL</b> (UN1230)					
	UN1244	<b>METHYLHYDRAZINE</b>	6.1	3, 8	I	P1, 1, N34	A10.6.
		Methyl hydroxide, see <b>METHANOL</b> (UN1230)					
		1-Methylimidazole, see <b>CORROSIVE LIQUID, N.O.S. ★</b> (UN2922)					
	UN2644	<b>METHYL IODIDE</b>	6.1		I	P2, 2	A10.6.
		Methyl isoamyl ketone, see <b>5-METHYLHEXAN-2-ONE</b> (UN2302)					
	UN2053	<b>METHYL ISOBUTYL CARBINOL</b>	3		III	P5	A7.2.
	UN1245	<b>METHYL ISOBUTYL KETONE</b>	3		II	P5	A7.2.
		Methyl isobutyl ketone peroxide, in solution with more than 9% by mass active oxygen					FORBIDDEN
	UN2480	<b>METHYL ISOCYANATE</b>	6.1	3	I	P1, 1	A10.6.
	UN1246	<b>METHYL ISOPROPENYL KETONE, STABILIZED</b>	3		II	P5, 387	A7.2.
		Methyl isopropenyl ketone, unstabilized					FORBIDDEN
	UN2477	<b>METHYL ISOTHIOCYANATE</b>	6.1	3	I	P2, 2	A10.6.
	UN2400	<b>METHYL ISOVALERATE</b>	3		II	P5	A7.2.
	UN1928	<b>METHYL MAGNESIUM BROMIDE IN ETHYL ETHER</b>	4.3	3	I	P3	A8.2.
	UN1064	<b>METHYL MERCAPTAN</b>	2.3	2.1		P2, 3, N89	A6.4.
		Methyl mercaptopropionaldehyde, see <b>4-THIAPENTANAL</b> (UN2785)					
	UN1247	<b>METHYL METHACRYLATE MONOMER, STABILIZED</b>	3		II	P5, 387	A7.2.
		Methyl methacrylate monomer, unstabilized					FORBIDDEN
	UN2535	<b>4-METHYLMORPHOLINE or N-METHYLMORPHOLINE</b>	3	8	II	P5	A7.2.
		Methyl nitramine (dry), metal salts of					FORBIDDEN

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Methyl nitrate					FORBIDDEN
		Methyl nitrite					FORBIDDEN
		Methyl norbornene dicarboxylic anhydride, see <b>CORROSIVE LIQUID N.O.S.</b> (UN1760)					
	UN2606	<b>METHYL ORTHOSILICATE</b>	6.1	3	I	P2, 2	A10.6.
		Methyl oxide, see <b>DIMETHYL ETHER</b> (UN1033)					
D	NA9206	<b>METHYL PHOSPHONIC DICHLORIDE</b>	6.1	8	I	P2, 2, A3 N34, N43	A10.6.
	UN2461	<b>METHYLPENTADIENES</b>	3		II	P5	A7.2.
		Methylpentanes, see <b>HEXANES</b> (UN1208)					
		4-methylpentan-2-ol, see <b>METHYL ISOBUTYL CARBINOL</b> (UN2053)					
	UN2560	<b>2-METHYLPENTAN-2-OL</b>	3		III	P5	A7.2.
		3-Methyl-2-penten-4-one-ol, see <b>1-PENTOL</b> (UN2705)					
	UN2437	<b>METHYLPHENYLDICHLOROSILANE</b>	8		II	P5	A12.2.
		2-Methyl-2-phenylpropane, see <b>BUTYLBENZENES</b> (UN2709)					
		Methyl phosphonothioic dichloride, anhydrous, see <b>CORROSIVE LIQUID, N.O.S.</b> (UN1760)					
		Methyl phosphonous dichloride, see <b>PYROPHORIC LIQUID, ORGANIC, N.O.S. ★</b> (UN2845)					
		Methyl picric acid (heavy metal salts of)					FORBIDDEN
D	NA2845	<b>METHYL PHOSPHONOUS DICHLORIDE, pyrophoric liquid</b>	6.1	4.2	I	P2, 2	A10.6.
	UN2399	<b>1-METHYLPYPERIDINE</b>	3	8	II	P4	A7.2.
		Methylpropane, see <b>ISOBUTANE</b> (UN1969)					
		2-Methyl-2-propanol, see <b>BUTANOLS</b> (UN1120)					
		2-Methylpropan-1-ol, see <b>ISOBUTANOL</b> (UN1212)					
	UN1248	<b>METHYL PROPIONATE</b>	3		II	P5	A7.2.
		Methylpropylbenzene, see <b>CYMENES</b> (UN2046)					
	UN2612	<b>METHYL PROPYL ETHER</b>	3		II	P5	A7.2.
	UN1249	<b>METHYL PROPYL KETONE</b>	3		II	P5	A7.2.
		Methyl pyridines, see <b>PICOLINES</b> (UN2313)					
		alpha- Methylstyrene, see <b>ISOPROPENYLBENZENE</b> (UN2303)					
		Methylstyrene, stabilized, see <b>VINYLTOLUENES, STABILIZED</b> (UN2618)					
		Methyl sulphate or sulfate, see <b>DIMETHYL SULPHATE, or SULFATE</b> (UN1595)					
		Methyl sulphate sulfide, see <b>DIMETHYL SULPHIDE or SULFIDE</b> (UN1164)					
	UN2536	<b>METHYLTETRAHYDROFURAN</b>	3		II	P5	A7.2.
	UN2533	<b>METHYL TRICHLOROACETATE</b>	6.1		III	P5	A10.4.
	UN1250	<b>METHYLTRICHLOROSILANE</b>	3	8	II	P3, A7, N34	A7.2.
		Methyl trimethylol methane trinitrate					FORBIDDEN
	UN2367	<b>ALPHA-METHYLVALERALDEHYDE</b>	3		II	P5	A7.2.
		Methyl vinyl benzene, stabilized, see <b>VINYLTOLUENES, STABILIZED</b> (UN2618)					
	UN1251	<b>METHYL VINYL KETONE, STABILIZED</b>	6.1	3, 8	I	P1, 1, 387	A10.6.
		Metramine, see <b>HEXAMETHYLENETETRAMINE</b> (UN1328)					
		MIBC, see <b>METHYL ISOBUTYL CARBINOL</b> (UN2053)					
	UN1235	<b>METHYLAMINE, AQUEOUS SOLUTION</b>	3	8	II	P4	A7.2.
		Methylamine dinitramine and dry salts thereof					FORBIDDEN
		Methylamine nitroform					FORBIDDEN
		Methylamine perchlorate (dry)					FORBIDDEN
	UN1233	<b>METHYLAMYL ACETATE</b>	3		III	P5	A7.2.
	UN2294	<b>N-METHYLANILINE</b>	6.1		III	P5	A10.4.
	UN2937	<b>ALPHA-METHYLBENZYL ALCOHOL, LIQUID</b>	6.1		III	P5	A10.4.
	UN3438	<b>ALPHA-METHYLBENZYL ALCOHOL, SOLID</b>	6.1		III	P5	A10.5



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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Mine rescue equipment containing carbon dioxide, see <b>CARBON DIOXIDE</b> (UN1013)					
	UN0137	<b>MINES</b> with bursting charge	1.1D			P4	A5.12.
	UN0136	<b>MINES</b> with bursting charge	1.1F			P4	A5.12.
	UN0138	<b>MINES</b> with bursting charge	1.2D			P4	A5.12.
	UN0294	<b>MINES</b> with bursting charge	1.2F			P4	A5.12.
		Mirbane, see <b>NITROBENZENE</b> (UN1662)					
		Missiles guided, see <b>ROCKETS</b> (UN0180, UN0181, UN0182, UN0183, UN0295, UN0436, UN0437, UN0438) or <b>ROCKETS, LIQUID FUELLED</b> (UN0397, UN0398)					
		Mixed acid, see <b>NITRATING ACID, MIXTURES, etc.</b> (UN1826, UN1796)					
		Mobility aids, see <b>BATTERY – POWERED EQUIPMENT</b> (UN3171) or <b>BATTERY POWERED VEHICLE</b> (UN3171)					
D	NA0276	<b>MODEL ROCKET MOTOR</b>	1.4C			P5, 51, 62	A5.12.
D	NA0323	<b>MODEL ROCKET MOTOR</b>	1.4S			P5, 51, 62	A5.12.
	UN2508	<b>MOLYBDENUM PENTACHLORIDE</b>	8		III	P5	A12.3.
		Monochloroacetic acid, see <b>CHLOROACETIC ACID SOLUTION</b> (UN1750) or <b>CHLOROACETIC ACID SOLID</b> (UN1751)					
		Monochloroacetone (unstabilized)					FORBIDDEN
		Monochlorobenzene, see <b>CHLOROBENZENE</b> (UN1134)					
		Monochlorodifluoromethane, see <b>CHLORODIFLUOROMETHANE</b> (UN1018)					
		Monochlorodifluoromethane and monochloropentafluoroethane mixture (R502) see <b>CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROMETHANE MIXTURE</b> (UN1973)					
		Monochlorodifluoromonobromomethane, see <b>CHLORODIFLUOROBROMOMETHANE</b> (UN1974)					
		Monochloropentafluoroethane and monochlorodifluoromethane mixture, see <b>CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE</b> (UN1973)					
		Monochloroethylene, see <b>VINYL CHLORIDE, STABILIZED</b> (UN1086)					
		Monoethanolamine, see <b>ETHANOLAMINE, SOLUTIONS</b> (UN2491)					
		Monoethylamine, see <b>ETHYLAMINE</b> (UN1036)					
		Monopropylamine, see <b>PROPYLAMINE</b> (UN1277)					
	UN2054	<b>MORPHOLINE</b>	8	3	I	P5	A12.2.
		Morpholine, aqueous, mixture, see <b>CORROSIVE LIQUID, N.O.S.</b> (UN1760)					
+	UN1649	<b>MOTOR FUEL ANTI-KNOCK MIXTURE</b>	6.1		I	P3, 14	A10.4.
	UN3483	<b>MOTOR FUEL ANTI-KNOCK MIXTURE, FLAMMABLE</b>	6.1	3	I	P3, 14	A10.4.
	UN1203	<b>MOTOR SPIRIT</b> or <b>GASOLINE</b> or <b>PETROL</b>	3		II	P5	A7.2.
		Motorcycle, see <b>VEHICLE, FLAMMABLE GAS POWERED</b> (UN3166) or <b>VEHICLE, FLAMMABLE LIQUID POWERED</b> (UN3166)					
		Muriatic acid, see <b>HYDROCHLORIC ACID</b> (UN1789)					
	UN2956	<b>MUSK XYLENE</b> or <b>5-TERT-BUTYL-2,4,6-TRINITO-M-XYLENE</b>	4.1		III	P5, 159	A8.4.
		Mysorite, see <b>ASBESTOS, AMPHIBOLE ★</b> (UN2212)					
		Naphtha, see <b>PETROLEUM DISTILLATE N.O.S ★</b> (UN1268)					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1334	<b>NAPHTHALENE, CRUDE or REFINED</b>	4.1		III	P5, A1	A8.3.
		<i>Naphthalene diozonide</i>					FORBIDDEN
	UN2304	<b>NAPHTHALENE, MOLTEN</b>	4.1		III		FORBIDDEN
		<i>Naphtha petroleum, see PETROLEUM DISTILLATES, N.O.S. ★ (UN1268)</i>					
		<i>Naphtha solvent, see PETROLEUM PRODUCTS, N.O.S. ★ (UN1268)</i>					
		<i>Naphthenates, see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)</i>					
		<i>Naphthene, see CYCLOHEXANE (UN1145)</i>					
	UN2077	<b>ALPHA-NAPHTHYLAMINE</b>	6.1		III	P5	A10.5.
		<i>Naphthy amineperchlorate</i>					FORBIDDEN
	UN1650	<b>BETA-NAPHTHYLAMINE, SOLID</b>	6.1		II	P5	A10.5.
	UN3411	<b>BETA- NAPHTHYLAMINE SOLUTION</b>	6.1		II III	P5 P5	A10.4 A10.4
		<i>1-Naphthylthiourea, see NAPHTHYLTHIOUREA (UN1651)</i>					
	UN1651	<b>NAPHTHYLTHIOUREA</b>	6.1		II	P5	A10.5.
	UN1652	<b>NAPHTHYLUREA</b>	6.1		II	P5	A10.5.
	UN1971	<b>NATURAL GAS, COMPRESSED, with methane content</b>	2.1			P4	A6.3., A6.5.
		<i>Natural gasoline, see MOTOR SPIRIT (UN1203) or GASOLINE (UN1203) or PETROL (UN1203)</i>					
	UN1972	<b>NATURAL GAS, REFRIGERATED LIQUID, with high methane content</b>	2.1			P3	A6.11.
		<i>Neohexane, see HEXANES (UN1208)</i>					
	UN1065	<b>NEON, COMPRESSED</b>	2.2			P5	A6.3., A6.5.
		<i>Neon, liquid, non-pressurized</i>					FORBIDDEN
	UN1913	<b>NEON, REFRIGERATED LIQUID</b>	2.2			P4	A6.11.
		<i>Neopentane, see 2,2-DIMETHYLPROPANE (UN2044)</i>					
		<i>Neothyl, see METHYL PROPYL ETHER (UN2612)</i>					
		<i>Nickel arsenate, solid, see ARSENIC COMPOUND, SOLID, N.O.S. ★ (UN1557)</i>					
	UN1259	<b>NICKEL CARBONYL</b>	6.1	3	I		FORBIDDEN
		<i>Nickel catalyst, see METAL CATALYST, WETTED ★ (UN1378) or METAL CATALYST, DRY ★ (UN2881)</i>					
	UN1653	<b>NICKEL CYANIDE</b>	6.1		II	P5, N74, N75	A10.5.
		<i>Nickel (II) cyanide, see NICKEL CYANIDE (UN1653)</i>					
		<i>Nickel (II) nitrate, see NICKEL NITRATE (UN2725)</i>					
		<i>Nickel (II) nitrite, see NICKEL NITRITE (UN2726)</i>					
	UN2725	<b>NICKEL NITRATE</b>	5.1		III	P5, A1	A9.6.
	UN2726	<b>NICKEL NITRITE</b>	5.1		III	P5, A1	A9.6.
		<i>Nickelous nitrate, see NICKEL NITRATE (UN2725)</i>					
		<i>Nickelous nitrite, see NICKEL NITRITE (UN2726)</i>					
		<i>Nickel Picrate</i>					FORBIDDEN
		<i>Nickel tetracarbonyl, see NICKEL CARBONYL (UN1259)</i>					
	UN1654	<b>NICOTINE</b>	6.1		II	P5	A10.4.
★	UN3144	<b>NICOTINE COMPOUNDS, LIQUID, N.O.S. or NICOTINE PREPARATIONS, LIQUID, N.O.S.</b>	6.1		I II III	P3, A4 P5 P5	A10.4. A10.4. A10.4.
★	UN1655	<b>NICOTINE COMPOUNDS, SOLID, N.O. S. or NICOTINE PREPARATIONS, SOLID, N.O.S.</b>	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1656	<b>NICOTINE HYDROCHLORIDE LIQUID or NICOTINE HYDROCHLORIDE SOLUTION</b>	6.1		II	P5	A10.4.
	UN3444	<b>NICOTINE HYDROCHLORIDE, SOLID</b>	6.1		II	P5	A10.6
	UN1657	<b>NICOTINE SALICYLATE</b>	6.1		II	P5	A10.5.
	UN3445	<b>NICOTINE SULFATE, SOLID</b>	6.1		II	P5	A10.6

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1658	NICOTINE SULFATE, SOLUTION	6.1		II	P5	A10.4
	UN1659	NICOTINE TARTRATE	6.1		II	P5	A10.5.
		Nitrated Paper (unstable)					FORBIDDEN
	UN3218	NITRATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1		II III	P5 P5	A9.5. A9.5.
	UN1477	NITRATES, INORGANIC, N.O.S.	5.1		II III	P5 P5	A9.6. A9.6.
		Nitrates of diazonium compounds					FORBIDDEN
	UN1796	NITRATING ACID MIXTURES with not more than 50% nitric acid	8		II	P4, A7	A12.10.
	UN1796	NITRATING ACID MIXTURES with more than 50% nitric acid	8	5.1	I	P3, A7	A12.10.
	UN1826	NITRATING ACID MIXTURES, SPENT with not more than 50% or less nitric acid	8		II	P4, A7	A12.10.
	UN1826	NITRATING ACID MIXTURES, SPENT with more than 50% nitric acid	8	5.1	I	P3, A7	A12.10.
		Nitrating acid mixture, spent, all concentrations, unstable					FORBIDDEN
	UN2031	NITRIC ACID other than red fuming, with more than 20% and less than 65% nitric acid	8		II	P4, A212	A12.10.
	UN2031	NITRIC ACID other than red fuming, with at least 65% but with not more than 70% nitric acid	8	5.1	II	P4	A12.10.
	UN2031	NITRIC ACID, other than red fuming, with not more than 20% or less nitric acid	8		II	P4	A12.10.
	UN2031	NITRIC ACID, other than red fuming, with more than 70% nitric acid	8	5.1	I	P3	A12.10.
+	UN2032	NITRIC ACID, RED FUMING	8	5.1, 6.1	I	P2, 2	A12.11.
	UN1975	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURES or NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURES	2.3	5.1, 8			FORBIDDEN
	UN1660	NITRIC OXIDE, COMPRESSED	2.3	5.1, 8		P1, 1	A6.20.
		Nitric oxide, compressed contained in gas cartridges for use in sterilization devices, see <b>RECEPTACLES, SMALL, CONTAINING GAS</b> (UN2037) or <b>GAS CARTRIDGES</b> (UN2037)					
★	UN3273	NITRILES, FLAMMABLE, TOXIC, N.O.S.	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3275	NITRILES, TOXIC, FLAMMABLE, N.O.S.	6.1	3 3	I II	P3, 5 P4	A10.4. A10.4.
★	UN3276	NITRILES, LIQUID, TOXIC, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.4. A10.4. A10.4.
★	UN3439	NITRILES, SOLID, TOXIC, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.5. A10.5. A10.5.
★	UN3219	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1		II III	P5, 148 P5	A9.5. A9.5.
★	UN2627	NITRITES, INORGANIC, N.O.S.	5.1		II	P5, 33	A9.6.
		N-Nitroaniline					FORBIDDEN
+	UN1661	NITROANILINES (o-;m-;p-)	6.1		II	P5	A10.5.
	UN2730	NITROANISOLE, LIQUID	6.1		III	P5	A10.4.
	UN3458	NITROANISOLE, SOLID	6.1		III	P5	A10.5.
+	UN1662	NITROBENZENE	6.1		II	P5	A10.4.
		Nitrobenzene bromide, see <b>NITROBROMOBENZENES, LIQUID</b> (UN2732) or <b>NITROBROMOBENZENES, SOLID</b> (UN3459)					
		m-Nitrobenzene diazonium perchlorate					FORBIDDEN
	UN2305	NITROBENZENESULFONIC ACID	8		II	P5	A12.2.
		Nitrobenzol, see <b>NITROBENZENE</b> (UN1662)					
	UN0385	5-NITROBENZOTRIAZOL	1.1D			P4	A5.6.
	UN2306	NITROBENZOTRIFLUORIDES, LIQUID	6.1		II	P5	A10.4.
	UN3431	NITROBENZOTRIFLUORIDES, SOLID	6.1		II	P5	A10.5
	UN2732	NITROBROMOBENZENES, LIQUID	6.1		III	P5	A10.4.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN3459	<b>NITROBROMOBENZENES, SOLID</b>	6.1		III	P5	A10.5.
	UN0340	<b>NITROCELLULOSE</b> , dry or wetted with less than 25% water (or alcohol), by mass	1.1D			P4, 196	A5.6.
	UN0341	<b>NITROCELLULOSE</b> , unmodified or plasticized with less than 18% plasticizing substance, by mass	1.1D			P4, 196	A5.6.
	UN3270	<b>NITROCELLULOSE MEMBRANE FILTERS</b>	4.1		II	P5, 43, A1	A8.3.
	UN2557	<b>NITROCELLULOSE, MIXTURE WITH or WITHOUT PLASTICIZER, WITH or WITHOUT PIGMENT</b> with 12.6% or less nitrogen, by dry mass	4.1		II	P5, 44, 197	A8.3.
	UN0343	<b>NITROCELLULOSE, PLASTICIZED</b> with not less than 18% plasticizing substance, by mass	1.3C			P4, 196	A5.5.
	UN2059	<b>NITROCELLULOSE SOLUTION, FLAMMABLE</b> with not more than 12.6% nitrogen, by mass, and not more than 55% nitrocellulose	3		I II III	P4, 198 P5, 198 P5, 198	A7.2 A7.2. A7.2.
	UN0342	<b>NITROCELLULOSE, WETTED</b> with 25% or more alcohol, by mass	1.3C			P4, 196	A5.9.
	UN2556	<b>NITROCELLULOSE WITH ALCOHOL</b> 25% or more alcohol by mass, and 12.6% or less nitrogen, by dry mass	4.1		II	P5, 197	A8.3.
	UN2555	<b>NITROCELLULOSE WITH WATER</b> with not less than 25% water by mass	4.1		II	P5, 197	A8.3.
		Nitrochlorobenzene, see <b>CHLORONITROBENZENES SOLID</b> (UN1578) or <b>CHLORONITROBENZENES LIQUID</b> (UN3409)					
	UN2307	<b>3-NITRO-4-CHLOROENZOTRIFLUORIDE</b>	6.1		II	P5	A10.4.
		Nitrochloroform, see <b>CHLOROPICRIN</b> (UN1580)					
	UN3434	<b>NITROCRESOLS, LIQUID</b>	6.1		III	P5	A10.4.
	UN2446	<b>NITROCRESOLS, SOLID</b>	6.1		III	P5	A10.5.
		6-Nitro-4-diazotoluene-3-sulfonic acid (dry)					FORBIDDEN
		Nitro isobutene triol trinitrate					FORBIDDEN
		N-Nitro-N-methylglycolamide nitrate					FORBIDDEN
		2-Nitro-2-methylpropanol nitrate					FORBIDDEN
	UN2842	<b>NITROETHANE</b>	3		III	P5	A7.2.
		Nitroethyl nitrate					FORBIDDEN
		Nitroethylene polymer					FORBIDDEN
	UN1066	<b>NITROGEN, COMPRESSED</b>	2.2			P5	A6.3., A6.5.
	UN1067	<b>NITROGEN DIOXIDE</b>	2.3	5.1, 8			FORBIDDEN
		Nitrogen dioxide contained in gas cartridges for use in sterilization devices, see <b>GAS CARTRIDGE</b> (UN2037) or <b>RECEPTACLES, SMALL, CONTAINING GAS</b> (UN2037)					
		Nitrogen fertilizer solution, see <b>FERTILIZER AMMONIATING SOLUTION</b> (UN1043), etc.					
		Nitrogen monoxide, see <b>NITRIC OXIDE, COMPRESSED</b> (UN1660)					
		Nitrogen peroxide, see <b>DINITROGEN TETROXIDE</b> , (UN1067)					
	UN1977	<b>NITROGEN, REFRIGERATED LIQUID</b> (cryogenic liquid)	2.2			P4, 345, 346	A6.11.
		Nitrogen tetroxide and nitric oxide mixtures, see <b>NITRIC OXIDE AND NITROGEN TETROXIDE MIXTURES</b> (UN1975)					
		Nitrogen tetroxide, see <b>DINITROGEN TETROXIDE</b> (UN1067)					
		Nitrogen trichloride					FORBIDDEN
	UN2451	<b>NITROGEN TRIFLUORIDE</b>	2.2	5.1		P4	A6.5.
		Nitrogen triiodide					FORBIDDEN
		Nitrogen triiodide monoamine					FORBIDDEN
	UN2421	<b>NITROGEN TRIOXIDE</b>	2.3	5.1, 8			FORBIDDEN
	UN0143	<b>NITROGLYCERIN, DESENSITIZED</b> with not less than 40% nonvolatile water insoluble phlegmatizer, by mass	1.1D	6.1		P4	A5.10.
		Nitroglycerin, desensitized, with less than 40% phlegmatizer, by weight					FORBIDDEN

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Nitroglycerin, liquid, not desensitized</i>					FORBIDDEN
★	UN3343	<b>NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, FLAMMABLE, N.O.S., with less than 30% Nitroglycerin by mass</b>	3			P5	A8.4.
★	UN3357	<b>NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, N.O.S., with less than 30% Nitroglycerin by mass</b>	3		II	P5, 142	A8.4.
★	UN3319	<b>NITROGLYCERIN, MIXTURE, DESENSITIZED SOLID, N.O.S., with more than 2% but not more than 10% Nitroglycerin by mass</b>	4.1		II	P4	A8.4.
		<i>Nitroglycerin, liquid, not desensitized</i>					FORBIDDEN
	UN0144	<b>NITROGLYCERIN, SOLUTION IN ALCOHOL with more than 1%, but not more than 10% nitroglycerin</b>	1.1D			P4	A5.10.
	UN1204	<b>NITROGLYCERIN SOLUTION IN ALCOHOL, with not more than 1% nitroglycerin</b>	3		II	P3, N34	A7.2.
	UN3064	<b>NITROGLYCERIN, SOLUTION IN ALCOHOL, with more than 1%, but not more than 5% nitroglycerin</b>	3		II	P3, N8	A7.2.
	UN0282	<b>NITROGUANIDINE or PICRITE, dry or wetted with less than 20% water, by mass</b>	1.1D			P4	A5.6.
		<i>Nitroguanidine nitrate</i>					FORBIDDEN
	UN1336	<b>NITROGUANIDINE WETTED, or PICRITE WETTED with not less than 20% water, by mass</b>	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		<i>1-Nitro hydantoin</i>					FORBIDDEN
	UN1798	<b>NITROHYDROCHLORIC ACID</b>	8		I	P3, N41	A12.2.
		<i>Nitro isobutene triol trinitrate</i>					FORBIDDEN
		<i>Nitromannite (dry)</i>					FORBIDDEN
	UN0133	<b>NITROMANNITE, WETTED or MANNITOL HEXANITRATE, WETTED with 40% or more water, or mixture of alcohol and water, by weight</b>	1.1D			P4	A5.6.
	UN1261	<b>NITROMETHANE</b>	3		II	P5	A7.2.
		<i>N-Nitro-N-methylglycolamide nitrate</i>					FORBIDDEN
		<i>2-Nitro-2-methylpropanol nitrate</i>					FORBIDDEN
		<i>Nitromuriatic acid; see NITROHYDROCHLORIC ACID (UN1798)</i>					
	UN2538	<b>NITRONAPHTHALENE</b>	4.1		III	P5, A1	A8.3.
	UN3376	<b>4-NITROPHENYLHYDRAZINE with 30% or more water, by mass</b>	4.1		I	P4, 162, A8, A19, A20, N41	A8.3
+	UN1663	<b>NITROPHENOLS (o-,m-,p-,)</b>	6.1		III	P5	A10.5.
		<i>m-Nitrophenyldinitro methane</i>					FORBIDDEN
	UN2608	<b>NITROPROPANES</b>	3		III	P5	A7.2.
	UN1369	<b>P-NITROSODIMETHYLANILINE</b>	4.2		II	P5, A19, A20, N34	A8.3.
	UN0146	<b>NITROSTARCH, dry or wetted with less than 20% water, by mass</b>	1.1D			P4	A5.6.
	UN1337	<b>NITROSTARCH, WETTED with not less than 20% water by mass</b>	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		<i>Nitrosugars (dry)</i>					FORBIDDEN
	UN1069	<b>NITROSYL CHLORIDE</b>	2.3	8		P2, 3	A6.4.
	UN2308	<b>NITROSYLSULFURIC ACID, LIQUID</b>	8		II	P5, A3, A7, N34	A12.2.
	UN3456	<b>NITROSYLSULFURIC ACID, SOLID</b>	8		II	P5, A7, N34	A12.3.
	UN1664	<b>NITROTOLUENES, LIQUID</b>	6.1		II	P5	A10.4.
	UN3446	<b>NITROTOLUENES, SOLID</b>	6.1		II	P5	A10.6.
	UN2660	<b>NITROTOLUIDINES (MONO)</b>	6.1		III	P5	A10.5.
	UN0490	<b>NITROTRIAZOLONE or NTO</b>	1.1D			P4	A5.6.
		<i>Nitrotrichloromethane, see CHLOROPICRIN (UN1580)</i>					
	UN0147	<b>NITRO UREA</b>	1.1D			P4	A5.6.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Nitrous ether, see</i> <b>ETHYL NITRITE SOLUTION</b> (UN1194)					
	UN1070	<b>NITROUS OXIDE</b>	2.2	5.1		P5, A14	A6.3., A6.4.
	UN2201	<b>NITROUS OXIDE, REFRIGERATED LIQUID</b>	2.2	5.1		P4	A6.4.
		Tri-(b-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN1665	<b>NITROXYLENES, LIQUID</b>	6.1		II	P5	A10.4.
	UN3447	<b>NITROXYLENES, SOLID</b>	6.1		II	P5	A10.5
		<i>Nitroxylol, see</i> <b>NITROXYLENES</b> (UN1665) (UN3447)					
		<i>Non-activated carbon or Non-activated charcoal, see</i> <b>CARBON</b> (UN1361)					
	UN1920	<b>NONANES</b>	3		III	P5	A7.2.
		<i>Nonflammable gas, N.O.S., see</i> <b>COMPRESSED GAS, TOXIC N.O.S. ★</b> (UN1955) <b>COMPRESSED GAS, (UN1956) or LIQUEFIED GAS, TOXIC, N.O.S. ★</b> (UN3162) <b>LIQUEFIED GAS</b> (UN3163)					
		<i>Non-liquefied gases, see</i> <b>COMPRESSED GAS TOXIC, FLAMMABLE, N.O.S. ★</b> (UN1953), or <b>COMPRESSED GAS, FLAMMABLE, N.O.S. ★</b> (UN1954), or <b>COMPRESSED GAS, TOXIC, N.O.S. ★</b> (UN1955), or <b>COMPRESSED GAS, N.O.S. ★</b> (UN1956), or <b>COMPRESSED GAS, OXIDIZING, N.O.S. ★</b> (UN3156), or <b>COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S. ★</b> (UN3303), or <b>COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. ★</b> (UN3304), or <b>COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. ★</b> (UN3305) or <b>COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. ★</b> (UN3306)					
		<i>Non-liquefied hydrocarbon gas, see</i> <b>HYDROCARBON GAS, MIXTURE, COMPRESSED, N.O.S. ★</b> (UN1964)					
	UN1799	<b>NONYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
	UN2251	<b>2,5-NORBORNADIENE, STABILIZED</b>	3		II	P5	P7.3
		<i>Nordhausen acid, see</i> <b>SULFURIC or SULPHRIC ACID, FUMING, (UN1831)</b>					
		<i>Normal propyl alcohol, see</i> <b>PROPYL ALCOHOL, NORMAL</b> (UN1274)					
	UN0490	<b>NTO</b>	1.1D			P4	A5.6.
	UN1800	<b>OCTADECYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
	UN2309	<b>OCTADIENE</b>	3		II	P5	A7.2.
		<i>1,7-Octadiene-3,5-diyne-1,8-dimethoxy-9-octadecynoic acid</i>					FORBIDDEN
	UN2422	<b>OCTAFLUOROBUT-2-ENE or REFRIGERANT GAS R1318</b>	2.2			P5	A6.4.
	UN1976	<b>OCTAFLUOROCYCLOBUTANE or REFRIGERANT GAS RC318</b>	2.2			P5	A6.4.
	UN2424	<b>OCTAFLUOROPROPANE or REFRIGERANT GAS R218</b>	2.2			P5	A6.4.
	UN1262	<b>OCTANES</b>	3		II	P5	A7.2.
		<i>Octogen, etc., see</i> <b>CYCLOTETRAMETHYLENE TETRANITRAMINE, (UN0484, UN0483, UN0226)</b>					
	UN0484	<b>OCTOGEN, DESENSITIZED</b>	1.1D			P4	A5.6.
		<i>Octogen (dry or unphlegmatized)</i>					FORBIDDEN
	UN0226	<b>OCTOGEN, WETTED with not less than 15% water, by mass</b>	1.1D			P4	A5.6.
	UN0266	<b>OCTOLITE or OCTOL dry or wetted with less than 15% water by mass</b>	1.1D			P4	A5.6.
	UN0496	<b>OCTONAL</b>	1.1D			P4	A5.7.
	UN1191	<b>OCTYL ALDEHYDES</b>	3		III	P5	A7.2.
		<i>Tert-Octyl Mercaptan, see</i> <b>2-METHYL-2-HEPTANETHIOL</b> (UN3023)					
	UN1801	<b>OCTYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
		<i>Oenanthal, see</i> <b>n-HEPTALDEHYDE</b> (UN3056)					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1071	<b>OIL GAS, COMPRESSED</b>	2.3	2.1		P2, 6	A6.4.
		<i>Oil well sampling device, charged, see</i>					
		<b>COMPRESSED GAS, FLAMMABLE GAS, N.O.S.</b>					
		★ (UN1954) or <b>LIQUEFIED GAS, FLAMMABLE, N.O.S.</b> ★ (UN3161)					
		<i>Oleum, see SULFURIC ACID, FUMING (UN1831)</i>					
		<i>Organic Peroxide Type A, Liquid or Solid</i>					FORBIDDEN
		<i>Organic peroxide type B, liquid</i>					FORBIDDEN
		<i>Organic peroxide type B, liquid, temperature controlled</i>					FORBIDDEN
		<i>Organic peroxide, type B, solid</i>					FORBIDDEN
		<i>Organic peroxide, type B, solid, temperature controlled</i>					FORBIDDEN
★	UN3101	<b>ORGANIC PEROXIDE TYPE B, LIQUID</b>	5.2	1	II	P3, 53	A9.2. (173.225)
★	UN3111	<b>ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED</b>	5.2	1	II	P3, 53	A9.2. (173.225)
★	UN3102	<b>ORGANIC PEROXIDE TYPE B, SOLID</b>	5.2	1	II	P3, 53	A9.2. (173.225)
		<i>tert-Butyl Monoperoxymaneate</i>					A9.2. (173.225)
		<i>3-Chloroperoxybenzoic Acid</i>					A9.2. (173.225)
		<i>Dibenzoyl Peroxide &gt; 52 &lt; 100</i>					A9.2. (173.225)
		<i>Dibenzoyl Peroxide &gt; 78, &lt; 94</i>					A9.2. (173.225)
		<i>Di-4-Chlorobenzoyl Peroxide</i>					A9.2. (173.225)
		<i>Di-2,4-Dichlorobenzoyl Peroxide</i>					A9.2. (173.225)
		<i>2,2-Dihydroperoxypropane</i>					A9.2. (173.225)
		<i>2,5-Dimethyl-2,5-di-(Benzoyl-Peroxy) Hexane</i>					A9.2. (173.225)
		<i>Di-(2 Phenoxyethyl) Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Disuccinic Acid Peroxide</i>					A9.2. (173.225)
		<i>3,3,6,6,9,9,-Hexamethyl-1,2,4,5-Tetraoxa191yclononane</i>					A9.2. (173.225)
★	UN3112	<b>ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED</b>	5.2	1	II	P3, 53	A9.2. (173.225)
		<i>Acetyl Cyclohexanesulphonyl Peroxide</i>					A9.2. (173.225)
		<i>Dibenzyl Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Dicyclohexyl Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Diisopropyl Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Di-(2-Methylbenzoyl) Peroxide</i>					A9.2. (173.225)
★	UN3103	<b>ORGANIC PEROXIDE TYPE C, LIQUID</b>	5.2		III	P5	A9.2. (173.225)
		<i>tert-Amyl peroxybenzoate</i>					A9.2. (173.225)
		<i>n-Butyl-4,4-di-(Tertcutylperoxy)-Valerate</i>					A9.2. (173.225)
		<i>tert-Butyl Hydroperoxide</i>					A9.2. (173.225)
		<i>tert-Butyl Hydroperoxide and di-tert-Butyl Peroxide</i>					A9.2. (173.225)
		<i>tert-Butyl Monoperoxymaneate</i>					A9.2. (173.225)
		<i>tert-Butyl Peroxyacetate</i>					A9.2. (173.225)
		<i>tert-Butyl Peroxybenzoate</i>					A9.2. (173.225)
		<i>tert-Butylperoxy Isopropyl Carbonate</i>					A9.2. (173.225)
		<i>2,2-Di-(tert-Butylperoxy) Butane</i>					A9.2. (173.225)
		<i>1,1-Di-(tert-Butylperoxy) Cyclohexane</i>					A9.2. (173.225)
		<i>2,5-Dimethyl-2,5-Di-(tert-Butyl-Peroxy)Hexane -3</i>					A9.2. (173.225)
		<i>Ethyl-3,3-Di-(tert-Butylperoxy)-Butyrate</i>					A9.2. (173.225)
		<i>Organic Peroxide, Liquid, Sample</i>					A9.2. (173.225)
★	UN3113	<b>ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
		<i>tert-Amyl Peroxypivalate</i>					A9.2. (173.225)
		<i>tert-Butyl Peroxydiethylacetate</i>					A9.2. (173.225)
		<i>tert-Butyl Peroxy-2-Ethylhexanoate</i>					A9.2. (173.225)
		<i>tert-Butyl Peroxypivalate</i>					A9.2. (173.225)
		<i>Di-sec-Butyl-Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Di-(2-Ethylhexyl) Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Di-n-Propyl Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Organic Peroxide, Liquid Temperature Controlled</i>					A9.2. (173.225)

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3104	<b>ORGANIC PEROXIDE TYPE C, SOLID</b>	5.2		III	P5	A9.2. (173.225)
		<i>Cyclohexanone Peroxide(s)</i>					A9.2. (173.225)
		<i>Dibenzoyl Peroxide</i>					A9.2. (173.225)
		<i>2,5-Dimethyl-2-5-di-(Benzoyl Peroxy) Hexane</i>					A9.2. (173.225)
		<i>2,5-Dimethyl-2,5-Dihydroperoxyhexane</i>					A9.2. (173.225)
		<i>Organic Peroxide, Solid, Sample</i>					A9.2. (173.225)
★	UN3114	<b>ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
		<i>Di-(4-tert-Butylcyclohexyl) Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Dicyclohexyl Peroxydicarbonate</i>					A9.2. (173.225)
		<i>Dideconoyl Peroxide</i>					A9.2. (173.225)
		<i>Di-n-Octanoyl Peroxide</i>					A9.2. (173.225)
		<i>Organic Peroxide, Solid, Temperature Controlled</i>					A9.2. (173.225)
★	UN3105	<b>ORGANIC PEROXIDE TYPE D, LIQUID</b>	5.2		III	P5	A9.2. (173.225)
★	UN3115	<b>ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
★	UN3106	<b>ORGANIC PEROXIDE TYPE D, SOLID</b>	5.2		III	P5	A9.2. (173.225)
★	UN3116	<b>ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
★	UN3107	<b>ORGANIC PEROXIDE TYPE E, LIQUID</b>	5.2		III	P5, A61	A9.2. (173.225)
★	UN3117	<b>ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
		<i>tert-Butyl peroxy-2-ethylhexanonate</i>					A9.2. (173.225)
		<i>Di-n-butyl peroxydicarbonate</i>					A9.2. (173.225)
		<i>Di-(2-ethylhexyl) peroxydicarbonate as a stable dispersion in water</i>					A9.2. (173.225)
		<i>Di-(2-Ethylhexyl) Peroxydicarbonate as a stable dispersion in water (frozen)</i>					A9.2. (173.225)
		<i>Dipropionyl peroxide</i>					A9.2. (173.225)
★	UN3108	<b>ORGANIC PEROXIDE TYPE E, SOLID</b>	5.2		III	P5	A9.2. (173.225)
★	UN3118	<b>ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
★	UN3109	<b>ORGANIC PEROXIDE TYPE F, LIQUID</b>	5.2		III	P5, A61	A9.2. (173.225)
★	UN3119	<b>ORGANIC PEROXIDE TYPE F, LIQUID TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
★	UN3110	<b>ORGANIC PEROXIDE TYPE F, SOLID <i>Dicumyl peroxide</i></b>	5.2		III	P5	A9.2. (173.225)
★	UN3120	<b>ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED</b>	5.2		II	P3	A9.2. (173.225)
D	NA1955	<b>ORGANIC PHOSPHATE MIXED WITH COMPRESSED GAS, ORGANIC PHOSPHATE COMPOUND MIXED WITH COMPRESSED GAS or ORGANIC PHOSPHORUS COMPOUND MIXED WITH COMPRESSED GAS</b>	2.3				FORBIDDEN
	UN3313	<b>ORGANIC PIGMENTS, SELF-HEATING</b>	4.2		II III	P5 P5	A8.3. A8.3.
★	UN3280	<b>ORGANOARSENIC COMPOUND, LIQUID N.O.S.</b>	6.1		I II III	P5, 5 P5 P5	A10.4. A10.4. A10.4.
★	UN3465	<b>ORGANOARSENIC COMPOUND, SOLID N.O.S.</b>	6.1		I II III	P5, 5 P5 P5	A10.5. A10.5. A10.5.
★	UN2762	<b>ORGANOCHLORINE PESTICIDES LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C</b>	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2996	<b>ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC</b>	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2995	<b>ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23 degrees C</b>	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2761	<b>ORGANOCHLORINE PESTICIDES, SOLID, TOXIC</b>	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3282	ORGANOMETALLIC COMPOUND, LIQUID, TOXIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.4. A10.4. A10.4.
★	UN3467	ORGANOMETALLIC COMPOUND, SOLID, TOXIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
★	UN3392	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC	4.2				FORBIDDEN
★	UN3394	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE	4.2	4.3			FORBIDDEN
★	UN3398	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE	4.3		I II III	P3 P4 P5	A8.2. A8.2. A8.2.
★	UN3399	ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE	4.3	3 3 3	I II III	P3 P4 P5	A8.2. A8.2. A8.2.
★	UN3391	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC	4.2		I		FORBIDDEN
★	UN3393	ORGANOMETALLIC SUBSTANCE, SOLID, PYROPHORIC, WATER-REACTIVE	4.2	4.3	I		FORBIDDEN
★	UN3400	ORGANOMETALLIC SUBSTANCE, SOLID, SELF-HEATING	4.2		II III	P4 P5	A8.3. A8.3.
★	UN3395	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE	4.3		I II III	P3, N40 P4 P5	A8.3. A8.3. A8.3.
★	UN3396	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE	4.3	4.1	I II III	P3, N40 P4 P5	A8.3. A8.3. A8.3.
★	UN3397	ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, SELF-HEATING	4.3	4.2	I II III	P3, N40 P4 P5	A8.3. A8.3. A8.3.
★	UN3279	ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.	6.1	3 3	I II	P3, 5 P4	A10.4. A10.4.
★	UN3278	ORGANOPHOSPHORUS COMPOUND, LIQUID, TOXIC, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.4. A10.4. A10.4.
★	UN3464	ORGANOPHOSPHORUS COMPOUND, SOLID, TOXIC, N.O.S.	6.1		I II III	P3, 5 P4 P5	A10.6. A10.6. A10.6.
★	UN3279	ORGANOPHOSPHORUS COMPOUND, TOXID, FLAMMABLE, N.O.S.	6.1	3	I II	P5 P5	A10.4 A10.4
★	UN2784	ORGANOPHOSPHOROUS PESTICIDES, LIQUID, FLAMMABLE, TOXIC, <i>flashpoint less than 23 degrees C</i>	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3018	ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3, N76 P4, N76 P5, N76	A10.4. A10.4. A10.4.
★	UN3017	ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC, FLAMMABLE, <i>flashpoint not less than 23 degrees C</i>	6.1	3 3 3	I II III	P3, N76 P4, N76 P5, N76	A10.4. A10.4. A10.4.
★	UN2783	ORGANOPHOSPHORUS PESTICIDES, SOLID, TOXIC	6.1		I II III	P5, N77 P5, N77 P5, N77	A10.5. A10.5. A10.5.
	UN2788	ORGANOTIN COMPOUNDS, LIQUID, N.O.S.	6.1		I II III	P3, N33, N34 P4, A3, N33, N34 P5	A10.4. A10.4. A10.4.
	UN3146	ORGANOTIN COMPOUNDS, SOLID, N.O.S.	6.1		I II III	P5, A5 P5 P5	A10.5. A10.5. A10.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN2787	ORGANOTIN PESTICIDES, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3020	ORGANOTIN PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3019	ORGANOTIN PESTICIDES, LIQUID, TOXIC, FLAMMABLE, flashpoint more than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2786	ORGANOTIN PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Orthonitroaniline, see NITROANILINES, etc. (UN1661)					
		Orthophosphonic acid, see PHOSPHORIC ACID, SOLUTION (UN1805) or PHOSPHONIC ACID, SOLID (UN3453)					
		Osmic acid anhydride, see OSMIUM TETROXIDE (UN2471)					
	UN2471	OSMIUM TETROXIDE	6.1		I	P5, A8, N33, N34	A10.5.
		Other regulated substance, aromatic extracts or aromatic flavourings, (not falling under definitions of classes 1-8), see AVIATION REGULATED LIQUID, N.O.S. ★ (UN3334) or AVIATION REGULATION SOLID, N.O.S. ★ (UN3335)					
D	NA3082	OTHER REGULATED SUBSTANCES, LIQUID, N.O.S.	9		III	P5	A13.2.
D	NA3077	OTHER REGULATED SUBSTANCES, SOLID, N.O.S.	9		III	P5	A13.2.
★	UN3139	OXIDIZING LIQUID, N.O.S.	5.1		I II III	P3, 62, 127, A2 P4, 62, 127, 148, A2 P5, 62, 127, 148, A2	A9.5. A9.5. A9.5.
★	UN3098	OXIDIZING LIQUID, CORROSIVE, N.O.S.	5.1	8 8 8	I II III	P3, 62 P4, 62 P5, 62	A9.5. A9.5. A9.5.
★	UN3099	OXIDIZING LIQUID, TOXIC, N.O.S.	5.1	6.1 6.1 6.1	I II III	P3, 62 P4, 62 P5, 62	A9.5. A9.5. A9.5.
★	UN1479	OXIDIZING SOLID, N.O.S.	5.1		I II III	P5, 62 P5, 62 P5, 62, 148	A9.6. A9.6. A9.6.
★	UN3085	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	8 8 8	I II III	P5, 62 P5, 62 P5, 62	A9.6. A9.6. A9.6.
★	UN3137	OXIDIZING SOLID, FLAMMABLE, N.O.S.	5.1	4.1	I	P4, 62	A9.8.
★	UN3100	OXIDIZING SOLID, SELF-HEATING, N.O.S.	5.1	4.2 4.2	I II	P3, 62 P4, 62	A9.8.
★	UN3087	OXIDIZING SOLID, TOXIC, N.O.S.	5.1	6.1 6.1 6.1	I II III	P5, 62 P5, 62 P5, 62	A9.6. A9.6. A9.6.
★	UN3121	OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	5.1	4.3		P4, 62	A9.8.
		Oxirane, see ETHYLENE OXIDE (UN1040)					
	UN1072	OXYGEN, COMPRESSED	2.2	5.1		P5, 110, A14, A511	A6.3., A6.5.
	UN2190	OXYGEN DIFLUORIDE. COMPRESSED	2.3	5.1, 8		P1, 1, N86	A6.15.
	UN3356	OXYGEN GENERATORS, CHEMICAL (including when contained in associated equipment, e.g., passenger service units (PSU's) portable breathing equipment (PBE) etc.)	5.1		II	P4, 61	A9.10.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
+	NA3356	OXYGEN GENERATOR, CHEMICAL SPENT	9		III		FORBIDDEN
	UN1073	OXYGEN, REFRIGERATED LIQUID ( <i>cryogenic liquid</i> )	2.2	5.1		P4, A511	A6.11.
		1-Oxy-4-nitrobenzene, see NITROPHENOLS (UN1663)					
	UN3509	PACKAGING DISCARDED, EMPTY, UNCLEARED	9			P3, A525	FORBIDDEN
	UN1263	PAINT ( <i>including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base</i> )	3		I II III	P3, 367 P5, 149, 367 P5, 367	A7.2. A7.2. A7.2.
	UN3066	PAINT or PAINT RELATED MATERIAL	8		II III	P5, 367 P5, 367	A12.2. A12.2.
	UN3470	PAINT, CORROSIVE, FLAMMABLE ( <i>including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base</i> )	8	3	II	P5, 367	A12.2
		Paint driers, see FLAMMABLE SOLID, ORGANIC, N.O.S. or FLAMMABLE SOLID, INORGANIC, N.O.S.					
	UN3469	PAINT, FLAMMABLE, CORROSIVE ( <i>including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base</i> )	3	8	I II III	P3, 367 P5, 367 P5, 367	A7.2 A7.2 A7.2
	UN1263	PAINT RELATED MATERIAL ( <i>including paint thinning, drying, removing, or reducing compound</i> )	3		I II III	P3, 367 P5, 149, 367 P5, 367	A7.2. A7.2. A7.2.
	UN3470	PAINT RELATED MATERIAL, CORROSIVE, FLAMMABLE ( <i>including paint thinning, drying, removing, or reducing compound</i> )	8	3	II	P5, 367	A12.2.
	UN3469	PAINT RELATED MATERIAL, FLAMMABLE, CORROSIVE ( <i>including paint thinning, drying, removing, or reducing compound</i> )	3	8	I II III	P3, 367 P5, 367 P5, 367	A7.2. A7.2. A7.2.
		Paper stock, wet					Forbidden
	UN1379	PAPER, UNSATURATED OIL TREATED incompletely dried ( <i>including carbon paper</i> )	4.2		III	P5	A8.3.
		Paraffin, see KEROSENE (UN1223)					
	UN2213	PARAFORMALDEHYDE	4.1		III	P5, A1	A8.3.
	UN1264	PARALDEHYDE	3		III	P5	A7.2.
		Paranitroaniline solid, see NITROANILINES, etc.					
D	NA1967	PARATHION AND COMPRESSED GAS MIXTURE	2.3			P2, 3	A6.18.
		Paris green, solid, see COPPER ACETOARSENITE					
		PCB, see POLYCHLORINATED BIPHENYLS LIQUID (UN2315) or POLYCHLORINATED BIPHENYLS, SOLID (UN3432)					
+	UN1380	PENTABORANE	4.2	6.1	I		FORBIDDEN
	UN1669	PENTACHLOROETHANE	6.1		II	P5	A10.4.
	UN3155	PENTACHLOROPHENOL	6.1		II	P5	A10.5.
	UN0411	PENTAERYTHRITOL TETRANITRATE or PENTAERYTHRITOL TETRANITRATE or PETN with not less than 7% wax by mass	1.1D			P4	A5.6.
★	UN3344	PENTAERYTHRITOL TETRANITRATE MIXTURE, DESENSITIZED SOLID, N.O.S. with more than 10% but less than or equal to 20% PETN by mass	4.1		II	P4, 118, N85	A8.4.
	UN0150	PENTAERYTHRITOL TETRANITRATE, WETTED or PENTAERYTHRITOL TETRANITRATE, WETTED or PETN, WETTED with not less than 25% water by mass, or PETN, DESENSITIZED with 15% or more phlegmatizer, by weight or PENTAERYTHRITOL TETRANITRATE or PENTAERYTHRITOL TETRANITRATE or PENTAERYTHRITOL TETRANITRATE, DESENSITIZED with not less than 15% phlegmatizer by mass or	1.1D			P4	A5.6.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Pentaerythrite Tetranitrate (dry)</i>					FORBIDDEN
		<i>Pentaerythritol tetranitrate (dry)</i>					FORBIDDEN
		<i>Pentafluoroethane, 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1-trifluoroethane, see REFRIGERANT GAS R404A (UN3337)</i>					
	UN3220	<b>PENTAFLUOROETHANE or REFRIGERANT GAS R125</b>	2.2			P5	A6.3., A6.4.
	UN2286	<b>PENTAMETHYLHEPTANE</b>	3		III	P5	A7.2.
		<i>Pentanal, see VALERALDEHYDE (UN2058)</i>					
		<i>n-Pentane, see PENTANES (UN1265)</i>					
	UN2310	<b>PENTANE-2,4-DIONE</b>	3	6.1	III	P5	A7.2.
		<i>Pentane, methyl, see HEXANES (UN1208)</i>					
	UN1265	<b>PENTANES</b>	3		I II	P3 P5	A7.2. A7.2.
		<i>Pentanitroaniline (dry)</i>					FORBIDDEN
		<i>3-Pentanol, see PENTANOLS (UN1105)</i>					
	UN1105	<b>PENTANOLS</b>	3		II III	P5 P5	A7.2. A7.2.
	UN1108	<b>1-PENTENE (N-AMYLENE)</b>	3		I	P3	A7.2.
	UN2705	<b>1-PENTOL</b>	8		II	P5	A12.2.
	UN0151	<b>PENTOLITE</b> , dry or wetted with less than 15% water by mass	1.1D			P4	A5.6.
		<i>Pentyl nitrite, see AMYL NITRITE (UN1113)</i>					
		<i>Pepper spray, see AEROSOLS FLAMMABLE (UN1950) or SELF-DEFENSE SPRAY, NON-PRESSURIZED (NA3334)</i>					
	UN3211	<b>PERCHLORATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.</b>	5.1		II III	P5 P5	A9.5. A9.5.
	UN1481	<b>PERCHLORATES, INORGANIC, N.O.S.</b>	5.1		II III	P5 P5	A9.6. A9.6.
	UN1873	<b>PERCHLORIC ACID</b> with more than 50% but not more than 72% acid, by mass	5.1	8	I	P3, A2, N41	A9.5.
		<i>Perchloric Acid, with more than 72% acid by mass</i>					FORBIDDEN
	UN1802	<b>PERCHLORIC ACID</b> with not more than 50% acid by mass	8	5.1	II	P4, N41	A12.2.
		<i>Perchlorobenzene, see HEXACHLOROBENZENE (UN2729)</i>					
		<i>Perchlorocyclopentadiene, see HEXACHLOROCYCLOPENTADIENE (UN2646)</i>					
		<i>Perchloroethylene, see TETRACHLOROETHYLENE (UN1897)</i>					
		<i>Perchloromethane, see CARBON TETRACHLORIDE (UN1846)</i>					
		<i>Perchloroethylene, see TETRACHLOROETHYLENE (UN1897)</i>					
	UN1670	<b>PERCHLOROMETHYL MERCAPTAN</b>	6.1		I	P2, 2, A3, A7, N34	A10.6.
	UN3083	<b>PERCHLORYL FLUORIDE</b>	2.3	5.1		P2, 2	A6.5.
		<i>Percussion Caps; see PRIMERS, CAP TYPE (UN0044, UN0377, UN0378)</i>					
		<i>Perfluoroacetyl chloride, see TRIFLUOROACETYL CHLORIDE (UN3057)</i>					
		<i>Perfluoro-2-butene, see OCTAFLUOROBUT-2-ENE (UN2422)</i>					
	UN3154	<b>PERFLUORO (ETHYL VINYL ETHER)</b>	2.1			P4	A6.3., A6.4., A6.5.
	UN3153	<b>PERFLUORO (METHYL VINYL ETHER)</b>	2.1			P4	A6.3., A6.4., A6.5.
		<i>Perfluoropropane, see OCTAFLUOROPROPANE (UN2424)</i>					
		<i>Perfluoro-2-butene, see OCTAFLUOROBUT-2-ENE (UN2422)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1266	PERFUMERY PRODUCTS with flammable solvents	3		II III	P5, 149 P5	A7.2. A7.2.
		Perfumery products in small inner packagings, see CONSUMER COMMODITY (ID8000)					
★	UN1482	PERMANGANATES, INORGANIC, N.O.S.	5.1		II III	P5, 26, 353, A30 P5, 26, 353, A30	A9.6. A9.6.
★	UN3214	PERMANGANATES, INORGANIC AQUEOUS SOLUTION, N.O.S.	5.1		II	P5, 26, 353	A9.5.
		Permeation devices, containing dangerous goods, for calibrating air quality monitoring equipment				A521	
		Peroxide organic, see ORGANIC PEROXIDE TYPE C, LIQUID ★ (UN3103) or ORGANIC PEROXIDE TYPE C, SOLID ★ (UN3104), or ORGANIC PEROXIDE TYPE D, LIQUID ★ (UN3105) or ORGANIC PEROXIDE TYPE D, SOLID ★ (UN3106) or ORGANIC PEROXIDE TYPE E, LIQUID ★ (UN3107) or ORGANIC PEROXIDE TYPE E, SOLID ★ (UN3108) or ORGANIC PEROXIDE TYPE F, LIQUID ★ (UN3109) or ORGANIC PEROXIDE TYPE F, SOLID ★ (UN31010) or ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED ★ (UN3113) or ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED ★ (UN3114) or ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED ★ (UN3115) or ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED ★ (UN3116) or ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED ★ (UN3117) or ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED ★ (UN3118) or ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED ★ (UN3119) or ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED ★ (UN3120)					
★	UN1482	PERMANGANATES, INORGANIC, N.O.S.	5.1		II III	P5, A30 P5, A30	A9.6. A9.6.
	UN1483	PEROXIDES, INORGANIC, N.O.S.	5.1		II III	P5, A7, A20, N34 P5, A7, A20, N34	A9.6. A9.6.
		Peroxyacetic acid, more than 43% and with more than 6% hydrogen peroxide					FORBIDDEN
	UN3216	PERSULFATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1		III	P5	A9.5.
	UN3215	PERSULFATES, INORGANIC, N.O.S.	5.1		III	P5	A9.6.
★	UN3021	PESTICIDES, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2902	PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2903	PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S. flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2588	PESTICIDES, SOLID, TOXIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Pesticide, toxic, under compressed gas, N.O.S., see AEROSOLS FLAMMABLE (UN1950)					
		PETN, see PENTAERYTHRITETETRANITRATE (UN0411)					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		PETN/TNT, <i>see</i> PENTOLITE, (UN0151)					
	UN0411	PETN with 7% or more wax, by weight	1.1D		II	P4	A5.6.
	UN0150	PETN, DESENSITIZED with 15% or more phlegmatizer, by weight or PETN, WETTED with 25% or more water, by weight	1.1D		II	P4	A5.6.
★	UN3344	PETN MIXTURE DESENSITIZED, SOLID, N.O.S. with greater than 10% but equal to or less than 20% PETN, BY WEIGHT					
	UN1203	PETROL or GASOLINE or MOTOR SPIRIT	3		II	P5	A7.2.
	UN1267	PETROLEUM CRUDE OIL	3		I II III	P3, 144, 357 P5, 144, 357 P5, 144, 357	A7.2. A7.2. A7.2.
	UN1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3		I II III	P3, 144 P5, 144 P5, 144	A7.2. A7.2. A7.2.
		Petroleum ether, <i>see</i> PETROLEUM DISTILLATES, N.O.S. (UN1268)					
		Petroleum raffinate, <i>see</i> PETROLEUM DISTILLATES, N.O.S. (UN1268)					
		Petroleum spirit, <i>see</i> PETROLEUM PRODUCTS, N.O.S. (UN1268)					
	UN1075	PETROLEUM GASES, LIQUEFIED or LIQUEFIED PETROLEUM GAS	2.1			P4, 19, N95	A6.3., A6.6.
		Petroleum naphtha, <i>see</i> PETROLEUM DISTILLATES, N.O.S. (UN1268)					
		Petroleum oil, <i>see</i> PETROLEUM PRODUCTS, N.O.S. (UN1268)					
D	NA1270	PETROLEUM OIL	3		I II III	P3, 144 P5, 144 P5, 144	A7.2. A7.2. A7.2.
	UN3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3	6.1	I II III	P3, 343 P5, 343 P5, 343	A7.2. A7.2. A7.2.
	UN2645	PHENACYL BROMIDE	6.1		II	P5	A10.5.
+	UN2311	PHENETIDINES	6.1		III	P5	A10.4.
	UN2312	PHENOL, MOLTEN	6.1				FORBIDDEN
+	UN1671	PHENOL, SOLID	6.1		II	P5, N78	A10.5.
	UN2821	PHENOL SOLUTIONS	6.1		II III	P5 P5	A10.4. A10.4.
	UN2904	PHENOLATES, LIQUID	8		III	P5	A12.2.
	UN2905	PHENOLATES, SOLID	8		III	P5	A12.3.
	UN1803	PHENOLSULFONIC ACID, LIQUID	8		II	P5, N41	A12.2.
★	UN3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC (flashpoint less than 23 degrees C)	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE (flashpoint not less than 23 degrees C)	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2746	PHENYL CHLOROFORMATE	6.1	8	II	P4	A10.4.
		Phenyl cyanide, <i>see</i> BENZONITRILE (UN2224)					
		Phenyldichloroarsine					FORBIDDEN
		m-Phenylene diaminediperchlorate (dry)					FORBIDDEN
	UN2487	PHENYL ISOCYANATE	6.1	3	II	P2, 2, N33, N34	A10.6.
		Phenylisocyanodichloride, <i>see</i> PHENYLCARBYLAMINE CHLORIDE					
	UN2337	PHENYL MERCAPTAN	6.1	3	I	P2, 2	A10.6.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		1-Phenyl-5-mercapto-tetrazol, see <b>FLAMMABLE SOLID, ORGANIC, N.O.S.</b>					
	UN2798	<b>PHENYL PHOSPHORUS DICHLORIDE</b>	8		II	P4	A12.2.
	UN2799	<b>PHENYL PHOSPHOROUS THIODICHLORIDE</b>	8		II	P4	A12.2.
		2-Phenylpropene, see <b>ISOPROPENYLBENZENE</b>					
	UN3002	<b>PHENYL UREA PESTICIDES, LIQUID, TOXIC</b>	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
	UN2470	<b>PHENYLACETONITRILE, LIQUID</b>	6.1		III	P5	A10.4.
	UN2577	<b>PHENYLACETYL CHLORIDE</b>	8		II	P5	A12.2.
		Phenylamine, see <b>ANILINE</b> (UN1547)					
		1-Phenylbutane or 2-Phenylbutane, see <b>BUTYLBENZENES</b>					
	UN1672	<b>PHENYLCARBYLAMINE CHLORIDE</b>	6.1		I	P2, 2	A10.6.
+	UN1673	<b>PHENYLENEDIAMINES (o-,m-,p-)</b>	6.1		III	P5	A10.5.
		Phenylethylene, see <b>STYRENE MONOMER, STABILIZED</b> (UN2055)					
		D(-)-alpha Phenylglycine chloride hydrochloride, see <b>AVIATION REGULATED LIQUID, N.O.S.</b>					
	UN2572	<b>PHENYLHYDRAZINE</b>	6.1		II	P5	A10.4.
	UN1674	<b>PHENYLMERCURIC ACETATE</b>	6.1		II	P5	A10.5.
★	UN2026	<b>PHENYLMERCURIC COMPOUNDS, N.O.S.</b>	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1894	<b>PHENYLMERCURIC HYDROXIDE</b>	6.1		II	P5	A10.5.
	UN1895	<b>PHENYLMERCURIC NITRATE</b>	6.1		II	P5	A10.5.
	UN1804	<b>PHENYLTRICHLOROSILANE</b>	8		II	P4, A7, N34	A12.2.
	UN1076	<b>PHOSGENE</b>	2.3	8		P1, 1	A6.15.
	UN2940	<b>9-PHOSPHABICYCLONONANES or CYCLOOCTADIENE PHOSPHINES</b>	4.2		II	P5, A19	A8.3.
	UN2199	<b>PHOSPHINE</b>	2.3	2.1		P1, 1	A6.15.
	UN352	<b>PHOSPHINE, ADSORBED</b>	2.3	2.1		P1, 1	A6.15.
		Phosphoretted hydrogen, see <b>PHOSPHINE</b> (UN2199)					
		Phosphoric acid, anhydrous, see <b>PHOSPHORUS PENTOXIDE</b> (UN1807)					
	UN3453	<b>PHOSPHORIC ACID, SOLID</b>	8		III	P5	A12.3.
	UN1805	<b>PHOSPHORIC ACID, SOLUTION</b>	8		III	P5, A7, N34	A12.2.
		Phosphoric acid triethyleneimine, see <b>TRIS-(1-AZIRIDIYL) PHOSPHINE OXIDE, SOLUTION</b> (UN2501)					
		Phosphoric Anhydride, see <b>PHOSPHORUS PENTOXIDE</b> (UN1807)					
	UN2834	<b>PHOSPHOROUS ACID</b>	8		III	P5	A12.3.
	UN1338	<b>PHOSPHORUS, AMORPHOUS</b>	4.1		III	P5, A1, A19	A8.3.
		Phosphorus bromide, see <b>PHOSPHORUS TRIBROMIDE</b> (UN1808)					
		Phosphorus chloride, see <b>PHOSPHORUS TRICHLORIDE</b> (UN1809)					
	UN1339	<b>PHOSPHORUS HEPTASULFIDE, free from yellow or white phosphorus</b>	4.1		II	P5, A20, N34	A8.3.
		Phosphorous pentasulfide or heptasulphide, with yellow and/or white phosphorous					FORBIDDEN
	UN1939	<b>PHOSPHORUS OXYBROMIDE</b>	8		II	P5, N41, N43	A12.3.
	UN2576	<b>PHOSPHORUS OXYBROMIDE, MOLTEN</b>	8				FORBIDDEN
+	UN1810	<b>PHOSPHORUS OXYCHLORIDE</b>	6.1	8	I	P2, 2, N34	A10.6.
	UN2691	<b>PHOSPHORUS PENTABROMIDE</b>	8		II	P4, A7, N34	A12.2.
	UN1806	<b>PHOSPHORUS PENTACHLORIDE</b>	8		II	P4, A7, N34	A12.2.
	UN2198	<b>PHOSPHORUS PENTAFLUORIDE</b>	2.3	8		P1, 2	A6.4., A6.5.
	UN3524	<b>PHOSPHORUS PENTAFLUORIDE, ADSORBED</b>	2.3	8		P1, 2	A6.4., A6.5.
	UN1340	<b>PHOSPHORUS PENTASULFIDE, free from yellow or white phosphorus</b>	4.3	4.1	II	P5, A20	A8.3.
		Phosphorus pentasulfide, with yellow and/or white phosphorus					FORBIDDEN

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1807	<b>PHOSPHORUS PENTOXIDE</b>	8		II	P4, A7, N34	A12.3.
	UN1341	<b>PHOSPHORUS SESQUISULFIDE</b> , free from yellow or white phosphorus	4.1		II	P5, A20, N34	A8.3.
		Phosphorus sesquisulphide, with yellow and/or white phosphorus					FORBIDDEN
		Phosphorus sulphochloride, see <b>THIOPHOSPHORYL CHLORIDE</b> (UN1837)					
	UN1808	<b>PHOSPHORUS TRIBROMIDE</b>	8		II	P4, A3, A7, N34, N43	A12.2.
	UN1809	<b>PHOSPHORUS TRICHLORIDE</b>	6.1	8	I	P2, 2, N34	A12.11.
	UN2578	<b>PHOSPHORUS TRIOXIDE</b>	8		III	P5	A12.3.
	UN1343	<b>PHOSPHORUS TRISULFIDE</b> , free from yellow or white phosphorus	4.1		II	P5, A20, N34	A8.3.
		Phosphorus trisulphide, with yellow and/or white phosphorus					FORBIDDEN
		Phosphorus (V) sulfide, free from yellow and white phosphorus, see <b>PHOSPHORUS PENTASULFIDE</b> (UN1340)					
	UN1381	<b>PHOSPHORUS, WHITE DRY</b> or <b>PHOSPHORUS, WHITE, UNDER WATER</b> or <b>PHOSPHORUS WHITE IN SOLUTION</b> or <b>PHOSPHORUS YELLOW DRY</b> or <b>PHOSPHORUS YELLOW UNDER WATER</b> or <b>PHOSPHORUS YELLOW IN SOLUTION</b>	4.2	6.1	I	P3, N34	A8.16.
	UN2447	<b>PHOSPHORUS WHITE, MOLTEN</b>	4.2	6.1	I		FORBIDDEN
		Phosphorus (white or red) and a chlorate, mixtures of					FORBIDDEN
		Phosphoryl Chloride, see <b>PHOSPHORUS OXYCHLORIDE</b> (UN1810)					
	UN2214	<b>PHTHALIC ANHYDRIDE</b> with more than .05% maleic anhydride	8		III	P5	A12.3.
	UN2313	<b>PICOLINES</b>	3		III	P5	A7.2.
	UN0153	<b>PICRAMIDE</b>	1.1D		II	P4	A5.7.
	UN0154	<b>PICRIC ACID</b> or <b>TRINITROPHENOL</b> dry or wetted with less than 30% water, by weight	1.1D		II	P4	A5.6.
	UN3364	<b>PICRIC ACID, WETTED</b> with 10% or more water, by weight	4.1		I	P4, A8, A19, N41	A8.3.
	UN1344	<b>PICRIC ACID, WETTED</b> with 30% or more water, by weight	4.1		I	P4, A8, A19, N41	A8.3.
		Picrite, see <b>NITROGUANIDINE</b> , etc.					
	UN0282	<b>PICRITE</b> dry or wetted with less than 20% water, by weight	1.1D			P4	A5.6.
	UN1336	<b>PICRITE, WETTED</b> with 20% or more water, by weight	4.1		I	P4, 23, A8, A19, A20, N41	A8.3.
		Picotroxin, see <b>TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S. ★</b> (UN3172) or <b>TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S. ★</b> (UN3462)					
	UN0155	<b>PICRYL CHLORIDE</b> or <b>TRINITROCHLOROBENZENE</b>	1.1D		II	P4	A5.7.
	UN3365	<b>PICRYL CHLORIDE, WETTED</b> with 10% or more water, by weight	4.1		I	P4	A8.3.
	UN1272	<b>PINE OIL</b>	3		III	P5	A7.2.
	UN2368	<b>alpha-PINENE</b>	3		III	P5	A7.2.
	UN2579	<b>PIPERAZINE</b>	8		III	P5	A12.3.
	UN2401	<b>PIPERIDINE</b>	8	3	I	P4	A12.2.
		Pivaloyl Chloride, see <b>TRIMETHYLACETYL CHLORIDE</b> (UN2438)					
		Plastic explosives, see <b>EXPLOSIVE, BLASTING, TYPE D</b> (UN0084)					
	UN3314	<b>PLASTIC MOULDING COMPOUND</b> in dough, sheet, or extruded rope form evolving flammable vapor	9		III	P5	A13.17.
★	UN2006	<b>PLASTICS, NITROCELLULOSE BASED, SELF-HEATING, N.O.S.</b>	4.2		III	P2	A8.3.



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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Plastic solvent, N.O.S., see <b>FLAMMABLE LIQUIDS, N.O.S. ★</b> (UN1993)					
		Plutonium nitrate solution, see IATA 10.5					
		Polish, see <b>PAINT</b> (UN1263)					
		Poisonous gases, N.O.S., see <b>COMPRESSED</b> (UN1956) or <b>LIQUEFIED GASES, FLAMMABLE</b> (UN3161) or <b>TOXIC, N.O.S.</b> (UN3162)					
		Polyalkylamines, N.O.S., see <b>AMINES, etc.</b> (UN2773)					
★	UN2733	<b>POLYAMINES, FLAMMABLE, CORROSIVE, N.O.S. or AMINES, FLAMMABLE, CORROSIVE N.O.S.</b>	3	8 8 8	I II III	P3 P5 P5	A7.2. A7.2. A7.2.
★	UN2735	<b>POLYAMINES, LIQUID, CORROSIVE, N.O.S. or AMINES, LIQUID, CORROSIVE, N.O.S.</b>	8		I II III	P3 P4 P5	A12.2. A12.2. A12.2.
★	UN2734	<b>POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. or AMINES, LIQUID, CORROSIVE, FLAMMABLE N.O.S.</b>	8	3 3	I II	P5 P5	A12.2. A12.2.
★	UN3259	<b>POLYAMINES, SOLID, CORROSIVE, N.O.S.</b>	8		I II III	P5 P5 P5	A12.3. A12.3. A12.3.
	UN2315	<b>POLYCHLORINATED BIPHENYLS, LIQUID</b>	9		II	P5, 9, 81, 140	A13.2.
	UN3432	<b>POLYCHLORINATED BIPHENYLS, SOLID</b>	9		II	P5, 9, 81, 140	A13.2.
	UN3269	<b>POLYESTER RESIN KIT, liquid base material</b>	3			P5, 149	A7.6.
	UN3527	<b>POLYESTER RESIN KIT, solid base material</b>	4.1			P5, 157	A8.19.
	UN3151	<b>POLYHALOGENATED BIPHENYLS, LIQUID or HALOGENATED MONOMETHYLDIPHENYLMETHANES, LIQUID or POLYHALOGENATED TERPHENYLS, LIQUID</b>	9		II	P5	A13.2.
	UN3152	<b>POLYHALOGENATED BIPHENYLS, SOLID, or HALOGENATED MONOMETHYLDIPHENYLMETHANES, SOLID or POLYHALOGENATED TERPHENYLS, SOLID</b>	9		II	P5	A13.2.
	UN2211	<b>POLYMERIC BEADS, EXPANDABLE, evolving flammable vapor</b>	9		III	P5, 32	A13.17.
	UN3532	<b>POLYMERIZING SUBSTANCE, LIQUID, STABILIZED, N.O.S.</b>	4.1		III	P5, 387, N92	A8.2
	UN3534	<b>POLYMERIZING SUBSTANCE, LIQUID, TEMPERATURE CONTROLLED, N.O.S.</b>	4.1		III	387, N92	FORBIDDEN
	UN3531	<b>POLYMERIZING SUBSTANCE, SOLID, STABILIZED, N.O.S.</b>	4.1		III	P5, 387, N92	A8.3
	UN3533	<b>POLYMERIZING SUBSTANCE, LIQUID, STABILIZED, N.O.S.</b>	4.1		III	387, N92	FORBIDDEN
		Polystyrene beads, expandable, etc., see <b>POLYMERIC BEADS, EXPANDABLE</b> (UN2211)					
	UN2257	<b>POTASSIUM</b>	4.3		I	P3, A7, A19, A20, N6, N34	A8.3.
	UN1677	<b>POTASSIUM ARSENATE</b>	6.1		II	P5	A10.5.
	UN1678	<b>POTASSIUM ARSENITE</b>	6.1		II	P5	A10.5.
		Potassium bifluoride, see <b>POTASSIUM HYDROGENDIFLUORIDE, SOLID</b> (UN1811) or <b>POTASSIUM HYDROGENDIFLUORIDE, SOLUTION</b> (UN3421)					
		Potassium bisulphate, see <b>POTASSIUM HYDROGEN SULPHATE</b> (UN2509)					
		Potassium bisulphite solution, see <b>BISULFITES, AQUEOUS SOLUTIONS, N.O.S. ★</b> (UN2693)					
	UN1870	<b>POTASSIUM BOROHYDRIDE</b>	4.3		I	P3, A19, N40	A8.3.
	UN1484	<b>POTASSIUM BROMATE</b>	5.1		II	P5	A9.6.
		Potassium carbonyl					FORBIDDEN
	UN1485	<b>POTASSIUM CHLORATE</b>	5.1		II	P5, A9, N34	A9.6.

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN2427	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5.1		II III	P5, A2 P5, A2	A9.5. A9.5.
		Potassium chlorate mixed with mineral oil, see EXPLOSIVE BLASTING, TYPE C (UN0083)					
	UN1679	POTASSIUM CUPROCYANIDE	6.1		II	P5	A10.5.
	UN1680	POTASSIUM CYANIDE, SOLID	6.1		I	P5, N74, N75	A10.5.
	UN3413	POTASSIUM CYANIDE, SOLUTION	6.1		I II III	P5, N74, N75 P5, N74, N75 P5, N74, N75	A10.4. A10.4. A10.4.
		Potassium dichloro isocyanurate or Potassium dichloro-s-triazinetriene, see DICHLOROISOCYANURIC ACID DRY (UN2465) or DICHLOROISOCYANURIC ACID SALTS (UN2465), etc					
		Potassium dicyanocuprate (I), see POTTASIUM CUPROCYANIDE (UN1679)					
	UN1929	POTASSIUM DITHIONITE or POTASSIUM HYDROSULFITE	4.2		II	P5, A8, A19, A20	A8.3.
	UN1812	POTASSIUM FLUORIDE, SOLID	6.1		III	P5	A10.5.
	UN3422	POTASSIUM FLUORIDE, SOLUTION	6.1		III	P5	A10.4.
	UN2628	POTASSIUM FLUOROACETATE	6.1		I	P5	A10.5.
	UN2655	POTASSIUM FLUOROSILICATE	6.1		III	P5	A10.5.
		Potassium hexafluorosilicate, see POTASSIUM FLUOROSILICATE (UN2655)					
		Potassium hydrate, see POTASSIUM HYDROXIDE, SOLID (UN1813)					
	UN2509	POTASSIUM HYDROGEN SULPHATE	8		II	P5, A7, N34	A12.3.
	UN1811	POTASSIUM HYDROGENDIFLUORIDE, SOLID	8	6.1	II	P5, N3, N34	A12.3.
	UN3421	POTASSIUM HYDROGENDIFLUORIDE, SOLUTION	8	6.1	II III	P5, N3, N34 P5, N3, N34	A12.2 A12.2
		Potassium hydrogen fluoride, see POTASSIUM HYDROGENFLUORIDE, SOLID (UN1811) or POTASSIUM HYDROGENFLUORIDE SOLUTION (UN3421)					
	UN1929	POTASSIUM HYDROSULFITE or POTASSIUM DITHIONITE	4.2		II	P5, A19, A20, N34	A8.3.
		Potassium hydroxide, liquid, see POTASSIUM HYDROXIDE SOLUTION (UN1814)					
	UN1813	POTASSIUM, HYDROXIDE, SOLID	8		II	P5	A12.3.
	UN1814	POTASSIUM HYDROXIDE, SOLUTION	8		II III	P5 P5	A12.2. A12.2.
		Potassium hypochlorite, solution, see HYPOCHLORITE SOLUTIONS (UN1791)					
	UN1420	POTASSIUM, METAL ALLOYS, LIQUID	4.3		I	P3, A7, A19, A20	A8.2.
	UN3403	POTASSIUM METAL ALLOYS, SOLID	4.3		I	P3, A19, A20	A8.3.
		Potassium metal, liquid alloy, see ALKALI METAL ALLOY, LIQUID, N.O.S. ★ (UN1421)					
	UN2864	POTASSIUM METAVANADATE	6.1		II	P5	A10.5.
	UN2033	POTASSIUM MONOXIDE	8		II	P5	A12.3.
	UN1486	POTASSIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
		Potassium nitrate and sodium nitrate mixture, see SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE (UN1499)					
	UN1487	POTASSIUM NITRATE AND SODIUM NITRITE MIXTURES	5.1		II	P5	A9.6.
	UN1488	POTASSIUM NITRITE	5.1		II	P5	A9.6.
	UN1489	POTASSIUM PERCHLORATE	5.1		II	P5	A9.5., A9.6.
	UN1490	POTASSIUM PERMANGANATE	5.1		II	P5	A9.6.
	UN1491	POTASSIUM PEROXIDE	5.1		I	P5, A20, N34	A9.6.
	UN1492	POTASSIUM PERSULFATE	5.1		III	P5, A1, A29	A9.6.
	UN2012	POTASSIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Potassium selenate, see <b>SELENATES ★</b> (UN2630) or <b>SELENITES ★</b> (UN2630)					
		Potassium silicofluoride, see <b>POTASSIUM FLUOROSILICATE</b> (UN2655)					
	UN1422	<b>POTASSIUM SODIUM ALLOYS, LIQUID</b>	4.3		I	P3, A7, A19 N34, N40	A8.2.
	UN3404	<b>POTASSIUM SODIUM ALLOYS, SOLID</b>	4.3		I	P3, A19 N34, N40	A8.3.
	UN1382	<b>POTASSIUM SULPHIDE or SULFIDE, ANHYDROUS or POTASSIUM SULPHIDE or SULFIDE with less than 30% water of crystallization</b>	4.2		II	P5, A19, A20, N34	A8.3.
	UN1847	<b>POTASSIUM SULFIDE, HYDRATED with not less than 30% water of crystallization</b>	8		II	P5	A12.3.
	UN2466	<b>POTASSIUM SUPEROXIDE</b>	5.1		I	P5, A20	A9.6.
		Potassium tetracyanomercurate (II) see <b>MERCURIC POTASSIUM CYANIDE</b> (UN1626)					
	UN0433	<b>POWDER CAKE, WETTED, or POWDER PASTE, WETTED with 17% or more alcohol, by mass</b>	1.1C			P4	A5.5.
	UN0159	<b>POWDER CAKE, WETTED, or POWDER PASTE, WETTED with not less than 25% water, by mass</b>	1.3C			P4	A5.5.
		<i>Powder Paste, see <b>POWDER CAKE, etc.</b></i>					
	UN0160	<b>POWDER, SMOKELESS</b>	1.1C			P4	A5.9.
	UN0161	<b>POWDER, SMOKELESS</b>	1.3C			P4	A5.9.
	UN0509	<b>POWDER, SMOKELESS</b>	1.4C			P5	A5.9.
		Power device, explosive, see <b>CARTRIDGES, POWER DEVICE</b> (UN0275, UN0276, UN0323, UN0381)					
		Pressurized products, see <b>AEROSOLS, FLAMMABLE</b> (UN1950)					
	UN0377	<b>PRIMERS, CAP TYPE</b>	1.1B			P4	A5.16.
	UN0378	<b>PRIMERS, CAP TYPE</b>	1.4B			P5	A5.16.
	UN0044	<b>PRIMERS, CAP TYPE</b>	1.4S			P5	A5.16.
		<i>Primers small arms, see <b>PRIMERS, CAP TYPE</b> (UN044, UN0377, UN0378)</i>					
	UN0319	<b>PRIMERS, TUBULAR</b>	1.3G			P4	A5.16.
	UN0320	<b>PRIMERS, TUBULAR</b>	1.4G			P5	A5.16.
	UN0376	<b>PRIMERS, TUBULAR</b>	1.4S			P5	A5.16.
	UN1210	<b>PRINTING INK, flammable or PRINTING INK RELATED MATERIAL</b> (including printing ink thinning or reducing compound) flammable	3		I II III	P3, 367 P5, 149, 367 P5, 367	A7.2. A7.2. A7.2.
		<i>Projectiles illuminating, see <b>AMMUNITION, ILLUMINATING</b>, (UN0171, UN0254, UN0297)</i>					
	UN0424	<b>PROJECTILES, inert, with tracer</b>	1.3G			P4	A5.12.
	UN0425	<b>PROJECTILES, inert, with tracer</b>	1.4G			P5	A5.12.
	UN0345	<b>PROJECTILES, inert with tracer</b>	1.4S			P5	A5.12.
	UN0346	<b>PROJECTILES, with burster or expelling charge</b>	1.2D			P4	A5.12.
	UN0347	<b>PROJECTILES, with burster or expelling charge</b>	1.4D			P5	A5.12.
	UN0426	<b>PROJECTILES, with burster or expelling charge</b>	1.2F			P4	A5.12.
	UN0427	<b>PROJECTILES, with burster or expelling charge</b>	1.4F			P5	A5.12.
	UN0434	<b>PROJECTILES, with burster or expelling charge</b>	1.2G			P4	A5.12.
	UN0435	<b>PROJECTILES, with burster or expelling charge</b>	1.4G			P5	A5.12.
	UN0168	<b>PROJECTILES, with bursting charge</b>	1.1D			P4	A5.12.
	UN0167	<b>PROJECTILES, with bursting charge</b>	1.1F			P4	A5.12.
	UN0169	<b>PROJECTILES, with bursting charge</b>	1.2D			P4	A5.12.
	UN0324	<b>PROJECTILES, with bursting charge</b>	1.2F			P4	A5.12.
	UN0344	<b>PROJECTILES, with bursting charge</b>	1.4D			P5	A5.12.
		Propadiene and methylacetylene mixture, stabilized, see <b>METHYLACETYLENE AND PROPADIENE MIXTURE, STABILIZED</b> (UN1060)					
	UN2200	<b>PROPADIENE, STABILIZED</b>	2.1			P4, 387	A6.4.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1978	PROPANE, <i>see also</i> PETROLEUM GASES, LIQUEFIED	2.1			P4, 19, N95	A6.3., A6.6.
	UN2402	PROPANETHIOLS	3		II	P5	A7.2.
	UN1274	n-PROPANOL or PROPYL ALCOHOL, NORMAL	3		II III	P5 P5	A7.2. A7.2.
	UN0497	PROPELLANT, LIQUID	1.1C			P4	A5.10.
	UN0495	PROPELLANT, LIQUID	1.3C			P4	A5.10.
		Propellant, single, double or triple base, <i>see</i> POWDER SMOKELESS (UN0160, UN0161)					
	UN0498	PROPELLANT, SOLID	1.1C			P4	A5.9.
	UN0499	PROPELLANT, SOLID	1.3C			P4	A5.9.
	UN0501	PROPELLANT, SOLID	1.4C				FORBIDDEN
		Propene, <i>see</i> PROPYLENE (UN1077)					
	UN1275	PROPIONALDEHYDE	3		II	P5	A7.2.
	UN3463	PROPIONIC ACID with 90% or more acid by mass	8	3	II	P5	A12.2
	UN1848	PROPIONIC ACID with 10% or more and less than 90% acid by mass	8		III	P5	A12.2.
	UN2496	PROPIONIC ANHYDRIDE	8		III	P5	A12.2.
	UN2404	PROPIONITRILE	3	6.1	II	P4	A7.2.
	UN1815	PROPIONYL CHLORIDE	3	8	II	P5	A7.2.
	UN1276	n-PROPYL ACETATE	3		II	P5	A7.2.
		Propyl alcohol, <i>see</i> PROPANOL					
	UN1277	PROPYLAMINE	3	8	II	P5, N34	A7.2.
	UN2364	n-PROPYL BENZENE	3		III	P5	A7.2.
		Propyl chloride, <i>see</i> 1-CHLOROPROPANE					
	UN2740	n-PROPYL CHLOROFORMATE	6.1	3, 8	I	P2, 2, N34	A10.6.
	UN1281	PROPYL FORMATES	3		II	P5	A7.2.
	UN2482	n-PROPYL ISOCYANATE	6.1	3	I	P1, 1	A10.6.
		Propyl mercaptan, <i>see</i> PROPANETHIOLS					
	UN1865	n-PROPYL NITRATE	3		II	P5	A7.2.
	UN1277	PROPYLAMINE	3	8	II	P5, N34	A7.2.
	UN1077	PROPYLENE	2.1			P4	A6.3., A6.4.
	UN2611	PROPYLENE CHLOROHYDRIN	6.1	3	II	P5	A10.4.
	UN1280	PROPYLENE OXIDE	3		I	P3, N34	A7.2.
	UN2258	1,2-PROPYLENEDIAMINE	8	3	II	P5, A3, N34	A12.3.
		Propylene dichloride, <i>see</i> 1,2-DICHLOROPROPANE					
	UN1921	PROPYLENEIMINE, STABILIZED	3	6.1	I	P3, 387, N34	A7.2.
		Propyleneimine, unstabilized					FORBIDDEN
		Propylene or liquefied petroleum gas, <i>see</i> PETROLEUM GASES, LIQUEFIED					
	UN2850	PROPYLENE TETRAMER	3		III	P5	A7.2.
		Propylene timer, <i>see</i> TRIPOPYLENE					
	UN1816	PROPYLTRICHLOROSILANE	8	3	II	P5, A7, N34	A12.2.
		Protective breathing equipment (PBE), <i>see</i> OXYGEN GENERATOR, CHEMICAL (UN3356)					
		Prussic acid, <i>see</i> HYDROGEN CYANIDE, STABILIZED (UN1051, UN1614) or HYDROCYANIC ACID, AQUEOUS SOLUTION (UN1613) or HYDROGEN CYANIDE, SOLUTION IN ALCOHOL (UN3294)					
		Pyrazine hexahydride, <i>see</i> PIPERAZINE (UN2579)					
	UN3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC (flashpoint less than 23 degrees C)	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
	UN3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.5. A10.5. A10.5.
	UN3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE (flashpoint not less than 23 degrees C)	6.1	3 3 3	I II III	P3 P4 P5	A10.5. A10.5. A10.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN1282	PYRIDINE	3		II	P4	A7.2.
		Pyridine perchlorate					FORBIDDEN
★	UN3194	PYROPHORIC LIQUID, INORGANIC, N.O.S.	4.2		I	P3	A8.5.
★	UN2845	PYROPHORIC LIQUID, ORGANIC, N.O.S.	4.2		I	P3	A8.5.
★	UN1383	PYROPHORIC METAL, N.O.S., or PYROPHORIC ALLOY, N.O.S.	4.2		I	P3	A8.11.
★	UN3200	PYROPHORIC SOLID, INORGANIC, N.O.S.	4.2		I	P3	A8.11.
★	UN2846	PYROPHORIC SOLID, ORGANIC, N.O.S.	4.2		I	P3	A8.11.
	UN1817	PYROSULFURYL CHLORIDE	8		II	P5	A12.2.
		Pyroxylin cement, see ADHESIVES (UN1133)					
		Pyroxylin plastic, see CELLULOID (UN2000)					
		Pyroxylin solution, see NITROCELLULOSE SOLUTION, FLAMMABLE (UN2059)					
		Pyroxylin solvent N.O.S., see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)					
	UN1922	PYRROLIDINE	3	8	II	P5	A7.2.
		Quebrachitol pentanitrate					FORBIDDEN
		Quicklime, see CALCIUM OXIDE (UN1910)					
		Quickmatch, see FUSE, NON-DETONATING (UN0101)					
		Quicksilver, see MERCURY (UN2809)					
	UN2656	QUINOLINE	6.1		III	P5	A10.4.
		Quinone, see BENZOQUINONE (UN2587)					
		R114b2, Dibromotetrafluoromethane (Not Restricted)					
		R11, Trichlorofluoromethane (Not Restricted)					
		R12 or R21, see DICHLORODIFLUOROMETHANE (UN1028)					
		R12B1, see CHLORODIFLUOROBROMOMETHANE (UN1974)					
		R13, see CHLOROTRIFLUOROMETHANE (UN1022)					
		R13B1, see BROMOTRIFLUOROMETHANE (UN1009)					
		R14, see TETRAFLUOROMETHANE (UN1982)					
		R22, see CHLORODIFLUOROMETHANE (UN1018)					
		R114, see 1,2-DICHLORO,1,1,2,2- TETRAFLUOROETHANE (UN1958)					
		R115, see CHLOROPENTAFLUROETHANE (UN1020)					
		R116, see HEXAFLUROETHANE (UN2193)					
		R124, see CHLOROTETRAFLUROETHANE (UN1021)					
		R133a, see 1- CHLORO2,2,2- TRIFLUOROETHANE (UN1983)					
		R152a, see 1,1-DIFLUOROETHANE (UN1030)					
		R500, see DICHLORODIFLUOROMETHANE and DIFLUOROETHANE, etc. (UN2602)					
		R502, see CHLORODIFLUOROMETHANE (UN1973)					
		R503, see CHLOROTRIFLUOROMETHANE and TRIFLUOROMETHANE, AZEOTROPIC MIXTURE, with 60% chlorotrifluoromethane (UN2599)					
	UN2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-INSTRUMENTS	7			A507	A11.5.
	UN2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES	7			A507	A11.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM DEPLETED URANIUM	7			A507	A11.5.
	UN2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM NATURAL THORIUM	7			A507	A11.5.
	UN2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM NATURAL URANIUM	7			A507	A11.5.
	UN2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-EMPTY PACKAGING	7			A507	A11.5.
	UN2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE- LIMITED QUANTITY OF MATERIAL	7			P5, 368	A11.5.
	UN2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) <i>non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.6
	UN3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II) <i>non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.6
	UN3324	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II) FISSILE	7			A56, A507	A11.6, A11.10.
	UN3322	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III) <i>non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.6.
	UN3325	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III) FISSILE	7			A56, A507	A11.6, A11.10.
	UN2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I ) <i>non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.6.
	UN2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-II) <i>non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.6.
	UN3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I ), FISSILE	7			A56, A507	A11.6.
	UN3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS ( SCO-II), FISSILE	7			A56, A507	A11.6.
	UN2913	RADIOACTIVE MATERIAL,SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II) <i>non-fissile or fissile excepted</i>	7			325, A56, A507	A11.6
	UN2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT <i>non-fissile or fissile-excepted</i>	7			325, 139, A56, A507	A11.11.
	UN3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE	7			139, A56, A507	A11.11.
	UN2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE <i>non-special form, non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.8. , A11.12.
	UN3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE <i>non-special form</i>	7			A56, A507	A11.10.
	UN3332	RADIOACTIVE MATERIAL,TYPE A PACKAGE, SPECIAL FORM <i>non-fissile or fissile-excepted</i>	7			A56, A507	A11.8.
	UN3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	7			A56, A507	A11.10.
	UN2917	RADIOACTIVE MATERIAL,TYPE B(M) PACKAGE <i>non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.9.
	UN3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE	7			A56, A507	A11.10.
	UN2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE <i>non-fissile or fissile-excepted</i>	7			325, A56, A507	A11.9.
	UN3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE	7			A56, A507	A11.10.
	UN3323	RADIOACTIVE MATERIAL, TYPE C PACKAGE <i>non-fissile or fissile excepted</i>	7			A56, A507	A11.11
	UN3330	RADIOACTIVE MATRIAL, TYPE C PACKAGE, FISSILE	7			A56, A507	A11.11

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN2978	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE <i>non-fissile or fissile-excepted</i>	7	6.1, 8		A56, A507	A11.7.
	UN2977	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSIONABLE	7	6.1, 8		A507	A11.7., A11.10.
	UN1856	RAGS, OILY	4.2		III		FORBIDDEN
		<i>Rags, wet, see COTTON, WET (UN1365)</i>					
		<i>Railway torpedo, see SIGNALS, RAILWAY TRACK, EXPLOSIVE (UN0192, UN0193)</i>					
		<i>RC138, see OCTAFLUOROCYCLOBUTANE</i>					
	UN0391	RDX AND CYCLOTETRAMETHYLENETETRAMINE MIXTURE, DESENSITIZED D, or RDX AND HMX MIXTURE, DESENSITIZED <i>with not less than 10% phlegmatizer by mass</i>	1.1D			P4	A5.6.
	UN0391	RDX AND CYCLOTETRAMETHYLENETETRAMINE MIXTURE, WETTED, or RDX AND HMX MIXTURE <i>with not less than 15% water by mass</i>	1.1D			P4	A5.6.
	UN0483	RDX, DESENSITIZED	1.1D			P4	A5.6.
	UN0072	RDX, WETTED <i>with not less than 15% water by mass</i>	1.1D			P4	A5.6.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS or GAS CARTRIDGES ( <i>nonflammable</i> ) without release device, not refillable (and not exceeding 1L capacity)	2.2			P5	A6.3., A6.4.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS or GAS CARTRIDGES ( <i>flammable</i> ) without release device, not refillable (and not exceeding 1L capacity)	2.1			P5	A6.3., A6.4.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS or GAS CARTRIDGES ( <i>oxidizing</i> ) without a release device, non-refillable (and not exceeding 1L capacity)	2.2	5.1		P5, A14	A6.3., A6.4.
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS ( <i>toxic</i> ) without a release device, non-refillable	2.3				FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS ( <i>toxic and corrosive</i> ) without a release device, non-refillable	2.3	8			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS ( <i>toxic and flammable</i> ) without a release device, non-refillable	2.3	2.1			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS ( <i>toxic and oxidizing</i> ) without a release device, non-refillable	2.3	5.1			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS ( <i>toxic, flammable, corrosive</i> ) without a release device, non-refillable	2.3	2.1, 8			FORBIDDEN
	UN2037	RECEPTACLES, SMALL, CONTAINING GAS ( <i>toxic, oxidizing and corrosive</i> ) without a release device, non-refillable	2.3	5.1, 8			FORBIDDEN
		<i>Red Phosphorus, see PHOSPHORUS, AMORPHUS (UN1338)</i>					
★	UN1078	REFRIGERANT GAS, N.O.S.	2.2.			P5	A6.3., A6.4.
	UN1082	REFRIGERANT GAS R 1113	2.3	2.1			FORBIDDEN
	UN1028	REFRIGERANT GAS R12 or DICHLORODIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1974	REFRIGERANT GAS R12B1 or CHLORODIFLUOROBROMO-METHANE	2.2			P5	A6.3., A6.4.
	UN1022	REFRIGERANT GAS R13 or CHLOROTRIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1009	REFRIGERANT GAS R13B1 or BROMOTRIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1982	REFRIGERANT GAS R14 or TETRAFLUOROMETHANE	2.2			P5	A6.5.
	UN1029	REFRIGERANT GAS R21 or DICHLOROFLUOROMETHANE	2.2			P5	A6.3., A6.4.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1018	REFRIGERANT GAS R22 <i>or</i> CHLORODIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN1984	REFRIGERANT GAS R23 <i>or</i> TRIFLUOROMETHANE	2.2			P5	A6.3., A6.4.
	UN3252	REFRIGERANT GAS R32 <i>or</i> DIFLUOROMETHANE	2.1			P4	A6.3., A6.5.
	UN1063	REFRIGERANT GAS R40 <i>or</i> METHYL CHLORIDE	2.1			P4	A6.3., A6.4.
	UN2454	REFRIGERANT GAS R41 <i>or</i> METHYL FLUORIDE	2.1			P4	A6.3., A6.4.
	UN1958	REFRIGERANT GAS R114 <i>or</i> DICHLOROTETRAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN1020	REFRIGERANT GAS R115 <i>or</i> CHLOROPENTAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN2193	REFRIGERANT GAS R116 <i>or</i> HEXAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN1021	REFRIGERANT GAS R124 <i>or</i> CHLOROTETRAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN3220	REFRIGERANT GAS R125 <i>or</i> PENTAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN1983	REFRIGERANT GAS R133A <i>or</i> CHLOROTRIFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN3159	REFRIGERANT GAS R134A <i>or</i> 1,1,1,2-TETRAFLUOROETHANE	2.2			P5	A6.3., A6.4.
	UN2517	REFRIGERANT GAS 142B <i>or</i> 1-CHLORO-1,1-DIFLUOROETHANE	2.1			P4	A6.3., A6.4.
	UN2035	REFRIGERANT GAS 143A <i>or</i> 1,1,1-TRIFLUOROETHANE	2.1			P4	A6.3., A6.4.
	UN1030	REFRIGERANT GAS 152A <i>or</i> DIFLUOROETHANE	2.1			P4	A6.3., A6.4.
	UN2453	REFRIGERANT GAS 161 <i>or</i> ETHYL FLUORIDE	2.1			P4	A6.3., A6.4.
	UN2424	REFRIGERANT GAS 218 <i>or</i> OCTAFLUOROPROPANE	2.2			P5	A6.4.
	UN3296	REFRIGERANT GAS 227 <i>or</i> HEPTAFLUOROPROPANE	2.2			P5	A6.3., A6.4.
	UN1976	REFRIGERANT GAS RC318 <i>or</i> OCTAFLUOROCYCLOBUTANE	2.2			P5	A6.4.
	UN3337	REFRIGERANT GAS R404A	2.2			P5	A6.3., A6.4.
	UN3338	REFRIGERANT GAS R407A	2.2			P5	A6.3., A6.4.
	UN3339	REFRIGERANT GAS R407B	2.2			P5	A6.3., A6.4.
	UN3340	REFRIGERANT GAS R407C	2.2			P5	A6.3., A6.4.
	UN2602	REFRIGERANT GAS R500 <i>or</i> DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE	2.2			P5	A6.3., A6.4.
	UN1973	REFRIGERANT GAS R502 <i>or</i> CHLOROPENTAFLUOROETHANE MIXTURE	2.2			P5	A6.3., A6.4.
	UN2599	REFRIGERANT GAS R503 <i>or</i> CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE	2.2			P5	A6.3., A6.4.
	UN1959	REFRIGERANT GAS R1132A <i>or</i> 1,1-DIFLUOROETHYLENE	2.1			P4	A6.3., A6.4.
	UN1858	REFRIGERANT GAS R1216 <i>or</i> HEXAFLUOROPROPYLENE	2.2			P5	A6.3., A6.4.
	UN2422	REFRIGERANT GAS R1318 <i>or</i> OCTAFLUOROBUT-2-ENE	2.2			P5	A6.4.
★	UN1078	REFRIGERANT GASES, N.O.S.	2.2			P5	A6.3., A6.4.
D	NA1954	REFRIGERANT GASES, N.O.S. <i>or</i> DISPERSANT GASES, N.O.S.	2.1			P4	A6.3., A6.4.
	UN3358	REFRIGERATING MACHINES, <i>containing flammable, non-toxic, liquefied gas</i>	2.1			P4, A523	FORBIDDEN
	UN2857	REFRIGERATING MACHINES, <i>containing nonflammable non-toxic, liquefied gas or ammonia solutions (UN2672)</i>	2.2			P5, A53	A6.3., A6.8.



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Refrigerating machines containing toxic liquefied gas or ammonia solution with more than 50% ammonia					FORBIDDEN
		Refrigerating machines With less than 12kg non-flammable, non-toxic, liquefied gas or containing less than 12 L ammonia solution with 35% or less ammonia (Not Restricted)					
	UN3291	REGULATED MEDICAL WASTE N.O.S.	6.2		II	P5	A10.10.
	UN0173	RELEASE DEVICES, EXPLOSIVE	1.4S			P5	A5.17.
		Resinate of cobalt, precipitated, see <b>COBALT RESINATE, PRECIPITATED (UN1318)</b>					
		Resinates, liquid, see <b>FLAMMABLE LIQUID, N.O.S. ★ (UN1993)</b>					
		Resinates, solid, see <b>FLAMMABLE SOLID, ORGANIC, N.O.S. ★ (UN1325)</b>					
	UN1866	RESIN SOLUTION, flammable	3		I II III	P3 P5, 149 P5	A7.2. A7.2. A7.2.
		Resorcin, see <b>RESORCINOL (UN2876)</b>					
	UN2876	RESORCINOL	6.1		III	P5	A10.5.
		Rifle grenade, see <b>GRENADERS, (UN0284, UN0285, UN0292, UN0293)</b>					
		Rifle powder, see <b>POWDER, SMOKELESS (UN0160, UN0161)</b>					
	UN0174	RIVETS, EXPLOSIVE	1.4S			P5	A5.17.
		Road asphalt or tar liquid, see <b>TARS, LIQUID, (UN1999)</b>					
	UN 0510	ROCKET MOTORS	1.4C			P5, 109	A5.12.
	UN0186	ROCKET MOTORS	1.3C			P4, 109	A5.12.
	UN0280	ROCKET MOTORS	1.1C			P4, 109	A5.12.
	UN0281	ROCKET MOTORS	1.2C			P4, 109	A5.12.
	UN0395	ROCKET MOTORS, LIQUID FUELED	1.2J			P3, 109	A5.3.
	UN0396	ROCKET MOTORS, LIQUID FUELED	1.3J			P3, 109	A5.3.
	UN0250	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without an expelling charge	1.3L			P2, 109, 500	A5.3.
	UN0322	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without an expelling charge	1.2L			P2, 109, 500	A5.3.
	UN0238	ROCKETS, LINE-THROWING	1.2G			P4	A5.12.
	UN0240	ROCKETS, LINE-THROWING	1.3G			P4	A5.12.
	UN0453	ROCKETS, LINE-THROWING	1.4G			P5	A5.12.
	UN0397	ROCKETS, LIQUID FUELED with bursting charge	1.1J			P3, A500	A5.3.
	UN0398	ROCKETS, LIQUID FUELED with bursting charge	1.2J			P3, A500	A5.3.
	UN0180	ROCKETS, with bursting charge	1.1F			P4	A5.12.
	UN0181	ROCKETS, with bursting charge	1.1E			P4	A5.12.
	UN0182	ROCKETS, with bursting charge	1.2E			P4	A5.12.
	UN0295	ROCKETS, with bursting charge	1.2F			P4	A5.12.
	UN0436	ROCKETS, with expelling charge	1.2C			P4	A5.12.
	UN0437	ROCKETS, with expelling charge	1.3C			P4	A5.12.
	UN0438	ROCKETS, with expelling charge	1.4C			P5	A5.12.
	UN0183	ROCKETS, with inert head	1.3C			P4	A5.12.
	UN0502	ROCKETS, with inert head	1.2C			P4	A5.12.
	UN1286	ROSIN OIL	3		II III	P5 P5	A7.2. A7.2.
	UN1345	RUBBER SCRAP or RUBBER SHODDY, powdered or granulated, not exceeding 840 microns & rubber Content exceeding 45%	4.1		II	P5	A8.3
	UN1287	RUBBER SOLUTION	3		II III	P5, 149 P5	A7.2. A7.2.
	UN1423	RUBIDIUM	4.3		I	P3, 22, A7, A19, N34, N40, N45	A8.3.
	UN2678	RUBIDIUM HYDROXIDE	8		II	P5	A12.3.
	UN2677	RUBIDIUM HYDROXIDE SOLUTION	8		II III	P5 P5	A12.2. A12.2.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN3268	<b>SAFETY DEVICES</b> , electrically initiated	9			P5, 160, A200	A13.15.
	UN0503	<b>SAFETY DEVICES</b> , pyrotechnic	1.4G			P5, A200	A5.18.
		<i>Safety fuse, see FUSE, SAFETY (UN0105)</i>					
		<i>Safety squibs, see IGNITERS (UN0325, UN0454)</i>					
		<i>Saltpetre, see POTASSIUM NITRATE (UN1486)</i>					
		<i>Sand acid, see FLUOROSILICIC ACID (UN1778)</i>					
★	UN0190	<b>SAMPLES, EXPLOSIVE</b> , other than initiating explosives	use class/division of sample		II	P4, 113	A5.3.
		<i>seat-belt pretensioner, see SAFETY DEVICES, (UN3268), SAFETY DEVICES, PYROTECHNIC (UN0503)</i>					
	UN3268	<i>seat-belt pretensioners, see SAFETY DEVICES, electrically initiated</i>					
		<i>Security type attaché cases, cash boxes/bags, incorporating dangerous goods such as lithium batteries and/or pyrotechnic material</i>					FORBIDDEN
	UN1386	<b>SEED CAKE</b> , containing vegetable oil solvent extractions and expelled seeds, with not more than 10% of oil and when the amount of moisture is higher than 11%, not more than 20% of oil and moisture combined	4.2		III	P5, N7	A8.3.
	UN1386	<b>SEED CAKE</b> with more than 1.5% oil and not more than 11% moisture	4.2		III	P5, N7	A8.3.
	UN2217	<b>SEED CAKE</b> with not more than 1.5% oil and not more than 11% moisture	4.2		III	P5, N7	A8.3.
		<i>Seed expellers, see SEED CAKE (UN1386, UN2217)</i>					
★	UN2630	<b>SELENATES or SELENITES</b>	6.1		I	P5	A10.5.
	UN1905	<b>SELENIC ACID</b>	8		I	P3, N34	A12.3.
	UN3440	<b>SELENIUM COMPOUND, LIQUID, N.O.S.</b>	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3283	<b>SELENIUM COMPOUND, SOLID, N.O.S.</b>	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2657	<b>SELENIUM DISULFIDE</b>	6.1		II	P5	A10.5.
	UN2194	<b>SELENIUM HEXAFLUORIDE</b>	2.3	8		P1, 1	A6.15.
		<i>Selenium nitride</i>					FORBIDDEN
	UN2879	<b>SELENIUM OXYCHLORIDE</b>	8	6.1	I	P3, A7, N34	A12.2.
		<i>Self-defense spray, aerosol, see AEROSOLS, Nonflammable, (not exceeding 1 L capacity) (UN1950).</i>					
+, D	NA3334	<b>SELF-DEFENSE SPRAY, NON-PRESSURIZED</b>	9		III	P5, A37	A13.2.
★	UN3188	<b>SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.</b>	4.2	8 8	II III	P4 P5	A8.2. A8.2.
★	UN3185	<b>SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.</b>	4.2	8 8	II III	P4 P5	A8.2. A8.2.
★	UN3186	<b>SELF-HEATING LIQUID, INORGANIC, N.O.S.</b>	4.2		II III	P4 P5	A8.2. A8.2.
★	UN3183	<b>SELF-HEATING LIQUID, ORGANIC, N.O.S.</b>	4.2		II III	P4 P5	A8.2. A8.2.
★	UN3187	<b>SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.</b>	4.2	6.1 6.1	II III	P4 P5	A8.2. A8.2.
★	UN3184	<b>SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.</b>	4.2	6.1 6.1	II III	P4 P5	A8.2. A8.2.
★	UN3192	<b>SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.</b>	4.2	8 8	II III	P5 P5	A8.3. A8.3.
★	UN3126	<b>SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.</b>	4.2	8 8	II III	P5 P5	A8.3. A8.3.
★	UN3190	<b>SELF-HEATING SOLID, INORGANIC, N.O.S.</b>	4.2		II III	P5 P5	A8.3. A8.3.
★	UN3088	<b>SELF-HEATING SOLID, ORGANIC, N.O.S.</b>	4.2		II III	P5 P5	A8.3. A8.3.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3127	SELF-HEATING SOLID, OXIDIZING, N.O.S.	4.2	5.1		P3	A8.4.
★	UN3191	SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.	4.2	6.1 6.1	II III	P5 P5	A8.3. A8.3.
★	UN3128	SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.	4.2	6.1 6.1	II III	P5 P5	A8.3. A8.3.
		Self-inflating passenger restraint systems (air bags) for motor vehicles, see <b>LIFE-SAVING APPLIANCES, SELF-INFLATING</b> (UN2990) or <b>AIR BAG INFLATORS</b> (UN0503) or <b>SEAT-BELT PRETENSIONERS</b> (UN0503, UN2368) or <b>AIR BAG MODULES</b> (UN0503) or <b>SAFETY DEVICES</b> (UN3268)					
		Self-propelled vehicle, see <b>VEHICLE, FLAMMABLE GAS POWERED</b> (UN3166) or <b>VEHICLE, FLAMMABLE LIQUID POWERED</b> (UN3166) or <b>BATTERY-POWERED VEHICLE</b> (UN3171) or <b>BATTERY-POWERED EQUIPMENT</b> (UN3171)					
★	UN3221	SELF-REACTIVE LIQUID TYPE B	4.1				FORBIDDEN
★	UN3231	SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
★	UN3223	SELF-REACTIVE LIQUID TYPE C	4.1			P5	A8.7.
★	UN3233	SELF-REACTIVE LIQUID TYPE C TEMPERATURE CONTROLLED	4.1				FORBIDDEN
★	UN3225	SELF-REACTIVE LIQUID TYPE D	4.1			P5	A8.7.
★	UN3235	SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
★	UN3227	SELF-REACTIVE LIQUID TYPE E	4.1			P5	A8.7.
★	UN3237	SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
★	UN3229	SELF-REACTIVE LIQUID TYPE F	4.1			P5	A8.7.
★	UN3239	SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
		Self-reactive solid type B					FORBIDDEN
		Self-reactive solid type B temperature controlled					FORBIDDEN
★	UN3222	SELF-REACTIVE SOLID TYPE B (see below for specific technical name)	4.1			P5, 53	(see technical name below for packaging paragraph reference)
		2-Diazo-1-Naphthol-4-sulphonyl chloride					A8.9.
		2-Diazo-1-Naphthol-5-sulphonyl chloride					A8.9.
★	UN3232	SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
★	UN3224	SELF-REACTIVE SOLID TYPE C (see below for specific technical name)	4.1			P5	(see technical name below for packaging paragraph reference)
		2,2'-Azodi(isobutyronitrile) as a water base paste					
		N,N'-dinitroso-N,N'-dimethyl-terephthalamide, as a paste					A8.6.
		N,N'-dinitrosopentamethylenetetramine					A8.7.
★	UN3234	SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED (specific technical name required)	4.1				FORBIDDEN
★	UN3226	SELF-REACTIVE SOLID TYPE D (see below for specific technical name)	4.1			P5	(see technical name below for packaging paragraph reference)
		1,1'-azodi-(hexahydrobenzonitrile)					A8.7.
		benzene-1,3-disulphohydrazide as a paste					A8.7.
		benzene sulphohydrazide					A8.7.
		2-Diazo-1-Naphtholsulphonic acid ester mixture					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		2,5-Diethoxy-4-(4-morpholinyl)-benzene-diazonium sulphate					
		diphenyloxide-4,4'-disulphohydrazide					A8.6.
		4-dipropylaminobenzenediazonium zinc chloride					A8.8.
		4-Methylbenzenesulphonylhydrazide					
		sodium 2-diazo-1-naphthol-4-sulphonate					A8.8.
		sodium 2-diazo-1-naphthol-5-sulphonate					A8.8.
★	UN3236	SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
★	UN3228	SELF-REACTIVE SOLID TYPE E, (see below for specific technical name)	4.1			P5	(see technical name below for packaging paragraph reference)
		Acetone-pyrogallol copolymer 2- diazo-1-naphthol-5-sulphonate					A8.8.
		2,5-Dibutoxy-4-(4-morpholinyl)-Benzenediazonium, tetrachlorozincate (2:1)					
		4-(Dimethylamino)-benzenediazonium trichlorozincate (-1)					A8.8.
★	UN3238	SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
★	UN3230	SELF-REACTIVE SOLID TYPE F,	4.1			P5	A8.8.
★	UN3240	SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED	4.1				FORBIDDEN
	UN1288	SHALE OIL	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		Shaped Charges, commercial, see CHARGES, SHAPED (UN0059, UN0439, UN0440, UN0441)					
		Shellac, see PAINT (UN1263)					
	UN0191	SIGNAL DEVICES, HAND	1.4G			P5	A5.18.
	UN0373	SIGNAL DEVICES, HAND	1.4S			P5	A5.18.
	UN0194	SIGNALS, DISTRESS, ship	1.1G			P4	A5.18.
	UN0195	SIGNALS, DISTRESS, ship	1.3G			P4	A5.18.
	UN0505	SIGNALS, DISTRESS ship	1.4G			P5	A5.18.
	UN0506	SIGNALS, DISTRESS ship	1.4S			P5	A5.18.
		Signals, distress, ship, water-activated, see CONTRIVANCES, WATER-ACTIVATED ★ (UN0248, UN0249)					
		Signals, highway, see SIGNAL DEVICES, HAND (UN0191, UN0373) or FIREWORKS (UN0333, UN0334, UN0335, UN0336, UN0337)					
	UN0192	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.1G			P4	A5.18.
	UN0492	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.3G			P4	A5.18.
	UN0493	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4G			P5	A5.18.
	UN0193	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4S			P5	A5.18.
	UN0196	SIGNALS, SMOKE	1.1G			P4	A5.18.
	UN0313	SIGNALS, SMOKE	1.2G			P4	A5.18.
	UN0487	SIGNALS, SMOKE	1.3G			P4	A5.18.
	UN0197	SIGNALS, SMOKE	1.4G			P5	A5.18.
	UN0507	SIGNALS, SMOKE	1.4S			P5	A5.18.
	UN2203	SILANE	2.1		II	P4	A6.5.
		Silicofluoric acid, see FLUROSILICIC ACID (UN1778)					
		Silicofluorides, see FLUROSILICATES, N.O.S. * (UN2856)					
		Silicon chloride, see SILICON TETRACHLORIDE (UN1818)					
	UN1346	SILICON POWDER, AMORPHOUS	4.1		III	P5, A1	A8.3.
	UN1818	SILICON TETRACHLORIDE	8		II	P5, A3	A12.2.
	UN1859	SILICON TETRAFLUORIDE	2.3	8		P2, 2	A6.6.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN3521	<b>SILICON TETRAFLUORIDE, ADSORBED</b>	2.3	8		P2, 2	A6.6.
		<i>Silver acetylide (dry)</i>					FORBIDDEN
	UN1683	<b>SILVER ARSENITE</b>	6.1		II	P5	A10.5.
		<i>Silver azide (dry)</i>					FORBIDDEN
		<i>Silver chlorite (dry)</i>					FORBIDDEN
	UN1684	<b>SILVER CYANIDE</b>	6.1		II	P5	A10.5.
		<i>Silver fulminate (dry)</i>					FORBIDDEN
	UN1493	<b>SILVER NITRATE</b>	5.1		II	P5	A9.6.
		<i>Silver oxadate (dry)</i>					FORBIDDEN
		<i>Silver picrate (dry)</i>					FORBIDDEN
	UN1347	<b>SILVER PICRATE, WETTED, with not less than 30% water, by mass</b>	4.1		I	P3	A8.3.
		<i>Silver picrate, wetted with less than 30% water, by weight</i>					FORBIDDEN
		<i>Sisal, see FIBERS, SYNTHETIC, N.O.S. ★ (UN1373) or FIBERS, VEGETABLE, N.O.S. ★ (UN1373) or FIBERS, ANIMAL, N.O.S. ★ (UN1373)</i>					
	UN1906	<b>SLUDGE, ACID</b>	8		II	P5, A3, A7, N34	A12.2.
D	NA3178	<b>SMOKELESS POWDER FOR SMALL ARMS (100 pounds or less)</b>	4.1		I	P4, 16	A8.17.
	UN1907	<b>SODA LIME with more than 4% sodium hydroxide</b>	8		III	P5	A12.3.
	UN1428	<b>SODIUM</b>	4.3		I	P3, A7, A8, A19, A20, N34	A8.3.
	UN2812	<b>SODIUM ALUMINATE, SOLID</b>	8		III	P5	A12.3.
	UN1819	<b>SODIUM ALUMINATE, SOLUTION</b>	8		II III	P5 P5	A12.2. A12.2.
	UN2835	<b>SODIUM ALUMINUM HYDRIDE</b>	4.3		II	P5, A8, A19, A20	A8.3.
		<i>Sodium amalgam, see ALKALI METAL AMALGAM, LIQUID (UN1389) or ALKALI, METAL AMALGAM, SOLID (UN3401)</i>					
		<i>Sodium amide, see ALKALI METAL AMIDES (UN1390)</i>					
	UN2863	<b>SODIUM AMMONIUM VANADATE</b>	6.1		II	P5	A10.5.
	UN2473	<b>SODIUM ARSANILATE</b>	6.1		III	P5	A10.5.
	UN1685	<b>SODIUM ARSENATE</b>	6.1		II	P5	A10.5.
	UN1686	<b>SODIUM ARSENITE, AQUEOUS SOLUTIONS</b>	6.1		II III	P5 P5	A10.4. A10.4.
	UN2027	<b>SODIUM ARSENITE, SOLID</b>	6.1		II	P5	A10.5.
	UN1687	<b>SODIUM AZIDE</b>	6.1		II	P5	A10.5.
		<i>Sodium bifluoride, see SODIUM HYDROGENDIFLUORIDE, (UN2439)</i>					
		<i>Sodium binoxide, see SODIUM PEROXIDE (UN1504)</i>					
		<i>Sodium bisulfates or bisulphate solution, see BISULFATES or BISULPHATE, AQUEOUS SOLUTION (UN2837)</i>					
		<i>Sodium bisulphite or bisulfites, solution, see BISULFITES or BISULPHITE, AQUEOUS SOLUTIONS N.O.S. ★ (UN2693)</i>					
	UN1426	<b>SODIUM BOROHYDRIDE</b>	4.3		I	P3, N40	A8.3.
	UN3320	<b>SODIUM BOROHYDRIDE AND SODIUM HYDROXIDE SOLUTION with no more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass</b>	8		II III	P5, N34 P5, N34	A12.2. A12.2.
	UN1494	<b>SODIUM BROMATE</b>	5.1		II	P5	A9.6.
	UN1688	<b>SODIUM CACODYLATE</b>	6.1		II	P5	A10.5.
	UN3378	<b>SODIUM CARBONATE PEROXYHYDRATE</b>	5.1		II III	P5 P5	A9.6 A9.6
	UN1495	<b>SODIUM CHLORATE</b>	5.1		II	P5, A9, N34	A9.6.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN2428	<b>SODIUM CHLORATE, AQUEOUS SOLUTION</b>	5.1		II III	P5, A2 P5, A2	A9.5. A9.5.
		<i>Sodium chlorate mixed with dinitrotoluene, see <b>EXPLOSIVE BLASTING TYPE C</b> (UN0083)</i>					
	UN1496	<b>SODIUM CHLORITE</b>	5.1		II	P5, A9, N34	A9.6.
		<i>Sodium chlorite solution, see <b>CHLORITE SOLUTION</b> (UN1908)</i>					
		Sodium chlorite solution with less than 5% available chlorine, Not Restricted					
	UN2659	<b>SODIUM CHLOROACETATE</b>	6.1		III	P5	A10.5.
	UN2316	<b>SODIUM CUPROCYANIDE, SOLID</b>	6.1		I	P5	A10.5.
	UN2317	<b>SODIUM CUPROCYANIDE, SOLUTION</b>	6.1		I	P3	A10.4.
	UN1689	<b>SODIUM CYANIDE, SOLID</b>	6.1		I	P3, N74, N75	A10.5.
	UN3414	<b>SODIUM CYANIDE, SOLUTION</b>	6.1		I II III	P3, N74, N75 P4, N74, N75 P5, N74, N75	A10.4 A10.4 A10.4
		<i>Sodium 2-diazo-1-naphthol-4-sulphonate or Sodium 2-diazo-1-naphthol-5-sulphonate, see <b>SELF REACTIVE SOLID TYPE D</b> (UN3226)</i>					
		<i>Sodium dichloroisocyanurate or Sodium dichloro-s-triazine-trione, see <b>DICHLOROISOCYANURIC ACID</b>, (UN2465)</i>					
		<i>Sodium dicyanocuprate (I), solid, see <b>SODIUM CUPROCYANIDE, SOLID</b> (UN2316)</i>					
		<i>Sodium dicyanocuprate (I), solution, see <b>SODIUM CUPROCYANIDE, SOLUTION</b> (UN2317)</i>					
		<i>Sodium dimethylarsenate, <b>SODIUM CACODYLATE</b> (UN1688)</i>					
	UN0234	<b>SODIUM DINITRO-O-CRESOLATE, dry or wetted, with less than 15% water, by mass</b>	1.3C			P4	A5.9.
	UN3369	<b>SODIUM DINITRO-O-CRESOLATE, WETTED, with not less than 10% water, by mass</b>	4.1		I	P4, 23, A8, A19, A20, N41, N84	A8.3.
	UN1348	<b>SODIUM DINITRO-O-CRESOLATE, WETTED, with not less than 15% water, by mass</b>	4.1	6.1	I	P4, 23, A8, A19, A20, N41	A8.3.
		<i>Sodium dioxide, see <b>SODIUM PEROXIDE</b> (UN1504)</i>					
	UN1384	<b>SODIUM DITHIONITE or SODIUM HYDROSULFITE</b>	4.2		II	P5, A19, A20	A8.3.
	UN1690	<b>SODIUM FLUORIDE, SOLID</b>	6.1		III	P5	A10.5.
	UN3415	<b>SODIUM FLUORIDE, SOLUTION</b>	6.1		III	P5	A10.4.
	UN2629	<b>SODIUM FLUOROACETATE</b>	6.1		I	P5	A10.5.
	UN2674	<b>SODIUM FLUOROSILICATE</b>	6.1		III	P5	A10.5.
		<i>Sodium hexafluorosilicate, see <b>SODIUM FLUOROSILICATE</b> (UN2674)</i>					
		<i>Sodium hydrate solid, see <b>SODIUM HYDROXIDE, SOLID</b></i>					
		<i>Sodium hydrate solution, see <b>SODIUM HYDROXIDE, SOLUTION</b> (UN1824)</i>					
	UN1427	<b>SODIUM HYDRIDE</b>	4.3		I	P3, A19, N40	A8.3.
		<i>Sodium hydrogen 4-aminophenylarsenate, see <b>SODIUM ARSANILATE</b> (UN2473)</i>					
	UN2439	<b>SODIUM HYDROGENDIFLUORIDE</b>	8		II	P5, N3, N34	A12.2., A12.3.
		<i>Sodium hydrogen sulphate or sulfate solution, see <b>BISULFATES or BISULPHATES, AQUEOUS SOLUTION</b> (UN2837)</i>					
		<i>Sodium hydrogen sulphite in solution, or sulfite solution, see <b>BISULFITES or BISULPHITES, AQUEOUS SOLUTION N.O.S. ★</b> (UN2693)</i>					
	UN2318	<b>SODIUM HYDROSULFIDE, with less than 25% water of crystallization</b>	4. 2		II	P5, A7, A19, A20	A8.3.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN2949	<b>SODIUM HYDROSULFIDE</b> , with not less than 25% water of crystallization	8		II	P5, A7	A12.3.
	UN1384	<b>SODIUM HYDROSULFITE</b> or <b>SODIUM DITHIONITE</b>	4.2		II	P5, A19, A20	A8.3.
	UN1823	<b>SODIUM HYDROXIDE, SOLID</b>	8		II	P5	A12.3.
	UN1824	<b>SODIUM HYDROXIDE, SOLUTION</b>	8		II III	P5, N34 P5, N34	A12.2. A12.2.
		<i>Sodium hypochlorite, solution, see</i> <b>HYPOCHLORITE SOLUTIONS, (UN1791)</b> .					
		<i>Sodium metal, liquid alloy, see</i> <b>ALKALI METAL ALLOY LIQUID, N.O.S. ★ (UN1421)</b>					
		<i>Sodium metasilicate pentahydrate, see</i> <b>DISODIUM TRIOXOSILICATE (UN3253)</b>					
	UN1431	<b>SODIUM METHYLATE</b>	4.2	8	II	P5, A7, A19	A8.3.
	UN1289	<b>SODIUM METHYLATE SOLUTIONS</b> in alcohol	3	8 8	II III	P5 P5	A7.2. A7.2.
	UN1825	<b>SODIUM MONOXIDE</b>	8		II	P5	A12.3.
	UN1498	<b>SODIUM NITRATE</b>	5.1		III	P5, A1, A29	A9.6.
	UN1499	<b>SODIUM NITRATE AND POTASSIUM NITRATE MIXTURES</b>	5.1		III	P5, A1, A29	A9.6.
	UN1500	<b>SODIUM NITRITE</b>	5.1	6.1	III	P5, A1, A29	A9.6.
		<i>Sodium nitrite and potassium nitrate mixture, see</i> <b>POTASSIUM NITRATE AND SODIUM NITRITE MIXTURE (UN1487)</b>					
	UN2567	<b>SODIUM PENTACHLOROPHENATE</b>	6.1		II	P5	A10.5.
	UN3377	<b>SODIUM PERBORATE MONOHYDRATE</b>	5.1		III	P5, A1, A29	A9.6.
	UN1502	<b>SODIUM PERCHLORATE</b>	5.1		II	P5	A9.6.
	UN1503	<b>SODIUM PERMANGANATE</b>	5.1		II	P5	A9.6.
	UN1504	<b>SODIUM PEROXIDE</b>	5.1		I	P3, A20, N34	A9.6.
	UN3247	<b>SODIUM PEROXOBORATE, ANHYDROUS</b>	5.1		II	P5	A9.6.
	UN1505	<b>SODIUM PERSULFATE</b>	5.1		III	P5, A1	A9.6.
		<i>Sodium phenolate, solid, see</i> <b>PHENOLATES, SOLID (UN2905)</b>					
	UN1432	<b>SODIUM PHOSPHIDE</b>	4.3	6.1	I	P3, A19, N40	A8.3.
	UN0235	<b>SODIUM PICRAMATE</b> , dry or wetted, with less than 20% water, by mass	1.3C			P3	A5.9.
	UN1349	<b>SODIUM PICRAMATE, WETTED</b> , with not less than 20% water, by mass	4.1		I	P4, 23, A8, A19, N41	A8.3.
		<i>Sodium picryl peroxide</i>					FORBIDDEN
		<i>Sodium potassium alloys, see</i> <b>POTASSIUM SODIUM ALLOYS, LIQUID (UN1422)</b> or <b>POTASSIUM SODIUM ALLOYS, SOLID (UN3404)</b>					
		<i>Sodium selenate or selenite, see</i> <b>SELENATES or SELENITES (UN2630)</b>					
		<i>Sodium silicofluoride, see</i> <b>SODIUM FLUOROSILICATE (UN2674)</b>					
		<i>Sodium sulphate or sulfate acid solution, see</i> <b>BISULFATES or BISULPHATE, AQUEOUS SOLUTION (UN2837)</b>					
	UN1385	<b>SODIUM SULPHIDE</b> or <b>SULFIDE</b> , ANHYDROUS or <b>SODIUM SULPHIDE</b> or <b>SULFIDE</b> with less than 30% water of crystallization	4.2		II	P5, A19, A20, N34	A8.3.
	UN1849	<b>SODIUM SULPHIDE</b> or <b>SULFIDE</b> , HYDRATED with not less than 30% water	8		II	P5	A12.3.
	UN2547	<b>SODIUM SUPEROXIDE</b>	5.1		I	P5, A20, N34	A9.6.
		<i>Sodium tetranitride</i>					FORBIDDEN
★	UN3244	<b>SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.</b>	8		II	P5, 49	A12.3.
★	UN3175	<b>SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.</b>	4.1		II	P5, 47	A8.3.
		<i>Solvents, flammable, N.O.S., see</i> <b>FLAMMABLE LIQUID, N.O.S.</b>					

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Solvents, flammable, toxic, N.O.S., see FLAMMABLE LIQUID, TOXIC, N.O.S.</i>					
★	UN3243	SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	6.1		II	P5, 48	A10.5.
		<i>Solvents, flammable, n.o.s., see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)</i>					
		<i>Solvents, flammable, toxic, n.o.s., see FLAMMABLE LIQUID, TOXIC, N.O.S. ★ (UN1992)</i>					
	UN0374	SOUNDING DEVICES, EXPLOSIVE	1.1D			P4	A5.17.
	UN0296	SOUNDING DEVICES, EXPLOSIVE	1.1F			P4	A5.17.
	UN0375	SOUNDING DEVICES, EXPLOSIVE	1.2D			P4	A5.17.
	UN0204	SOUNDING DEVICES, EXPLOSIVE	1.2F			P4	A5.17.
		<i>Spirits of salts, see HYDROCHLORIC ACID (UN1789)</i>					
		<i>Squibs, see IGNITERS (UN0325, UN0454)</i>					
		<i>Stain, see PAINT (UN1263)</i>					
	UN1827	STANNIC CHLORIDE, ANHYDROUS	8		II	P5	A12.2.
	UN2440	STANNIC CHLORIDE, PENTAHYDRATE	8		III	P5	A12.3.
	UN1433	STANNIC PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
		<i>Steel swarf, see FERROUS METAL SHAVINGS (UN2793) or FERROUS METAL TURNINGS (UN2793) or FERROUS METAL CUTTINGS (UN2793) or FERROUS METAL BORINGS (UN2793)</i>					
	UN2676	STIBINE	2.3	2.1		P1, 1	A6.15.
		<i>Storage batteries, wet, see BATTERIES, WET, FILLED WITH ACID (UN2794) or BATTERIES, WET, FILLED WITH ALKALI (UN2795) or BATTERIES, WET, NON-SPILLABLE (UN2800).</i>					
	UN1327	STRAW	4.1			A520, A524	FORBIDDEN
		<i>Strontium alloy, see ALKALINE EARTH METAL ALLOY, N.O.S. ★ (UN1393)</i>					
		<i>Strontium alloy, pyrophoric, see PYROPHORIC METAL, N.O.S. ★ (UN1383) or PYROPHORIC ALLOY, N.O.S. ★ (UN1383)</i>					
	UN1691	STRONTIUM ARSENITE	6.1		II	P5	A10.5.
	UN1506	STRONTIUM CHLORATE	5.1		II	P5, A1, A9, N34	A9.6.
		<i>Strontium dioxide, see STRONTIUM PEROXIDE (UN1509)</i>					
	UN1507	STRONTIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN1508	STRONTIUM PERCHLORATE	5.1		II	P5	A9.6.
	UN1509	STRONTIUM PEROXIDE	5.1		II	P5	A9.6.
	UN2013	STRONTIUM PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
	UN1692	STRYCHNINE or STRYCHNINE SALTS	6.1		I	P5	A10.5.
	UN0219	STYPHNIC ACID or TRINITRORESORCINOL dry or wetted with no more than 20% water, or mixture of alcohol and water, by weight	1.1D		II	P4	A5.6.
	UN0394	STYPHNIC ACID, WETTED with more than 20% water, or mixture of alcohol and water, by weight	1.1D		II	P4	A5.6.
	UN2055	STYRENE MONOMER, STABILIZED	3		III	P5, 387	A7.2.
		<i>Styrene monomer, unstabilized</i>					FORBIDDEN
★	UN0482	SUBSTANCES EVI, N.O.S. or SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S.	1.5D		II	P5	A5.3.
★	UN0473	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1A			P3, 101, 111	A5.3.
★	UN0474	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1C			P4, 101	A5.3.
★	UN0475	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1D			P4, 101	A5.3.
★	UN0476	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1G			P4, 101	A5.3.
★	UN0357	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1L			P3, 101	A5.3.
★	UN0358	SUBSTANCES, EXPLOSIVE, N.O.S.	1.2L			P3, 101	A5.3.



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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN0477	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3C			P4, 101	A5.3.
★	UN0478	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3G			P4, 101	A5.3.
★	UN0359	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3L			P3, 101	A5.3.
★	UN0479	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4C			P5, 101	A5.3.
★	UN0480	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4D			P5, 101	A5.3.
★	UN0485	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4G			P5, 101	A5.3.
★	UN0481	SUBSTANCES, EXPLOSIVE, N.O.S.	1.4S			P5, 101, 347	A5.3.
★	UN0482	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S. or SUBSTANCES EVI, N.O.S.	1.5D			P5, 101	A5.3.
		Substances liable to spontaneous combustion, N.O.S., see <b>PYROPHORIC LIQUID, ORGANIC, N.O.S. ★</b> (UN2845) or <b>PYROPHORIC SOLID, ORGANIC, N.O.S. ★</b> (UN2846) or <b>SELF-HEATING SOLID, ORGANIC, N.O.S. ★</b> (UN3088) or <b>HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURE STABILIZED</b> (UN3149) or <b>SELF-HEATING LIQUID, ORGANIC, N.O.S. ★</b> (UN3183) or <b>SELF-HEATING LIQUID, INORGANIC, N.O.S. ★</b> (UN3186) or <b>SELF-HEATING SOLID, INORGANIC, N.O.S. ★</b> (UN3190) or <b>PYROPHORIC LIQUID INORGANIC, N.O.S. ★</b> (UN3194) or <b>PYROPHORIC SOLID, INORGANIC, ★</b> (UN3200)					
		Substances which in contact with water emit flammable gases, see <b>WATER-REACTIVE SOLID, N.O.S. ★</b> (UN2813) or <b>WATER-REACTIVE LIQUID, CORROSIVE, N.O.S. ★</b> (UN3129) or <b>WATER-REACTIVE LIQUID, TOXIC, N.O.S. ★</b> (UN3130) or <b>WATER-REACTIVE SOLID, CORROSIVE, N.O.S. ★</b> (UN3131) or <b>WATER-REACTIVE SOLID, FLAMMABLE, N.O.S. ★</b> (UN3132) or <b>WATER-REACTIVE SOLID, OXIDIZING, N.O.S. ★</b> (UN3133) or <b>WATER-REACTIVE SOLID, TOXIC, N.O.S. ★</b> (UN3134) or <b>WATER-REACTIVE SOLID, SELF-HEATING, N.O.S. ★</b> (UN3135) or <b>WATER-REACTIVE LIQUID, N.O.S. ★</b> (UN3148)					
★	UN2780	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, FLAMMABLE, TOXIC flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN3014	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3013	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC, FLAMMABLE flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2779	SUBSTITUTED NITROPHENOL PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Sucrose octanitrate (dry)					FORBIDDEN
	UN2967	SULPHAMIC ACID	8		III	P5	A12.3.
D	NA1350	SULFUR	9		III	P5	A13.2.
	UN1350	SULPHUR or SULFUR	4.1		III	P5, 30	A8.3.
		Sulfur and chlorate, loose mixtures of					FORBIDDEN
	UN1828	SULFUR or SULPHUR CHLORIDES	8		I	P2, 5, A7, A10, N34	A12.2.
		Sulfur or Sulphur dichloride, see <b>SULFUR or SULPHUR CHLORIDES</b> (UN1828)					
	UN1079	SULPHUR or SULFUR DIOXIDE	2.3	8		P2, 3	A6.4.
		Sulfur or Sulphur dioxide solution, see <b>SULFURUS or SULPHURUS ACID</b> (UN1833)					

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Sulfuretted or Sulphuretted hydrogen, see HYDROGEN SULPHIDE (UN1053)</i>					
	UN1080	SULFUR HEXAFLUORIDE	2.2			P5	A6.3., A6.4.
	UN2796	SULPHURIC ACID with 51% or less acid	8		II	P5, A3, A7, A6, N34	A12.2.
	UN1830	SULPHURIC ACID with more than 51% acid	8		II	P4, A3, A7, N34	A12.2.
+	UN1831	SULPHURIC ACID, FUMING with less than 30% free sulfur trioxide	8		I	P3, A7, N34	A12.2.
	UN1832	SULPHURIC ACID, SPENT	8		II	P4, A3, A7, N34	A12.2.
		Sulphuric acid, unstable					FORBIDDEN
		Sulphuric and hydrofluoric acid mixture, see HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURE (UN1786)					
		Sulphuric anhydride, see SULPHUR TRIOXIDE STABILIZED (UN1829)					
D	NA2448	SULPHUR or SULFUR, MOLTEN	9				FORBIDDEN
	UN2448	SULPHUR or SULFUR, MOLTEN	4.1				FORBIDDEN
		Sulphur monochloride, see SULPHUR CHLORIDES (UN1828)					
	UN1833	SULPHURUS ACID	8		II	P5	A12.2.
	UN2418	SULPHUR or SULFUR TETRAFLUORIDE	2.3	8		P1, 1	A6.15.
+	UN1829	SULPHUR or SULFUR TRIOXIDE, STABILIZED	8	6.1	I	P2, 2, 387, N34	A12.11.
		<i>Sulphur or Sulfur trioxide, unstabilized</i>					FORBIDDEN
+	UN1834	SULFURYL or SULPHURYL CHLORIDE	6.1	8	I	P1, 1, A3, N34	A12.11.
	UN2191	SULFURYL or SULPHURYL FLUORIDE	2.3			P2, 4	A6.4.
		Talcum with tremolite and/or actinolite, see ASBESTOS AMPHIBOLE ★ (UN2212)					
	UN1999	TARS, LIQUID, including road oils, bitumen and cut backs or cutback bitumens	3		II III	P5, 149 P5	A7.2. A7.2.
		Tartar emetic, see ANTIMONY POTASSIUM TARTRATE (UN1551)					
	UN1700	TEAR GAS CANDLES	6.1	4.1		P4	A10.7.
		Tear gas cartridges, see AMMUNITION, TEAR-PRODUCING, (UN0018, UN0019, UN0301)					
		Tear gas devices containing tear gas substances, see AEROSOLS, NON-FLAMMABLE (TEAR GAS DEVICES) (UN1950)					
		Tear gas grenades, see TEAR GAS CANDLES (UN1700)					
D, ★	NA1693	TEAR GAS DEVICES, with more than 2% tear gas substance, by mass	6.1		I II	P4 P4	A10.7. A10.7.
		Tear gas devices, with not more than 2 percent tear gas substances, by mass, see AEROSOLS, (UN1950).					
		Tear gas grenades, see TEAR GAS CANDLES (UN1700)					
★	UN1693	TEAR GAS SUBSTANCES LIQUID, N.O.S.	6.1		I II	P3 P5	A10.4. A10.4.
★	UN3448	TEAR GAS SUBSTANCES, SOLID, N.O.S.	6.1		I II	P5 P5	A10.5. A10.5.
★	UN3284	TELLURIUM COMPOUND, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
	UN2195	TELLURIUM HEXAFLUORIDE	2.3	8		P1, 1	A6.15.
	UN2319	TERPENE HYDROCARBONS, N.O.S.	3		III	P5	A7.2.
	UN2541	TERPINOLENE	3		III	P5	A7.2.
		Tertiary alcohol, see ALCOHOLS, N.O.S. (UN1987)					
		Tetraazido benzene quinone					FORBIDDEN
	UN2504	TETRABROMOETHANE	6.1		III	P5	A10.4.

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	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Tetrachlorodinitroethane, see TOXIC SOLID, ORGANIC, N.O.S. ★ (UN2811)</i>					
	UN1702	<b>1,1,2,2-TETRACHLOROETHANE</b>	6.1		II	P5, N36	A10.4.
	UN1897	<b>TETRACHLOROETHYLENE</b>	6.1		III	P5, N36	A10.4.
		<i>Tetrachloromethane, see CARBON TETRACHLORIDE (UN1846)</i>					
		<i>Tetraethylammonium perchlorate (dry)</i>					FORBIDDEN
	UN1704	<b>TETRAETHYL DITHIOPYROPHOSPHATE</b>	6.1		II	P5	A10.5.
	UN1292	<b>TETRAETHYL SILICATE</b>	3		III	P5	A7.2.
		<i>Tetrafluorodichloroethane, see REFRIGERANT GAS R114 (UN1958)</i>					
	UN2320	<b>TETRAETHYLENEPENTAMINE</b>	8		III	P5	A12.2.
		<i>Tetraethyl lead, see MOTOR FUEL ANTI-KNOCK MIXTURE (UN1649)</i>					
		<i>Tetraethyloxysilane, see TETRAETHYL SILICATE (UN1292)</i>					
	UN3159	<b>1,1,1,2-TETRAFLUOROETHANE or REFRIGERANT GAS R134A</b>	2.2			P5	A6.3., A6.4.
	UN1081	<b>TETRAFLUOROETHYLENE, STABILIZED</b>	2.1			P4, 387	A6.3., A6.4.
		<i>Tetrafluoroethylene, unstabilized</i>					FORBIDDEN
	UN1982	<b>TETRAFLUOROMETHANE or REFRIGERANT GAS R14</b>	2.2			P5	A6.5.
	UN2498	<b>1,2,3,6-TETRAHYDROBENZALDEHYDE</b>	3		III	P5	A7.2.
	UN2056	<b>TETRAHYDROFURAN</b>	3		II	P5	A7.2.
	UN2943	<b>TETRAHYDROFURFURYLAMINE</b>	3		III	P5	A7.2.
		<i>Tetrahydro-1,4-oxazine, see MORPHOLINE (UN2054)</i>					
	UN2698	<b>TETRAHYDROPHthalic ANHYDRIDES with more than 0.05% of maleic anhydride</b>	8		III	P5	A12.3.
	UN2410	<b>1,2,3,6-TETRAHYDROPYRIDINE</b>	3		II	P5	A7.2.
	UN2412	<b>TETRAHYDROTHIOPHENE</b>	3		II	P5	A7.2.
		<i>Tetramethoxysilane, see METHYL ORTHOSILICATE (UN2606)</i>					
	UN3423	<b>TETRAMETHYLAMMONIUM HYDROXIDE, SOLID</b>	8		II	P5	A12.3
	UN1835	<b>TETRAMETHYLAMMONIUM HYDROXIDE, SOLUTION</b>	8		II III	P5 P5	A12.2. A12.2
		<i>Tetramethylene, see CYCLOBUTANE (UN2601)</i>					
		<i>Tetramethylene cyanide, see ADIPONITRILE (UN2205)</i>					
		<i>Tetramethylene diperoxide dicarbamide</i>					FORBIDDEN
		<i>Tetramethyl lead, see MOTOR FUEL ANTI-KNOCK MIXTURE (UN1649)</i>					
	UN2749	<b>TETRAMETHYLSILANE</b>	3		I	P3, A7	A7.2.
	UN0207	<b>TETRANITROANILINE</b>	1.1D			P4	A5.7.
		<i>Tetranitro diglycerin</i>					FORBIDDEN
+	UN1510	<b>TETRANITROMETHANE</b>	6.1	5.1	I		FORBIDDEN
		<i>2,3,4,6-Tetranitrophenol</i>					FORBIDDEN
		<i>2,3,4,6-Tetranitrophenyl methyl nitramine</i>					FORBIDDEN
		<i>2,3,4,6-Tetranitrophenylnitramine</i>					FORBIDDEN
		<i>Tetranitroresorcinol (dry)</i>					FORBIDDEN
		<i>2,3,5,6-Tetranitroso-1,4-dinitrobenzene</i>					FORBIDDEN
		<i>2,3,5,6-Tetranitroso nitrobenzene (dry)</i>					FORBIDDEN
	UN2413	<b>TETRAPROPYLORHOTITANATE</b>	3		III	P5	A7.2.
		<i>Tetrazene, see GUANYL NITROSAMINO GUANYLTETRAZENE (UN0113) or TETRAZINE, WETTED, (UN0114)</i>					FORBIDDEN
		<i>Tetrazine (dry)</i>					FORBIDDEN
	UN0114	<b>TETRAZENE, WETTED with 30% or more water, or mixture of alcohol and water, by weight or GUANYL NITROSAMINO GUANYLTETRAZENE, WETTED</b>	1.1A		II	P3, 111, 117	A5.4.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN0407	TETRAZOL-1-ACETIC ACID	1.4C			P5	A5.9.
	UN0504	1H-TETRAZOLE	1.1D				FORBIDDEN
		Tetrazolyl azide (dry)					FORBIDDEN
	UN0208	TETRYL or TRINITROPHENYLMETHYL-NITRAMINE	1.1D			P4	A5.6.
	UN1857	TEXTILE WASTE, WET	4.2		III		FORBIDDEN
	UN2573	THALLIUM CHLORATE	5.1	6.1	II	P5	A9.6.
	UN1707	THALLIUM COMPOUNDS, N.O.S.	6.1		II	P5	A10.5.
		Thallium (I) chlorate, see <b>THALLIUM CHLORATE</b> (UN2573)					
		Thallium (I) nitrate, see <b>THALLIUM NITRATE</b> (UN2727)					
	UN2727	THALLIUM NITRATE	6.1	5.1	II	P5	A10.5.
		Thallous Chlorate, see <b>THALLIUM CHLORATE</b> (UN2573)					
		Thermometers, barometers, etc., see <b>MERCURY CONTAINED IN MANUFACTURED ARTICLES</b> (UN3506)					
		Thia-4-pentanal, see <b>4-THIAPENTANAL</b> (UN2785)					
	UN2785	4-THIAPENTANAL	6.1		III	P5	A10.4.
	UN2436	THIOACETIC ACID	3		II	P5	A7.2.
★	UN2772	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P5	A7.2. A7.2.
★	UN3005	THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3006	THIOCARBAMATE PESTICIDE, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2771	THIOCARBAMATE PESTICIDE, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Thiocarbonylchloride, see <b>THIOPHOSGENE</b> (UN2474)					
	UN2966	THIOGLYCOL	6.1		II	P5	A10.4.
	UN1940	THIOGLYCOLIC ACID	8		II	P5, A7, N34	A12.2.
	UN2936	THIOLACTIC ACID	6.1		II	P5	A10.5.
	UN1836	THIONYL CHLORIDE	8		I	P3, N34	A12.2.
	UN2414	THIOPHENE	3		II	P5	A7.2.
		Thiophenol, see <b>PHENYL MERCAPTAN</b> (UN2337)					
+	UN2474	THIOPHOSGENE	6.1		I	P2, 2, A7, N33, N34	A10.6.
	UN1837	THIOPHOSPHORYL CHLORIDE	8		II	P4, A3, A7, N34	A12.2.
	UN3341	THIOREA DIOXIDE	4.2		II III	P5 P5	A8.3. A8.3.
		Tin chloride, fuming, see <b>STANNIC CHLORIDE, ANHYDROUS</b> (UN1827)					
		Tin, chloride anhydrous or Tin (IV) chloride anhydrous, see <b>STANNIC CHLORIDE ANHYDROUS</b> (UN1827)					
		Tin, chloride pentahydrate or Tin (IV) pentahydrate, see <b>STANNIC CHLORIDE PENTAHYDRATE</b> (UN2440)					
		Tin perchloride or Tin tetrachloride, see <b>STANNIC CHLORIDE, ANHYDROUS</b> (UN1827)					
	UN1293	TINCTURES, MEDICINAL	3		II III	P5 P5	A7.2. A7.2.
		Tinning flux, see <b>ZINC CHLORIDE, ANHYDROUS</b> (UN2331)					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Tin tetrachloride, see <b>STANNIC CHLORIDE, ANHYDROUS</b> (UN1827)					
		<i>Tire assemblies inflated, unserviceable, damaged or above maximum rated pressure</i>				A522	FORBIDDEN
		Tire assemblies serviceable, inflated to pressure not greater than their rated inflation pressure (Not Restricted)				A522	
		<b>Tire assembly, see Tyre assemblies, see AIR COMPRESSED</b> (UN1002) or <b>NITROGEN, COMPRESSED</b> (UN1066)					
	UN3174	<b>TITANIUM DISULPHIDE</b>	4.2		III	P5	A8.3.
	UN1871	<b>TITANIUM HYDRIDE</b>	4.1		II	P5, A19, A20, N34	A8.3.
	UN2546	<b>TITANIUM POWDER, DRY</b>	4.2		I II III	P3 P5, A19, A20, N5, N34 P5	A8.3. A8.3. A8.3.
	UN1352	<b>TITANIUM POWDER, WETTED</b> , with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)	4.1		II	P5, A19, A20, N34	A8.3.
	UN2878	<b>TITANIUM SPONGE GRANULES or TITANIUM SPONGE POWDERS</b>	4.1		III	P5, A1	A8.3.
		Titanium sulphate solution with 45% or less sulphuric acid, see <b>CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. ★</b> (UN3264)					
+	UN1838	<b>TITANIUM TETRACHLORIDE</b>	6.1	8	I	P2, 2	A12.11.
	UN2869	<b>TITANIUM TRICHLORIDE MIXTURES</b>	8		II III	P5, A7, N34 P5, A7, N34	A12.3. A12.3.
	UN2441	<b>TITANIUM TRICHLORIDE, PYROPHORIC, or TITANIUM TRICHLORIDE MIXTURES, PYROPHORIC</b>	4.2	8	I	P3, N34	A8.5.
		<i>TNT mixed with aluminium, see TRITONAL</i> (UN0390)					
	UN0209	<b>TNT or TRINITROTOLUENE</b> dry or wetted with < 30% water, by weight	1.1D			P4	A5.6.
	UN0388	<b>TNT AND HEXANITROSTILBENE MIXTURE or TNT AND TRINITROBENZENE MIXTURE</b>	1.1D			P4	A5.7.
		<i>TNT mixed with aluminum, see TRITONAL</i> (UN0390)					
	UN0389	<b>TNT MIXTURE CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE</b>	1.1D			P4	A5.7.
	UN3366	<b>TNT, WETTED</b> with more than 10% but less than 30% water, by weight	4.1		I	P4, A8, A19, N41, N84	A8.3.
		<i>Toe puffs, nitrocellulose base, see FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROLLCELLULOSE, N.O.S.</i>					
	UN1356	<b>TNT, wetted</b> with ≥ 30% water, by weight	4.1		I	P4, A8, A19, N41	A8.3.
		<i>Toe puffs, nitrocellulose base, see FABRICS IMPREGNATED WITH WEAKLY NITRATED NITROLLCELLULOSE, N.O.S. ★</i> (UN1353)					
	UN1294	<b>TOLUENE</b>	3		II	P5	A7.2.
+	UN2078	<b>TOLUENE DIISOCYANATE</b>	6.1		II	P5	A10.4.
		<i>Toluene sulphonic or sulfonic acid, see ALKYL SULFONIC or ALKYL SULPHONIC ACIDS, SOLID</i> (UN2583, UN2585) or <i>ARYL SULFONIC or ALKYL SULPHONIC ACIDS, LIQUID</i> (UN2584, UN2586)					
+	UN1708	<b>TOLUIDINES, LIQUID</b>	6.1		II	P5	A10.4.
	UN3451	<b>TOLUIDINES, SOLID</b>	6.1		II	P5	A10.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Toluol, see TOLUENE (UN 1294)</i>					
	UN1709	<b>2,4-TOLUYLENEDIAMINE, SOLID</b>	6.1		III	P5	A10.5.
	UN3418	<b>2,4-TOLUYLENEDIAMINE, SOLUTION</b>	6.1		III	P5	A10.4
		<i>Tolylene diisocyanate, see TOLUENE DIISOCYANATE (UN2078)</i>					
		<i>Tolylene diisocyanate, see TOLUENE DIISOCYANATE (UN2078)</i>					
		<i>Tolylethylene see VINYL TOLUENES, STABILIZED (UN2618)</i>					
	UN0451	<b>TORPEDOES, with bursting charge</b>	1.1D			P4	A5.12.
	UN0329	<b>TORPEDOES, with bursting charge</b>	1.1E			P4	A5.12.
	UN0330	<b>TORPEDOES, with bursting charge</b>	1.1F			P4	A5.12.
	UN0449	<b>TORPEDOES, LIQUID FUELED, with or without bursting charge</b>	1.1J			P3	A5.3.
	UN0450	<b>TORPEDOES, LIQUID FUELED, with inert head</b>	1.3J			P3	A5.3.
★	UN3381	<b>TOXIC BY INHALATION LIQUID, N.O.S. with an LC<sub>50</sub> lower than or equal to 200 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC<sub>50</sub></b>	6.1				FORBIDDEN
★	UN3382	<b>TOXIC BY INHALATION LIQUID, N.O.S. with an LC<sub>50</sub> lower than or equal to 1000 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC<sub>50</sub></b>	6.1				FORBIDDEN
★	UN3390	<b>TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC<sub>50</sub> lower than or equal to 1000 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC<sub>50</sub></b>	6.1	8			FORBIDDEN
★	UN3389	<b>TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC<sub>50</sub> lower than or equal to 200 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC<sub>50</sub></b>	6.1	8			FORBIDDEN
★	UN3383	<b>TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC<sub>50</sub> lower than or equal to 200 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC<sub>50</sub></b>	6.1	3			FORBIDDEN
★	UN3384	<b>TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC<sub>50</sub> lower than or equal to 1000 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC<sub>50</sub></b>	6.1	3			FORBIDDEN
★	UN3488	<b>TOXIC BY INHALATION LIQUID, FLAMMABLE, CORROSIVE N.O.S. with an LC<sub>50</sub> lower than or equal to 200 mL/m<sup>3</sup> and saturated vapor concentration greater than or equal to 500 LC<sub>50</sub></b>	6.1	3,8			FORBIDDEN
★	UN3489	<b>TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an LC<sub>50</sub> lower than or equal to 1000 mL/m<sup>3</sup> and saturated vapor concentration greater than or equal to 10 LC<sub>50</sub></b>	6.1	3,8			FORBIDDEN
★	UN3388	<b>TOXIC BY INHALATION LIQUID, OXIDIZING N.O.S. with an LC<sub>50</sub> lower than or equal to 1000 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC<sub>50</sub></b>	6.1	5.1			FORBIDDEN
★	UN3387	<b>TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S. with an LC<sub>50</sub> lower than or equal to 200 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC<sub>50</sub></b>	6.1	5.1			FORBIDDEN
★	UN3385	<b>TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC<sub>50</sub> lower than or equal to 200 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 500 LC<sub>50</sub></b>	6.1	4.3			FORBIDDEN
★	UN3386	<b>TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S. with an LC<sub>50</sub> lower than or equal to 1000 mL/m<sup>3</sup> and saturated vapour concentration greater than or equal to 10 LC<sub>50</sub></b>	6.1	4.3			FORBIDDEN

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3490	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE N.O.S. with an $LC_{50}$ lower than or equal to 200 mL/m <sup>3</sup> and saturated vapour concentration greater than or equal to 500 $LC_{50}$	6.1	4.3, 3			FORBIDDEN
		Toxic gas, n.o.s., see COMPRESSED GASS, TOXIC, FLAMMABLE, N.O.S. ★ (UN1953) or COMPRESSED GAS, TOXIC, N.O.S. ★ (UN1955 or LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S. ★ (UN3160) or LIQUEFIED GAS, TOXIC, N.O.S. ★ (UN3162) or COMPRESSED GAS, TOXIC, OXIDIZING, N.O.S. ★ (UN3303) or COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. ★ (UN3304) or COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. ★ (UN3305) or COMPRESSED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. ★ (UN3306) or LIQUEFIED GAS, TOXIC OXIDIZING, N.O.S. ★ (UN3307) or LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S. ★ (UN3308) or LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S. ★ (UN3309) or LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S. ★ (UN3310)					
★	UN3491	TOXIC BY INHALATION LIQUID, WATER-REACTIVE, FLAMMABLE N.O.S. with an $LC_{50}$ lower than or equal to 1000 mL/m <sup>3</sup> and saturated vapour concentration greater than or equal to 10 $LC_{50}$	6.1	4.3, 3			FORBIDDEN
★	UN3289	TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.	6.1	8 8	I II	P3 P4	A10.4. A10.4.
★	UN3287	TOXIC LIQUID, INORGANIC, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2927	TOXIC LIQUID, CORROSIVE, ORGANIC, N.O.S.	6.1	8 8	I II	P3 P4	A10.4. A10.4.
★	UN2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	3 3	I II	P3 P4	A10.4. A10.4.
★	UN2810	TOXIC LIQUID, ORGANIC, N.O.S.	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN3122	TOXIC LIQUID, OXIDIZING, N.O.S.	6.1	5.1 5.1	I II	P3, A4 P4	A10.4. A10.4.
★	UN3123	TOXIC LIQUID, WATER-REACTIVE, N.O.S.	6.1	4.3 4.3	I II	P3, A4 P4	A10.4. A10.4.
★	UN3290	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.	6.1	8 8	I II	P5 P5	A10.5. A10.5.
★	UN2928	TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S.	6.1	8 8	I II	P5 P5	A10.5. A10.5.
★	UN3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	4.1 4.1	I II	P5 P5	A10.5 A10.5
★	UN2930	TOXIC SOLID, FLAMMABLE, ORGANIC, N.O.S.	6.1	4.1 4.1	I II	P5 P5	A10.5. A10.5.
★	UN3288	TOXIC SOLID, INORGANIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
★	UN2811	TOXIC SOLID, ORGANIC, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
★	UN3086	TOXIC SOLID, OXIDIZING, N.O.S.	6.1	5.1 5.1	I II	P5 P5	A10.5. A10.5.
★	UN3124	TOXIC SOLID, SELF-HEATING, N.O.S.	6.1	4.2 4.2	I II	P5, A5 P5	A10.5. A10.5.
★	UN3125	TOXIC SOLID, WATER-REACTIVE, N.O.S.	6.1	4.3 4.3	I II	P5, A5 P5	A10.5. A10.5.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
★	UN3172	TOXINS, EXTRACTED FROM LIVING SOURCES, LIQUID, N.O.S.	6.1		I II III	P3, 141 P4, 141 P4, 141	A10.12. A10.12. A10.12.
★	UN3462	TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.	6.1		I II III	P4, 141 P4, 141 P4, 141	A10.12. A10.12. A10.12.
D	NA0337	TOY CAPS	1.4S			P5	A5.16.
	UN0212	TRACERS FOR AMMUNITION	1.3G			P4	A5.16.
	UN0306	TRACERS FOR AMMUNITION	1.4G			P5	A5.16.
		Tractors, see VEHICLES, FLAMMABLE GAS POWERED (UN3166) or VEHICLE, FLAMMABLE LIQUID POWERED (UN3166)					
		Tremolite, see ASBESTOS AMPHIBOLE ★ (UN2212)					
		Tri-(b-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN2609	TRIALLYL BORATE	6.1		III	P5	A10.4.
	UN2610	TRIALLYLAMINE	3	8	III	P5	A7.2.
★	UN2764	TRIAZINE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, flashpoint less than 23 degrees C	3	6.1 6.1	I II	P3 P4	A7.2. A7.2.
★	UN2998	TRIAZINE PESTICIDES, LIQUID, TOXIC	6.1		I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2997	TRIAZINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, flashpoint not less than 23 degrees C	6.1	3 3 3	I II III	P3 P4 P5	A10.4. A10.4. A10.4.
★	UN2763	TRIAZINE PESTICIDES, SOLID, TOXIC	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.
		Tribromoborane, see BORON TRIBROMIDE (UN2692)					
	UN2542	TRIBUTYLAMINE	6.1		II	P5	A10.4.
	UN3254	TRIBUTYLPHOSPHANE	4.2		I	P3	A8.3.
		Trichloroacetaldehyde, see CHLORAL, ANHYDROUS, STABILIZED (UN2075)					
	UN1839	TRICHLOROACETIC ACID	8		II	P5, A7, N34	A12.3.
	UN2564	TRICHLOROACETIC ACID, SOLUTION	8		II III	P5, A3, A7, N34 P5, A3, A6 A7, N34	A12.2. A12.2.
+	UN2442	TRICHLOROACETYL CHLORIDE	8	6.1	II	P2, 2, A3, A7, N34	A12.11.
	UN2321	TRICHLOROBENZENES, LIQUID	6.1		III	P5	A10.4.
	UN2322	TRICHLOROBUTENE	6.1		II	P5	A10.4.
	UN2831	1,1,1-TRICHLOROETHANE	6.1		III	P5, N36	A10.4.
	UN1710	TRICHLOROETHYLENE	6.1		III	P5, N36	A10.4.
	UN2468	TRICHLOROISOCYANURIC ACID, DRY	5.1		II	P5	A9.6.
		Trichloromethyl perchlorate					FORBIDDEN
		Trichloronitromethane, see CHLOROPICRIN (UN1580)					
	UN1295	TRICHLOROSILANE	4.3	3, 8	I	P3, N34	A8.2.
		1,3,5-Trichloro-s-triazine-2,4,6-trione, see TRICHLOROISOCYANURIC ACID, DRY (UN2468)					
		2,4,6-Trichloro-1,3,5-triazine, see CYANURIC CHLORIDE (UN2670)					
		Trichloro-s-triazinetriene dry, containing over 39% available chlorine, see TRICHLOROISOCYANURIC ACID, DRY (UN2468)					
	UN2574	TRICRESYL PHOSPHATE with more than 3% ortho isomer	6.1		II	P5, A3, N33, N34	A10.4.
	UN2323	TRIETHYL PHOSPHITE	3		III	P5	A7.2.



Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1296	<b>TRIETHYLAMINE</b>	3	8	II	P4	A7.2.
		<i>Triethyl borate, see ETHYL BORATE (UN1176)</i>					
	UN2259	<b>TRIETHYLENETETRAMINE</b>	8		II	P5	A12.2.
		<i>Triethylmethyl lead mixture, see MOTOR FUEL ANTI-KNOCK MIXTURE (UN1649)</i>					
		<i>Triethyl orthoformate, see ETHYL ORTHOFORMATE (UN2524)</i>					
	UN2699	<b>TRIFLUOROACETIC ACID</b>	8		I	P3, A7, N3, N34, N36	A12.2.
	UN3057	<b>TRIFLUOROACETYL CHLORIDE</b>	2.3	8		P2, 2	A6.4.
		<i>Trifluorobromomethane, see BROMOTRIFLUOROMETHANE (UN1009)</i>					
		<i>Trifluorochloroethane, see 1-CHLORO-2,2,2-TRIFLUOROETHANE (UN1983)</i>					
	UN1082	<b>TRIFLUOROCHLOROETHYLENE, STABILIZED or REFRIGERANT GAS R1113</b>	2.3	2.1		P2, 3, 387	A6.3., A6.4.
		<i>Trifluorochloromethane, see CHLOROTRIFLUOROMETHANE (UN1022)</i>					
	UN1984	<b>TRIFLUOROMETHANE or REFRIGERANT GAS R23</b>	2.2			P5	A6.3., A6.4.
	UN3136	<b>TRIFLUOROMETHANE, REFRIGERATED LIQUID</b>	2.2			P4	A6.3., A6.11.
	UN2035	<b>1,1,1-TRIFLUOROETHANE, COMPRESSED or REFRIGERANT GAS R143A</b>	2.1			P4	A6.3., A6.4.
	UN2942	<b>2-TRIFLUOROMETHYLANILINE</b>	6.1		III	P5	A10.4.
	UN2948	<b>3-TRIFLUOROMETHYLANILINE</b>	6.1		II	P5	A10.4.
		<i>Triformoxime trinitrate</i>					FORBIDDEN
	UN2324	<b>TRIISOBUTYLENE</b>	3		III	P5	A7.2.
	UN2616	<b>TRIISOPROPYL BORATE</b>	3		II III	P5 P5	A7.2. A7.2.
D	NA9269	<b>TRIMETHOXYSILANE</b>	6.1	3	I	P2, 2	A10.6.
	UN2416	<b>TRIMETHYL BORATE</b>	3		II	P5	A7.2.
		<i>Trimethyl carbonyl, see BUTANOLS (UN1120)</i>					
	UN2329	<b>TRIMETHYL PHOSPHITE</b>	3		III	P5	A7.2.
		<i>1,3,5-Trimethyl-2,4,6-trinitrobenzene</i>					FORBIDDEN
		<i>Trimethoxy silane</i>					FORBIDDEN
		<i>Trinitroacetic acid</i>					FORBIDDEN
		<i>Trinitroacetoneitrile</i>					FORBIDDEN
		<i>Trinitroamine cobalt</i>					FORBIDDEN
	UN2438	<b>TRIMETHYLACETYL CHLORIDE</b>	6.1	8, 3	I	P2, 2, N34	A12.11.
	UN1083	<b>TRIMETHYLAMINE, ANHYDROUS</b>	2.1			P4, N87	A6.3., A6.4.
	UN1297	<b>TRIMETHYLAMINE, AQUEOUS SOLUTIONS not more than 50% trimethylamine, by mass</b>	3	8 8 8	I II III	P3 P4 P5	A7.2. A7.2. A7.2.
	UN2325	<b>1,3,5-TRIMETHYLBENZENE</b>	3		III	P5	A7.2.
	UN1298	<b>TRIMETHYLCHLOROSILANE</b>	3	8	II	P5, A3, A7, N34	A7.2.
	UN2326	<b>TRIMETHYLCYCLOHEXYLAMINE</b>	8		III	P5	A12.2.
		<i>Trimethylenchlorobromide, see 1-BROMO-3-CHLOROPROPANE (UN2688)</i>					
		<i>Trimethylene glycol diperchlorate</i>					FORBIDDEN
	UN2328	<b>TRIMETHYLHEXAMETHYLENE DIISOCYANATE</b>	6.1		III	P5	A10.4.
		<i>Trimethylol nitromethane trinitrate</i>					FORBIDDEN
		<i>2,4,4-Trimethylpentene-2 or 2,4,4-Trimethylpentene-1, see DIISOBUTYLENE, ISOMERIC COMPOUND (UN2050)</i>					
	UN2327	<b>TRIMETHYLHEXAMETHYLENEDIAMINES</b>	8		III	P5	A12.2.
	UN0216	<b>TRINITRO-M-CRESOL</b>	1.1D			P4	A5.7.
		<i>2,4,6-Trinitro-1,3-diazobenzene</i>					FORBIDDEN
		<i>2,4,6-Trinitro-1,3,5-triazido benzene (dry)</i>					FORBIDDEN
		<i>Trinitroacetic acid</i>					FORBIDDEN
		<i>Trinitroacetoneitrile</i>					FORBIDDEN

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Trinitroamine cobalt</i>					FORBIDDEN
		<i>Trinitroethanol</i>					FORBIDDEN
		<i>Trinitroethylnitrate</i>					FORBIDDEN
	UN0153	<b>TRINITROANILINE or PICRAMIDE</b>	1.1D			P4	A5.7.
	UN0213	<b>TRINITROANISOLE</b>	1.1D			P4	A5.7.
	UN3367	<b>TRINITROBENZENE, WETTED</b> with not less than 10% water, by mass	4.1		I	P4, 162, A8, A19, N41, N84	A8.3.
	UN0214	<b>TRINITROBENZENE</b> , dry or wetted, with less than 30% water, by mass	1.1D			P4	A5.6.
	UN1354	<b>TRINITROBENZENE, WETTED</b> with not less than 30% water, by mass	4.1		I	P4, 23, A2, A8, A19, N41	A8.3.
	UN0386	<b>TRINITROBENZENESULPHONIC ACID</b>	1.1D			P4	A5.7.
	UN0215	<b>TRINITROBENZOIC ACID</b> , dry or wetted with less than 30% water, by mass	1.1D			P4	A5.6.
	UN3368	<b>TRINITROBENZOIC ACID, WETTED</b> with not less than 10% water, by mass	4.1		I	P4, 162, A8, A19, N41, N84	A8.3.
	UN1355	<b>TRINITROBENZOIC ACID, WETTED</b> with not less than 30% water, by mass	4.1		I	P4, 23, A2, A8, A19, N41	A8.3.
	UN0155	<b>TRINITROCHLOROBENZENE (picryl chloride)</b>	1.1D			P4	A5.7.
	UN3365	<b>TRINITROCHLOROBENZENE, WETTED</b> (pycryl chloride) with not less than 10% water, by mass	4.1		I	P4, 162, A8, A19, N41, N84	A8.3.
	UN0387	<b>TRINITROFLUORENONE</b>	1.1D			P4	A5.7.
		<i>Trinitromethane</i>					FORBIDDEN
		<i>1,3,5-Trinitronaphthalene</i>					FORBIDDEN
	UN0217	<b>TRINITRONAPHTHALENE</b>	1.1D			P4	A5.7.
	UN0218	<b>TRINITROPHENETOLE</b>	1.1D			P4	A5.7.
	UN0154	<b>TRINITROPHENOL PICRIC ACID</b> , dry or wetted with less than 30% water, by mass	1.1D			P4	A5.6.
	UN3364	<b>TRINITROPHENOL, WETTED</b> with not less than 10% water, by mass (picric acid)	4.1		I	P4, 23, A8, 19, N41, N84	A8.3.
	UN1344	<b>TRINITROPHENOL, WETTED</b> with not less than 30% water, by mass	4.1		I	P4, 162, A8, A19, N41	A8.3.
		<i>2,4,6-Trinitrophenyl guanidine (dry)</i>					FORBIDDEN
	UN0208	<b>TRINITROPHENYLMETHYL-NITRAMINE or TETRYL</b>	1.1D			P4	A5.6.
		<i>2,4,6-Trinitrophenyl nitramine</i>					FORBIDDEN
		<i>2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry)</i>					FORBIDDEN
	UN0219	<b>TRINITRORESORCINOL or STYPHNIC ACID</b> , dry or wetted with less than 20% water, or mixture of alcohol and water, by mass	1.1D			P4	A5.6.
	UN0394	<b>TRINITRORESORCINOL WETTED or STYPHNIC ACID, WETTED</b> with not less than 20% water, or mixture of alcohol and water, by mass	1.1D			P4	A5.6.
		<i>2,4,6-Trinitroso-3-methyl nitraminoanisole</i>					FORBIDDEN
		<i>Trinitrotetramine cobalt nitrate</i>					FORBIDDEN
	UN0209	<b>TRINITROTOLUENE or TNT</b> , (dry or wetted with less than 30% water, by mass)	1.1D			P4	A5.6.
	UN0388	<b>TRINITROTOLUENE AND TRINITROBENZENE MIXTURES or TNT AND TRINITROBENZENE MIXTURES or TNT AND HEXANITROSTILBENE MIXTURES or TRINITROTOLUENE AND HEXANITROSTILBENE MIXTURES</b>	1.1D			P4	A5.7.
	UN0389	<b>TRINITROTOLUENE MIXTURES, CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE or TNT MIXTURES CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE</b>	1.1D			P4	A5.7.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN3366	TRINITROTOLUENE (TNT), WETTED with not less than 10% water, by mass	4.1		I	P4, 162, A8, A19, N41, N84	A8.3.
	UN1356	TRINITROTOLUENE WETTED, with not less than 30% water, by mass	4.1		I	P4, 23, A2, A8, A19, N41	A8.3.
		2,4,6-Trinitro-1,3,5-triazido benzene (dry)					FORBIDDEN
		Tri-(b-nitroxyethyl) ammonium nitrate					FORBIDDEN
	UN2260	TRIPROPYLAMINE	3	8	III	P5	A7.2.
	UN2057	TRIPROPYLENE	3		II III	P5 P5	A7.2. A7.2.
	UN2501	TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1		II III	P5 P5	A10.4. A10.4.
		Tris bis-bifluoroamino diethoxy propane (TVOPA)					FORBIDDEN
	UN0390	TRITONAL	1.1D			P4	A5.6.
		Tropilidene, see CYCLOHEPTATRIENE (UN2603)					
		Tungates, liquid, see FLAMMABLE LIQUID, N.O.S. ★ (UN1993)					
		Tungates, solid, see FLAMMABLE SOLID, ORGANIC, N.O.S. ★ (UN1325) or FLAMMABLE SOLID, INORGANIC, N.O.S. ★ (UN3178)					
	UN2196	TUNGSTEN HEXAFLUORIDE	2.3	8			FORBIDDEN
	UN1299	TURPENTINE	3		III	P5	A7.2.
	UN1300	TURPENTINE SUBSTITUTE	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
		Tyre assemblies inflated, above maximum rated pressure	2.2			A522	FORBIDDEN
		Tyre assemblies inflated, unserviceable, damaged or above maximum rated pressure	2.2			A522	FORBIDDEN
		Tyre assemblies serviceable, inflated to pressure not greater than their rated inflation pressure, (Not Restricted)				A522	
	UN2330	UNDECANE	3		III	P5	A7.2.
	UN3507	URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL EXCEPTED PACKAGE, less than 0.1 kg per package, non-fissile or fissile excepted	6.1	7, 8	I	P4, 369	A11.7
	UN1511	UREA HYDROGEN PEROXIDE	5.1	8	III	P5, A1, A7, A29	A9.6.
	UN0220	UREA NITRATE, dry or wetted with less than 20% water, by mass	1.1D			P4, 119	A5.6.
	UN3370	UREA NITRATE, WETTED with not less than 10% water by mass	4.1		I	P4, 162, A8, A19, N41, N84	A8.3.
	UN1357	UREA NITRATE, WETTED with not less than 20% water, by mass	4.1		I	P4, 23, 39, A8, A19, N41	A8.3.
		Urea peroxide, see UREA HYDROGEN PEROXIDE (UN1511)					
		Valeral or n-Valeraldehyde, see VALERALDEHYDE (UN2058)					
		n-Valeraldehyde, see VALERALDEHYDE (UN2058)					
	UN2058	VALERALDEHYDE	3		II	P5	A7.2.
		Valeric acid, see CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. ★ (UN3265)					
		Valeric aldehyde, see VALERALDEHYDE (UN2058)					
	UN2502	VALERYL CHLORIDE	8	3	II	P5, A3, A7, N34	A12.2.
★	UN3285	VANADIUM COMPOUND, N.O.S.	6.1		I II III	P5 P5 P5	A10.5. A10.5. A10.5.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		Vanadium (IV) oxide sulphate or Vanadium oxysulphate or oxysulfate, see <b>VANADYL SULPHATE or SULFATE</b> (UN2931)					
	UN2443	<b>VANADIUM OXYTRICHLORIDE</b>	8		II	P5, A3, A7, N34	A12.2.
	UN2862	<b>VANADIUM PENTOXIDE</b> , nonfused form	6.1		III	P5	A10.5.
	UN2444	<b>VANADIUM TETRACHLORIDE</b>	8		I	P3, A7, N34	A12.2.
	UN2475	<b>VANADIUM TRICHLORIDE</b>	8		III	P5	A12.3.
	UN2931	<b>VANADYL SULFATE</b>	6.1		II	P5	A10.5.
		Varnish, see <b>PAINT</b> (UN1263)					
		Varnish drier, liquid, see <b>FLAMMABLE LIQUID, N.O.S. ★</b> (UN1993)					
		Varnish drier solid, see <b>FLAMMABLE SOLID, ORGANIC, N.O.S. ★</b> (UN1325) or <b>FLAMMABLE SOLID, INORGANIC, N.O.S. ★</b> (UN3178)					
	UN3166	<b>VEHICLE, FLAMMABLE GAS POWERED or VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED</b>	9			P5, 134, 135, 360, A200	A13.4.
	UN3166	<b>VEHICLE, FLAMMABLE LIQUID POWERED or VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED</b>	9			P5, 134, 135, 360, A200	A13.4.
		Vehicles, self-propelled, see <b>VEHICLE, FLAMMABLE GAS POWERED</b> (UN3166) or <b>VEHICLE, FLAMMABLE LIQUID POWERED</b> (UN3166) or <b>BATTERY-POWERED VEHICLE</b> (UN3171) or <b>BATTERY-POWERED EQUIPMENT</b> (UN3171)					
		Very signal cartridge, see <b>CARTRIDGES SIGNAL</b> (UN0054, UN0312, UN0405)					
		Villiumite, see <b>SODIUM FLUORIDE, SOLID</b> (UN1690) or <b>SODIUM FLUORIDE, SOLUTION</b> (UN3415)					
	UN1301	<b>VINYL ACETATE, STABILIZED</b>	3		II	P5, 387	A7.2.
		Vinyl acetate, unstabilized					FORBIDDEN
		Vinyl benzene, see <b>STYRENE MONOMER, STABILIZED</b> (UN2055)					
	UN1085	<b>VINYL BROMIDE, STABILIZED</b>	2.1			P4, 387, N86	A6.3., A6.4.
		Vinyl bromide, unstabilized					FORBIDDEN
	UN2838	<b>VINYL BUTYRATE, STABILIZED</b>	3		II	P5, 387	A7.2.
		Vinyl butyrate, unstabilized					FORBIDDEN
	UN1086	<b>VINYL CHLORIDE, STABILIZED</b>	2.1			P4, 21, 387, N86	A6.3., A6.4.
		Vinyl chloride, unstabilized					FORBIDDEN
	UN2589	<b>VINYL CHLOROACETATE</b>	6.1	3	II	P5	A10.4.
		Vinyl cyanide, see <b>ACRYLONITRILE, STABILIZED</b> (UN1093)					
	UN1302	<b>VINYL ETHYL ETHER, STABILIZED</b>	3		I	P3, 387	A7.2.
		Vinyl ethyl ether, unstabilized					FORBIDDEN
	UN1860	<b>VINYL FLUORIDE, STABILIZED</b>	2.1			P4, 387, N86	A6.3., A6.4.
		Vinyl fluoride, unstabilized					FORBIDDEN
	UN1304	<b>VINYL ISOBUTYL ETHER, STABILIZED</b>	3		II	P5, 387	A7.2.
		Vinyl isobutyl ether, unstabilized					FORBIDDEN
	UN1087	<b>VINYL METHYL ETHER, STABILIZED</b>	2.1			P4, 387	A6.3., A6.4.
		Vinyl methyl ether, unstabilized					FORBIDDEN
		Vinyl nitrate polymer					FORBIDDEN
	UN1303	<b>VINYLDENE CHLORIDE, STABILIZED</b>	3		I	P3, 387	A7.2.
		Vinyldene chloride, unstabilized					FORBIDDEN
		Vinyldene fluoride, see <b>1,1-DIFLUOROETHYLENE</b> (UN1959)					
	UN3073	<b>VINYLPYRIDINES, STABILIZED</b>	6.1	3, 8	II	P5, 387	A10.4.
		Vinylpyridines, unstabilized					FORBIDDEN
	UN2618	<b>VINYLTOLUENES, STABILIZED</b>	3		III	P5, 387	A7.2.

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(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
		<i>Vinyltoluene, unstabilized</i>					FORBIDDEN
	UN1305	<b>VINYLTRICHLOROSILANE,</b>	3	8	II	P5, A3, A7, N34	A7.2.
		<i>Vinyltrichlorosilane, unstabilized</i>					FORBIDDEN
		<i>Warheads for guided missiles, see WARHEADS, ROCKET (UN0286, UN0287, UN0369, UN0370, UN0371)</i>					
	UN0370	<b>WARHEADS, ROCKET</b> with burster or expelling charge	1.4D			P5	A5.12.
	UN0371	<b>WARHEADS, ROCKET</b> with burster or expelling charge	1.4F			P5	A5.12.
	UN0286	<b>WARHEADS, ROCKET</b> with bursting charge	1.1D			P4	A5.12.
	UN0287	<b>WARHEADS, ROCKET</b> with bursting charge	1.2D			P4	A5.12.
	UN0369	<b>WARHEADS, ROCKET</b> with bursting charge	1.1F			P4	A5.12.
	UN0221	<b>WARHEADS, TORPEDO</b> with bursting charge	1.1D			P4	A5.12.
★	UN3129	<b>WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.</b>	4.3	8 8 8	I II III	P3 P4 P5	A8.2. A8.2. A8.2.
★	UN3148	<b>WATER-REACTIVE LIQUID, N.O.S.</b>	4.3		I II III	P3 P5 P5	A8.2. A8.2. A8.2.
★	UN3130	<b>WATER-REACTIVE LIQUID, TOXIC, N.O.S.</b>	4.3	6.1 6.1 6.1	I II III	P3, A4 P4 P5	A8.2. A8.2. A8.2.
★	UN3131	<b>WATER-REACTIVE SOLID, CORROSIVE, N.O.S.</b>	4.3	8 8 8	I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN3132	<b>WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.</b>	4.3	4.1 4.1 4.1	I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN2813	<b>WATER-REACTIVE SOLID, N.O.S.</b>	4.3		I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN3133	<b>WATER-REACTIVE SOLID, OXIDIZING, N.O.S.</b>	4.3	5.1 5.1	II III	P3 P5	A8.4. A8.4.
★	UN3135	<b>WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.</b>	4.3	4.2 4.2 4.2	I II III	P3, N40 P5 P5	A8.3. A8.3. A8.3.
★	UN3134	<b>WATER-REACTIVE SOLID, TOXIC, N.O.S.</b>	4.3	6.1 6.1 6.1	I II III	P3, A8, N40 P5 P5	A8.3. A8.3. A8.3.
		<i>Wheelchair, electric with batteries, see BATTERY-POWERED EQUIPMENT (UN3171) or BATTERY-POWERED VEHICLE (UN3171)</i>					
		<i>White acid, see HYDROFLUORIC ACID (UN1790)</i>					
		<i>White arsenic, see ARSENIC TRIOXIDE (UN1561)</i>					
		<i>White spirit, see TURPENTINE SUBSTITUTE (UN1300)</i>					
	UN1306	<b>WOOD PRESERVATIVES, LIQUID</b>	3		II III	P5, 149 P5	A7.2. A7.2.
	UN1387	<b>WOOL WASTE, WET</b>	4.2		III		FORBIDDEN
	UN3342	<b>XANTHATES</b>	4.2		II III	P5 P5	A8.3. A8.3.
	UN2036	<b>XENON</b>	2.2			P5	A6.3., A6.5.
	UN2591	<b>XENON, REFRIGERATED LIQUID</b> (cryogenic liquid)	2.2			P4	A6.11.
	UN1307	<b>XYLENES</b>	3		II III	P5 P5	A7.2. A7.2.
	UN3430	<b>XYLENOLS, LIQUID</b>	6.1		II	P5	A10.4
	UN2261	<b>XYLENOLS, SOLID</b>	6.1		II	P5	A10.5.
	UN1711	<b>XYLIDINES, LIQUID</b>	6.1		II	P5	A10.4.
	UN3452	<b>XYLIDINES, SOLID</b>	6.1		II	P5	A10.6.
		<i>Xylols, see XYLENES (UN1307)</i>					

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	UN/ID NUMBER	(3)	(4)	(5)	(6)	(7)	(8)
	UN1701	XYLYL BROMIDE, LIQUID	6.1		II	P4, A3, A7, N33	A10.7.
	UN3417	XYLYL BROMIDE, SOLID	6.1		II	P4, A3, A6, A7, N33	A10.7.
		<i>p</i> -Xylyl diazide					FORBIDDEN
	UN1512	ZINC AMMONIUM NITRITE	5.1		II	P5	A9.6.
	UN1712	ZINC ARSENATE or ZINC ARSENITE or ZINC ARSENATE AND ZINC ARSENITE MIXTURES	6.1		II	P5	A10.5.
	UN1435	ZINC ASHES	4.3		III	P5, A1, A19	A8.3.
		<i>Zinc bisulfite solution, see BISULFITES, AQUEOUS SOLUTIONS, N.O.S. ★ (UN2693)</i>					
	UN2469	ZINC BROMATE	5.1		III	P5, A1, A29	A9.6.
	UN1513	ZINC CHLORATE	5.1		II	P5, A9, N34	A9.6.
	UN2331	ZINC CHLORIDE, ANHYDROUS	8		III	P5	A12.3.
	UN1840	ZINC CHLORIDE, SOLUTION	8		III	P5	A12.2.
	UN1713	ZINC CYANIDE	6.1		I	P5	A10.5.
	UN1931	ZINC DITHIONITE or ZINC HYDROSULFITE	9		III	P5	A13.2.
	UN1436	ZINC POWDER or ZINC DUST	4.3	4.2	I	P3, A19, N40	A8.3.
				4.2	II	P5, A19	A8.3.
				4.2	III	P5	A8.3.
	UN2855	ZINC FLUOROSILICATE	6.1		III	P5	A10.5.
		<i>Zinc hexafluorosilicate, see ZINC FLUOROSILICATE (UN2855) or ZINC CHLORIDE SOLUTION (UN1840)</i>					
		<i>Zinc muriate solution, see ZINC CHLORIDE, SOLUTION (UN1840)</i>					
	UN1514	ZINC NITRATE	5.1		II	P5	A9.6.
	UN1515	ZINC PERMANGANATE	5.1		II	P5	A9.6.
	UN1516	ZINC PEROXIDE	5.1		II	P5	A9.6.
	UN1714	ZINC PHOSPHIDE	4.3	6.1	I	P3, A19, N40	A8.3.
	UN1436	ZINC POWDER or ZINC DUST	4.3	4.2	I	P3, A19, N40	A8.3.
				4.2	II	P4, A19	A8.3.
				4.2	III	P5	A8.3.
	UN2714	ZINC RESINATE	4.1		III	P5, A1	A8.3.
		<i>Zinc selenates, see SELENATES ★ or SELENITES ★ (UN2630)</i>					
		<i>Zinc selenite, see SELENATES ★ or SELENITES ★ (UN2630)</i>					
		<i>Zinc silicofluoride, see ZINC FLUOROSILICATE (UN2855)</i>					
	UN2858	ZIRCONIUM, DRY, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	4.1		III	P5, A1	A8.3.
	UN2009	ZIRCONIUM, DRY, finished sheets, strip, or coiled wire	4.2		III	P5, A1, A19	A8.3.
	UN1437	ZIRCONIUM HYDRIDE	4.1		II	P5, A19, A20, N34	A8.3.
	UN2728	ZIRCONIUM NITRATE	5.1		III	P5, A1, A29	A9.6.
	UN0236	ZIRCONIUM PICRAMATE, dry or wetted with less than 20% water, by mass	1.3C			P4	A5.9.
	UN1517	ZIRCONIUM PICRAMATE, WETTED with not less than 20% water, by mass	4.1		I	P4, 23, N41	A8.3.
	UN2008	ZIRCONIUM POWDER, DRY	4.2		I	P3	A8.3.
					II	P5, A19, A20, N5, N34	A8.3.
					III	P5	A8.3.

Table A4.1		PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	SUBSIDIARY RISK	PG	SPECIAL PROVISION	PACKAGING PARAGRAPH
	UN/ID NUMBER						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	UN1358	<b>ZIRCONIUM POWDER, WETTED</b> , with not less than 25% water (a visible excess of water must be present (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)	4.1		II	P5, A19, A20, N34	A8.3.
		Zirconium powder, wetted with not less than 25% water (a visible excess of water must be present (a) mechanically produced, particle size more than 53 microns; (b) chemically produced, particle size more than 840 microns)					FORBIDDEN
	UN1932	<b>ZIRCONIUM SCRAP</b>	4.2		III	P5, N34	A8.3.
	UN1308	<b>ZIRCONIUM SUSPENDED IN A LIQUID</b>	3		I II III	P3 P5 P5	A7.2. A7.2. A7.2.
	UN2503	<b>ZIRCONIUM TETRACHLORIDE</b>	8		III	P5	A12.3.

**Table A4.2. Special Provisions**

When column 7 of Table A4.1. refers to a special provision for a hazardous material, the meaning and requirements of that provision are defined in this Table. The following list identifies the requirements of the special provisions referred to in column 7 of Table A4.1.:
<b>Passenger Eligibility “P” Codes.</b> These provisions apply to passenger movement with hazardous materials (see also Attachment 22).
<b>P1</b> Transport this material on dedicated airlift (e.g., Special Assignment Airlift Mission) aircraft as identified in Attachment 24. Material authorized on cargo aircraft only. Passenger deviations are not authorized.
<b>P2</b> Transport this material on cargo aircraft only. Passenger deviations are not authorized.
<b>P3</b> Transport this material on cargo aircraft only. Deviations are authorized according to paragraph 2.2. and Attachment 22.
<b>P4</b> Transport this material on cargo aircraft only. Deviations are authorized according to paragraph 2.2. and Attachment 22. DOD duty passengers do not require a deviation.
<b>P5</b> Transport this material on passenger and cargo aircraft without passenger restriction.
<b>Numeric Special Provisions.</b>
<b>1</b> This material is poisonous by inhalation in Hazard Zone A, describe as an inhalation hazard.
<b>2</b> This material is poisonous by inhalation in Hazard Zone B, describe as an inhalation hazard.
<b>3</b> This material is poisonous by inhalation in Hazard Zone C, describe as an inhalation hazard.
<b>4</b> This material is poisonous by inhalation in Hazard Zone D, describe as an inhalation hazard.
<b>5</b> If this material meets the defining criteria for a material poisonous by inhalation (49 CFR Paragraphs 173.116(a) or 173.133(a)) use an appropriate Class 2.3 or Class 6.1 generic PSN that identifies the inhalation hazard.
<b>6</b> This material is poisonous by inhalation and must be described as an inhalation hazard. <b>(T-0).</b>
<b>8</b> A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substance, liquid or solid", as appropriate.
<b>9</b> EPA in 40 CFR Sections 761.60 and 761.65 prescribes packaging for certain PCBs for disposal and storage.
<b>11</b> Package material either as a liquid or solid, as appropriate, depending on its physical form at 55 degrees C (131 degrees F) at atmospheric pressure.
<b>12</b> In concentrations greater than 40 percent, this material has strong oxidizing properties and is capable of starting fires in contact with combustible materials. If applicable, a package containing this material must comply with the subsidiary hazard labeling requirements of Attachment 15. <b>(T-0).</b>
<b>13</b> Enter the words “Inhalation Hazard” on each shipping paper in association with the shipping description.
<b>14</b> Motor fuel anti-knock mixtures are mixtures of one or more organic lead mixtures (such as tetraethyl lead, triethylmethyl lead, diethyldimethyl lead, ethyltrimethyl lead, and tetramethyl lead) with one or more halogen compounds (such as ethylene dibromide and ethylene dichloride), hydrocarbon solvents or other equally efficient stabilizers; or tetraethyl lead.



<b>15</b> This entry applies to “Chemical kits” and “First aid kits” containing one or more compatible items of hazardous materials in boxes, cases, <i>etc.</i> that, for example, are used for medical, analytical, diagnostic, testing, or repair purposes. Kits that are carried on board transport vehicles for first aid or operating purposes are not subject to the requirements of this subchapter.
<b>16</b> This description applies to smokeless powder and other solid propellants that are used as powder for small arms and have been classed as Division 1.3C, 1.4C and Division 4.1 in accordance with 49 CFR § 173.56 of this subchapter.
<b>19</b> For domestic transportation only, the identification number “UN1075” may be used in place of the identification number specified in column (2) of the Table A4.1. The identification number used must be consistent on package markings, shipping papers and emergency response information.
<b>21</b> This material must be stabilized by appropriate means to prevent dangerous polymerization. (T-0).
<b>22</b> If the hazardous material is in dispersion in organic liquid, the organic liquid must have a flash point above 50 degrees C (122 degrees F). (T-0).
<b>23</b> Classify this material as Class 4.1 only if it is packed so that the percentage of diluent will not fall below that stated in the shipping description at any time during transport.
<b>24</b> Alcoholic beverages containing more than 70 percent alcohol by volume must be transported as materials in Packing Group II. Alcoholic beverages containing more than 24 percent but not more than 70 percent alcohol by volume must be transported as materials in Packing Group III.
<b>26</b> This entry does not include ammonium permanganate, the transport of which is prohibited except when approved by the Associate Administrator.
<b>28</b> The dihydrated sodium salt of dichloroisocyanuric acid does not meet the criteria for inclusion in Division 5.1 (Oxidizer) and is not subject to the requirements of this subchapter unless meeting the criteria for inclusion in another class or division.
<b>30</b> Sulphur is not regulated if transported in a non-bulk packaging or if formed to a specific shape (e.g., prills, granules, pellets, pastilles, or flakes).
<b>31</b> Materials which have undergone sufficient heat treatment to render them non-hazardous are not subject to the requirements of this subchapter.
<b>32</b> Polymeric beads and molding compounds may be made from polystyrene, poly(methyl methacrylate) or other polymeric material.
<b>33</b> Ammonium nitrites and mixtures of an inorganic nitrite with an ammonium salt are prohibited.
<b>34</b> The commercial grade of calcium nitrate fertilizer, when consisting mainly of a double salt (calcium nitrate and ammonium nitrate) containing not more than 10 percent ammonium nitrate and at least 12 percent water of crystallization, is not subject to the requirements of this subchapter.
<b>35</b> Antimony sulphides and oxides which do not contain more than 0.5 percent of arsenic calculated on the total mass do not meet the definition of Division 6.1.
<b>37</b> Unless it can be demonstrated by testing that the sensitivity of the substance in its frozen state is no greater than in its liquid state, the substance must remain liquid during normal transport conditions. It must not freeze at temperatures above $-15^{\circ}\text{C}$ ( $5^{\circ}\text{F}$ ).

**38** If this material shows a violent effect in laboratory tests involving heating under confinement, the labeling requirements of Special Provision 53 apply, and the material must be packaged in accordance with packing method OP6 in [§ 173.225 of this subchapter](#). If the SADT of the technically pure substance is higher than 75 °C, the technically pure substance and formulations derived from it are not self-reactive materials and, if not meeting any other hazard class, are not subject to the requirements of this subchapter.

**39** This substance may be carried under provisions other than those of Class 1 only if it is so packed that the percentage of water will not fall below that stated at any time during transport. When phlegmatized with water and inorganic inert material, the content of urea nitrate must not exceed 75 percent by mass and the mixture should not be capable of being detonated by test 1(a)(i) or test 1(a)(ii) in the UN Manual of Tests and Criteria (IBR, see [§ 171.7 of this subchapter](#)).

**40** Polyester resin kits consist of two components: A base material (either Class 3 or Division 4.1, Packing Group II or III) and an activator (organic peroxide), each separately packed in an inner packaging. The organic peroxide must be type D, E, or F, not requiring temperature control. The components may be placed in the same outer packaging provided they will not interact dangerously in the event of leakage. The Packing Group assigned will be II or III, according to the classification criteria for either Class 3 or Division 4.1, as appropriate, applied to the base material. Additionally, unless otherwise excepted in this subchapter, polyester resin kits must be packaged in specification combination packagings based on the performance level of the base material contained within the kit.

**41** This material at the Packing Group II hazard criteria level may be transported in Large Packagings.

**43** The nitrogen content of the nitrocellulose must not exceed 11.5 percent. **(T-0)**. Pack each single filter sheet between sheets of glazed paper. Ensure the portion of glazed paper between the filter sheets is not less than 65 percent, by mass. The membrane filters/paper arrangement must not be liable to propagate a detonation. **(T-0)**.

**44** The formulation must be prepared so that it remains homogenous and does not separate during transport. **(T-0)**. Formulations with low nitrocellulose contents and neither showing dangerous properties when tested for their ability to detonate, deflagrate or explode when heated under defined confinement by the appropriate test methods and criteria in the UN Manual of Tests and Criteria, nor classed as a Division 4.1 (flammable solid) when tested in accordance with the procedures specified in 49 CFR Section 173.124 (chips, if necessary, crushed and sieved to a particle size of less than 1.25 mm), are not subject to the requirements of this manual.

**45** Temperature should be maintained between 18 °C (64.4 °F) and 40 °C (104 °F). Tanks containing solidified methacrylic acid must not be reheated during transport.

**46** During transport, it must be protected from direct sunshine and stored (or kept) in a cool and well-ventilated place, away from all sources of heat. **(T-0)**.

**47** Mixtures of solids which are not subject to this subchapter and flammable liquids may be transported under this entry without first applying the classification criteria of Division 4.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. **(T-0)**. Small inner packagings consisting of sealed packets containing less than 10 mL of a Class 3 liquid in Packing Group II

or III absorbed onto a solid material are not subject to this subchapter provided there is no free liquid in the packet.

**48** Mixtures of solids which are not subject to this subchapter and toxic liquids may be transported under this entry without first applying the classification criteria of Division 6.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. **(T-0)**. This entry may not be used for solids containing a Packing Group I liquid.

**49** Mixtures of solids which are not subject to this subchapter and corrosive liquids may be transported under this entry without first applying the classification criteria of Class 8, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. **(T-0)**.

**50** Cases, cartridge, empty with primer which are made of metallic or plastic casings and meeting the classification criteria of Division 1.4 are not regulated for domestic transportation.

**51** This description applies to items previously described as "Toy propellant devices, Class C" and includes reloaded kits. Model rocket motors containing 30 grams or less propellant are classed as Division 1.4S and items containing more than 30 grams of propellant but not more than 62.5 grams of propellant are classed as Division 1.4C.

**52** This entry may only be used for substances that are too insensitive for acceptance into Class 1 (explosive) when tested in accordance with Test Series 2 in the UN Manual of Tests and Criteria, Part I (incorporated by reference; see [§ 171.7 of this subchapter](#)).

**53** Packages of these materials must bear a subsidiary hazard label, "EXPLOSIVE", unless exempted by the DOT. **(T-0)**. A copy of the permit must accompany the shipment. **(T-0)**.

**54** Maneb or maneb preparations not meeting the definition of Division 4.3 or any other hazard class are not subject to the requirements of this subchapter when transported by motor vehicle, rail car, or aircraft.

**55** This device must be approved in accordance with [§ 173.56 of this subchapter](#) by the Associate Administrator.

**56** Ensure a means to interrupt and prevent detonation of the detonator from initiating the detonating cord is installed between each electric detonator and the detonating cord ends of the jet perforating guns.

**57** Maneb *or* Maneb preparations stabilized against self-heating need not be classified in Division 4.2 when it can be demonstrated by testing that a volume of 1 m<sup>3</sup> of substance does not self-ignite and that the temperature at the center of the sample does not exceed 200 °C, when the sample is maintained at a temperature of not less than 75 °C ±2 °C for a period of 24 hours, in accordance with procedures set forth for testing self-heating materials in the UN Manual of Tests and Criteria (IBR, see [§ 171.7 of this subchapter](#)).

**58** Aqueous solutions of Division 5.1 inorganic solid nitrate substances are considered as not meeting the criteria of Division 5.1 if the concentration of the substances in solution at the minimum temperature encountered in transport is not greater than 80% of the saturation limit.

**59** Ferrocenium, stabilized against corrosion, with a minimum iron content of 10 percent is not subject to the requirements of this subchapter.

<b>61</b>	A chemical oxygen generator is spent if its means of ignition and all or a part of its chemical contents have been expended.
<b>62</b>	Oxygen generators are not authorized for transportation under this entry.
<b>64</b>	The group of alkali metals includes lithium, sodium, potassium, rubidium, and caesium.
<b>65</b>	The group of alkaline earth metals includes magnesium, calcium, strontium, and barium.
<b>66</b>	Formulations of these substances containing not less than 30 percent non-volatile, non-flammable phlegmatizer are not subject to this subchapter.
<b>70</b>	Black powder that has been classed in accordance with the requirements of <a href="#">§ 173.56 of this subchapter</a> may be reclassified and offered for domestic transportation as a Division 4.1 material if it is offered for transportation and transported in accordance with the limitations and packaging requirements of <a href="#">§ 173.170 of this subchapter</a> .
<b>74</b>	During transport, this material must be protected from direct sunshine and stored or kept in a cool and well-ventilated place, away from all sources of heat.
<b>78</b>	This entry may not be used to describe compressed air which contains more than 23.5 percent oxygen. Compressed air containing greater than 23.5 percent oxygen must be shipped using the description "Compressed gas, oxidizing, n.o.s., UN3156."
<b>79</b>	This entry may not be used for mixtures that meet the definition for oxidizing gas.
<b>81</b>	Polychlorinated biphenyl items, as defined in <a href="#">40 CFR 761.3</a> , for which specification packagings are impractical, may be packaged in non-specification packagings meeting the general packaging requirements of subparts A and B of <a href="#">part 173 of this subchapter</a> . Alternatively, the item itself may be used as a packaging if it meets the general packaging requirements of subparts A and B of <a href="#">part 173 of this subchapter</a> .
<b>101</b>	The name of the particular substance or article must be specified.
<b>102</b>	This article may be transported as Class 1.4D if all of the conditions specified in 49 CFR Paragraph 173.63(a) are met. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
<b>105</b>	The word "Agents" may be used instead of "Explosives" when approved by the DOT.
<b>106</b>	The recognized name of the particular explosive may be specified in addition to the type.
<b>107</b>	The classification of the substance is expected to vary especially with the particle size and packaging, but the border lines have not been experimentally determined; verify appropriate classifications following the test procedures in 49 CFR Sections 173.57 and 173.58. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
<b>108</b>	Fireworks must be constructed and packaged so that loose pyrotechnic composition is not present in packages during transportation. <b>(T-0).</b>
<b>109</b>	Rocket motors must be nonpropulsive in transportation unless approved according to A3.3.1.4. <b>(T-0).</b> To be considered "nonpropulsive", a rocket motor must be capable of unrestrained burning and must not appreciably move in any direction when ignited by any means. <b>(T-0).</b>
<b>110</b>	Fire extinguishers transported under UN1044 and oxygen cylinders transported for emergency use under UN1072 may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2 unless listed as a Class 1 material in the JHCS, provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per cylinder. Oxygen cylinders with installed

actuating cartridges as prepared for transportation must have an effective means of preventing inadvertent activation. <b>(T-0).</b>
<b>111</b> Explosive substances of Class 1.1A are forbidden for transportation if dry or not desensitized, unless incorporated in a device.
<b>113</b> The sample must be given a tentative approval by an agency or laboratory according to the provisions of 49 CFR Section 173.56. <b>(T-0).</b>
<b>114</b> Jet perforating guns, charged, oil well, without detonator may be reclassified to Division 1.4 Compatibility Group D (1.4D) if the following conditions are met: <b>a.</b> The total weight of the explosive contents of the shaped charges assembled in the guns does not exceed 90.5 kg (200 pounds) per vehicle; and <b>b.</b> The guns are packaged in accordance with Packing Method US 1 as specified in <a href="#">§ 173.62 of this subchapter</a> .
<b>115</b> Boosters with detonator (detonating primers) in which the total explosive charge per unit does not exceed 25 g, and which will not mass detonate and undergo only limited propagation in the shipping package may be assigned to Class 1.4B. Mass detonate means more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one booster near the center of the package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional boosters in the outer packaging that explode may not exceed 25 g. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
<b>116</b> Fuzes, detonating, may be classed in Class 1.4 if the fuzes do not contain more than 25 g of explosive per fuze and are made and packaged so that they will not cause functioning of other fuzes, explosives, or other explosive devices if one of the fuzes detonates in a shipping packaging or in adjacent packages. Reclassification requires approval by a DOD Explosive Hazard Classification Authority according to A3.3.1.4.
<b>117</b> If a shipment of the explosive substance is to take place at a time that freezing weather is anticipated, the water contained in the explosive substance must be mixed with denatured alcohol so that freezing will not occur. <b>(T-0).</b>
<b>118</b> This substance may not be transported under the provisions of Division 4.1 unless specifically authorized by the Associate Administrator.
<b>119</b> This substance, when in quantities of not more than 11.5 kg (25.3 pounds), with not less than 10 percent water, by mass, also may be classed as Division 4.1, provided a negative test result is obtained when tested in accordance with test series 6(c) of the UN Manual of Tests and Criteria (IBR, see <a href="#">§ 171.7 of this subchapter</a> ).
<b>120</b> The phlegmatized substance must be significantly less sensitive than dry PETN.
<b>121</b> This substance, when containing less alcohol, water or phlegmatizer than specified, may not be transported unless approved by the Associate Administrator.
<b>123</b> Any explosive, blasting, type C containing chlorate must be segregated from explosives containing ammonium nitrate or other ammonium salts. <b>(T-0).</b>
<b>125</b> Lactose or glucose or similar materials may be used as a phlegmatizer provided that the substance contains not less than 90%, by mass, of phlegmatizer. These mixtures may be classified in Division 4.1 when tested in accordance with test series 6(c) of the UN Manual of Tests and Criteria (IBR, see <a href="#">§ 171.7 of this subchapter</a> ) and approved by the Associate Administrator. Testing must be conducted on at least three packages as prepared for transport.



<p>Mixtures containing at least 98%, by mass, of phlegmatizer are not subject to the requirements of this subchapter. Packages containing mixtures with not less than 90% by mass, of phlegmatizer need not bear a POISON subsidiary risk label.</p>	
<p><b>127</b> Mixtures containing oxidizing and organic materials transported under this entry may not meet the definition and criteria of a Class 1 material.</p>	
<p><b>128</b> Regardless of the provisions of <a href="#">§ 172.101(c)(12)</a>, aluminum smelting by-products and aluminum remelting by-products described under this entry, meeting the definition of Class 8, Packing Group II and III may be classed as a Division 4.3 material and transported under this entry. The presence of a Class 8 hazard must be communicated as required by this part for subsidiary hazards.</p>	aluminum
<p><b>129</b> These materials may not be classified and transported unless authorized by the Associate Administrator on the basis of results from Series 2 Test and a Series 6(c) Test from the UN Manual of Tests and Criteria (IBR, see <a href="#">§ 171.7 of this subchapter</a>) on packages as prepared for transport. The packing group assignment and packaging must be approved by the Associate Administrator for Hazardous Materials Safety on the basis of the criteria in <a href="#">§ 173.21 of this subchapter</a> and the package type used for the Series 6(c) test.</p>	
<p><b>130</b> “Batteries, dry, sealed, n.o.s.,” commonly referred to as dry batteries, are hermetically sealed and generally utilize metals (other than lead) and/or carbon as electrodes. These batteries are typically used for portable power applications. The rechargeable (and some non-rechargeable) types have gelled alkaline electrolytes (rather than acidic) making it difficult for them to generate hydrogen or oxygen when overcharged and therefore, differentiating them from non-spillable batteries. Dry batteries specifically covered by another entry in the <a href="#">§ 172.101</a> Table must be transported in accordance with the requirements applicable to that entry. For example, nickel-metal hydride batteries transported by vessel in certain quantities are covered by another entry (<i>see</i> Batteries, nickel-metal hydride, UN3496). Dry batteries not specifically covered by another entry in the <a href="#">§ 172.101</a> Table are covered by this entry (<i>i.e.</i>, Batteries, dry, sealed, n.o.s.) and are not subject to requirements of this subchapter except for the following:</p> <p><b>(a) Incident reporting.</b> For transportation by aircraft, a telephone report in accordance with <a href="#">§ 171.15(a)</a> is required if a fire, violent rupture, explosion or dangerous evolution of heat (<i>i.e.</i>, an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence) occurs as a direct result of a dry battery. For all modes of transportation, a written report submitted, retained, and updated in accordance with <a href="#">§ 171.16</a> is required if a fire, violent rupture, explosion or dangerous evolution of heat occurs as a direct result of a dry battery or battery-powered device.</p> <p><b>(b) Preparation for transport.</b> Batteries and battery-powered device(s) containing batteries must be prepared and packaged for transport in a manner to prevent:</p> <p><b>(1)</b> A dangerous evolution of heat;</p> <p><b>(2)</b> Short circuits, including but not limited to the following methods:</p> <p><b>(i)</b> Packaging each battery or each battery-powered device when practicable, in fully enclosed inner packagings made of non-conductive material;</p> <p><b>(ii)</b> Separating or packaging batteries in a manner to prevent contact with other batteries, devices or conductive materials (<i>e.g.</i>, metal) in the packagings; or</p>	

(iii) Ensuring exposed terminals or connectors are protected with non-conductive caps, non-conductive tape, or by other appropriate means; and

(3) Damage to terminals. If not impact resistant, the outer packaging should not be used as the sole means of protecting the battery terminals from damage or short circuiting. Batteries must be securely cushioned and packed to prevent shifting which could loosen terminal caps or reorient the terminals to produce short circuits. Batteries contained in devices must be securely installed. Terminal protection methods include but are not limited to the following:

- (i) Securely attaching covers of sufficient strength to protect the terminals;
- (ii) Packaging the battery in a rigid plastic packaging; or
- (iii) Constructing the battery with terminals that are recessed or otherwise protected so that the terminals will not be subjected to damage if the package is dropped.

(c) *Additional air transport requirements.* For a battery whose voltage (electrical potential) exceeds 9 volts—

- (1) When contained in a device, the device must be packaged in a manner that prevents unintentional activation or must have an independent means of preventing unintentional activation (*e.g.*, packaging restricts access to activation switch, switch caps or locks, recessed switches, trigger locks, temperature sensitive circuit breakers, *etc.*); and
- (2) An indication of compliance with this special provision must be provided by marking each package with the words “not restricted” or by including the words “not restricted” on a transport document such as an air waybill accompanying the shipment.

(d) *Used or spent battery exception.* Used or spent dry batteries of both non-rechargeable and rechargeable designs, with a marked rating up to 9-volt that are combined in the same package and transported by highway or rail for recycling, reconditioning, or disposal are not subject to this special provision or any other requirement of the HMR. Note that batteries utilizing different chemistries (*i.e.*, those battery chemistries specifically covered by another entry in the [§ 172.101](#) Table) as well as dry batteries with a marked rating greater than 9-volt may not be combined with used or spent batteries in the same package. Note also that this exception does not apply to batteries that have been reconditioned for reuse.

**131** This material may not be offered for transportation unless approved by the Associate Administrator.

**132** This description may only be used for ammonium nitrate-based compound fertilizers. They must be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, part III, section 39. **(T-0).**

**134** This entry only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries that are transported with these batteries installed.

a. For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are electrically-powered cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with an electric motor) and other vehicles of this type (*e.g.*, self-balancing vehicles or vehicles not equipped with at least one seating position), lawn tractors, self-propelled farming and construction equipment, boats, aircraft, wheelchairs and other mobility aids. This includes vehicles transported in a packaging. In this case some parts of the vehicle may be detached from its frame to fit into the packaging.

b. Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries must be consigned under the entries “Lithium metal batteries contained in equipment” or “Lithium metal batteries packed with equipment” or “Lithium ion batteries contained in equipment” or “Lithium ion batteries packed with equipment” as appropriate. **(T-0)**.

c. Self-propelled vehicles or equipment that also contain an internal combustion engine must be consigned under the entries “Engine, internal combustion, flammable gas powered” or “Engine, internal combustion, flammable liquid powered” or “Vehicle, flammable gas powered” or “Vehicle, flammable liquid powered,” as appropriate. **(T-0)**. These entries include hybrid electric vehicles powered by both an internal combustion engine and batteries. Additionally, self-propelled vehicles or equipment that contain a fuel cell engine must be consigned under the entries “Engine, fuel cell, flammable gas powered” or “Engine, fuel cell, flammable liquid powered” or “Vehicle, fuel cell, flammable gas powered” or “Vehicle, fuel cell, flammable liquid powered,” as appropriate. **(T-0)**. These entries include hybrid electric vehicles powered by a fuel cell engine, an internal combustion engine, and batteries. powered” or “Vehicle, fuel cell, flammable liquid powered,” as appropriate.

**135** Internal combustion engines installed in a vehicle must be consigned under the entries “Vehicle, flammable gas powered” or “Vehicle, flammable liquid powered,” as appropriate. **(T-0)**. If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, it must be consigned under the entry “Vehicle, flammable gas powered.” **(T-0)**. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet, sodium or lithium batteries installed. If a fuel cell engine is installed in a vehicle, the vehicle must be consigned using the entries “Vehicle, fuel cell, flammable gas powered” or “Vehicle, fuel cell, flammable liquid powered,” as appropriate. **(T-0)**. These entries include hybrid electric vehicles powered by a fuel cell, an internal combustion engine, and wet, sodium or lithium batteries installed. For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, trucks, locomotives, scooters, three- and four-wheeled vehicles or motorcycles, lawn tractors, self-propelled farming and construction equipment, boats and aircraft.

**136** This entry applies only to articles, machinery, and apparatus containing hazardous materials as an integral element of the article, machinery, or apparatus. It may not be used to describe articles, machinery, or apparatus for which a proper shipping name exists in the [§ 172.101](#) Table. Except when approved by the Associate Administrator, these items may only contain hazardous materials for which exceptions are referenced in Column (8) of the [§ 172.101](#) Table and are provided in part 173, subparts D and G, of this subchapter. Hazardous materials shipped under this entry are excepted from the labeling requirements of this subchapter unless offered for transportation or transported by aircraft and are not subject to the placarding requirements of [subpart F of this part](#). Orientation markings as described in [§ 172.312\(a\)\(2\)](#) are required when liquid hazardous materials may escape due to incorrect orientation. The article, machinery, or apparatus, if unpackaged, or the packaging in which it is contained shall be marked “Dangerous goods in articles” or “Dangerous goods in machinery” or “Dangerous goods in apparatus” as appropriate, with the identification number UN3363. For transportation by aircraft, articles, machinery, or apparatus, may not contain any material forbidden for transportation by passenger or cargo aircraft. The Associate Administrator may except from the requirements of this subchapter articles, machinery, and apparatus provided:

a. It is shown that it does not pose a significant risk in transportation;



- b. The quantities of hazardous materials do not exceed those specified in [§ 173.4a of this subchapter](#); and
- c. The equipment, and machinery or apparatus articles conforms with [§ 173.222 of this subchapter](#).

**137** Cotton, dry; flax, dry; sisal, dry; and tampico fiber, dry are not subject to the requirements of this subchapter when they are baled in accordance with ISO 8115, "Cotton Bales—Dimensions and Density" (IBR, see [§ 171.7 of this subchapter](#)) to a density of not less than 360 kg/m<sup>3</sup> (22.1 lb/ft<sup>3</sup>) for cotton, 400 kg/m<sup>3</sup> (24.97 lb/ft<sup>3</sup>) for flax, 620 kg/m<sup>3</sup> (38.71 lb/ft<sup>3</sup>) for sisal and 360 kg/m<sup>3</sup> (22.1 lb/ft<sup>3</sup>) for tampico fiber and transported in a freight container or closed transport vehicle.

**138** This entry applies to lead compounds which, when mixed in a ratio of 1:1,000 with 0.07 M (Molar concentration) hydrochloric acid and stirred for one hour at a temperature of 23 °C ±2 °C, exhibit a solubility of more than 5%. Lead compounds which, when mixed in a ratio of 1:1,000 with 0.07 M (Molar concentration) hydrochloric acid and stirred for one hour at a temperature of 23 °C ±2 °C, exhibit a solubility of 5% or less are not subject to the requirements of this subchapter unless they meet criteria as another hazard class or division. Lead compounds that have a solubility of 5% or less in accordance with this special provision are not subject to the requirements of this subchapter that pertain to Marine Pollutants.

**139** Use of the "special arrangement" proper shipping names for international shipments must be made under an IAEA Certificate of Competent Authority issued by the Associate Administrator in accordance with the requirements in 49 CFR Sections 173.471, 173.472, or 173.473. **(T-0)**. Use of these proper shipping names for domestic shipments may be made only under a DOT special permit.

**140** This material is regulated only when it meets the defining criteria for a hazardous substance or a marine pollutant. In addition, the column 5 reference is modified to read "III" on those occasions when this material is offered for transportation or transported by highway or rail.

**141** A toxin obtained from a plant, animal, or bacterial source containing an infectious substance, or a toxin contained in an infectious substance, must be classed as Division 6.2, described as an infectious substance, and assigned to UN 2814 or UN 2900, as appropriate.

**142** These hazardous materials may not be classified and transported unless authorized by the Associate Administrator. The Associate Administrator will base the authorization on results from Series 2 tests and a Series 6(c) test from the UN Manual of Tests and Criteria (IBR, see [§ 171.7 of this subchapter](#)) on packages as prepared for transport in accordance with the requirements of this subchapter.

**144** If transported as a residue in an underground storage tank (UST), as defined in [40 CFR 280.12](#), that has been cleaned and purged or rendered inert according to the American Petroleum Institute (API) Standard 1604 (IBR, see [§ 171.7 of this subchapter](#)), then the tank and this material are not subject to any other requirements of this subchapter. However, sediments remaining in the tank that meet the definition for a hazardous material are subject to the applicable regulations of this subchapter.

**145** This entry applies to formulations that neither detonate in the cavitated state nor deflagrate in laboratory testing, show no effect when heated under confinement, exhibit no explosive power, and are thermally stable (self-accelerating decomposition temperature (SADT) at 60 °C (140 °F) or higher for a 50 kg (110.2 lbs.) package). Formulations not meeting these criteria must be transported under the provisions applicable to the appropriate entry in the Organic Peroxide Table in [§ 173.225 of this subchapter](#).

**146** This description may be used for a material that poses a hazard to the environment but does not meet the definition for a hazardous waste or a hazardous substance, as defined in [§ 171.8 of this subchapter](#), or any hazard class, as defined in [part 173 of this subchapter](#), if it is designated as environmentally hazardous by another Competent Authority. This provision may be used for both domestic and international shipments.

**147** This entry applies to non-sensitized emulsions, suspensions, and gels consisting primarily of a mixture of ammonium nitrate and fuel, intended to produce a Type E blasting explosive only after further processing prior to use. The mixture for emulsions typically has the following composition: 60–85% ammonium nitrate; 5–30% water; 2–8% fuel; 0.5–4% emulsifier or thickening agent; 0–10% soluble flame suppressants; and trace additives. Other inorganic nitrate salts may replace part of the ammonium nitrate. The mixture for suspensions and gels typically has the following composition: 60–85% ammonium nitrate; 0–5% sodium or potassium perchlorate; 0–17% hexamine nitrate or monomethylamine nitrate; 5–30% water; 2–15% fuel; 0.5–4% thickening agent; 0–10% soluble flame suppressants; and trace additives. Other inorganic nitrate salts may replace part of the ammonium nitrate. These substances must satisfy the criteria for classification as an ammonium nitrate emulsion of Test Series 8 of the UN Manual of Tests and Criteria, Part I, Section 18 (IBR, *see* [§ 171.7 of this subchapter](#)), and may not be classified and transported unless approved by the Associate Administrator.

**148** For domestic transportation, this entry directs to [§ 173.66](#) for:

- a. The standards for transporting a single bulk hazardous material for blasting by cargo tank motor vehicles (CTMV); and
- b. The standards for CTMVs capable of transporting multiple hazardous materials for blasting in bulk and non-bulk packagings (*i.e.*, a multipurpose bulk truck (MBT)).

**149** When transported as a limited quantity or a consumer commodity, the maximum net capacity specified in [§ 173.150\(b\)\(2\) of this subchapter](#) for inner packagings may be increased to 5 L (1.3 gallons).

**150** This description may only be used for ammonium nitrate-based fertilizers. They must be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, part III, section 39 (IBR, *see* [§ 171.7 of this subchapter](#)).

**151** If this material meets the definition of a flammable liquid in [§ 173.120 of this subchapter](#), a FLAMMABLE LIQUID label is also required and the basic description on the shipping paper must indicate the Class 3 subsidiary hazard.

**155** Fish meal, fish scrap and krill meal may not be transported if the temperature at the time of loading either exceeds 35 °C (95 °F), or exceeds 5 °C (41 °F) above the ambient temperature, whichever is higher.

**156** Asbestos that is immersed or fixed in a natural or artificial binder material, such as cement, plastic, asphalt, resins or mineral ore, or contained in manufactured products is not subject to the requirements of this manual.

**157** When transported as a limited quantity or a consumer commodity, the maximum net capacity specified in [§ 173.151\(b\)\(1\)\(i\) of this subchapter](#) for inner packagings may be increased to 5 kg (11 pounds).

**159** This material must be protected from direct sunshine and kept in a cool, well-ventilated place away from sources of heat.

**160** This entry applies to safety devices for vehicles, vessels or aircraft, e.g., air bag inflators, air bag modules, seat-belt pretensioners, and pyromechanical devices containing Class 1 (explosive) materials or materials of other hazard classes. These articles must be tested in accordance with Test series 6(c) of Part I of the UN Manual of Tests and Criteria, with no explosion of the device, no fragmentation of device casing or pressure vessel, and no projection hazard or thermal effect that would significantly hinder fire-fighting or other emergency response efforts in the immediate vicinity. **(T-0)**. If the air bag inflator unit satisfactorily passes the series 6(c) test, it is not necessary to repeat the test on the air bag module. This entry does not apply to life saving appliances described in 49 CFR Section 173.219 (UN2990 and UN3072).

**162** This material may be transported under the provisions of Division 4.1 only if it is packed so that at no time during transport will the percentage of diluent fall below the percentage that is stated in the shipping description. **(T-0)**.

**163** Substances must satisfactorily pass Test Series 8 of the UN Manual of Tests and Criteria, Part I, Section 18 (IBR, see [§ 171.7 of this subchapter](#)).

**164** Substances must not be transported under this entry unless approved by the Associate Administrator on the basis of the results of appropriate tests according to Part I of the UN Manual of Tests and Criteria (IBR, see [§ 171.7 of this subchapter](#)). The material must be packaged so that the percentage of diluent does not fall below that stated in the approval at any time during transportation.

**165** These substances are susceptible to exothermic decomposition at elevated temperatures. Decomposition can be initiated by heat, moisture or by impurities (e.g., powdered metals (iron, manganese, cobalt, magnesium)). During the course of transportation, these substances must be shaded from direct sunlight and all sources of heat and be placed in adequately ventilated areas. **(T-0)**.

**166** When transported in non-friable tablet form, calcium hypochlorite, dry, may be transported as a Packing Group III material.

**167** These storage systems must always be considered as containing hydrogen. **(T-0)**. A metal hydride storage system installed in or intended to be installed in a vehicle or equipment or in vehicle or equipment components must be approved for transport by the Associate Administrator. **(T-0)**. A copy of the approval must accompany each shipment. **(T-0)**.

**168** For lighters containing a Division 2.1 gas (see [§ 171.8 of this subchapter](#)), representative samples of each new lighter design must be examined and successfully tested as specified in [§ 173.308\(b\)\(3\)](#). For criteria in determining what is a new lighter design, see [§ 173.308\(b\)\(1\)](#). For transportation of new lighter design samples for examination and testing, see [§ 173.308\(b\)\(2\)](#). The examination and testing of each lighter design must be performed by a person authorized by the Associate Administrator under the provisions of [subpart E of part 107 of this chapter](#), as specified in [§ 173.308\(a\)\(4\)](#). For continued use of approvals dated prior to January 1, 2012, see [§ 173.308\(b\)\(5\)](#).

For non-pressurized lighters containing a Class 3 (flammable liquid) material, its design, description, and packaging must be approved by the Associate Administrator prior to being

offered for transportation or transported in commerce. In addition, a lighter design intended to contain a non-pressurized Class 3 material is excepted from the examination and testing criteria specified in [§ 173.308\(b\)\(3\)](#). An unused lighter or a lighter that is cleaned of residue and purged of vapors is not subject to the requirements of this subchapter.

**169** This entry applies to lighter refills (*see* [§ 171.8 of this subchapter](#)) that contain a Division 2.1 (flammable) gas but do not contain an ignition device. Lighter refills offered for transportation under this entry may not exceed 4 fluid ounces capacity (7.22 cubic inches) or contain more than 65 grams of fuel. A lighter refill exceeding 4 fluid ounces capacity (7.22 cubic inches) or containing more than 65 grams of fuel must be classed as a Division 2.1 material, described with the proper shipping name appropriate for the material, and packaged in the packaging specified in [part 173 of this subchapter](#) for the flammable gas contained therein. In addition, a container exceeding 4 fluid ounces volumetric capacity (7.22 cubic inches) or containing more than 65 grams of fuel may not be connected or manifolded to a lighter or similar device and must also be described and packaged according to the fuel contained therein. For transportation by passenger-carrying aircraft, the net mass of lighter refills may not exceed 1 kg per package, and, for cargo-only aircraft, the net mass of lighter refills may not exceed 15 kg per package. See [§ 173.306\(h\) of this subchapter](#).

**170** Air must be eliminated from the vapor space by nitrogen or other means.

**171** This entry may only be used when the material is transported in non-friable tablet form or for granular or powered mixtures that have been shown to meet the PG III criteria in [§ 173.127](#).

**172** This entry includes alcohol mixtures containing up to 5% petroleum products.

**173** For adhesives, printing inks, printing ink-related materials, paints, paint-related materials, and resin solutions which are assigned to UN3082, and do not meet the definition of another hazard class, metal or plastic packaging for substances of packing groups II and III in quantities of 5 L (1.3 gallons) or less per packaging are not required to meet the UN performance package testing when transported:

- a. Except for transportation by aircraft, in palletized loads, a pallet box or unit load device (*e.g.* individual packaging placed or stacked and secured by strapping, shrink or stretch-wrapping or other suitable means to a pallet). For vessel transport, the palletized loads, pallet boxes or unit load devices must be firmly packed and secured in closed cargo transport units; or
- b. Except for transportation by aircraft, as an inner packaging of a combination packaging with a maximum net mass of 40 kg (88 pounds). For transportation by aircraft, as an inner packaging of a combination packaging with a maximum gross mass of 30 kg when packaged as a limited quantity in accordance with [§ 173.27\(f\)](#).

**175** This substance must be stabilized when in concentrations of not more than 99%.

**176** This entry must be used for formaldehyde solutions containing methanol as a stabilizer. Formaldehyde solutions not containing methanol and not meeting the Class 3 flammable liquid criteria must be described using a different proper shipping name.

**177** Gasoline, or, ethanol and gasoline mixtures, for use in internal combustion engines (*e.g.*, in automobiles, stationary engines and other engines) must be assigned to Packing Group II regardless of variations in volatility. **(T-0)**.

<p><b>181</b> When a package contains a combination of lithium batteries contained in equipment and lithium batteries packed with equipment, the following requirements apply:</p> <p>a. The shipper must ensure that all applicable requirements of <a href="#">§ 173.185 of this subchapter</a> are met. The total mass of lithium batteries contained in any package must not exceed the quantity limits in columns (9A) and (9B) for passenger aircraft or cargo aircraft, as applicable;</p> <p>b. Except as provided in <a href="#">§ 173.185(c)(3) of this subchapter</a>, the package must be marked “UN 3091 Lithium metal batteries packed with equipment”, or “UN 3481 Lithium ion batteries packed with equipment,” as appropriate. If a package contains both lithium metal batteries and lithium ion batteries packed with and contained in equipment, the package must be marked as required for both battery types. However, button cell batteries installed in equipment (including circuit boards) need not be considered; and</p> <p>c. The shipping paper must indicate “UN 3091 Lithium metal batteries packed with equipment” or “UN 3481 Lithium ion batteries packed with equipment,” as appropriate. If a package contains both lithium metal batteries and lithium ion batteries packed with and contained in equipment, then the shipping paper must indicate both “UN 3091 Lithium metal batteries packed with equipment” and “UN 3481 Lithium ion batteries packed with equipment.”</p>
<p><b>182</b> Equipment containing only lithium batteries must be classified as either UN3091 or UN3481. (T-0).</p>
<p><b>196</b> The nitrocellulose must meet the criteria of the Bergmann-Junk test or methyl violet paper test in the UN Manual of Tests and Criteria, Appendix 10 (IBR, <i>see</i> <a href="#">§ 171.7 of this subchapter</a>). Test of type 3(c) is not required.</p>
<p><b>197</b> The nitrocellulose must meet the criteria of the Bergmann-Junk test or methyl violet paper test in the UN Manual of Tests and Criteria, Appendix 10 (IBR, <i>see</i> <a href="#">§ 171.7 of this subchapter</a>).</p>
<p><b>198</b> Nitrocellulose solutions containing not more than 20% nitrocellulose may be transported as paint or printing ink, perfumery products, as applicable, provided the nitrocellulose contains no more 12.6% nitrogen (by dry mass). See UN1210, UN1263, UN3066, UN3469, and UN3470.</p>
<p><b>200</b> Division 1.4G consumer fireworks may be certified for transportation by a DOT-approved Fireworks Certification Agency in accordance with the provisions of <a href="#">§ 173.65 of this subchapter</a>.</p>
<p><b>237</b> This entry may only be used for the transport of non-activated batteries that contain dry potassium hydroxide and that are intended to be activated prior to use by the addition of an appropriate amount of water to the individual cells.</p>



**238** Neutron radiation detectors: Neutron radiation detectors containing non-pressurized boron trifluoride gas in excess of 1 gram (0.035 ounces) and radiation detection systems containing such neutron radiation detectors as components may be transported by highway, rail, vessel, or cargo aircraft in accordance with the following:

a. Each radiation detector must meet the following conditions:

- (1) The pressure in each neutron radiation detector must not exceed 105 kPa absolute at 20 °C (68 °F);
- (2) The amount of gas must not exceed 13 grams (0.45 ounces) per detector; and
- (3) Each neutron radiation detector must be of welded metal construction with brazed metal to ceramic feed through assemblies. These detectors must have a minimum burst pressure of 1800 kPa as demonstrated by design type qualification testing; and
- (4) Each detector must be tested to a  $1 \times 10^{-10}$  cm<sup>3</sup>/s leaktightness standard before filling.

b. Radiation detectors transported as individual components must be transported as follows:

- (1) They must be packed in a sealed intermediate plastic liner with sufficient absorbent or adsorbent material to absorb or adsorb the entire gas contents.
- (2) They must be packed in strong outer packagings and the completed package must be capable of withstanding a 1.8 meter (5.9 feet) drop without leakage of gas contents from detectors.
- (3) The total amount of gas from all detectors per outer packaging must not exceed 52 grams (1.83 ounces).

c. Completed neutron radiation detection systems containing detectors meeting the conditions of paragraph a of this special provision must be transported as follows:

- (1) The detectors must be contained in a strong sealed outer casing;
- (2) The casing must contain include sufficient absorbent or adsorbent material to absorb or adsorb the entire gas contents;
- (3) The completed system must be packed in strong outer packagings capable of withstanding a 1.8 meter (5.9 feet) drop test without leakage unless a system's outer casing affords equivalent protection.

d. Except for transportation by aircraft, neutron radiation detectors and radiation detection systems containing such detectors transported in accordance with paragraph a of this special provision are not subject to the labeling and placarding requirements of [part 172 of this subchapter](#).

e. When transported by highway, rail, vessel, or as cargo on an aircraft, neutron radiation detectors containing not more than 1 gram of boron trifluoride, including those with solder glass joints are not subject to any other requirements of this subchapter provided they meet the requirements in paragraph a of this special provision and are packed in accordance with paragraph b of this special provision. Radiation detection systems containing such detectors are not subject to any other requirements of this subchapter provided they are packed in accordance with paragraph c of this special provision.

**325** In the case of non-fissile or fissile-excepted uranium hexafluoride, the material must be classified under UN 2978.

**328** When lithium metal or lithium ion batteries are contained in the fuel cell system, the item must be described under this entry and the appropriate entries for “Lithium metal batteries contained in equipment” or “Lithium ion batteries contained in equipment”. **(T-0)**.

**332** “Magnesium nitrate hexahydrate” is not subject to the requirements of this manual.

**335** Mixtures of solids that are not subject to this subchapter and environmentally hazardous liquids or solids may be classified as “Environmentally hazardous substances, solid, n.o.s,” UN3077 and may be transported under this entry, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each transport unit must be leakproof when used as bulk packaging.

**336** The use of UN1H1 drums, UN3H1 jerricans, and UN6HA1 composite packagings which meet the requirements of part 178 of the HMR at the Packing Group I or II performance level. These packagings are not required to: (1.) meet the venting requirements in [§ 173.24\(g\)](#) or (2.) be marked with the hydrostatic pressure test marking specified in [§ 173.24a\(b\)\(4\)](#). Shipment of packages under this special provision must be made by private or contract motor carrier. Transportation of these packages also requires the door of each van trailer to be marked with “Warning trailer may contain chemical vapor. Do not enter until vapors have dissipated.” The driver of the transport vehicle and the consignee(s) must be trained not to enter the transport vehicle until the ammonia vapors have dissipated, and the emergency response information on the shipping paper must indicate that the vehicle contains ammonia vapors. This training must be documented in training records required by [§ 172.704\(d\)](#). Transport vehicles must be vented to prevent accumulation of vapors at a poisonous or flammable concentration.

**337** Authorizes the use of regulated waste containers manufactured prior to October 1, 2006 to be marked with the alternative shipping name of Regulated medical waste, UN3291 and arrows that deviate as prescribed in [§ 172.312\(a\)\(2\)](#) in that they may be black or white.

**338** n Life Saving appliances, self-inflating transported by motor vehicle only between an U.S. Coast Guard approved inflatable life raft servicing facility and a vessel are only subject to the following requirements:

- a. Prior to repacking into the life-saving appliance, an installed inflation cylinder must successfully meet and pass all inspection and test criteria and standards of the raft manufacturer and the vessel Flag State requirements for cylinders installed as part of life-saving appliances, self-inflating (UN2990) used on marine vessels. Additionally, each cylinder must be visually inspected in accordance with CGA pamphlet, CGA C-6 (incorporated by reference, see [§ 171.7](#)). A current copy of CGA pamphlet, CGA C-6 must be available at the facility servicing the life-saving appliance.
- b. An installed inflation cylinder that requires recharging must be filled in accordance with [§ 173.301\(l\)](#).
- c. Every installed inflation cylinder, as associated equipment of the life-saving appliance, must be packed within the protective packaging of the life raft and the life raft itself must otherwise be in compliance with [§ 173.219](#).
- d. The serial number for each cylinder must be recorded as part of the life-saving appliance service record by the U.S. Coast Guard-approved servicing facility.

**340** This entry only applies to Vessel Transport of Nickel-metal hydride as cargo. Batteries subject to this special provision are subject only to the following requirements: (1) The batteries must be prepared and packaged for transport in a manner to prevent a dangerous evolution of heat, short circuits, and damage to terminals; (2) Subject to the incident reporting in accordance with this AFMAN 24-604 and 49 CFR Section 171.16 if a fire, violent rupture, explosion or dangerous evolution of heat (i.e. damage to any part of packaging, melting, charring, scorching, of packing material or other evidence) occurs as a direct result of a nickel-metal hydride battery. Any other transport mode see special provision 130. (T-0)

**342** Glass inner packagings (such as ampoules or capsules) intended only for use in sterilization devices, when containing less than 30 mL of ethylene oxide per inner packaging with not more than 300 mL per outer packaging, may be transported in accordance with [§ 173.4a of this subchapter](#), irrespective of the restriction of [§ 173.4a\(b\)](#) and the indication of “forbidden” in columns (9A) and (9B) of the [§ 172.101](#) table provided that:

- a. After filling, each glass inner packaging must be determined to be leak-tight by placing the glass inner packaging in a hot water bath at a temperature and for a period of time sufficient to ensure that an internal pressure equal to the vapor pressure of ethylene oxide at 55 °C is achieved. Any glass inner packaging showing evidence of leakage, distortion or other defect under this test must not be transported under the terms of this special provision;
- b. In addition to the packaging required in [§ 173.4a](#), each glass inner packaging must be placed in a sealed plastic bag compatible with ethylene oxide and capable of containing the contents in the event of breakage or leakage of the glass inner packaging; and
- c. Each glass inner packaging is protected by a means of preventing puncture of the plastic bag (*e.g.*, sleeves or cushioning) in the event of damage to the packaging (*e.g.*, by crushing).

**343** A bulk packaging that emits hydrogen sulfide in sufficient concentration that vapors evolved from the sour crude oil can present an inhalation hazard must be marked as specified in [§ 172.327](#).

**345** “Nitrogen, refrigerated liquid (*cryogenic liquid*), UN1977” transported in open cryogenic receptacles with a maximum capacity of 1 L are not subject to the requirements of this subchapter. The receptacles must be constructed with glass double walls having the space between the walls vacuum insulated and each receptacle must be transported in an outer packaging with sufficient cushioning and absorbent materials to protect the receptacle from damage.

**346** “Nitrogen, refrigerated liquid (*cryogenic liquid*), UN1977” transported in accordance with the requirements for open cryogenic receptacles in 49 CFR Section 173.320 and this special provision are not subject to any other requirements of this manual. The receptacle must contain no hazardous materials other than the liquid nitrogen which must be fully absorbed in a porous material in the receptacle. **(T-0).**

**347** Substances and articles assigned to these PSNs must pass Test series 6(d) of Part I of the UN Manual of Tests and Criteria, be shipped under an appropriate CAA/DOT-SP, or must be reclassified as other than 1.4S. **(T-0).**

**349** Mixtures of hypochlorite with an ammonium salt are forbidden for transport. A hypochlorite solution, UN1791, is a Class 8 corrosive material.

**350** Ammonium bromate, ammonium bromate aqueous solutions, and mixtures of a bromate with an ammonium salt are forbidden for transport.

**351** Ammonium chlorate, ammonium chlorate aqueous solutions, and mixtures of a chlorate with an ammonium salt are forbidden for transport.

**352** Ammonium chlorite, ammonium chlorite aqueous solutions, and mixtures of a chlorite with an ammonium salt are forbidden for transport.

**353** Ammonium permanganate, ammonium permanganate aqueous solutions, and mixtures of a permanganate with an ammonium salt are forbidden for transport.

**357** A bulk packaging that emits hydrogen sulfide in sufficient concentration that vapors evolved from the crude oil can present an inhalation hazard must be marked as specified in [§ 172.327 of this part](#).



**360** Vehicles powered only by lithium batteries must be described using “UN3171, Battery-powered vehicle.” Lithium batteries installed in a cargo transport unit, designed only to provide power external to the transport unit, must be described using “UN3536, Lithium batteries installed in a cargo transport unit.”

**361** Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to the requirements of this manual. Energy storage capacity means the energy held by a capacitor, as calculated using the nominal voltage and capacitance. This entry does not apply to capacitors that by design maintain a terminal voltage (e.g., asymmetrical capacitors.)

**362** This entry applies to liquids, pastes or powders, pressurized with a propellant that meets the definition of a gas in 49 CFR Section 173.115. A chemical under pressure packaged in an aerosol dispenser must be transported under UN1950. **(T-0)**. The chemical under pressure must be classed based on the hazard characteristics of the components in the propellant; the liquid; or the solid. **(T-0)**. The following provisions also apply:

(1) If one of the components, which can be a pure substance or a mixture, is classed as flammable, the chemical under pressure must be classed as flammable in Division 2.1. **(T-0)**. Flammable components are flammable liquids and liquid mixtures, flammable solids and solid mixtures or flammable gases and gas mixtures meeting the following criteria:

- (a) A flammable liquid is a liquid having a flashpoint of not more than 93 °C (200 °F);
- (b) A flammable solid is a solid that meets the criteria in 49 CFR Section 173.124; or
- (c) A flammable gas is a gas that meets the criteria in 49 CFR Section 173.115.

(2) Gases of Division 2.3 and gases with a subsidiary hazard of 5.1 must not be used as a propellant in a chemical under pressure. **(T-0)**.

(3) Where the liquid or solid components are classed as Division 6.1, packing groups II or III, or Class 8, packing groups II or III, the chemical under pressure must be assigned a subsidiary hazard of Division 6.1 or Class 8 and the appropriate identification number must be assigned. **(T-0)**. Components classed as Division 6.1, packing group I, or Class 8, packing group I, must not be offered for transportation and transported under this description. **(T-0)**.

(4) A chemical under pressure with components meeting the properties of : Class 1 (explosives); Class 3 (liquid desensitized explosives); Division 4.1 (self-reactive substances and solid desensitized explosives); Division 4.2 (substances liable to spontaneous combustion); Division 4.3 (substances which, in contact with water, emit flammable gases or toxic gases); Division 5.1 (oxidizing substances); Division 5.2 (organic peroxides); Division 6.2 (Infectious substances); or, Class 7 (Radioactive material), must not be offered for transportation under this description. **(T-0)**.

(5) A description to which Special provision 170 or TP7 is assigned in Column 7 of the 172.101 Hazardous Materials Table, and therefore requires air to be eliminated from the package vapor space by nitrogen or other means, must not be offered for transportation under this description. **(T-0)**.

**365** For manufactured instruments and articles containing mercury, see UN3506.

**367** For the purposes of documentation and package marking:

- a. The proper shipping name “Paint related material” may be used for consignments of packages containing “Paint” and “Paint related material” in the same package;
- b. The proper shipping name “Paint related material, corrosive, flammable” may be used for consignments of packages containing “Paint, corrosive, flammable” and “Paint related material, corrosive, flammable” in the same package;

c. The proper shipping name “Paint related material, flammable, corrosive” may be used for consignments of packages containing “Paint, flammable, corrosive” and “Paint related material, flammable, corrosive” in the same package; and

d. The proper shipping name “Printing ink related material” may be used for consignments of packages containing “Printing ink” and “Printing ink related material” in the same package.

**368** In the case of non-fissile or fissile-excepted uranium hexafluoride, the material must be classified under UN3507 or UN2978. **(T-0).**

**369** This radioactive material in an excepted package possessing toxic and corrosive properties is classified in Division 6.1 with radioactivity and corrosive subsidiary risks.

**370** This entry also applies to ammonium nitrate with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any added substance, that gives a positive result when tested in accordance with Test Series 2 of the UN Manual of Tests and Criteria, Part I (IBR; see § 171.7 of this subchapter). *See also* UN1942 in the § 172.101 Hazardous Materials Table. This entry may not be used for ammonium nitrate for which a proper shipping name already exists in the § 172.101 Hazardous Materials Table, including ammonium nitrate mixed with fuel oil or any other commercial grade of ammonium nitrate (*e.g.*, ammonium nitrate fertilizer).

**371** a. This entry also applies to articles not conforming to the requirements of §§ 173.302, 173.304, or 173.306 of this subchapter, containing a small pressure receptacle with a release device. Such articles must comply with the following requirements:

(1) The water capacity of the pressure receptacle must not exceed 0.5 L and the working pressure must not exceed 25 bar at 15 °C (59 °F);

(2) The minimum burst pressure of the pressure receptacle must be at least four times the pressure of the gas at 15 °C (59 °F);

(3) Each article must be manufactured in such a way that unintentional firing or release is avoided under normal conditions of handling, packing, transport and use. This may be fulfilled by an additional locking device linked to the activator;

(4) Each article must be manufactured in such a way as to prevent hazardous projections of the pressure receptacle or parts of the pressure receptacle;

(5) Each pressure receptacle must be manufactured from material which will not fragment upon rupture;

(6) The design type of the article must be subjected to a fire test. For this test, the provisions of paragraphs 16.6.1.2 except letter g, 16.6.1.3.1 to 16.6.1.3.6, 16.6.1.3.7(b) and 16.6.1.3.8 of the UN Manual of Tests and Criteria must be applied. It must be demonstrated that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, in such a way that the pressure receptacle will not fragment and that the article or fragments of the article do not rocket more than 10 meters; and

(7) The design type of the article must be subjected to the following test. A stimulating mechanism must be used to initiate one article in the middle of the packaging. There must be no hazardous effects outside the package such as disruption of the package, metal fragments or a receptacle which passes through the packaging.

b. The manufacturer must produce technical documentation of the design type, manufacture as well as the tests and their results. The manufacturer must apply procedures to ensure that articles produced in series are made of good quality, conform to the design type and are able to meet the requirements in (a). The manufacturer must provide such information to a representative of the Department upon request.

**372** This entry applies to asymmetric capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to the requirements of this manual. Energy storage capacity means the energy stored in a capacitor, as calculated according to the following equation,  $Wh = 1/2CN(UR^2 - UL^2) \times (1/3600)$  Using the nominal capacitance (CN), rated voltage (UR) and the rated lower limit voltage (UL). Nickel-carbon asymmetric capacitors containing Class 8 alkaline electrolytes must be transported as UN2795, Batteries, wet, filled with alkali, electric storage. **(T-0).**

**387** When chemical stabilization is employed, the person offering the material for transport ensures that the level of stabilization is sufficient to prevent the material as packaged from dangerous polymerization at 50 °C (122 °F). If chemical stabilization becomes ineffective at lower temperatures within the anticipated duration of transport, temperature control is required and is forbidden by aircraft.

**388** Lithium batteries containing both primary lithium metal cells and rechargeable lithium ion cells that are not designed to be externally charged, must meet the following conditions:

- i. The rechargeable lithium ion cells can only be charged from the primary lithium metal cells;
- ii. Overcharge of the rechargeable lithium ion cells is precluded by design;
- iii. The battery has been tested as a primary lithium battery; and
- iv. Component cells of the battery must be of a type proved to meet the respective testing requirements of the Manual of Tests and Criteria, part III, subsection 38.3.

These lithium batteries must be assigned to UN3090 or UN3091, as appropriate. When such batteries are transported in accordance with 49 CFR Paragraph 173.185(c), the total lithium content of all lithium metal cells contained in the battery must not exceed 1.5 g and the total capacity of all lithium ion cells contained in the battery must not exceed 10 Wh. **(T-0).**

**389** This entry only applies to lithium ion batteries or lithium metal batteries installed in a cargo transport unit and designed only to provide power external to the cargo transport unit. The lithium batteries must meet the requirements paragraph A3.3.9.2. and contain the necessary systems to prevent overcharge and over discharge between the batteries. **(T-0).** The batteries must be securely attached to the interior structure of the cargo transport unit (e.g., by means of placement in racks, cabinets, etc.) in such a manner as to prevent short circuits, accidental operation, and significant movement relative to the cargo transport unit under the shocks, loadings, and vibrations normally incident to transport. **(T-0).** Hazardous materials necessary for the safe and proper operation of the cargo transport unit (e.g., fire extinguishing systems and air conditioning systems), must be properly secured to or installed in the cargo transport unit and are not otherwise subject certification by this manual. **(T-0).** Hazardous materials not necessary for the safe and proper operation of the cargo transport unit must not be transported within the cargo transport unit. **(T-0).** The batteries inside the cargo transport unit are not subject to marking or labelling requirements of this manual. Display the UN number in a manner in accordance with 49 CFR Section 172.332 and be marked on two opposite sides of the cargo transport unit. **(T-0).**

**391** Articles containing hazardous materials of Division 2.3, Division 4.2, Division 4.3, Division 5.1, Division 5.2, or Division 6.1 (substances with a inhalation toxicity of Packing Group I) and articles containing more than one of the following hazards: (1) Gases of Class 2; (2) Liquid desensitized explosives of Class 3; or (3) Self-reactive substances and solid desensitized explosives of

Division 4.1, may only be offered for transportation and transported under conditions approved by the DOT Associate Administrator.

<b>422</b> When labelling is required, the label to be used must be the label shown in <a href="#">§ 172.447</a> . When a placard is displayed, the placard must be the placard shown in <a href="#">§ 172.560</a> .
<b>430</b> This entry shall only be used for solid medical waste of Category A transported for disposal.
<b>"A" Provisions.</b> These special provisions are in addition to other requirements for military air shipment.
<b>A1</b> Single packaging is not permitted on aircraft carrying passengers. P4 restrictions apply.
<b>A2</b> Single packagings are not permitted.
<b>A3</b> For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed rigid and leakproof receptacles before packing in outer packagings. <b>(T-0)</b> .
<b>A4</b> Liquids having an inhalation toxicity of PG I and are identified as P1, P2, or P3 are not permitted on passenger aircraft. Deviations are not allowed.
<b>A5</b> Solids having an inhalation toxicity of PG I and are identified as P1, P2, or P3, are not permitted on passenger aircraft and may not exceed a maximum net quantity per package of 15 kg (33 pounds) on cargo aircraft. See paragraph 2.2. for deviation authority.
<b>A6</b> For combination packagings, if plastic inner packagings are used, pack in tightly closed metal receptacles before packing into outer packagings.
<b>A7</b> Steel packagings must be corrosion-resistant or have protection against corrosion. <b>(T-0)</b> .
<b>A8</b> For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with cushioning material in tightly closed metal receptacles before packing in outer packagings. <b>(T-0)</b> .
<b>A9</b> For combination packages, if plastic bags are used, they must be packed in tightly closed metal receptacles before packing in outer packagings. <b>(T-0)</b> .
<b>A10</b> When aluminum or aluminum alloy construction materials are used, they must be resistant to corrosion. <b>(T-0)</b> .
<b>A11</b> For combination packagings, when metal inner packagings are permitted, only specification cylinders constructed of metals which are compatible with the hazardous material may be used.
<b>A13</b> Bulk packagings are not authorized for transportation by aircraft.
<b>A14</b> This material is not authorized to be transported as a limited quantity or consumer commodity in accordance with <a href="#">§ 173.306 of this subchapter</a> when transported aboard an aircraft.
<b>A19</b> Combination packagings consisting of outer fiber drums or plywood drums, with inner plastic packagings, are not authorized.
<b>A20</b> Plastic bags as inner receptacles of combination packagings are not authorized.
<b>A29</b> Combination packagings consisting of outer expanded plastic boxes with inner plastic bags are not authorized.
<b>A30</b> Ammonium permanganate is not authorized.
<b>A34</b> Aerosols containing a corrosive liquid in Packing Group II charged with a gas are not permitted for transportation by aircraft.
<b>A35</b> This includes material which is not covered by any other hazard class but has anesthetic, narcotic, noxious or other properties such that, in the event of spillage or leakage on the aircraft, extreme annoyance or discomfort could be caused to aircrew members so as to prevent correct performance of assigned duties. For material containing aromatic extract or flavoring, use

packaging paragraph A13.2. For all other material shipped under this PSN, use packaging paragraph A13.14.
<b>A37</b> This entry applies only to a material meeting the definition in 49 CFR Section 171.8 for self-defense spray.
<b>A51</b> For aircraft batteries, irrespective of the quantity limitations specified in Column (9A) of the <a href="#">§ 172.101</a> Table or <a href="#">§ 175.75(c)</a> , wet cell batteries, UN2794 or UN2795, up to a limit of 100 kg net mass per package may be transported aboard passenger aircraft. Transport in accordance with this special provision must be noted on the shipping paper.
<b>A53</b> Refrigerating machines and refrigerating machine components are not subject to the requirements of this subchapter when containing less than 12 kg (26.4 pounds) of a non-flammable gas or when containing 12 L (3 gallons) or less of ammonia solution (UN2672) (see <a href="#">§ 173.307 of this subchapter</a> ).
<b>A54</b> Irrespective of the quantity limits in Column 9B of the <a href="#">§ 172.101</a> table, a lithium battery, including a lithium battery packed with, or contained in, equipment that otherwise meets the applicable requirements of <a href="#">§ 173.185</a> , may have a mass exceeding 35 kg if approved by the Associate Administrator prior to shipment.
<b>A56</b> Radioactive material with a subsidiary hazard of Division 4.2 Packing Group I must be transported in Type B packages when offered for transportation by aircraft. Radioactive material with a subsidiary hazard of Division 2.1 is forbidden from transport on passenger aircraft.
<b>A60</b> Sterilization devices, when containing less than 30 mL per inner packaging with not more than 150 mL per outer packaging, may be transported in accordance with the provisions in <a href="#">§ 173.4a</a> , irrespective of <a href="#">§ 173.4a(b)</a> , provided such packagings were first subjected to comparative fire testing. Comparative fire testing between a package as prepared for transport (including the substance to be transported) and an identical package filled with water must show that the maximum temperature measured inside the packages during testing does not differ by more than 200 °C (392 °F). Packagings may include a vent to permit the slow escape of gas ( <i>i.e.</i> not more than 0.1 mL/hour per 30 mL inner packaging at 20 °C (68 °F) produced from gradual decomposition. The requirements of <a href="#">§§ 173.24(g)(1)</a> and <a href="#">173.27(c)</a> do not apply.
<p><b>A61</b> When used for purposes such as sterilization, inner packagings of peroxyacetic acid, stabilized, classified as UN3107 Organic peroxide type E, liquid or UN3109 Organic peroxide type F, liquid may be fitted with a vent consisting of hydrophobic membrane, provided:</p> <ol style="list-style-type: none"> <li>(1) Each inner packaging contains not more than 70 mL;</li> <li>(2) The inner packaging is designed so that the vent is not immersed in liquid in any orientation;</li> <li>(3) Each inner packaging is enclosed in an intermediate rigid plastic packaging with a small opening to permit release of gas and contains a buffer that neutralizes the contents of the inner packaging in the event of leakage;</li> <li>(4) Intermediate packagings are packed in a fiberboard box (4G) outer packaging;</li> <li>(5) Each outer packaging contains not more than 1.4 L of liquid; and</li> <li>(6) The rate of oxygen release from the outer packaging does not exceed 15 mL per hour.</li> </ol> <p>Such packages must be transported on cargo aircraft only. <b>(T-0)</b>.</p>
<b>A82</b> The quantity limits do not apply to human or animal body parts, whole organs or whole bodies known to contain or suspected of containing an infectious substance.

<p><b>A101</b> In addition to the applicable requirements of <a href="#">§ 173.185</a>, the quantity of lithium metal in the batteries contained in any piece of equipment must not exceed 12 g per cell and 500 g per battery.</p>
<p><b>A105</b> a. This entry applies to machinery or apparatus containing hazardous materials as a residue or as an integral element of the machinery or apparatus. It must not be used for machinery or apparatus for which a proper shipping name already exists in the <a href="#">§ 172.101</a> Table.</p> <p>b. Where the quantity of hazardous materials contained as an integral element in machinery or apparatus exceeds the limits permitted by <a href="#">§ 173.222(c)(2)</a>, and the hazardous materials meet the provisions of <a href="#">§ 173.222(c)</a>, the machinery or apparatus may be transported by aircraft only with the prior approval of the Associate Administrator.</p>
<p><b>A112</b> Notwithstanding the quantity limits shown in Column (9A) and (9B) for this entry, the following IBCs are authorized for transportation aboard passenger and cargo-only aircraft. Each IBC may not exceed a maximum net quantity of 1,000 kg:</p> <p>a. Metal: 11A, 11B, 11N, 21A, 21B and 21N</p> <p>b. Rigid plastics: 11H1, 11H2, 21H1 and 21H2</p> <p>c. Composite with plastic inner receptacle: 11HZ1, 11HZ2, 21HZ1 and 21HZ2</p> <p>d. Fiberboard: 11G</p> <p>e. Wooden: 11C, 11D and 11F (with inner liners)</p> <p>f. Flexible: 13H2, 13H3, 13H4, 13H5, 13L2, 13L3, 13L4, 13M1 and 13M2 (flexible IBCs must be sift-proof and water resistant or must be fitted with a sift-proof and water resistant liner).</p>
<p><b>A117</b> Wastes containing Category A infectious substances may be assigned to UN2814, UN2900, or UN3549. <b>(T-0)</b> Solid Medical or Clinical Waste containing Category A infectious substances must use UN3549. Wastes transported under UN3291 are routine regulated medical waste. UN3373 is only for Category B material as they are reasonably believed to have a low probability of containing infectious substances. Decontaminated wastes are not subject to these Regulations unless the criteria of another Class or Division apply.</p>
<p><b>A189</b> Except where the defining criteria of another class or division are met, concentrations of formaldehyde solution:</p> <p>a. With less than 25 percent but not less than 10 percent formaldehyde, must be described as UN3334, Aviation regulated liquid, n.o.s.; and</p> <p>b. With less than 10 percent formaldehyde, are not subject to this subchapter.</p>
<p><b>A191</b> Notwithstanding the Division 6.1 subsidiary hazard for this description, the toxic subsidiary hazard label and the requirement to indicate the subsidiary hazard on the shipping paper are not required for manufactured articles containing less than 5 kg (11 pounds) of mercury.</p>
<p><b>A200</b> These articles must be transported as cargo and may not be carried aboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically authorized in <a href="#">§ 175.10</a>.</p>
<p><b>A210</b> This substance is forbidden for transport by air. It may be transported on cargo aircraft only with the prior approval of the Associate Administrator.</p>
<p><b>A212</b> “UN 2031, Nitric acid, <i>other than red fuming, with more than 20% and less than 65% nitric acid</i>” intended for use in sterilization devices only, may be transported on passenger aircraft irrespective of the indication of “forbidden” in columns (9A) of the <a href="#">§ 172.101</a> table provided that:</p> <p>a. Each inner packaging contains not more than 30 mL;</p>

- b. Each inner packaging is contained in a sealed leak-proof intermediate packaging with sufficient absorbent material capable of containing the contents of the inner packaging;
- c. Intermediate packagings are securely packed in an outer packaging of a type permitted by [§ 173.158\(g\) of this subchapter](#) which meet the requirements of [part 178 of this subchapter](#) at the Packing Group I performance level;
- d. The maximum quantity of nitric acid in the package does not exceed 300 mL; and
- e. Transport in accordance with this special provision must be noted on the shipping paper.

**A218 This entry must only be used for solid medical waste of category A transported for disposal.**

**A500** P2 Code applies if rocket motor contains hypergolic liquids.

**A501** P3 does not apply to unit maintenance and support personnel traveling on Special Assignment Airlift Missions.

**A502** With approval of Shipper's HAZMAT service focal point (see paragraph 1.2.2.), may be shipped as P2.

**A503** Only Class 2 (non-toxic aerosols only), Class 3 (Packing Group II or III only) and Division 6.1 (Packing Group III only) provided such substances do not have a subsidiary hazard may be shipped to an international (non-domestic) location as a Class 9.

**A504** Deleted

**A506** Inner receptacles of a combination package and a single package must be capable of meeting the internal air gauge pressure requirements for a PG III liquid. **(T-0)**.

**A507** Determine passenger eligibility ("P" Coded special provisions) for radioactive materials as follows:

- (1) Radioactive materials requiring a Category III-Yellow label are transported under the provisions of P3. Deviations not authorized unless radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment. Also see A22.1.7.2.
- (2) Radioactive materials requiring a Category II-Yellow label are transported under the provisions of P4. Deviations not authorized unless radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment, and the total TI of all of the packages is 50 TI or less. Also see A22.1.7.2.
- (3) Radioactive materials requiring a Category I-White or no label are transported under the provisions of P5. Also see A3.3.7.5.4.

**A508** Diagnostic, Patient, or Clinical Specimens not containing a Category A or B infectious substances are not regulated by this manual.

**A509** Magnesium alloys with 50% or less magnesium in pellets, turning or ribbons are not regulated.

**A510** Emergency power units (EPU) for F-16 aircraft are packaged, marked and labeled in accordance with a DOT-SP, CAA or COE.

**A511** See A15.4.2.1. for acceptable labeling of UN1072 Oxygen, Compressed and UN1073 Oxygen, Refrigerated Liquid.

**A520 (IATA2)** "UN1327 BHUSA" May be transported if article or substance is on cargo aircraft only with prior approval of the appropriate authority of the State of origin and the State of the operator under the written conditions established by those authorities. Transportaton under this special provision must be noted on the Shipper's Declaration. Other States that are transited, overflight and destinations must all so be considered for approval before transporting.



**A521 (IATA41) (49 CFR 173.175)** Permeation devices that contain hazardous materials and that are used for calibrating air quality monitoring devices are not subject to the requirements of this subchapter provided the following requirements are met:

- (a) Each device must be constructed of a material compatible with the hazardous materials it contains;
- (b) The total contents of hazardous materials in each device is limited to 2 ml (0.07 ounces) and the device must not be liquid full at 55 °C (131 °F);
- (c) Each permeation device must be placed in a sealed, high impact resistant, tubular inner packaging of plastic or equivalent material. Sufficient absorbent material must be contained in the inner packaging to completely absorb the contents of the device. The closure of the inner packaging must be securely held in place with wire, tape or other positive means;
- (d) Each inner packaging must be contained in a secondary packaging constructed of metal, or plastic having a minimum thickness of 1.5 mm (0.06 inches). The secondary packaging must be hermetically sealed;
- (e) The secondary packaging must be securely packed in strong outer packaging. The completed package must be capable of withstanding, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:
  - (1) The following free drops onto a rigid, non resilient, flat and horizontal surface from a height of 1.8 m (5.9 feet):
    - (i) One drop flat on the bottom;
    - (ii) One drop flat on the top;
    - (iii) One drop flat on the long side;
    - (iv) One drop flat on the short side;
    - (v) One drop on a corner at the junction of three intersecting edges; and
  - (2) A force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (10 feet) (including the test sample).
  - (3) Each of the above tests may be performed on different but identical packages.
- (f) The gross mass of the completed package must not exceed 30 kg.
- (g) For transportation by aircraft, permeation devices must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by [§ 175.10](#).

**A522 (IATA59)** Tyre assemblies are not subject to these regulations provided that:

- (a) Unserviceable or damaged tyre assemblies, the tyre is deflated to a gauge pressure of less than 200 kpa at 20 degrees C or,
- (b) Serviceable tyre assemblies, the tyre is not inflated to a gauge pressure exceeding the maximum rated pressure for that tyre. However, such tyres (including valve assemblies) must be protected from damage during transport, which may require the use of a protective cover.

**A523 (IA103)** Flammable liquified gases must be contained within refrigerating machine components. These components must be designed and tested to at least three times the working pressure of the machinery. The refrigerating machines must be designed and constructed to contain the liquified gas and preclude the risk of bursting or cracking of the pressure retaining components during normal conditions of transport. Refrigerating machines and refrigerating machine components are considered not subject to these Regulations if containing less than 100 g. of flammable, non-toxic, liquified gas.”



<b>A524 (IATA198)</b> Hay, straw and BHUSA, when not wet, damp or contaminated with oil are not subject to HMR
<b>A525 (IATA200)</b> This entry applies to packaging that contain residues of dangerous goods and which no longer meet the provisions of section 6. These packageings are forbidden for transport by air. Such packagings or parts thereof must be transported in accordance with 5.0.2.13.5.1 of IATA Regulations
<b>"N" Provisions.</b>
<b>N3</b> Glass inner packagings are permitted in combination or composite packagings only if the hazardous material is free from hydrofluoric acid.
<b>N4</b> For combination or composite packagings, glass inner packagings, other than ampoules, are not permitted.
<b>N5</b> Glass materials of construction are not authorized for any part of the packaging which is normally in contact with the hazardous material.
<b>N6</b> Battery fluid packaged with electric storage batteries, wet or dry, must conform to the packaging provisions of A12.4.4.
<b>N7</b> The hazard class or division number of the material must be marked on the package according to 49 CFR Section 172.302. <b>(T-0)</b> . However, the hazard label corresponding to the hazard class or division may be substituted for the marking.
<b>N8</b> Nitroglycerin solution in alcohol may be transported under this entry only when the solution is packed in metal cans of not more than 1 L capacity each, overpacked in a wooden box containing not more than 5 L. Completely surround metal cans with absorbent material. Completely line wooden boxes with a suitable material impervious to water and nitroglycerin.
<b>N11</b> This material is excepted for the specification packaging requirements of this subchapter if the material is packaged in strong, tight non-bulk packaging meeting the requirements of subparts A and B of <a href="#">part 173 of this subchapter</a> .
<b>N12</b> Plastic packagings are not authorized.
<b>N20</b> A 5M1 multi-wall paper bag is authorized if transported in a closed transport vehicle.
<b>N25</b> Steel single packagings are not authorized.
<b>N32</b> Aluminum materials of construction are not authorized for single packagings.
<b>N33</b> Aluminum drums are not authorized.
<b>N34</b> Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous materials.
<b>N36</b> Aluminum or aluminum alloy construction materials are permitted only for halogenated hydrocarbons that will not react with aluminum.
<b>N37</b> This material may be shipped in an integrally-lined fiber drum (1G) which meets the general packaging requirements of Attachment 3, the UN performance tests required based on the PG assigned to the material and to any other special provisions of column 7 of Table A4.1.
<b>N40</b> This material is not authorized in the following packagings: (1) A combination packaging consisting of a 4G fiberboard box with inner receptacles of glass or earthenware. (2) A single packaging of a 4C2 sift-proof, natural wood box. (3) A composite packaging 6PG2 (glass, porcelain, or stoneware receptacles within a fiberboard box).

<b>N41</b> Metal construction materials are not authorized for any part of a packaging that is normally in contact with the hazardous material.
<b>N42</b> 1A1 drums made of carbon steel with thickness of body and heads of not less than 1.3 mm (0.050 inch) and with a corrosion-resistant phenolic lining are authorized for stabilized benzyl chloride if tested and certified to the Packing Group I performance level at a specific gravity of not less than 1.8.
<b>N43</b> Metal drums are permitted as single packagings only if constructed of nickel or Monel.
<b>N45</b> For combination packagings, copper cartridges are permitted as inner packagings when the hazardous material is not in dispersion.
<b>N65</b> Outage must be sufficient to prevent cylinders or spheres from becoming liquid full at 55 degrees C (130 degrees F). <b>(T-0)</b> . The vacant space (outage) may be charged with a nonflammable, nonliquefied compressed gas if the pressure in the cylinder or sphere at 55 degrees C (130 degrees F) does not exceed 125 percent of the marked service pressure.
<b>N73</b> Packagings consisting of outer wooden or fiberboard boxes with inner glass, metal, or other strong containers; metal or fiber drums; kegs or barrels; or strong metal cans are authorized and need not conform to the UN test requirements for domestic shipment.
<b>N74</b> Packages consisting of tightly closed inner containers of glass, earthenware, metal or polyethylene, capacity not over 0.5 kg (1.1 pounds) securely cushioned and packed in outer wooden barrels or wooden or fiberboard boxes, not over 15 kg (33 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.
<b>N75</b> Packages consisting of tightly closed inner packagings of glass, earthenware, or metal, securely cushioned and packed in outer wooden barrels, or wooden or fiberboard boxes, capacity not over 2.5 kg (5.5 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.
<b>N76</b> For materials of not more than 25 percent active ingredient by weight, packages consisting of inner metal packagings not greater than 250 ml (8 ounces) capacity each, packed in strong outer packagings together with sufficient absorbent material to completely absorb the liquid contents are authorized and need not conform to the UN test requirements for domestic shipment.
<b>N77</b> For materials of not more than two percent active ingredients by weight and the liquid contents are absorbed in an inert material, the packagings need not conform to the UN test requirements for domestic shipment.
<b>N78</b> Packages consisting of inner glass, earthenware, polyethylene, or other nonfragile plastic bottles or jars not over 0.5 kg (1.1 pounds) capacity each, or metal cans not over 5 pounds capacity each, packed in outer wooden boxes, barrels, kegs, or fiberboard boxes, are authorized and need not conform to the UN test requirements for domestic shipments. Net weight of contents in fiberboard boxes may not exceed 29 kg (64 pounds). Net weight of contents in wooden boxes, barrels, or kegs may not exceed 45 kg (99 pounds).
<b>N79</b> Packages consisting of tightly closed metal inner packagings not over 0.5 kg (1.1 pounds) capacity each, packed in outer wooden or fiberboard boxes, or wooden barrels, are authorized and need not conform to UN test requirements for domestic shipment. Net weight of contents may not exceed 15 kg (33 pounds).
<b>N80</b> Packages consisting of one inner metal can, not over 2.5 kg (5.5 pounds) capacity, packed in an outer wooden or fiberboard box, or a wooden barrel, are authorized and need not conform to the requirements of <a href="#">part 178 of this subchapter</a> .

<b>N82</b> See <a href="#">§ 173.115 of this subchapter</a> for classification criteria for flammable aerosols.
<b>N83</b> This material may not be transported in quantities of more than 11.5 kg (25.4 lbs) per package.
<b>N84</b> The maximum quantity per package is 500 g (1.1 lbs.).
<b>N85</b> Packagings certified at the Packing Group I performance level may not be used.
<b>N86</b> UN pressure receptacles made of aluminum alloy are not authorized.
<b>N87</b> The use of copper valves on UN pressure receptacles is prohibited.
<b>N88</b> Any metal part of a UN pressure receptacle in contact with the contents may not contain more than 65% copper, with a tolerance of 1%.
<b>N89</b> When steel UN pressure receptacles are used, only those bearing the “H” mark are authorized.
<b>N90</b> Metal packagings are not authorized.
<b>N91</b> The use of a non specification sift-proof, non-bulk, metal can with or without lid, or a non specification sift-proof, non-bulk fiber drum, with or without lid is authorized when transporting coal tar pitch compounds by motor vehicle or rail freight. The fiber drum must to be fabricated with a three ply wall, as a minimum. The coal tar pitch compound must be in a solid mass during
<b>N92</b> Notwithstanding the provisions of <a href="#">§ 173.24(g) of this subchapter</a> , packagings shall be designed and constructed to permit the release of gas or vapor to prevent a build-up of pressure that could rupture the packagings in the event of loss of stabilization.
<b>N95</b> UN1075, Liquefied petroleum gas and UN1978, Propane authorized for transport in DOT 4BA240 cylinders is not subject to the UN identification number and proper shipping name marking or the label requirements of this part subject to the following conditions: a. The cylinder must be transported in a closed motor vehicle displaying FLAMMABLE GAS placards in accordance with <a href="#">subpart F of part 172 of this subchapter</a> . b. Shipping papers at all times must reflect a correct current accounting of all cylinders both full and expended. c. The cylinders are collected and transported by a private or a contract carrier for reconditioning, reuse or disposal.

**Table A4.3. Hazardous Substance and Reportable Quantities.**

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
A2213	5000 (2270)
Acenaphthene	100 (45.4)
Acenaphthylene	5000 (2270)
Acetaldehyde	1000 (454)
Acetaldehyde, chloro-	1000 (454)
Acetaldehyde, trichloro-	5000 (2270)
Acetamide	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Acetamide, N-(aminothioxomethyl)-	1000 (454)
Acetamide, N-(4-ethoxyphenyl)-	100 (45.4)
Acetamide, N-9H-fluoren-2-yl-	1 (0.454)
Acetamide, 2-fluoro-	100 (45.4)
Acetic acid	5000 (2270)
Acetic acid, (2,4-dichlorophenoxy)-, salts & esters	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Acetic acid, ethyl ester	5000 (2270)
Acetic acid, fluoro-, sodium salt	10 (4.54)
Acetic acid, lead(2 + ) salt	10 (4.54)
Acetic acid, thallium(1 + ) salt	100 (45.4)
Acetic acid, (2,4,5-trichlorophenoxy)-	1000 (454)
Acetic anhydride	5000 (2270)
Acetone	5000 (2270)
Acetone cyanohydrin	10 (4.54)
Acetonitrile	5000 (2270)
Acetophenone	5000 (2270)
2-Acetylaminofluorene	1 (0.454)
Acetyl bromide	5000 (2270)
Acetyl chloride	5000 (2270)
1-Acetyl-2-thiourea	1000 (454)
Acrolein	1 (0.454)
Acrylamide	5000 (2270)
Acrylic acid	5000 (2270)
Acrylonitrile	100 (45.4)
Adipic acid	5000 (2270)
Aldicarb	1 (0.454)
Aldicarb sulfone	100 (45.4)
Aldrin	1 (0.454)
Allyl alcohol	100 (45.4)
Allyl chloride	1000 (454)
Aluminum phosphide	100 (45.4)
Aluminum sulfate	5000 (2270)
4-Aminobiphenyl	1 (0.454)
5-(Aminomethyl)-3-isoxazolol	1000 (454)
4-Aminopyridine	1000 (454)
Amitrole	10 (4.54)
Ammonia	100 (45.4)
Ammonium acetate	5000 (2270)
Ammonium benzoate	5000 (2270)
Ammonium bicarbonate	5000 (2270)
Ammonium bichromate	10 (4.54)
Ammonium bifluoride	100 (45.4)
Ammonium bisulfite	5000 (2270)
Ammonium carbamate	5000 (2270)
Ammonium carbonate	5000 (2270)
Ammonium chloride	5000 (2270)
Ammonium chromate	10 (4.54)
Ammonium citrate, dibasic	5000 (2270)
Ammonium dichromate@	10 (4.54)
Ammonium fluoborate	5000 (2270)
Ammonium fluoride	100 (45.4)
Ammonium hydroxide	1000 (454)
Ammonium oxalate	5000 (2270)
Ammonium picrate	10 (4.54)
Ammonium silicofluoride	1000 (454)
Ammonium sulfamate	5000 (2270)
Ammonium sulfide	100 (45.4)
Ammonium sulfite	5000 (2270)
Ammonium tartrate	5000 (2270)
Ammonium thiocyanate	5000 (2270)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Ammonium vanadate	1000 (454)
Amyl acetate	5000 (2270)
iso-Amyl acetate	
sec-Amyl acetate	
tert-Amyl acetate	
Aniline	5000 (2270)
o-Anisidine	100 (45.4)
Anthracene	5000 (2270)
Antimony	5000 (2270)
Antimony pentachloride	1000 (454)
Antimony potassium tartrate	100 (45.4)
Antimony tribromide	1000 (454)
Antimony trichloride	1000 (454)
Antimony trifluoride	1000 (454)
Antimony trioxide	1000 (454)
Argentate(1-), bis(cyano-C)-, potassium	1 (0.454)
Aroclor 1016	1 (0.454)
Aroclor 1221	1 (0.454)
Aroclor 1232	1 (0.454)
Aroclor 1242	1 (0.454)
Aroclor 1248	1 (0.454)
Aroclor 1254	1 (0.454)
Aroclor 1260	1 (0.454)
Aroclors	1 (0.454)
Arsenic	1 (0.454)
Arsenic acid H <sub>3</sub> AsO <sub>4</sub>	1 (0.454)
Arsenic disulfide	1 (0.454)
Arsenic oxide As <sub>2</sub> O <sub>3</sub>	1 (0.454)
Arsenic oxide As <sub>2</sub> O <sub>5</sub>	1 (0.454)
Arsenic pentoxide	1 (0.454)
Arsenic trichloride	1 (0.454)
Arsenic trioxide	1 (0.454)
Arsenic trisulfide	1 (0.454)
Arsine, diethyl-	1 (0.454)
Arsinic acid, dimethyl-	1 (0.454)
Arsonous dichloride, phenyl-	1 (0.454)
Asbestos	1 (0.454)
Auramine	100 (45.4)
Azaserine	1 (0.454)
Aziridine	1 (0.454)
Aziridine, 2-methyl-	1 (0.454)
Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[aminocarbonyl]oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha,8beta,8aalpha,8balpha)]-	10 (4.54)
Barban	10 (4.54)
Barium cyanide	10 (4.54)
Bendiocarb	100 (45.4)
Bendiocarb phenol	1000 (454)
Benomyl	10 (4.54)
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	10 (4.54)
Benz[c]acridine	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Benzal chloride	5000 (2270)
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	5000 (2270)
Benz[a]anthracene	10 (4.54)
1,2-Benzanthracene	10 (4.54)
Benz[a]anthracene, 7,12-dimethyl-	1 (0.454)
Benzenamine	5000 (2270)
Benzenamine, 4,4'-carbonimidoylbis (N,N dimethyl-	100 (45.4)
Benzenamine, 4-chloro-	1000 (454)
Benzenamine, 4-chloro-2-methyl-, hydrochloride	100 (45.4)
Benzenamine, N,N-dimethyl-4-(phenylazo)-	10 (4.54)
Benzenamine, 2-methyl-	100 (45.4)
Benzenamine, 4-methyl-	100 (45.4)
Benzenamine, 4,4'-methylenebis[2-chloro-	10 (4.54)
Benzenamine, 2-methyl-, hydrochloride	100 (45.4)
Benzenamine, 2-methyl-5-nitro-	100 (45.4)
Benzenamine, 4-nitro-	5000 (2270)
Benzene	10 (4.54)
Benzeneacetic acid, 4-chloro- $\alpha$ -(4-chlorophenyl)- $\alpha$ -hydroxy-, ethyl ester	10 (4.54)
Benzene, 1-bromo-4-phenoxy-	100 (45.4)
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	10 (4.54)
Benzene, chloro-	100 (45.4)
Benzene, (chloromethyl)-	100 (45.4)
Benzenediamine, ar-methyl-	10 (4.54)
1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	100 (45.4)
1,2-Benzenedicarboxylic acid, dibutyl ester	10 (4.54)
1,2-Benzenedicarboxylic acid, diethyl ester	1000 (454)
1,2-Benzenedicarboxylic acid, dimethyl ester	5000 (2270)
1,2-Benzenedicarboxylic acid, dioctyl ester	5000 (2270)
Benzene, 1,2-dichloro-	100 (45.4)
Benzene, 1,3-dichloro-	100 (45.4)
Benzene, 1,4-dichloro-	100 (45.4)
Benzene, 1,1'-(2,2-dichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene, (dichloromethyl)-	5000 (2270)
Benzene, 1,3-diisocyanatomethyl-	100 (45.4)
Benzene, dimethyl-	100 (45.4)
1,3-Benzenediol	5000 (2270)
1,2-Benzenediol,4-[1-hydroxy-2-(methylamino) ethyl]-	1000 (454)
Benzenethanamine, alpha,alpha-dimethyl-	5000 (2270)
Benzene, hexachloro-	10 (4.54)
Benzene, hexahydro-	1000 (454)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Benzene, methyl-	1000 (454)
Benzene, 1-methyl-2,4-dinitro-	10 (4.54)
Benzene, 2-methyl-1,3-dinitro-	100 (45.4)
Benzene, (1-methylethyl)-	5000 (2270)
Benzene, nitro-	1000 (454)
Benzene, pentachloro-	10 (4.54)
Benzene, pentachloronitro-	100 (45.4)
Benzenesulfonic acid chloride	100 (45.4)
Benzenesulfonyl chloride	100 (45.4)
Benzene,1,2,4,5-tetrachloro-	5000 (2270)
Benzenethiol	100 (45.4)
Benzene,1,1'-(2,2,2-trichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene,1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy-	1 (0.454)
Benzene, (trichloromethyl)-	10 (4.54)
Benzene, 1,3,5-trinitro-	10 (4.54)
Benzidine	1 (0.454)
Benzo[a]anthracene	10 (4.54)
1,3-Benzodioxole, 5-(1-propenyl)-1	100 (45.4)
1,3-Benzodioxole, 5-(2-propenyl)-	100 (45.4)
1,3-Benzodioxole, 5-propyl-	10 (4.54)
1,3-Benzodioxol-4-ol, 2,2-dimethyl-	1000 (454)
1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate	100 (45.4)
Benzo[b]fluoranthene	1 (0.454)
Benzo(k)fluoranthene	5000 (2270)
7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-	10 (4.54)
7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate	10 (4.54)
Benzoic acid	5000 (2270)
Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo [2,3-b]indol-5-yl methylcarbamate ester (1:1)	100 (45.4)
Benzonitrile	5000 (2270)
Benzo[rs]pentaphene	10 (4.54)
Benzo[ghi]perylene	5000 (2270)
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts	100 (45.4)
Benzo[a]pyrene	1 (0.454)
3,4-Benzopyrene	1 (0.454)
p-Benzoquinone	10 (4.54)
Benzotrichloride	10 (4.54)
Benzoyl chloride	1000 (454)
Benzyl chloride	100 (45.4)
Beryllium $\epsilon$	10 (4.54)
Beryllium chloride	1 (0.454)
Beryllium fluoride	1 (0.454)
Beryllium nitrate	1 (0.454)
Beryllium powder $\epsilon$	10 (4.54)
alpha-BHC	10 (4.54)
beta-BHC	1 (0.454)
delta-BHC	1 (0.454)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
gamma-BHC	1 (0.454)
2,2'-Bioxirane	10 (4.54)
Biphenyl	100 (45.4)
[1,1'-Biphenyl]-4,4'-diamine	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dichloro-	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethoxy-	100 (45.4)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethyl-	10 (4.54)
Bis(2-chloroethoxy) methane	1000 (454)
Bis(2-chloroethyl) ether	10 (4.54)
Bis(chloromethyl) ether	10 (4.54)
Bis(2-ethylhexyl) phthalate	100 (45.4)
Bromoacetone	1000 (454)
Bromoform	100 (45.4)
Bromomethane	1000 (454)
4-Bromophenyl phenyl ether	100 (45.4)
Brucine	100 (45.4)
1,3-Butadiene	10 (4.54)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1 (0.454)
1-Butanamine, N-butyl-N-nitroso-	10 (4.54)
1-Butanol	5000 (2270)
2-Butanone	5000 (2270)
2-Butanone, 3,3-dimethyl-1(methylthio)-, O [(methylamino) carbonyl] oxime	100 (45.4)
2-Butanone peroxide	10 (4.54)
2-Butenal	100 (45.4)
2-Butene, 1,4-dichloro-	1 (0.454)
2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy] methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z), 7(2S*,3R*),7aalpha]]-	10 (4.54)
Butyl acetate	5000 (2270)
iso-Butyl acetate	
sec-Butyl acetate	
tert-Butyl acetate	
n-Butyl alcohol	5000 (2270)
Butylamine	1000 (454)
iso-Butylamine	
sec-Butylamine	
tert-Butylamine	
Butyl benzyl phthalate	100 (45.4)
n-Butyl phthalate	10 (4.54)
Butyric acid	5000 (2270)
iso-Butyric acid	
Cacodylic acid	1 (0.454)
Cadmium	10 (4.54)
Cadmium acetate	10 (4.54)
Cadmium bromide	10 (4.54)
Cadmium chloride	10 (4.54)
Calcium arsenate	1 (0.454)
Calcium arsenite	1 (0.454)
Calcium carbide	10 (4.54)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Calcium chromate	10 (4.54)
Calcium cyanamide	1000 (454)
Calcium cyanide Ca(CN)2	10 (4.54)
Calcium dodecylbenzenesulfonate	1000 (454)
Calcium hypochlorite	10 (4.54)
Captan	10 (4.54)
Carbamic acid, 1H-benzimidazol-2-yl, methyl ester	10 (4.54)
Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-, methyl ester	10 (4.54)
Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester	10 (4.54)
Carbamic acid, [(dibutylamino)-thio]methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester	1000 (454)
Carbamic acid, dimethyl-,1-[(dimethylamino)carbonyl]-5-methyl-1H-pyrazol-3-yl ester	1 (0.454)
Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester	100 (45.4)
Carbamic acid, ethyl ester	100 (45.4)
Carbamic acid, methyl-, 3-methylphenyl ester	1000 (454)
Carbamic acid, methylnitroso-, ethyl ester	1 (0.454)
Carbamic acid, [1,2-phenylenebis(iminocarbonothioyl)] bis-, dimethyl ester	10 (4.54)
Carbamic acid, phenyl-, 1-methylethyl ester	1000 (454)
Carbamic chloride, dimethyl-	1 (0.454)
Carbamodithioic acid, 1,2-ethanediybis-, salts & esters	5000 (2270)
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	100 (45.4)
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester	100 (45.4)
Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester	5000 (2270)
Carbaryl	100 (45.4)
Carbendazim	10 (4.54)
Carbofuran	10 (4.54)
Carbofuran phenol	10 (4.54)
Carbon disulfide	100 (45.4)
Carbonic acid, dithallium(1 + ) salt	100 (45.4)
Carbonic dichloride	10 (4.54)
Carbonic difluoride	1000 (454)
Carbonochloridic acid, methyl ester	1000 (454)
Carbon oxyfluoride	1000 (454)
Carbon tetrachloride	10 (4.54)
Carbonyl sulfide	100 (45.4)
Carbosulfan	1000 (454)
Catechol	100 (45.4)
Chloral	5000 (2270)
Chloramben	100 (45.4)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
Chlorambucil	10 (4.54)
Chlordane	1 (0.454)
Chlordane, alpha & gamma isomers	1 (0.454)
CHLORDANE (TECHNICAL MIXTURE AND METABOLITES)	1 (0.454)
Chlorinated camphene	1 (0.454)
Chlorine	10 (4.54)
Chlornaphazine	100 (45.4)
Chloroacetaldehyde	1000 (454)
Chloroacetic acid	100 (45.4)
2-Chloroacetophenone	100 (45.4)
p-Chloroaniline	1000 (454)
Chlorobenzene	100 (45.4)
Chlorobenzilate	10 (4.54)
p-Chloro-m-cresol	5000 (2270)
Chlorodibromomethane	100 (45.4)
1-Chloro-2,3-epoxypropane	100 (45.4)
Chloroethane	100 (45.4)
2-Chloroethyl vinyl ether	1000 (454)
Chloroform	10 (4.54)
Chloromethane	100 (45.4)
Chloromethyl methyl ether	10 (4.54)
beta-Chloronaphthalene	5000 (2270)
2-Chloronaphthalene	5000 (2270)
2-Chlorophenol	100 (45.4)
o-Chlorophenol	100 (45.4)
4-Chlorophenyl phenyl ether	5000 (2270)
1-(o-Chlorophenyl)thiourea	100 (45.4)
Chloroprene	100 (45.4)
3-Chloropropionitrile	1000 (454)
Chlorosulfonic acid	1000 (454)
4-Chloro-o-toluidine, hydrochloride	100 (45.4)
Chlorpyrifos	1 (0.454)
Chromic acetate	1000 (454)
Chromic acid	10 (4.54)
Chromic acid H <sub>2</sub> CrO <sub>4</sub> , calcium salt	10 (4.54)
Chromic sulfate	1000 (454)
Chromium ⅈ	5000 (2270)
Chromous chloride	1000 (454)
Chrysene	100 (45.4)
Cobaltous bromide	1000 (454)
Cobaltous formate	1000 (454)
Cobaltous sulfamate	1000 (454)
Coke Oven Emissions	1 (0.454)
Copper ⅈ	5000 (2270)
Copper chloride @	10 (4.54)
Copper cyanide Cu(CN)	10 (4.54)
Coumaphos	10 (4.54)
Creosote	1 (0.454)
Cresol (cresylic acid)	100 (45.4)
m-Cresol	100 (45.4)
o-Cresol	100 (45.4)
p-Cresol	100 (45.4)
Cresols (isomers and mixture)	100 (45.4)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
Cresylic acid (isomers and mixture)	100 (45.4)
Crotonaldehyde	100 (45.4)
Cumene	5000 (2270)
m-Cumenyl methylcarbamate	10 (4.54)
Cupric acetate	100 (45.4)
Cupric acetoarsenite	1 (0.454)
Cupric chloride	10 (4.54)
Cupric nitrate	100 (45.4)
Cupric oxalate	100 (45.4)
Cupric sulfate	10 (4.54)
Cupric sulfate, ammoniated	100 (45.4)
Cupric tartrate	100 (45.4)
Cyanides (soluble salts and complexes) not otherwise specified	10 (4.54)
Cyanogen	100 (45.4)
Cyanogen bromide (CN)Br	1000 (454)
Cyanogen chloride (CN)Cl	10 (4.54)
2,5-Cyclohexadiene-1,4-dione	10 (4.54)
Cyclohexane	1000 (454)
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α, 2α, 3β-, 4α, 5α, 6β)	1 (0.454)
Cyclohexanone	5000 (2270)
2-Cyclohexyl-4,6-dinitrophenol	100 (45.4)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	10 (4.54)
Cyclophosphamide	10 (4.54)
2,4-D Acid	100 (45.4)
2,4-D Ester	100 (45.4)
2,4-D, salts and esters	100 (45.4)
Daunomycin	10 (4.54)
DDD	1 (0.454)
4,4'-DDD	1 (0.454)
DDE (72-55-9)#	1 (0.454)
DDE (3547-04-4)#	5000 (2270)
4,4'-DDE	1 (0.454)
DDT	1 (0.454)
4,4'-DDT	1 (0.454)
DEHP	100 (45.4)
Diallate	100 (45.4)
Diazinon	1 (0.454)
Diazomethane	100 (45.4)
Dibenz[a,h]anthracene	1 (0.454)
1,2:5,6-Dibenzanthracene	1 (0.454)
Dibenzo[a,h]anthracene	1 (0.454)
Dibenzofuran	100 (45.4)
Dibenzo[a,i]pyrene	10 (4.54)
1,2-Dibromo-3-chloropropane	1 (0.454)
Dibromoethane	1 (0.454)
Dibutyl phthalate	10 (4.54)
Di-n-butyl phthalate	10 (4.54)
Dicamba	1000 (454)
Dichlobenil	100 (45.4)
Dichlone	1 (0.454)
Dichlorobenzene	100 (45.4)
1,2-Dichlorobenzene	100 (45.4)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
1,3-Dichlorobenzene	100 (45.4)
1,4-Dichlorobenzene	100 (45.4)
m-Dichlorobenzene	100 (45.4)
o-Dichlorobenzene	100 (45.4)
p-Dichlorobenzene	100 (45.4)
3,3'-Dichlorobenzidine	1 (0.454)
Dichlorobromomethane	5000 (2270)
1,4-Dichloro-2-butene	1 (0.454)
Dichlorodifluoromethane	5000 (2270)
1,1-Dichloroethane	1000 (454)
1,2-Dichloroethane	100 (45.4)
1,1-Dichloroethylene	100 (45.4)
1,2-Dichloroethylene	1000 (454)
Dichloroethyl ether	10 (4.54)
Dichloroisopropyl ether	1000 (454)
Dichloromethane	1000 (454)
Dichloromethoxyethane	1000 (454)
Dichloromethyl ether	10 (4.54)
2,4-Dichlorophenol	100 (45.4)
2,6-Dichlorophenol	100 (45.4)
Dichlorophenylarsine	1 (0.454)
Dichloropropane	1000 (454)
1,1-Dichloropropane	
1,3-Dichloropropane	
1,2-Dichloropropane	1000 (454)
Dichloropropane-Dichloropropene (mixture)	100 (45.4)
Dichloropropene	100 (45.4)
2,3-Dichloropropene	
1,3-Dichloropropene	100 (45.4)
2,2-Dichloropropionic acid	5000 (2270)
Dichlorvos	10 (4.54)
Dicofol	10 (4.54)
Dieldrin	1 (0.454)
1,2:3,4-Diepoxybutane	10 (4.54)
Diethanolamine	100 (45.4)
Diethylamine	100 (45.4)
N,N-Diethylaniline	1000 (454)
Diethylarsine	1 (0.454)
Diethylene glycol, dicarbamate	5000 (2270)
1,4-Diethyleneoxide	100 (45.4)
Diethylhexyl phthalate	100 (45.4)
N,N'-Diethylhydrazine	10 (4.54)
O,O-Diethyl S-methyl dithiophosphate	5000 (2270)
Diethyl-p-nitrophenyl phosphate	100 (45.4)
Diethyl phthalate	1000 (454)
O,O-Diethyl O-pyrazinyl phosphorothioate	100 (45.4)
Diethylstilbestrol	1 (0.454)
Diethyl sulfate	10 (4.54)
Dihydrosafrole	10 (4.54)
Diisopropylfluorophosphate (DFP)	100 (45.4)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5alpha, 8alpha, 8abeta)-	1 (0.454)
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5beta, 8beta, 8abeta)-1 (0.454)	
2,7:3,6-Dimethanonaphth[2,3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2aalpha, 3beta, 6beta, 6aalpha, 7beta, 7aalpha)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2,3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2abeta, 3alpha, 6alpha, 6abeta, 7beta, 7aalpha)-, & metabolites	1 (0.454)
Dimethoate	10 (4.54)
3,3'-Dimethoxybenzidine	100 (45.4)
Dimethylamine	1000 (454)
Dimethyl aminoazobenzene	10 (4.54)
p-Dimethylaminoazobenzene	10 (4.54)
N,N-Dimethylaniline	100 (45.4)
7,12-Dimethylbenz[a]anthracene	1 (0.454)
3,3'-Dimethylbenzidine	10 (4.54)
alpha,alpha-Dimethylbenzylhydroperoxide	10 (4.54)
Dimethylcarbamoyl chloride	1 (0.454)
Dimethylformamide	100 (45.4)
1,1-Dimethylhydrazine	10 (4.54)
1,2-Dimethylhydrazine	1 (0.454)
Dimethylhydrazine, unsymmetrical@	10 (4.54)
alpha,alpha-Dimethylphenethylamine	5000 (2270)
2,4-Dimethylphenol	100 (45.4)
Dimethyl phthalate	5000 (2270)
Dimethyl sulfate	100 (45.4)
Dimetilan	1 (0.454)
Dinitrobenzene (mixed)	100 (45.4)
m-Dinitrobenzene	
o-Dinitrobenzene	
p-Dinitrobenzene	
4,6-Dinitro-o-cresol, and salts	10 (4.54)
Dinitrogen tetroxide@	10 (4.54)
Dinitrophenol	10 (4.54)
2,5-Dinitrophenol	
2,6-Dinitrophenol	
2,4-Dinitrophenol	10 (4.54)
Dinitrotoluene	10 (4.54)
3,4-Dinitrotoluene	
2,4-Dinitrotoluene	10 (4.54)
2,6-Dinitrotoluene	100 (45.4)
Dinoseb	1000 (454)
Di-n-octyl phthalate	5000 (2270)
1,4-Dioxane	100 (45.4)



Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
1,2-Diphenylhydrazine	10 (4.54)
Diphosphoramidate, octamethyl-	100 (45.4)
Diphosphoric acid, tetraethyl ester	10 (4.54)
Dipropylamine	5000 (2270)
Di-n-propylnitrosamine	10 (4.54)
Diquat	1000 (454)
Disulfoton	1 (0.454)
Dithiobiuret	100 (45.4)
1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O-[(methylamino)-carbonyl]oxime	100 (45.4)
Diuron	100 (45.4)
Dodecylbenzenesulfonic acid	1000 (454)
Endosulfan	1 (0.454)
alpha-Endosulfan	1 (0.454)
beta-Endosulfan	1 (0.454)
Endosulfan sulfate	1 (0.454)
Endothall	1000 (454)
Endrin	1 (0.454)
Endrin aldehyde	1 (0.454)
Endrin, & metabolites	1 (0.454)
Epichlorohydrin	100 (45.4)
Epinephrine	1000 (454)
1,2-Epoxybutane	100 (45.4)
Ethanal	1000 (454)
Ethanamine, N,N-diethyl-	5000 (2270)
Ethanamine, N-ethyl-N-nitroso-	1 (0.454)
1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	5000 (2270)
Ethane, 1,2-dibromo-	1 (0.454)
Ethane, 1,1-dichloro-	1000 (454)
Ethane, 1,2-dichloro-	100 (45.4)
Ethanedinitrile	100 (45.4)
Ethane, hexachloro-	100 (45.4)
Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	1000 (454)
Ethane, 1,1'-oxybis-	100 (45.4)
Ethane, 1,1'-oxybis[2-chloro-	10 (4.54)
Ethane, pentachloro-	10 (4.54)
Ethane, 1,1,1,2-tetrachloro-	100 (45.4)
Ethane, 1,1,2,2-tetrachloro-	100 (45.4)
Ethanethioamide	10 (4.54)
Ethane, 1,1,1-trichloro-	1000 (454)
Ethane, 1,1,2-trichloro-	100 (45.4)
Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester	5000 (2270)
Ethanimidothioic acid, 2-(dimethylamino)-N-[[[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester	100 (45.4)
Ethanimidothioic acid, N-[[[(methylamino) carbonyl]oxy]-, methyl ester	100 (45.4)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
Ethanimidothioic acid, N,N'[[thiobis[(methylimino)carbonyloxy]] bis-, dimethyl ester	100 (45.4)
Ethanol, 2-ethoxy-	1000 (454)
Ethanol, 2,2'-(nitrosoimino)bis-	1 (0.454)
Ethanol, 2,2'-oxybis-, dicarbamate	5000 (2270)
Ethanone, 1-phenyl-	5000 (2270)
Ethene, chloro-	1 (0.454)
Ethene, (2-chloroethoxy)-	1000 (454)
Ethene, 1,1-dichloro-	100 (45.4)
Ethene, 1,2-dichloro-(E)	1000 (454)
Ethene, tetrachloro-	100 (45.4)
Ethene, trichloro-	100 (45.4)
Ethion	10 (4.54)
Ethyl acetate	5000 (2270)
Ethyl acrylate	1000 (454)
Ethylbenzene	1000 (454)
Ethyl carbamate	100 (45.4)
Ethyl chloride	100 (45.4)
Ethyl cyanide	10 (4.54)
Ethylenebisdithiocarbamic acid, salts & esters	5000 (2270)
Ethylenediamine	5000 (2270)
Ethylenediamine-tetraacetic acid (EDTA)	5000 (2270)
Ethylene dibromide	1 (0.454)
Ethylene dichloride	100 (45.4)
Ethylene glycol	5000 (2270)
Ethylene glycol monoethyl ether	1000 (454)
Ethylene oxide	10 (4.54)
Ethylenethiourea	10 (4.54)
Ethylenimine	1 (0.454)
Ethyl ether	100 (45.4)
Ethylidene dichloride	1000 (454)
Ethyl methacrylate	1000 (454)
Ethyl methanesulfonate	1 (0.454)
Ethyl methyl ketone@	5000 (2270)
Famphur	1000 (454)
Ferric ammonium citrate	1000 (454)
Ferric ammonium oxalate	1000 (454)
Ferric chloride	1000 (454)
Ferric fluoride	100 (45.4)
Ferric nitrate	1000 (454)
Ferric sulfate	1000 (454)
Ferrous ammonium sulfate	1000 (454)
Ferrous chloride	100 (45.4)
Ferrous sulfate	1000 (454)
Fluoranthene	100 (45.4)
Fluorene	5000 (2270)
Fluorine	10 (4.54)
Fluoroacetamide	100 (45.4)
Fluoroacetic acid, sodium salt	10 (4.54)
Formaldehyde	100 (45.4)
Formetanate hydrochloride	100 (45.4)
Formic acid	5000 (2270)
Formparanate	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Fulminic acid, mercury(2 + )salt	10 (4.54)
Fumaric acid	5000 (2270)
Furan	100 (45.4)
2-Furancarboxyaldehyde	5000 (2270)
2,5-Furandione	5000 (2270)
Furan, tetrahydro-	1000 (454)
Furfural	5000 (2270)
Furfuran	100 (45.4)
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-	1 (0.454)
D-Glucose, 2-deoxy-2-[[[(methylnitrosoamino)-carbonyl]amino]-glycidyl]aldehyde	1 (0.454)
Guanidine, N-methyl-N'-nitro-N-nitroso-	10 (4.54)
Guthion	1 (0.454)
Heptachlor	1 (0.454)
Heptachlor epoxide	1 (0.454)
Hexachlorobenzene	10 (4.54)
Hexachlorobutadiene	1 (0.454)
Hexachlorocyclopentadiene	10 (4.54)
Hexachloroethane	100 (45.4)
Hexachlorophene	100 (45.4)
Hexachloropropene	1000 (454)
Hexaethyl tetraphosphate	100 (45.4)
Hexamethylene-1,6-diisocyanate	100 (45.4)
Hexamethylphosphoramide	1 (0.454)
Hexane	5000 (2270)
Hexone	5000 (2270)
Hydrazine	1 (0.454)
Hydrazinecarbothioamide	100 (45.4)
Hydrazine, 1,2-diethyl-	10 (4.54)
Hydrazine, 1,1-dimethyl-	10 (4.54)
Hydrazine, 1,2-dimethyl-	1 (0.454)
Hydrazine, 1,2-diphenyl-	10 (4.54)
Hydrazine, methyl-	10 (4.54)
Hydrochloric acid	5000 (2270)
Hydrocyanic acid	10 (4.54)
Hydrofluoric acid	100 (45.4)
Hydrogen chloride	5000 (2270)
Hydrogen cyanide	10 (4.54)
Hydrogen fluoride	100 (45.4)
Hydrogen phosphide	100 (45.4)
Hydrogen sulfide H2S	100 (45.4)
Hydroperoxide, 1-methyl-1-phenylethyl-	10 (4.54)
Hydroquinone	100 (45.4)
2-Imidazolidinethione	10 (4.54)
Indeno(1,2,3-cd)pyrene	100 (45.4)
Iodomethane	100 (45.4)
1,3-Isobenzofurandione	5000 (2270)
Isobutyl alcohol	5000 (2270)
Isodrin	1 (0.454)
Isolan	100 (45.4)
Isophorone	5000 (2270)
Isoprene	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Isopropanolamine dodecylbenzenesulfonate	1000 (454)
3-Isopropylphenyl N-methylcarbamate	10 (4.54)
Isosafrole	100 (45.4)
3(2H)-Isoxazolone, 5-(aminomethyl)-	1000 (454)
Kepone	1 (0.454)
Lasiocarpine	10 (4.54)
Lead	10 (4.54)
Lead acetate	10 (4.54)
Lead arsenate	1 (0.454)
Lead, bis(acetato-O)tetrahydroxytri-	10 (4.54)
Lead chloride	10 (4.54)
Lead fluoborate	10 (4.54)
Lead fluoride	10 (4.54)
Lead iodide	10 (4.54)
Lead nitrate	10 (4.54)
Lead phosphate	10 (4.54)
Lead stearate	10 (4.54)
Lead subacetate	10 (4.54)
Lead sulfate	10 (4.54)
Lead sulfide	10 (4.54)
Lead thiocyanate	10 (4.54)
Lindane	1 (0.454)
Lindane (all isomers)	1 (0.454)
Lithium chromate	10 (4.54)
Malathion	100 (45.4)
Maleic acid	5000 (2270)
Maleic anhydride	5000 (2270)
Maleic hydrazide	5000 (2270)
Malononitrile	1000 (454)
Manganese, bis(dimethylcarbamodithioato-S,S')-	10 (4.54)
Manganese dimethyldithiocarbamate	10 (4.54)
MDI	5000 (2270)
MEK	5000 (2270)
Melphalan	1 (0.454)
Mercaptodimethur	10 (4.54)
Mercuric cyanide	1 (0.454)
Mercuric nitrate	10 (4.54)
Mercuric sulfate	10 (4.54)
Mercuric thiocyanate	10 (4.54)
Mercurous nitrate	10 (4.54)
Mercury	1 (0.454)
Mercury, (acetato-O)phenyl-	100 (45.4)
Mercury fulminate	10 (4.54)
Methacrylonitrile	1000 (454)
Methanamine, N-methyl-	1000 (454)
Methanamine, N-methyl-N-nitroso-	10 (4.54)
Methane, bromo-	1000 (454)
Methane, chloro-	100 (45.4)
Methane, chloromethoxy-	10 (4.54)
Methane, dibromo-	1000 (454)
Methane, dichloro-	1000 (454)
Methane, dichlorodifluoro-	5000 (2270)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
Methane, iodo-	100 (45.4)
Methane, isocyanato-	10 (4.54)
Methane, oxybis(chloro-	10 (4.54)
Methanesulphenyl chloride, trichloro-	100 (45.4)
Methanesulfonic acid, ethyl ester	1 (0.454)
Methane, tetrachloro-	10 (4.54)
Methane, tetranitro-	10 (4.54)
Methanethiol	100 (45.4)
Methane, tribromo-	100 (45.4)
Methane, trichloro-	10 (4.54)
Methane, trichlorofluoro-	5000 (2270)
Methanimidamide, N,N-dimethyl-N'-[3-[(methylamino) carbonyl] oxy] phenyl]-, monohydrochloride	100 (45.4)
Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[(methylamino)carbonyl] oxy]phenyl]-	100 (45.4)
6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide	1 (0.454)
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	1 (0.454)
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	1 (0.454)
Methanol	5000 (2270)
Methapyrilene	5000 (2270)
1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5a,5b,6-decachlorooctahydro-	1 (0.454)
Methiocarb	10 (4.54)
Methomyl	100 (45.4)
Methoxychlor	1 (0.454)
Methyl alcohol	5000 (2270)
Methylamine @	100 (45.4)
2-Methyl aziridine	1 (0.454)
Methyl bromide	1000 (454)
1-Methylbutadiene	100 (45.4)
Methyl chloride	100 (45.4)
Methyl chlorocarbonate	1000 (454)
Methyl chloroform	1000 (454)
Methyl chloroformate @	1000 (454)
Methyl chloromethyl ether @	10 (4.54)
3-Methylcholanthrene	10 (4.54)
4,4'-Methylenebis(2-chloroaniline)	10 (4.54)
Methylene bromide	1000 (454)
Methylene chloride	1000 (454)
4,4'-Methylenedianiline	10 (4.54)
Methylene diphenyl diisocyanate	5000 (2270)
Methyl ethyl ketone	5000 (2270)
Methyl ethyl ketone peroxide	10 (4.54)
Methyl hydrazine	10 (4.54)
Methyl iodide	100 (45.4)
Methyl isobutyl ketone	5000 (2270)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
Methyl isocyanate	10 (4.54)
2-Methylactonitrile	10 (4.54)
Methyl mercaptan	100 (45.4)
Methyl methacrylate	1000 (454)
Methyl parathion	100 (45.4)
4-Methyl-2-pentanone	5000 (2270)
Methyl tert-butyl ether	1000 (454)
Methylthiouracil	10 (4.54)
Metolcarb	1000 (454)
Mevinphos	10 (4.54)
Mexacarbate	1000 (454)
Mitomycin C	10 (4.54)
MNNG	10 (4.54)
Monoethylamine	100 (45.4)
Monomethylamine	100 (45.4)
Naled	10 (4.54)
5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	10 (4.54)
1-Naphthalenamine	100 (45.4)
2-Naphthalenamine	10 (4.54)
Naphthalenamine, N,N'-bis(2-chloroethyl)-	100 (45.4)
Naphthalene	100 (45.4)
Naphthalene, 2-chloro-	5000 (2270)
1,4-Naphthalenedione	5000 (2270)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	10 (4.54)
1-Naphthalenol, methylcarbamate	100 (45.4)
Naphthenic acid	100 (45.4)
1,4-Naphthoquinone	5000 (2270)
alpha-Naphthylamine	100 (45.4)
beta-Naphthylamine	10 (4.54)
alpha-Naphthylthiourea	100 (45.4)
Nickel	100 (45.4)
Nickel ammonium sulfate	100 (45.4)
Nickel carbonyl Ni(CO)4, (T-4)-	10 (4.54)
Nickel chloride	100 (45.4)
Nickel cyanide Ni(CN)2	10 (4.54)
Nickel hydroxide	10 (4.54)
Nickel nitrate	100 (45.4)
Nickel sulfate	100 (45.4)
Nicotine, & salts	100 (45.4)
Nitric acid	1000 (454)
Nitric acid, thallium (1 + ) salt	100 (45.4)
Nitric oxide	10 (4.54)
p-Nitroaniline	5000 (2270)
Nitrobenzene	1000 (454)
4-Nitrobiphenyl	10 (4.54)
Nitrogen dioxide	10 (4.54)
Nitrogen oxide NO	10 (4.54)
Nitrogen oxide NO2	10 (4.54)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
Nitroglycerine	10 (4.54)
Nitrophenol (mixed)	100 (45.4)
m-Nitrophenol	
o-Nitrophenol	100 (45.4)
p-Nitrophenol	100 (45.4)
2-Nitrophenol	100 (45.4)
4-Nitrophenol	100 (45.4)
2-Nitropropane	10 (4.54)
N-Nitrosodi-n-butylamine	10 (4.54)
N-Nitrosodiethanolamine	1 (0.454)
N-Nitrosodiethylamine	1 (0.454)
N-Nitrosodimethylamine	10 (4.54)
N-Nitrosodiphenylamine	100 (45.4)
N-Nitroso-N-ethylurea	1 (0.454)
N-Nitroso-N-methylurea	1 (0.454)
N-Nitroso-N-methylurethane	1 (0.454)
N-Nitrosomethylvinylamine	10 (4.54)
N-Nitrosomorpholine	1 (0.454)
N-Nitrosopiperidine	10 (4.54)
N-Nitrosopyrrolidine	1 (0.454)
Nitrotoluene	1000 (454)
m-Nitrotoluene	
o-Nitrotoluene	
p-Nitrotoluene	
5-Nitro-o-toluidine	100 (45.4)
Octamethylpyrophosphoramide	100 (45.4)
Osmium oxide OsO <sub>4</sub> , (T-4)-	1000 (454)
Osmium tetroxide	1000 (454)
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	1000 (454)
Oxamyl	100 (45.4)
1,2-Oxathiolane, 2,2-dioxide	10 (4.54)
2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl) tetrahydro-, 2-oxide	10 (4.54)
Oxirane	10 (4.54)
Oxiranecarboxyaldehyde	10 (4.54)
Oxirane, (chloromethyl)-	100 (45.4)
Paraformaldehyde	1000 (454)
Paraldehyde	1000 (454)
Parathion	10 (4.54)
PCBs	1 (0.454)
PCNB	100 (45.4)
Pentachlorobenzene	10 (4.54)
Pentachloroethane	10 (4.54)
Pentachloronitrobenzene	100 (45.4)
Pentachlorophenol	10 (4.54)
1,3-Pentadiene	100 (45.4)
Perchloroethylene	100 (45.4)
Perchloromethyl mercaptan@	100 (45.4)
Phenacetin	100 (45.4)
Phenanthrene	5000 (2270)
Phenol	1000 (454)
Phenol, 2-chloro-	100 (45.4)
Phenol, 4-chloro-3-methyl-	5000 (2270)

Table A4.3	Reportable Quantity (RQ) pounds (kilograms)
Hazardous substance	
Phenol, 2-cyclohexyl-4,6-dinitro-	100 (45.4)
Phenol, 2,4-dichloro-	100 (45.4)
Phenol, 2,6-dichloro-	100 (45.4)
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	1 (0.454)
Phenol, 2,4-dimethyl-	100 (45.4)
Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)	1000 (454)
Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate	10 (4.54)
Phenol, 2,4-dinitro-	10 (4.54)
Phenol, methyl-	100 (45.4)
Phenol, 2-methyl-4,6-dinitro-, & salts	10 (4.54)
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	100 (45.4)
Phenol, 2-(1-methylethoxy)-, methylcarbamate	100 (45.4)
Phenol, 3-(1-methylethyl)-, methyl carbamate	10 (4.54)
Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate	1000 (454)
Phenol, 2-(1-methylpropyl)-4,6-dinitro-	1000 (454)
Phenol, 4-nitro-	100 (45.4)
Phenol, pentachloro-	10 (4.54)
Phenol, 2,3,4,6-tetrachloro-	10 (4.54)
Phenol, 2,4,5-trichloro-	10 (4.54)
Phenol, 2,4,6-trichloro-	10 (4.54)
Phenol, 2,4,6-trinitro-, ammonium salt	10 (4.54)
L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-	1 (0.454)
p-Phenylenediamine	5000 (2270)
Phenyl mercaptan@	100 (45.4)
Phenylmercury acetate	100 (45.4)
Phenylthiourea	100 (45.4)
Phorate	10 (4.54)
Phosgene	10 (4.54)
Phosphine	100 (45.4)
Phosphoric acid	5000 (2270)
Phosphoric acid, diethyl 4-nitrophenyl ester	100 (45.4)
Phosphoric acid, lead(2 + ) salt (2:3)	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	1 (0.454)
Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-methyl ester	5000 (2270)
Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	10 (4.54)
Phosphorofluoridic acid, bis(1-methylethyl) ester	100 (45.4)
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	10 (4.54)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Phosphorothioic acid, O-[4-[(dimethylamino) sulfonyl]phenyl] O,O-dimethyl ester	1000 (454)
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	100 (45.4)
Phosphorus	1 (0.454)
Phosphorus oxychloride	1000 (454)
Phosphorus pentasulfide	100 (45.4)
Phosphorus sulfide	100 (45.4)
Phosphorus trichloride	1000 (454)
Phthalic anhydride	5000 (2270)
Physostigmine	100 (45.4)
Physostigmine salicylate	100 (45.4)
2-Picoline	5000 (2270)
Piperidine, 1-nitroso-	10 (4.54)
Plumbane, tetraethyl-	10 (4.54)
POLYCHLORINATED BIPHENYLS	1 (0.454)
Potassium arsenate	1 (0.454)
Potassium arsenite	1 (0.454)
Potassium bichromate	10 (4.54)
Potassium chromate	10 (4.54)
Potassium cyanide K(CN)	10 (4.54)
Potassium hydroxide	1000 (454)
Potassium permanganate	100 (45.4)
Potassium silver cyanide	1 (0.454)
Promecarb	1000 (454)
Pronamide	5000 (2270)
Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime	100 (45.4)
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl] oxime	1 (0.454)
1-Propanamine	5000 (2270)
1-Propanamine, N-propyl-	5000 (2270)
1-Propanamine, N-nitroso-N-propyl-	10 (4.54)
Propane, 1,2-dibromo-3-chloro-	1 (0.454)
Propane, 1,2-dichloro-	1000 (454)
Propanedinitrile	1000 (454)
Propanenitrile	10 (4.54)
Propanenitrile, 3-chloro-	1000 (454)
Propanenitrile, 2-hydroxy-2-methyl-	10 (4.54)
Propane, 2-nitro-	10 (4.54)
Propane, 2,2'-oxybis[2-chloro-	1000 (454)
1,3-Propane sultone	10 (4.54)
1,2,3-Propanetriol, trinitrate	10 (4.54)
Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	100 (45.4)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	10 (4.54)
1-Propanol, 2-methyl-	5000 (2270)
2-Propanone	5000 (2270)
2-Propanone, 1-bromo-	1000 (454)
Propargite	10 (4.54)
Propargyl alcohol	1000 (454)
2-Propenal	1 (0.454)
2-Propenamide	5000 (2270)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
1-Propene, 1,3-dichloro-	100 (45.4)
1-Propene, 1,1,2,3,3,3-hexachloro-	1000 (454)
2-Propenenitrile	100 (45.4)
2-Propenenitrile, 2-methyl-	1000 (454)
2-Propenoic acid	5000 (2270)
2-Propenoic acid, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, methyl ester	1000 (454)
2-Propen-1-ol	100 (45.4)
Propham	1000 (454)
beta-Propiolactone	10 (4.54)
Propionaldehyde	1000 (454)
Propionic acid	5000 (2270)
Propionic anhydride	5000 (2270)
Propoxur (Baygon)	100 (45.4)
n-Propylamine	5000 (2270)
Propylene dichloride	1000 (454)
Propylene oxide	100 (45.4)
1,2-Propylenimine	1 (0.454)
2-Propyn-1-ol	1000 (454)
Prosulfocarb	5000 (2270)
Pyrene	5000 (2270)
Pyrethrins	1 (0.454)
3,6-Pyridazinedione, 1,2-dihydro-	5000 (2270)
4-Pyridinamine	1000 (454)
Pyridine	1000 (454)
Pyridine, 2-methyl-	5000 (2270)
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts	100 (45.4)
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	10 (4.54)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thio-	10 (4.54)
Pyrrolidine, 1-nitroso-	1 (0.454)
Pyrrolo[2,3-b] indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-	100 (45.4)
Quinoline	5000 (2270)
Quinone	10 (4.54)
Quintobenzene	100 (45.4)
RADIONUCLIDES	See Table 2
Reserpine	5000 (2270)
Resorcinol	5000 (2270)
Safrole	100 (45.4)
Selenious acid	10 (4.54)
Selenious acid, dithallium (1 + ) salt	1000 (454)
Selenium	100 (45.4)
Selenium dioxide	10 (4.54)
Selenium oxide	10 (4.54)
Selenium sulfide SeS <sub>2</sub>	10 (4.54)
Selenourea	1000 (454)
L-Serine, diazoacetate (ester)	1 (0.454)
Silver	1000 (454)
Silver cyanide Ag(CN)	1 (0.454)
Silver nitrate	1 (0.454)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Silvex (2,4,5-TP)	100 (45.4)
Sodium	10 (4.54)
Sodium arsenate	1 (0.454)
Sodium arsenite	1 (0.454)
Sodium azide	1000 (454)
Sodium bichromate	10 (4.54)
Sodium bifluoride	100 (45.4)
Sodium bisulfite	5000 (2270)
Sodium chromate	10 (4.54)
Sodium cyanide Na(CN)	10 (4.54)
Sodium dodecylbenzenesulfonate	1000 (454)
Sodium fluoride	1000 (454)
Sodium hydrosulfide	5000 (2270)
Sodium hydroxide	1000 (454)
Sodium hypochlorite	100 (45.4)
Sodium methylate	1000 (454)
Sodium nitrite	100 (45.4)
Sodium phosphate, dibasic	5000 (2270)
Sodium phosphate, tribasic	5000 (2270)
Sodium selenite	100 (45.4)
Streptozotocin	1 (0.454)
Strontium chromate	10 (4.54)
Strychnidin-10-one, & salts	10 (4.54)
Strychnidin-10-one, 2,3-dimethoxy-	100 (45.4)
Strychnine, & salts	10 (4.54)
Styrene	1000 (454)
Styrene oxide	100 (45.4)
Sulfur chlorides@	1000 (454)
Sulfuric acid	1000 (454)
Sulfuric acid, dimethyl ester	100 (45.4)
Sulfuric acid, dithallium (1 + ) salt	100 (45.4)
Sulfur monochloride	1000 (454)
Sulfur phosphide	100 (45.4)
2,4,5-T	1000 (454)
2,4,5-T acid	1000 (454)
2,4,5-T amines	5000 (2270)
2,4,5-T esters	1000 (454)
2,4,5-T salts	1000 (454)
TCDD	1 (0.454)
TDE	1 (0.454)
1,2,4,5-Tetrachlorobenzene	5000 (2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1 (0.454)
1,1,1,2-Tetrachloroethane	100 (45.4)
1,1,2,2-Tetrachloroethane	100 (45.4)
Tetrachloroethylene	100 (45.4)
2,3,4,6-Tetrachlorophenol	10 (4.54)
Tetraethyl pyrophosphate	10 (4.54)
Tetraethyl lead	10 (4.54)
Tetraethyldithiopyrophosphate	100 (45.4)
Tetrahydrofuran	1000 (454)
Tetranitromethane	10 (4.54)
Tetraphosphoric acid, hexaethyl ester	100 (45.4)
Thallic oxide	100 (45.4)
Thallium	1000 (454)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Thallium (I) acetate	100 (45.4)
Thallium (I) carbonate	100 (45.4)
Thallium chloride TlCl	100 (45.4)
Thallium (I) nitrate	100 (45.4)
Thallium oxide Tl <sub>2</sub> O <sub>3</sub>	100 (45.4)
Thallium (I) selenite	1000 (454)
Thallium (I) sulfate	100 (45.4)
Thioacetamide	10 (4.54)
Thiodicarb	100 (45.4)
Thiodiphosphoric acid, tetraethyl ester	100 (45.4)
Thiofanox	100 (45.4)
Thioimidodicarbonic diamide [(H <sub>2</sub> N)C(S)] <sub>2</sub> NH	100 (45.4)
Thiomethanol	100 (45.4)
Thioperoxydicarbonic diamide [(H <sub>2</sub> N)C(S)] <sub>2</sub> S <sub>2</sub> , tetramethyl-	10 (4.54)
Thiophanate-methyl	10 (4.54)
Thiophenol	100 (45.4)
Thiosemicarbazide	100 (45.4)
Thiourea	10 (4.54)
Thiourea, (2-chlorophenyl)-	100 (45.4)
Thiourea, 1-naphthalenyl-	100 (45.4)
Thiourea, phenyl-	100 (45.4)
Thiram	10 (4.54)
Tirpate	100 (45.4)
Titanium tetrachloride	1000 (454)
Toluene	1000 (454)
Toluenediamine	10 (4.54)
2,4-Toluene diamine	10 (4.54)
Toluene diisocyanate	100 (45.4)
2,4-Toluene diisocyanate	100 (45.4)
o-Toluidine	100 (45.4)
p-Toluidine	100 (45.4)
o-Toluidine hydrochloride	100 (45.4)
Toxaphene	1 (0.454)
2,4,5-TP acid	100 (45.4)
2,4,5-TP esters	100 (45.4)
Triallate	100 (45.4)
1H-1,2,4-Triazol-3-amine	10 (4.54)
Trichlorfon	100 (45.4)
1,2,4-Trichlorobenzene	100 (45.4)
1,1,1-Trichloroethane	1000 (454)
1,1,2-Trichloroethane	100 (45.4)
Trichloroethylene	100 (45.4)
Trichloromethanesulfonyl chloride	100 (45.4)
Trichloromonofluoromethane	5000 (2270)
Trichlorophenol	10 (4.54)
2,3,4-Trichlorophenol	
2,3,5-Trichlorophenol	
2,3,6-Trichlorophenol	
3,4,5-Trichlorophenol	
2,4,5-Trichlorophenol	10 (4.54)
2,4,6-Trichlorophenol	10 (4.54)
Triethanolamine	1000 (454)
dodecylbenzenesulfonate	

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Triethylamine	5000 (2270)
Trifluralin	10 (4.54)
Trimethylamine	100 (45.4)
2,2,4-Trimethylpentane	1000 (454)
1,3,5-Trinitrobenzene	10 (4.54)
1,3,5-Trioxane, 2,4,6-trimethyl-	1000 (454)
Tris(2,3-dibromopropyl) phosphate	10 (4.54)
Trypan blue	10 (4.54)
D002 Unlisted Hazardous Wastes Characteristic of Corrosivity	100 (45.4)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
D003 Unlisted Hazardous Wastes Characteristic of Reactivity	100 (45.4)
D004-D043 Unlisted Hazardous Wastes Characteristic of Toxicity:	
Arsenic (D004)	1 (0.454)
Barium (D005)	1000 (454)
Benzene (D018)	10 (4.54)
Cadmium (D006)	10 (4.54)
Carbon tetrachloride (D019)	10 (4.54)
Chlordane (D020)	1 (0.454)
Chlorobenzene (D021)	100 (45.4)
Chloroform (D022)	10 (4.54)
Chromium (D007)	10 (4.54)
o-Cresol (D023)	100 (45.4)
m-Cresol (D024)	100 (45.4)
p-Cresol (D025)	100 (45.4)
Cresol (D026)	100 (45.4)
2,4-D (D016)	100 (45.4)
1,4-Dichlorobenzene (D027)	100 (45.4)
1,2-Dichloroethane (D028)	100 (45.4)
1,1-Dichloroethylene (D029)	100 (45.4)
2,4-Dinitrotoluene (D030)	10 (4.54)
Endrin (D012)	1 (0.454)
Heptachlor (and epoxide) (D031)	1 (0.454)
Hexachlorobenzene (D032)	10 (4.54)
Hexachlorobutadiene (D033)	1 (0.454)
Hexachloroethane (D034)	100 (45.4)
Lead (D008)	10 (4.54)
Lindane (D013)	1 (0.454)
Mercury (D009)	1 (0.454)
Methoxychlor (D014)	1 (0.454)
Methyl ethyl ketone (D035)	5000 (2270)
Nitrobenzene (D036)	1000 (454)
Pentachlorophenol (D037)	10 (4.54)
Pyridine (D038)	1000 (454)
Selenium (D010)	10 (4.54)
Silver (D011)	1 (0.454)
Tetrachloroethylene (D039)	100 (45.4)
Toxaphene (D015)	1 (0.454)
Trichloroethylene (D040)	100 (45.4)
2,4,5-Trichlorophenol (D041)	10 (4.54)
2,4,6-Trichlorophenol (D042)	10 (4.54)
2,4,5-TP (D017)	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
Vinyl chloride (D043)	1 (0.454)
Uracil mustard	10 (4.54)
Uranyl acetate	100 (45.4)
Uranyl nitrate	100 (45.4)
Urea, N-ethyl-N-nitroso-	1 (0.454)
Urea, N-methyl-N-nitroso-	1 (0.454)
Urethane	100 (45.4)
Vanadic acid, ammonium salt	1000 (454)
Vanadium oxide V2O5	1000 (454)
Vanadium pentoxide	1000 (454)
Vanadyl sulfate	1000 (454)
Vinyl acetate	5000 (2270)
Vinyl acetate monomer	5000 (2270)
Vinylamine, N-methyl-N-nitroso-	10 (4.54)
Vinyl bromide	100 (45.4)
Vinyl chloride	1 (0.454)
Vinylidene chloride	100 (45.4)
Warfarin, & salts	100 (45.4)
Xylene	100 (45.4)
m-Xylene	1000 (454)
o-Xylene	1000 (454)
p-Xylene	100 (45.4)
Xylene (mixed)	100 (45.4)
Xylenes (isomers and mixture)	100 (45.4)
Xylenol	1000 (454)
Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester (3beta,16beta,17alpha,18beta, 20alpha)	5000 (2270)
Zinc	1000 (454)
Zinc acetate	1000 (454)
Zinc ammonium chloride	1000 (454)
Zinc, bis(dimethylcarbamodithioato-S,S')-	10 (4.54)
Zinc borate	1000 (454)
Zinc bromide	1000 (454)
Zinc carbonate	1000 (454)
Zinc chloride	1000 (454)
Zinc cyanide Zn(CN)2	10 (4.54)
Zinc fluoride	1000 (454)
Zinc formate	1000 (454)
Zinc hydrosulfite	1000 (454)
Zinc nitrate	1000 (454)
Zinc phenolsulfonate	5000 (2270)
Zinc phosphide Zn3P2	100 (45.4)
Zinc silicofluoride	5000 (2270)
Zinc sulfate	1000 (454)
Ziram	10 (4.54)
Zirconium nitrate	5000 (2270)
Zirconium potassium fluoride	1000 (454)
Zirconium sulfate	5000 (2270)
Zirconium tetrachloride	5000 (2270)
F001	10 (4.54)
(a) Tetrachloroethylene	100 (45.4)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
(b) Trichloroethylene	100 (45.4)
(c) Methylene chloride	1000 (454)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Carbon tetrachloride	10 (4.54)
(f) Chlorinated fluorocarbons	5000 (2270)
F002	10 (4.54)
(a) Tetrachloroethylene	100 (45.4)
(b) Methylene chloride	1000 (454)
(c) Trichloroethylene	100 (45.4)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Chlorobenzene	100 (45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane	5000 (2270)
(g) o-Dichlorobenzene	100 (45.4)
(h) Trichlorofluoromethane	5000 (2270)
(i) 1,1,2-Trichloroethane	100 (45.4)
F003	100 (45.4)
(a) Xylene	1000 (454)
(b) Acetone	5000 (2270)
(c) Ethyl acetate	5000 (2270)
(d) Ethylbenzene	1000 (454)
(e) Ethyl ether	100 (45.4)
(f) Methyl isobutyl ketone	5000 (2270)
(g) n-Butyl alcohol	5000 (2270)
(h) Cyclohexanone	5000 (2270)
(i) Methanol	5000 (2270)
F004	100 (45.4)
(a) Cresols/Cresylic acid	100 (45.4)
(b) Nitrobenzene	1000 (454)
F005	100 (45.4)
(a) Toluene	1000 (454)
(b) Methyl ethyl ketone	5000 (2270)
(c) Carbon disulfide	100 (45.4)
(d) Isobutanol	5000 (2270)
(e) Pyridine	1000 (454)
F006	10 (4.54)
F007	10 (4.54)
F008	10 (4.54)
F009	10 (4.54)
F010	10 (4.54)
F011	10 (4.54)
F012	10 (4.54)
F019	10 (4.54)
F020	1 (0.454)
F021	1 (0.454)
F022	1 (0.454)
F023	1 (0.454)
F024	1 (0.454)
F025	1 (0.454)
F026	1 (0.454)
F027	1 (0.454)
F028	1 (0.454)
F032	1 (0.454)
F034	1 (0.454)
F035	1 (0.454)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
F037	1 (0.454)
F038	1 (0.454)
F039	1 (0.454)
K001	1 (0.454)
K002	10 (4.54)
K003	10 (4.54)
K004	10 (4.54)
K005	10 (4.54)
K006	10 (4.54)
K007	10 (4.54)
K008	10 (4.54)
K009	10 (4.54)
K010	10 (4.54)
K011	10 (4.54)
K013	10 (4.54)
K014	5000 (2270)
K015	10 (4.54)
K016	1 (0.454)
K017	10 (4.54)
K018	1 (0.454)
K019	1 (0.454)
K020	1 (0.454)
K021	10 (4.54)
K022	1 (0.454)
K023	5000 (2270)
K024	5000 (2270)
K025	10 (4.54)
K026	1000 (454)
K027	10 (4.54)
K028	1 (0.454)
K029	1 (0.454)
K030	1 (0.454)
K031	1 (0.454)
K032	10 (4.54)
K033	10 (4.54)
K034	10 (4.54)
K035	1 (0.454)
K036	1 (0.454)
K037	1 (0.454)
K038	10 (4.54)
K039	10 (4.54)
K040	10 (4.54)
K041	1 (0.454)
K042	10 (4.54)
K043	10 (4.54)
K044	10 (4.54)
K045	10 (4.54)
K046	10 (4.54)
K047	10 (4.54)
K048	10 (4.54)
K049	10 (4.54)
K050	10 (4.54)
K051	10 (4.54)
K052	10 (4.54)



<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
K060	1 (0.454)
K061	10 (4.54)
K062	10 (4.54)
K064	10 (4.54)
K065	10 (4.54)
K066	10 (4.54)
K069	10 (4.54)
K071	1 (0.454)
K073	10 (4.54)
K083	100 (45.4)
K084	1 (0.454)
K085	10 (4.54)
K086	10 (4.54)
K087	100 (45.4)
K088	10 (4.54)
K090	10 (4.54)
K091	10 (4.54)
K093	5000 (2270)
K094	5000 (2270)
K095	100 (45.4)
K096	100 (45.4)
K097	1 (0.454)
K098	1 (0.454)
K099	10 (4.54)
K100	10 (4.54)
K101	1 (0.454)
K102	1 (0.454)
K103	100 (45.4)
K104	10 (4.54)
K105	10 (4.54)
K106	1 (0.454)
K107	10 (4.54)
K108	10 (4.54)
K109	10 (4.54)
K110	10 (4.54)
K111	10 (4.54)
K112	10 (4.54)
K113	10 (4.54)
K114	10 (4.54)

<b>Table A4.3</b>	<b>Reportable Quantity (RQ) pounds (kilograms)</b>
<b>Hazardous substance</b>	
K115	10 (4.54)
K116	10 (4.54)
K117	1 (0.454)
K118	1 (0.454)
K123	10 (4.54)
K124	10 (4.54)
K125	10 (4.54)
K126	10 (4.54)
K131	100 (45.4)
K132	1000 (454)
K136	1 (0.454)
K141	1 (0.454)
K142	1 (0.454)
K143	1 (0.454)
K144	1 (0.454)
K145	1 (0.454)
K147	1 (0.454)
K148	1 (0.454)
K149	10 (4.54)
K150	10 (4.54)
K151	10 (4.54)
K156	10 (4.54)
K157	10 (4.54)
K158	10 (4.54)
K159	10 (4.54)
K161	1 (0.454)
K169	10 (4.54)
K170	1 (0.454)
K171	1 (0.454)
K172	1 (0.454)
K174	1 (0.454)
K175	1 (0.454)
K176	1 (0.454)
K177	5000 (2270)
K178	1000 (454)
K181	1 (0.454)

**Footnotes:**

- The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 micrometers (0.004 inches).
- The RQ for asbestos is limited to friable forms only.
- Indicates that the name was added by PHMSA because (1) the name is a synonym for a specific hazar substance and (2) the name appears in the Hazardous Materials Table as a proper shipping name.

## Attachment 5

### CLASS 1--EXPLOSIVES AND AMMUNITION

**A5.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A5.2. through A5.27.2. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A5.2. through A5.27.2. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and must select the correct inner/intermediate packaging and outer container as specified in each packaging paragraph. **(T-0)**. Not all packaging paragraphs are inclusive and packaging is based on the category of explosive or ammunition as identified in each paragraph or subparagraph. This attachment contains information concerning packaging and general handling instructions for Class 1 material. Unless otherwise noted, certify specification containers for Class 1 materials to PG II requirements. See Attachment 3 for additional information concerning Class 1 material.

**A5.2. Unpackaged Explosives.** Unless otherwise authorized in this manual, package all explosives according to Attachment 5. Explosives may only be removed from their required packaging to meet operational requirements of **Chapter 3** under the following circumstances:

A5.2.1. On airdrop parachute platforms configured according to TO 13C7/FM 10-500 series publications.

A5.2.2. When stored in approved racks or containers, or secured in/on tactical equipment or vehicles as operational components according to technical orders or publications.

A5.2.3. When secured/restrained in freight containers according to service drawings approved for air movement.

**A5.3. Items requiring Special Approval.** Ship according to a Special Approval (includes CAA or COE) issued for the particular item. See paragraphs 2.5. and 2.6. for more information on CAAs and COEs. Comply with the following handling instructions only when shipping items containing a fuel that is corrosive or toxic.

A5.3.1. Handling Instructions. Exercise extreme caution in handling this item. Keep well ventilated, away from sparks, fire hazards, and oxidizing materials. Vapors are toxic when inhaled. Liquid is corrosive. Fuel in presence of an oxidizer is self-igniting and highly reactive. Approved protective clothing, gloves, safety goggles, and a positive pressure breathing apparatus must be available during handling of this material, and worn when handling leaking packages. **(T-0)**.

A5.3.2. Shipping Requirements. The following requirements apply:

A5.3.2.1. Load containers having an installed indicator in such a manner as to provide access to the indicator during flight. Inspect the indicator before aircraft loading, after aircraft loading, at cruise altitude, during flight every hour or as required by the applicable technical manual, as cargo tiedown is inspected, and after landing. The normal color of the indicator is white or off-white. The color will change to yellow if inhibited red fuming nitric acid leak occurs. The color will change to black if an amine fuel mixture leak occurs. Changes are obvious and do not require technical escort personnel to monitor.

A5.3.2.2. Preplan containers that do not have an indicator installed under the same conditions as described in paragraph 2.8. The shipper must contact the carrier no less than 72 hours before movement. **(T-0)**. The shipper must also furnish the following:

A5.3.2.2.1. Protective clothing, gloves, and a positive pressure breathing apparatus for all personnel aboard the aircraft (see also paragraph 1.9.).

A5.3.2.2.2. Fume-detecting equipment.

A5.3.2.2.3. A qualified technical escort or courier with equipment to monitor the item for leaks and is prepared to take emergency in-flight action. **(T-0)**.

A5.3.3. Emergency Procedures. When a leak is detected, either by observation of the indicator or by monitoring equipment:

A5.3.3.1. Get personnel out of the cargo compartment.

A5.3.3.2. Alert pilot and crew.

A5.3.3.3. Depressurize cargo compartment and ventilate as soon as possible.

A5.3.3.4. All personnel go on 100 percent oxygen.

A5.3.3.5. Declare an in-flight emergency.

A5.3.3.6. Be prepared to jettison cargo if possible.

A5.3.3.7. Descend and land as soon as possible.

A5.3.3.8. Park aircraft in an isolated area.

A5.3.3.9. EOD personnel unload aircraft as soon as possible.

**A5.4. Barium Azide; Diazodinitrophenol, Wetted; Guanyl Nitrosaminoguanilydene Hydrazine, Wetted; Guanyl Nitrosaminoguanilyltetrazene, Wetted; Tetrazene, Wetted; Lead Azide, Wetted; Lead Mononitroresorcinate; Lead Styphnate, Wetted; Lead Trinitroresorcinate, Wetted; and Mercury Fulminate, Wetted, package as follows:**

A5.4.1. Fill the intermediate and outer packagings with an appropriate water-saturated material such as an anti-freeze solution or wetted cushioning. Outer packagings must be constructed and sealed to prevent evaporation of the wetting solution, (except UN0224 when shipped dry). **(T-0)**. Package in drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
<b>Bags:</b> plastic textile, plastic coated or lined rubber textile, or rubberized textile <b>or</b> <b>Receptacles:</b> wood	<b>Bags:</b> plastics, textile, plastic coated or lined rubber textile, or rubberized textile bag <b>or</b> <b>Receptacles:</b> plastics, metal, or wood	<b>Drums:</b> steel (1A1 or 1A2), other metal (1N1 or 1N2), or plastic (1H1 or 1H2)

A5.4.2. Inner packagings must not contain more than 50 g of explosive substance (quantity corresponding to dry substance); separate inner packagings from each other with dividing partitions; and do not partition within the outer packaging with more than 25 compartments. **(T-0)**. Package in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
<b>Bags:</b> conductive rubber or conductive plastic <i>or</i> <b>Receptacles:</b> metal, wood conductive rubber or conductive plastic	<b>Dividing Partitions:</b> metal, wood, plastic, or fiberboard	<b>Boxes:</b> natural wood, sift-proof wall (4C2), plywood (4D), or reconstituted wood (4F)

**A5.5.** Powder Cake or Powder Paste, Wetted; or Nitrocellulose Plasticized. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> waterproof paper, plastic, or rubberized textile <i>or</i> <b>Sheets:</b> plastic or rubberized textile <i>or</i> <b>Receptacles:</b> wood <b>Note:</b> Inner packagings are not required for UN0159 when metal (1A1, 1A2, 1B1, 1B2, 1N1, or 1N2) or plastic (1H1 or 1H2) drums are used as the outer packaging	<b>Boxes:</b> steel (4A), aluminum (4B), other metal (4N), fiberboard (4G), ordinary wood (4C1), natural sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), other metal (1N1 or 1N2), plastic (1H1 or 1H2), plywood (1D), or fiberboard (1G)

**A5.6. Ammonium Picrate; Cyclotetramethylenetetranitramine, HMX, or Octogen Wetted; Cyclotrimethylenetrinitramine and Octogen, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Wetted; Cyclotrimethylenetrinitramine and Cyclotetramethylenetetranitramine, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine and HMX Mixtures, Wetted or Desensitized; Dinitrophenol; Dinitroresorcinol; Dipicryl Sulfide; Hexolite or Hexotol; Hexotonal; Mannitol Hexanitate or Nitromannite, Wetted; Nitrocellulose; Nitrostarch; Nitro Urea; Nitroguanidine or Picrite Trinitrophenol or Picric Acid; Octolite or Octol; Pentolite; Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN, Wetted; or Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN, Desensitized; RDX and Cyclotetramethylenetetranitramine, Wetted or Desensitized; Trinitrobenzene; Trinitrobenzoic Acid; Trinitroresorcinol or Styphnic Acid; Trinitroresorcinol, Wetted; Trinitrotoluene or TNT; RDX and HMX Mixtures, Wetted or Desensitized Urea Nitrate. Packaging must be lead free for UN0004, 0076, 0078, 0154, 0219, and 0394. (T-0).**

A5.6.1. Wetted Solids. Package follows:

Inner packaging	Intermediate packaging	Outer packaging
<b>Bags:</b> multiwall water resistant paper, plastic, textile, rubberized textile, woven plastic <b>or</b> <b>Receptacles:</b> metal, plastic, or wood	<b>Bags:</b> plastics, plastic coated or lined textile <b>or</b> <b>Receptacles:</b> metal, plastic, or wood <b>Note:</b> Intermediate packaging not required if leakproof drums are used as outer packaging or for UN0072 and UN0226.	<b>Boxes:</b> steel (4A), aluminum (4B), other metal (4N), ordinary natural wood, (4C1), sift proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic, (4H1), solid plastic (4H2) <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), other metal (1N1 or 1N2), plywood (1D), fiber (1G), plastic (1H1 or 1H2)

A5.6.2. Dry Solids Other Than Powders. Package in bags, boxes, or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
<p><b>Bags:</b> kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic</p>		<p><b>Bags:</b> sift-proof woven plastic (5H2), water-resistant woven plastic (5H3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2)</p> <p><i>or</i></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), other metal (4N), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)</p> <p><i>or</i></p> <p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), other metal (1N1 or 1N2), plywood (1D), fiber (1G), plastic (1H1 or 1H2).</p> <p><b>Note:</b> For UN0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.</p>

A5.6.3. Solid Dry Powders. Package in boxes or drums as follows (at least one of the packagings must be sift-proof) (T-0).:

Inner packaging	Intermediate packaging	Outer packaging
<b>Bags:</b> multiwall water resistant paper, plastic, woven plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <b>Note:</b> Inner packagings are not required if drums are used as the outer packaging	<b>Bags:</b> multiwall water resistant paper, plastic, woven plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, or wood	<b>Boxes:</b> steel (4A), aluminum (4B), other metal (4N), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2) <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), other metal (1N1 or 1N2), plywood (1D), fiber (1G), plastic (1H1 or 1H2). <b>Note:</b> For UN0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.

**A5.7. Ammonium Nitrate; Ammonium Perchlorate; Cyclotetramethylenetetranitramine, Octogen, or HMX Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Desensitized; Dinitroglycoluril or Dingu; Octonal; Tetranitroaniline; Trinitro-M-Cresol; Trinitroaniline or Picramide; Trinitroanisole; Trinitrobenzenesulphonic Acid; Trinitrochlorobenzene or Picryl Chloride; Trinitrofluorenone; Trinitronaphthalene; Trinitrophenetole; Trinitrotoluene and Trinitrobenzene Mixtures or TNT and Trinitrobenzene Mixtures or TNT and Hexanitrostilbene Mixtures or Trinitrotoluene and Hexanitrostilbene Mixtures; Trinitrotoluene Mixtures Containing Trinitrobenzene and Hexanitrostilbene or TNT Mixtures containing Trinitrobenzene and Hexanitrostilbene** package as follows. Packaging must be lead free for 0216, and 0386. (T-0).

A5.7.1. Dry Solids Other Than Powders. Package in bags, boxes, or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
<b>Bags:</b> kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic <b>Note:</b> Inner packaging not required for UN0222.	<b>Bags (required for UN0150 only):</b> plastic, plastic coated or lined textile	<b>Bags:</b> sift-proof woven plastic (5H2), water-resistant woven plastic (5H3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), other metal (4N), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), other metal (1N1 or 1N2), plywood (1D), fiber (1G), plastic (1H1 or 1H2).

A5.7.2. Solid Dry Powders. Package in boxes or drums as follows (at least one of the packagings must be sift-proof) (T-0):

Inner packaging	Intermediate packaging	Outer packaging
<b>Bags:</b> multiwall water resistant paper, plastic, woven plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <b>Note:</b> Inner packagings are not required if drums are used as the outer packaging	<b>Bags:</b> multiwall water resistant paper, plastic, woven plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, or wood	<b>Boxes:</b> steel (4A), aluminum (4B), other metal (4N), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2) <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), other metal (1N1 or 1N2), plywood (1D), fiber (1G), plastic (1H1 or 1H2).

**A5.8. Black Powder or Gunpowder; Black Powder, Compressed or Gunpowder, Compressed; Black Powder, in Pellets or Gunpowder, in Pellets, Flash Powder** package



as follows. At least one of the packagings must be sift-proof. **(T-0)**. Do not package more than 50 g (1.8 oz) of flash powder (UN0094 or UN0305) in each inner packaging. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> paper, plastic, or rubberized textile <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Sheets:</b> Kraft paper or waxed paper (only authorized for UN0028).	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2) <b>Note:</b> Inner packaging not required for UN0027 packed in drums.

**A5.9. Deflagrating Metal Salts of Aromatic Nitroderivatives, N.O.S.; Dinitrophenolates; Dinitrosobenzene; Nitrocellulose, Wetted; 5-Mercaptotetrazol-1-Acetic Acid; Tetrazol-1-Acetic Acid; Powder, Smokeless; Propellant, Solid; Sodium Dinitro-O-Cresolate; Sodium Picramate; and Zirconium Picramate** package as follows. Packagings must be lead free for UN0077, 0132, 0234, 0235 and 0236. **(T-0)**. Use paragraph A5.9.1. for UN0342. Use paragraph A5.9.2. for UN0132, 0160, 0161, 0406, 0407, 0448, 0498, 0499, and 0509.

A5.9.1. Wetted Solids. Package in boxes or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
<b>Bags:</b> plastic, textile, woven plastic <i>or</i> <b>Receptacles:</b> metal, plastic, or wood <b>Note:</b> Inner packaging not required for UN0342 when packed in outer 1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, or 1H2 drums.	<b>Bags:</b> plastic, plastic coated or lined textile <i>or</i> <b>Receptacles:</b> metal or plastic <b>Dividing Partitions:</b> wood <b>Note:</b> Intermediate packaging not required if packed in outer leakproof removable head drum.	<b>Boxes:</b> steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1, or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

A5.9.2. Dry Solids. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> kraft paper, plastic, sift-proof woven plastic or textile <b>or</b> <b>Receptacles:</b> fiberboard, metal, paper, plastic, wood, sift-proof woven plastic <b>Note:</b> Inner packaging not required for UN0160 and UN0161 when packed in drums.	<b>Boxes:</b> ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) <b>or</b> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G) plastic (1H1 or 1H2), other metal (1N1 or 1N2) <b>Notes:</b> For UN0160 and 0161, 1A2, 1B2, and 1N2 drums must be constructed so that risk of explosion caused by increased internal pressure (from internal or external causes) is prevented. <b>(T-0)</b> . For UN0509, do not use metal packagings.

**A5.10. Nitroglycerin, Desensitized; Nitroglycerin, Solution in Alcohol; and Propellant, Liquid** package as follows. Surround each inner packaging with sufficient amount of non-combustible absorbent material to absorb the entire contents. Cushion metal receptacles from each other in all directions. Liquid substances must not freeze at temperatures above -15 degrees C (5 degrees F). **(T-0)**. A composite packaging consisting of a plastic receptacle in a metal drum (6HA1) may be used instead of the inner and intermediate packagings. Package in boxes or drums as follows:

Inner packaging	Intermediate packaging	Outer packaging
<b>Receptacles:</b> plastic or wood <b>Note:</b> Tape screw cap closures and do not exceed 5 liters capacity each when boxes are used as outer packagings (does not apply to UN0144). Metal receptacles are allowed for UN0144.	<b>Bags:</b> plastic in metal receptacles <b>or</b> <b>Drums:</b> metal <b>or</b> <b>Receptacles:</b> wood <b>Note:</b> Intermediate packaging not required for UN0144. For UN0075, 0143, 0495 and 0497 use bags as intermediate packaging when boxes are used as outer packaging.	<b>Boxes:</b> ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F) <b>Note:</b> Maximum net mass for box must not exceed 30 kg. <b>(T-0)</b> . Fiberboard (4G) boxes may be used for UN0144. <b>or</b> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2) <b>Note:</b> Maximum net volume for drum must not exceed 120 liters. <b>(T-0)</b> . For UN0144, aluminum drums (1B1 and 1B2) and other metal drums (1N1 and 1N2) must not be used. <b>(T-0)</b> .

**A5.11. Ammonium Nitrate-Fuel Oil Mixture; Explosive, Blasting, Type A (UN0081); Explosive, Blasting, Type B (UN0082); and Explosive, Blasting, Type E (UN0241); Explosive, Blasting, Type B (UN0331) or Agent Blasting, Type B; Explosive, Blasting, Type C (UN0083); Explosive, Blasting, Type D (UN0084) and Explosive, Blasting, Type E (UN0332) package as follows.**

**Package in boxes, drums, jerricans, or bags as follows:**

Inner packaging	Outer packaging
<p><b>Bags:</b> paper, water and oil resistant plastic, textile, plastic coated or lined woven plastic, sift-proof</p> <p><i>or</i></p> <p><b>Receptacles:</b> fiberboard, water resistant metal, plastic, sift-proof wood</p> <p><i>or</i></p> <p><b>Sheets:</b> water resistant paper, waxed paper, plastic</p> <p><b>Note:</b> Inner packaging not required for UN0082, UN0241, UN0331, and UN0332 if packed in a leakproof removable head outer drum.</p> <p><b>Note:</b> Inner packaging not required for UN0082, UN0241, UN0331, and UN0332 when the explosive is contained in a material that is impervious to liquid.</p> <p><b>Note:</b> Inner packaging not required for UN0081 when packed in rigid plastic that is impervious to liquid.</p> <p><b>Note:</b> Inner packaging not required for UN0331 when 5H2, 5H3 or 5H4 bags are outer packaging.</p>	<p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N)</p> <p><i>or</i></p> <p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)</p> <p><i>or</i></p> <p><b>Jerricans:</b> steel (3A1 or 3A2), plastic (3H1 or 3H2)</p> <p><i>or</i></p> <p><b>Bags:</b> woven plastic (5H1, 5H2, or 5H3), multiwall water resistant paper (5M2), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3)</p> <p><b>Note:</b> Do not use any bags for UN0081.</p>

**A5.12. Ammunition, Illuminating; Ammunition, Incendiary; Ammunition, Incendiary, White Phosphorus; Ammunition, Practice; Ammunition, Proof; Ammunition, Smoke; Ammunition, Smoke, White Phosphorus; Ammunition, Tear-Producing; Bombs; Bombs, Photo-Flash; Cartridges, Depth; Cartridges for Weapons; Cartridges for Weapons, Blank; Cartridges for Weapons, Inert Projectile; Cartridges, Small Arms; Cartridges, Small Arms, Blank; Charges, Bursting, Charges, Demolition; Plastic Bonded; Charges, Propelling for Cannon; Mines; Projectiles; Rocket Motors; Rockets; Rockets, Line-Throwing; Torpedoes; Warheads, Rocket; and Warheads, Torpedo package as follows:**

A5.12.1. Package in boxes or drums as follows:

Inner packaging	Outer packaging
Inner packaging not required	<p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2), other metal (4N)</p> <p><i>or</i></p> <p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G) plastic (1H1 or 1H2), other metal (1N1 or 1N2)</p> <p><i>or</i></p> <p><b>Large Packagings:</b> steel (50A), aluminum (50B), natural wood (50C), plywood (50D), reconstituted wood (50F), rigid fiberboard (50G), rigid plastic (50H), other metal (50N)</p>

A5.12.2. Large and Robust Articles of UN numbers UN0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0238, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345, 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0459 and 0488. Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, protect their ignition systems against stimuli encountered during normal conditions of transport. Ship such articles in DOD-approved containers, crates, cradles, or other suitable handling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport.

**A5.13. Detonators, Electric** package as follows: Inner packagings are not required when detonators are packed in pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool restricting movement of the caps and protecting from impact. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> paper, plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Reels</b>	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.14. Detonators, Non-electric and Detonator Assemblies, Non-electric** package as follows: For detonators assemblies (UN0360, 0361, 0500), detonators are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube. Inner packagings are not required if the packing configuration restricts free movement of the caps and protects them from impact forces. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> paper, plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Reels</b> <b>Note:</b> For UN0029, UN0267, and UN0455, do not use bags and reels as inner packagings.	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.15. Boosters and Charges, Supplementary Explosive** package as follows:

A5.15.1. Package articles consisting of closed metal, plastic or fiberboard casing in boxes as follows:

Inner packaging	Outer packaging
Inner packaging not required	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N)

A5.15.2. Package articles without closed casings in combination packages as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Sheets:</b> paper, plastic	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2), other metal (4N)

**A5.16. Boosters with Detonator; Bursters; Detonators for Ammunition; Grenades, Empty Primed; Primers, Cap Type; Primers, Tubular; and Tracers for Ammunition** package in boxes as follows:

Inner packaging	Intermediate packaging	Outer packaging
<b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Trays (fitted with dividing partitions):</b> fiberboard, plastics, wood. <b>Note:</b> Do not use trays for UN0043, 0212, 0225, 0268 or 0306.	<b>Receptacles:</b> fiberboard, metal, plastic, wood. <b>Note:</b> Intermediate packaging only required when trays are used as inner packaging.	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2), other metal (4N)

**A5.17. Cutters, Cable, Explosive; Cartridges, Power Device; Cartridges, Oil Well; Fracturing Devices, Explosive; Release Devices, Explosive; Rivets, Explosive; and Sounding Devices, Explosive** package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> water resistant <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Sheets:</b> corrugated fiberboard <i>or</i> <b>Tubes:</b> fiberboard	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastics (4H1), solid plastics (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiberboard (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.18. Air Bag Inflators; Air Bag Modules; Articles, Pyrotechnic; Cartridges, Flash; Cartridges, Signal; Fireworks; Flares, Aerial; Flares, Surface; Seat-Belt Pretensioners; Signal Devices, Hand; Signals, Distress; Signals, Smoke; and Signals, Railway Track, Explosive package in boxes or drums as follows:**

Inner packaging	Outer packaging
<b>Bags:</b> paper, plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Sheets:</b> paper, plastic	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastics (4H1), and solid plastics (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.19. Cases, Cartridge, Empty with Primer; and Cases, Combustible, Empty, without Primer package in boxes or drums as follows:**

Inner packaging	Outer packaging
<b>Bags:</b> plastic, textile <i>or</i> <b>Boxes:</b> fiberboard, plastic, wood <i>or</i> <b>Dividing partitions:</b> within outer packaging	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.20. Charges, Shaped; or charges, Explosive, Commercial package in boxes as follows.** For UN0059, 0439, 0440, and 0441, when shaped charges are packed singly, the conical cavity must face downwards and the package marked with orientation markings meeting the requirements of 49 CFR Subparagraph 172.312(a)(2). **(T-0).** When shaped charges are packed in pairs, the conical cavities must face inwards. **(T-0).** Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> plastic <i>or</i> <b>Boxes:</b> fiberboard, wood <i>or</i> <b>Tubes:</b> fiberboard, metal, plastic <i>or</i> <b>Dividing partitions</b> within outer packaging	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.21. Charges, Shaped, Flexible, Linear** package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> plastic <b>Note:</b> If ends of articles are sealed, inner packaging is not required.	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.22. Cord or Fuse, Detonating; Cord or Fuse, Detonating, Mild Effect** package as follows.  
Seal ends of the detonating cord and fasten securely. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Sheets:</b> paper, plastic <i>or</i> <b>Reels</b> <b>Note:</b> For UN0065, 0104, 0289, 0290 the ends of the detonating cord are not required to be sealed provided the inner packaging containing the detonating cord consists of a static-resistant plastic bag of at least 3 mil thickness and the bag is securely closed. <b>Note:</b> Inner packaging is not required for UN0065 and UN0289 when securely fastened in coils.	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)



**A5.23. Cord, Igniter; Fuse, Igniter; Fuse, Non-detonating; or Fuse, Safety** package as follows. For UN0101, do not use steel, aluminum, or other metal packaging and the packaging must be sift-proof unless the fuse is covered by a paper tube and both ends of tube are covered with removable caps. **(T-0)**. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> plastic <i>or</i> <b>Sheets:</b> kraft paper, plastic <i>or</i> <b>Receptacles:</b> wood <b>Note:</b> Inner packaging not required for UN0105 if ends are sealed.	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.24. Fuzes, Detonating; Fuzes, Igniting; Grenades; and Grenades, Practice** package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Trays (individual partitions):</b> plastic wood <i>or</i> <b>Dividing partitions</b> in the outer packaging	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.25. Igniters or Lighters, Fuse** package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> paper, plastic <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Sheets:</b> paper <i>or</i> <b>Trays (individual partitions):</b> plastic	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

**A5.26. Charges, Propelling** package as follows. Ensure metal packagings are constructed so that risk of explosion, by reason of increase in internal pressure (from internal or external causes), is prevented.

A5.26.1. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Bags:</b> kraft paper, plastic, textile, rubberized textile <i>or</i> <b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Trays (individual partitions):</b> plastic, wood	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2), other metal (4N) <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), other metal (1N1 or 1N2)

A5.26.2. Package in composite packaging as follows:

Inner packaging	Outer packaging
Inner packaging not required with use of 6HH2 package.	Plastic receptacle with outer solid box (6HH2)

**A5.27. Contrivances, Water-Activated** package as follows:

A5.27.1. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> fiberboard, metal, plastic, wood <i>or</i> <b>Dividing partitions</b> in the outer packaging	<b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1) with metal liner, plywood (4D) with metal liner, reconstituted wood (4F) with metal liner, expanded plastic (4H1), solid plastic (4H2), other metal (4N). <i>or</i> <b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), plastic (1H1 or 1H2), other metal (1N1 or 1N2) <b>Note:</b> Seal packagings against the ingress of water.

A5.27.2. Package Large and Robust Articles as follows. Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, protect their ignition systems against stimuli encountered during normal conditions of transport. Such articles will be in DOD-approved containers, crates, cradles, or other suitable handling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport. Articles must contain at least two independent features which prevent the ingress of water. **(T-0).**

## Attachment 6

## CLASS 2-COMPRESSED GASES

**A6.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A6.2. through A6.28.3.2. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A6.2. through A6.28.3.2. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from provisions provided and comply with cylinder selection and packaging paragraph requirements. **(T-0)**. Not all packaging paragraphs are inclusive and packaging selection is based on the type of flammable, nonflammable or toxic gas category as stated in each packaging paragraph or compressed gas Table. This attachment contains information concerning the packaging and general handling instructions for Class 2.1 (flammable gas), Class 2.2 (nonflammable, nontoxic compressed gas), and Class 2.3 (toxic gas). See Attachment 3 for additional information concerning Class 2 material.

**A6.2. Aerosols.** Prepare aerosols meeting the definition of “Consumer Commodity” as authorized under paragraph A13.3. Package aerosol products identified under the proper shipping name “Aerosols” as follows:

**A6.2.1. Aerosols Containing Non-Toxic Substances.** For an aerosol containing non-toxic substances, pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid-ounce) capacity each, or in inner non-refillable metal or plastic receptacles not exceeding 1 L (34 fluid-ounces) provided all of the following conditions are met:

**A6.2.1.1.** Pressure in the aerosol container must not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F). **(T-0)**.

**A6.2.1.2.** If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, or ICAO/IATA IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, or ICAO/IATA IP7A, or IP7B inner metal receptacle.

**A6.2.1.3.** Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F). **(T-0)**.

**A6.2.1.4.** Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the content at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects. **(T-0)**.

**A6.2.1.5.** Protect the valves by a cap or other suitable means.

- A6.2.1.6. Tightly pack aerosols in a strong outer packaging capable of meeting packaging performance test outlined in A19.3.4. UN specification (UN marked) packaging is not required. The complete package must not exceed 30 kg (66 lbs) gross weight. **(T-0)**.
- A6.2.2. Other Aerosols. For other aerosols (including those containing toxic substances), pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid ounce) capacity each, or in inner non-refillable metal receptacles not exceeding 1 L (34 fluid ounces) provided all of the following conditions are met:
- A6.2.2.1. Pressure in the aerosol container must not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F). **(T-0)**.
- A6.2.2.2. If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, or ICAO/IATA IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, or ICAO/IATA IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1245 kPa at 55 degrees C (180 psig at 130 degrees F) but does not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) use an ICAO/IATA IP7B inner metal receptacle.
- A6.2.2.3. Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F). **(T-0)**.
- A6.2.2.4. Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects. **(T-0)**.
- A6.2.2.5. Protect the valves by a cap or other suitable means.
- A6.2.2.6. Tightly pack aerosols in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box meeting PG II requirements.
- A6.2.3. For an aerosol charged with a non-toxic solution containing a biological product or medical preparation that could be deteriorated by heat and compressed gases (except Class 6.1, PG III material that are poisonous or nonflammable) pack in inner non-refillable metal receptacles provided all of the following conditions are met:
- A6.2.3.1. Inner receptacles not exceeding 575 mL (20 fluid ounces) each.
- A6.2.3.2. Pressure in the receptacle must not exceed 970 kPa at 55 degrees C (140 psig at 130 degrees F). **(T-0)**.
- A6.2.3.3. The liquid content of the product and gas must not completely fill the receptacle at 55 degrees C. **(T-0)**.
- A6.2.3.4. One aerosol out of each lot of 500 or less, filled for shipment, must be heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects. **(T-0)**.

A6.2.3.5. Protect the valves by a cap or other suitable means.

A6.2.3.6. Package inner receptacles in a strong outer packaging. The outer packaging must be capable of meeting the limited quantity performance standards outlined in A19.3.4. UN specification (UN marked) packaging is not required. **(T-0)**.

A6.2.3.7. The complete package must not exceed 30 kg (66 lbs) gross weight. **(T-0)**.

A6.2.4. For an aerosol containing a biological product or medical preparation that could be deteriorated by heat and is nonflammable, pack in inner non-refillable metal receptacles provided all of the following conditions are met:

A6.2.4.1. The first five subparagraph requirements of A6.2.3. related to the aerosol receptacles apply.

A6.2.4.2. Tightly pack aerosol containers in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box meeting PG II requirements.

**A6.3. Small Receptacles Containing Compressed Gas.** Package Small receptacles of compressed gases, other than aerosols or Consumer Commodities, as identified in this paragraph, as follows. Unless otherwise specified, UN specification (UN marked) packaging is not required. Each package must not exceed 30 kg (66 lbs) gross weight. **(T-0)**. For unregulated compressed gases, comply with general handling requirements in A3.3.2.

A6.3.1. Use containers, except lighter refills, of not more than 120 mL (4 fluid ounces, 7.22 cubic inches or less) capacity each. Package inner receptacles in strong outer packaging.

A6.3.2. Use metal containers filled with nonhazardous material not over 90 percent capacity at 21 degrees C (70 degrees F) then charged with a nonflammable, nonliquefied gas. Test each container to three times the gas pressure at 21 degrees C (70 degrees F). When refilled, the container may be transported when retested to three times the gas pressure at 21 degrees C (70 degrees F) provided one of the following conditions are met:

A6.3.2.1. Container is not over 1 L (1 quart) capacity and charged to not more than 1172 kPa at 21 degrees C (170 psig at 70 degrees F).

A6.3.2.2. Container is not over 114L (30 gallon) capacity and charged to not more than 517 kPa at 21 degrees C (75 psig at 70 degrees F).

A6.3.3. Package electronic tubes of not more than 489 mL (30 cubic inch) volume charged with gas to a pressure of not more than 241 kPa (35 psig). Package in strong outer packaging.

A6.3.4. Use inside metal containers of a capacity not over 570.7 mL (35 cubic inches, 19.3 fluid ounces), charged with nonflammable, nonpoisonous or noncorrosive liquefied compressed gas designed for audible fire alarm systems. Pressure in the container must not exceed 482.6 kPa at 21 degrees C (70 psig at 70 degrees F). **(T-0)**. The completely assembled non-refillable container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 55 degrees C (130 degrees F.) **(T-0)**. Each refillable inside container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 55 degrees C (130 degrees F). **(T-0)**. The liquid portion of the gas must not completely fill the container at 55 degrees C (130 degrees F). **(T-0)**.

A6.3.5. Non-pressurized gas samples must be transported when its pressure corresponding to ambient atmospheric pressure in the container is not more than 105 kPa (15.22 psia) absolute.

**(T-0).** For Toxic or Toxic and Flammable non-pressurized gases pack in a hermetically sealed glass or metal inner packagings of not more than 1 L (0.3 gallons) and overpacked in strong outer packaging. For flammable non-pressurized gases pack in hermetically sealed glass or metal inner packagings of not more than 5L (1.3 gallons) and overpacked in strong outer packaging.

A6.3.6. A cylinder that is a component part of a passenger restraint system and is installed in a motor vehicle, charged with nonliquefied, nonflammable compressed gas and having no more than two actuating cartridges per valve, is exempt from the requirements of this manual with the following **exceptions**:

A6.3.6.1. Cylinder must comply with one of the cylinder specifications in 49 CFR Part 178, and be authorized for use in A6.6. for the gas it contains. **(T-0).**

A6.3.6.2. Cylinder must comply with the filling requirements of A3.3.2.6. **(T-0).**

A6.3.7. A cylinder that is part of a tire inflation system in a motor vehicle, charged with a nonliquefied, nonflammable compressed gas, and is excepted from the requirements of this manual except the following:

A6.3.7.1. Cylinder must comply with one of the cylinder specifications in 49 CFR Part 178, and be authorized for use in Table A6.1. for the gas it contains. **(T-0).**

A6.3.7.2. Cylinder must comply with the filling requirements of A3.3.2.6. **(T-0).**

A6.3.7.3. Each cylinder must be securely installed in the trunk of the motor vehicle, and the valve must be protected against accidental discharge. **(T-0).**

**A6.4. Liquefied Compressed Gases.** Package liquefied compressed gases as follows:

A6.4.1. Ship liquefied compressed gases, including nontoxic and nonflammable mixtures, in accordance with the filling, pressure, and DOT cylinder specification requirements of Table A6.1. If the compressed gas is not specifically identified in Table A6.1., ship (except gas in solution) in DOT 3, 3A, 3AA, 3AL, 3B, 3BN, 3E, 4B, 4BA, 4B240ET, 4BW, 4E, or 39 cylinders. Ensure compliance with general handling requirements in A3.1.7.2. Do not charge and ship DOT 4E or 39 cylinders with a mixture containing a pyrophoric liquid, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or toxic material, (Class 6.1 or 2.3) unless authorized in a specific packaging paragraph. Use of existing cylinders, DOT 3, 3D, 4, 4A, 9, 25, 26, 38, 40, and 41 is authorized, but new construction of these cylinders is not authorized.

A6.4.2. DOT 3AL Cylinders. DOT 3AL cylinders must not be used for any material with a primary or subsidiary hazard of Class 8. **(T-0).**

A6.4.3. Mixtures With Class 2.3. Ship a mixture containing any Class 2.3 material or irritating material, in such proportion that the mixture would be classed as toxic, in containers authorized for these poisonous materials.

A6.4.4. Ship carbon dioxide and oxygen mixture, compressed; liquefied gas, oxidizing, N.O.S.; or nitrous oxide in DOT-3A, 3AA, 3AL, 3E, 3HT, 39 cylinders, UN pressure receptacles ISO 9809-1, ISO 9802-2, ISO 9809-3 and ISO 7866 cylinders in rigid outer packaging in accordance with 49 CFR Paragraph 173.304(f).

A6.4.5. Carbon Dioxide, Refrigerated Liquid or Nitrous Oxide, Refrigerated Liquid. Ship in DOT 4AL cylinders in accordance with 49 CFR Subparagraph 173.304a(e).

A6.4.6. Refrigerant Gases. Ship refrigerant gases that are nonpoisonous and nonflammable in cylinders prescribed in A6.4.1. or as follows: Pack in DOT 2P and 2Q containers in strong wooden or fiberboard boxes designed to protect valves from damage or accidental functioning under conditions incident to transportation. Pressure in the container must not exceed 599 kPa at 21 degrees C (87 psia at 70 degrees F). **(T-0)**. Heat each completed metal container filled for shipment until contents reach a minimum temperature of 54 degrees C (130 degrees F), without evidence of leakage, distortion, or other defects. Mark each outside package "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS".

A6.4.7. Engine Starting Fluid. Engine-starting fluids containing compressed gas (or gases) that are flammable in cylinders prescribed in A6.4.1. or as follows:

A6.4.7.1. Inside nonrefillable metal containers not over 500 mL (32 cubic inch) capacity. Pressure in the container must not exceed 999 kPa at 54 degrees C (145 psia at 130 degrees F). **(T-0)**.

A6.4.7.2. If the pressure exceeds 999 kPa at 54 degrees C (145 psia at 130 degrees F) use a DOT 2P container.

A6.4.7.3. Any metal container must be capable of withstanding a pressure of 1 1/2 times the pressure of the content at 54 degrees C (130 degrees F) without bursting. **(T-0)**.

A6.4.7.4. The liquid content of the material and gas must not completely fill the container at 54 degrees C (130 degrees F). **(T-0)**. Heat each container filled for shipment until the contents reach a minimum temperature of 54 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.4.7.5. Pack inside nonrefillable metal containers in a strong tight outer packaging. Mark each outside package "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS".

A6.4.8. Foreign Cylinders. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.4.9. UN Specification cylinders meeting the requirements of 49 CFR Section 173.304b and marked with "USA" as country of approval.

**A6.5. Nonliquefied Compressed Gases.** Package nonliquefied compressed gases as follows:

A6.5.1. Ship nonliquefied, compressed gases in accordance with the filling, pressure, and DOT cylinder specification requirements of Table A6.1. If the compressed gas is not specifically identified in Table A6.1., ship in DOT 3, 3A, 3AA, 3AL, 3B, 3E, 4B, 4BA, or 4BW. Use of existing cylinders, DOT 3, 3C, 3D, 4, 4A, 4C, 25, 26, 33, and 38 is authorized, but new construction of these cylinders is not authorized.

A6.5.2. DOT-3HT Cylinders. DOT-3HT cylinders for use in aircraft only, having a maximum service life of 24 years, are only authorized for nonflammable gases. They must be equipped with a frangible disc safety relief device, without fusible metal backing, with a rated bursting pressure not over 90 percent of the minimum required test pressure of the cylinder with which the device is used. **(T-0)**. Pack cylinders in strong outer packagings.

A6.5.3. DOT 39 Cylinder. Use DOT 39 cylinder for compressed gasses. When used for flammable gases, the internal volume must not exceed 1.23 L (75 cubic inches). **(T-0)**. Use aluminum cylinders for oxygen only under the following conditions:

A6.5.3.1. Cylinder threads must be straight threads (except for UN Cylinders). **(T-0)**.

A6.5.3.2. Valves must be made of brass or stainless steel. **(T-0)**.

A6.5.3.3. Each cylinder must be cleaned to comply with the requirements of DLAI 4145.25 or MIL-STD-1411, *Inspection and Maintenance of Compressed Gas Cylinders*. **(T-0)**.

A6.5.3.4. The pressure in each cylinder must not exceed 20,684 kPa (3000 psig) at 21 degrees C (70 degrees F). **(T-0)**.

A6.5.4. DOT 3AL Cylinder. Ship flammable gases in 3AL cylinders on cargo aircraft only. When used in oxygen service, the cylinders must comply with 49 CFR Subparagraph 173.302a(a)(5). **(T-0)**.

A6.5.5. DOT 3AX, 3AAX, 3T Cylinders. Use cylinders, DOT 3AX, 3AAX, or 3T for Division 2.1 and 2.2 materials and for carbon monoxide. DOT 3T cylinders are not authorized for hydrogen. When used in methane service, the methane must be a nonliquefied gas with a minimum purity of 98.0 percent methane and which is commercially free of corroding components. **(T-0)**.

A6.5.6. UN Specification cylinders as authorized in 49 CFR Section 173.302b.

A6.5.7. Foreign Cylinders. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.5.8. Compressed Oxygen and Oxidizing Gases. Ship compressed oxygen and oxidizing gases in DOT specification 3A, 3AA, 3AL, 3E, 3HT, 39 cylinders, 4E (filled to less than 200 psig at 21 °C (70 °F)), and UN pressure receptacles ISO 9809-1, ISO 9809-2, ISO 9809-3 and ISO 7866 cylinders. Cylinders must be equipped with a pressure relief device in accordance with 49 CFR Paragraph 173.301(f) and, DOT specification cylinders or for the UN pressure receptacles prior to initial use. **(T-0)**. The rated burst pressure of a rupture disc for DOT 3A, 3AA, 3AL, 3E, and 39 cylinders, and UN pressure receptacles ISO 9809-1, ISO 9809-2, ISO 9809-3 and ISO 7866 cylinders must be 100% of the cylinder minimum test pressure with a tolerance of plus zero to minus 10%. **(T-0)**. The rated burst pressure of a rupture disc for a DOT 3HT cylinder must be 90% of the cylinder minimum test pressure with a tolerance of plus zero to minus 10%. **(T-0)**. A cylinder containing compressed oxygen, compressed oxidizing gases, or nitrogen trifluoride must be packaged in a rigid outer packaging that conforms to the requirements of either 49 CFR Part 178, Subparts L and M, at the Packing Group I or II performance level; or the performance criteria in Air Transport Association (ATA) Specification No. 300 for a Category I Shipping Container. **(T-0)**. In addition, is capable of meeting the following additional requirements:

A6.5.8.1. Pass the Flame Penetration Resistance Test specified in 49 CFR Part 178, Appendix E.

A6.5.8.2. Pass the Thermal Resistance Test specified in 49 CFR Part 178, Appendix D.

A6.5.8.3. Prior to each shipment, passes a visual inspection that verifies that all features of the packaging are in good condition, including all latches, hinges, seams, and other features, and that the packaging is free from perforations, cracks, dents, or other abrasions



that may negatively affect the flame penetration resistance and thermal resistance characteristics of the packaging.

A6.5.9. Carbon Monoxide. Ship carbon monoxide in a DOT-3A, 3AX, 3AA, 3AAX, 3AL, 3, 3E, or 3T cylinder having a minimum service pressure of 12,411 kPa (1800 psig). The pressure in the cylinder must not exceed 6895 kPa at 21 degrees C (1000 psig at 70 degrees F), except that if the gas is dry and sulfur free, charge the cylinder to no more than five-sixths of the cylinder service pressure or 13,790 kPa (2000 psig), whichever is the least. **(T-0)**. Fill DOT 3AL cylinders to no more than its marked service pressure.

A6.5.10. Fluorine. For fluorine gas use only DOT 3A1000, 3AA1000, or 3BN400 cylinders without a safety relief device and equipped with valve protection caps. Do not charge cylinders over 2758 kPa at 21 degrees C (400 psig at 70 degrees F) and ensure contents do not exceed 2.7 kg (6 pounds) of gas.

A6.5.11. Liquid Argon, Oxygen, and Nitrogen Samples. Ship liquid argon, oxygen, or nitrogen samples under pressure, in Cosmodyne Gas Samplers, Models CS 4.4 and CS 2.0 or in TTU-131/E Sampler (MIL-S-27626). Package as required for the specific model used. Take samples in the liquid state but vaporize before shipment.

A6.5.12. Diborane and Diborane Mixtures. For Diborane and Diborane mixtures, use only a DOT 3AL or 3AA cylinders having a minimum service pressure of 12,411 kPa (1800 psig). Ensure the maximum filling density of the diborane does not exceed 7 percent. Ensure diborane mixed with compatible compressed gas does not have a pressure exceeding the service pressure of the cylinder if complete decomposition of the diborane occurs.

A6.5.13. Recoil Mechanisms/Artillery Gun Mounts. Pack recoil mechanisms or artillery gun mounts containing nitrogen charged to a maximum pressure of 15,858 kPa at 21 degrees C (2300 psig at 70 degrees F) in strong outer wooden containers. Ship recoil mechanisms or artillery gun mounts containing nitrogen unpackaged when securely attached to the weapon system.

A6.5.14. Satellites, Spacecraft, and Other Articles Charged with Nitrogen or Dry Air. These items may be transported inside a protective shipping container with a nitrogen or air purge during flight. The compressed gas must be in authorized cylinders and protected from damage during transport. **(T-0)**. The system must be equipped with a safety valve, enabling the nitrogen flow to be immediately shut off in the event of a problem while on the aircraft. **(T-0)**. Transport authorized on C-5, and C-17 aircraft only. The following limitations apply:

A6.5.14.1. Nitrogen may be purged into the shipping container at a rate not to exceed five (5) cubic feet per hour.

A6.5.14.2. Nitrogen may be purged into the shipping container at a rate not to exceed twenty (20) cubic feet per hour during transport. A technical escort must, using a portable oxygen monitor, continuously check the atmosphere inside the aircraft during flight. **(T-0)**. If the percentage of oxygen drops to 19.5% per volume, the escort must notify the aircraft commander immediately and the nitrogen purge immediately discontinued. **(T-0)**. All personnel will use supplemental oxygen until the percentage of oxygen exceeds 19.5% per volume. **(T-0)**. Provide maximum airflow rate in the cargo compartment during flight. Cargo doors must remain open during ground operations to provide adequate ventilation. **(T-0)**.

A6.5.14.3. Dry air may be purged into the shipping container at a rate not to exceed 70 cubic feet per hour.

A6.5.14.4. Meet all other requirements of this manual.

A6.5.14.5. See Attachment 17 for additional certification requirements.

**Table A6.1. Cylinder Requirements for Compressed Gases.**

<b>Table A6.1</b> <b>Name of Gas</b>	<b>Maximum Permitted Filling Density in Percent (See A3.3.2.6)</b>	<b>Cylinders Marked as Shown Below, Or of The Same Type With Higher Service Pressure</b>
Anhydrous ammonia	54	DOT-3A480, DOT-3AA480, DOT-3A480X, DOT-4AA480, DOT-3, DOT-3E1800, DOT-3AL480
Bromotrifluoromethane (R-13B1 or H-1301)	124	DOT-3A400, DOT-3AA400, DOT-3B400, DOT-4AA480, DOT-4B400, DOT-4BA400, DOT-4BW400, DOT-3E1800, DOT-39, DOT-3AL400
Carbon dioxide (see notes 3 and 4)	68	DOT-3A1800, DOT-3AX1800, DOT-3AA1800, DOT-3AAX1800, DOT-3, DOT-3E1800, DOT-3T1800, DOT-3HT2000, DOT-39, DOT-3AL1800,
Carbon dioxide refrigerated liquid		DOT-4L
Chlorine (see note 1)	125	DOT-3A480, DOT-3AA480, DOT-3, DOT-3BN480, DOT-3E1800
Chlorodifluoroethane (R142b) or 1-Chloro-1, 1-Difluoroethane (see note 4)	100	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-3E1800, DOT-39, DOT-3AL150,
Chlorodifluoromethane (R22) (see note 4)	105	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4B240ET, DOT-4E240, DOT-39, DOT-3E1800, DOT-3ALA240,

<b>Table A6.1</b> <b>Name of Gas</b>	<b>Maximum Permitted Filling Density in Percent (See A3.3.2.6)</b>	<b>Cylinders Marked as Shown Below, Or of The Same Type With Higher Service Pressure</b>
Chloropentafluorethane (R-115)	110	DOT-3A225, DOT-3AA225, DOT-3B225, DOT-4A225, DOT-4BA225, DOT-4B225, DOT-4BW225, DOT-3E1800, DOT-39, DOT-3AL225,
Chlorotrifluoromethane (R-13) (see note 4)	100	DOT-3A1800, DOT-3AA1800, DOT-3, DOT-3E1800, DOT-39, DOT-3AL1800
Cyclopropane (see note 4)	55	DOT-3A225, DOT-3A480X, DOT-3AA225, DOT-3B225, DOT-4AA480, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-3, DOT-3E1800, DOT-39, DOT-3AL225
Dichlorodifluoromethane (R-12) (see note 4)	119	DOT-3A225, DOT-3AA225, DOT-3B225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-4E225, DOT-39, DOT-3E1800, DOT-3AL225
Dichlorodifluoromethane and difluoroethane mixture (constant boiling mixture) (R-500) (see note 4)	Not liquid full at 55 degrees C (131 degrees F)	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-39
Difluoroethane (R-152a) (see note 4)	79	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-3E1800, DOT-3AL150
1,1-Difluoroethylene (R-1132A)	73	DOT-3A2200, DOT-3AA2200, DOT-3AX2200, DOT-3AAX2200, DOT-3T2200, DOT-39

<b>Table A6.1</b> <b>Name of Gas</b>	<b>Maximum Permitted Filling Density in Percent (See A3.3.2.6)</b>	<b>Cylinders Marked as Shown Below, Or of The Same Type With Higher Service Pressure</b>
Dimethylamine, anhydrous	59	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, ICC-3E1800
Ethane (see note 4)	35.8	DOT-3A1800, DOT-3AX1800, DOT-3AA1800, DOT-3AAX1800, DOT-3, DOT 3E1800, DOT-3T1800, DOT-39, DOT-3AL1800
Ethane (see note 4)	36.8	DOT-3A2000, DOT-3AX2000, DOT-3AA2000, DOT-3AAX2000, DOT-3T2000, DOT-39, DOT-3AL2000
Ethylene (see note 4)	31.0	DOT-3A1800, DOT-3AX1800, DOT-3AA1800, DOT-3AAX1800, DOT -3, DOT-3E1800, DOT-3T1800, DOT-39, DOT-3AL1800
Ethylene (see note 4)	32.5	DOT-3A2000, DOT-3AX2000, DOT-3AA2000, DOT-3AAX2000, DOT-3T2000, DOT-39, DOT-3AL2000
Ethylene (see notes 4)	35.5	DOT-3A2400, DOT-3AX2400, DOT-3AA2400, DOT-3AAX2400, DOT-3T2400, DOT-39, DOT-3AL2400
Hydrogen chloride, anhydrous	65	DOT-3A1800, DOT-3AA1800, DOT-3AX1800, DOT-3AAX1800, DOT-3, DOT-3T1800, DOT-3E1800

<b>Table A6.1</b> <b>Name of Gas</b>	<b>Maximum Permitted Filling Density in Percent (See A3.3.2.6)</b>	<b>Cylinders Marked as Shown Below, Or of The Same Type With Higher Service Pressure</b>
Hydrogen sulfide (see notes 5 and 6)	62.5	DOT-3A, DOT-3AA, DOT-3B, DOT-4A, DOT-4B, DOT-4BA, DOT-4BW, DOT-3E1800, DOT-3AL
Insecticide, gases liquefied (see note 4 and 8)	Not liquid full at 55 degrees C (131 degrees F)	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-4B300, DOT-4BA300, DOT-4BW300, DOT-3E1800
Liquefied nonflammable gases, other than classified flammable, corrosive, toxic & mixtures or solution thereof filled with nitrogen, carbon dioxide or air (see notes 3 and 4)	Not liquid full at 55 degrees C (131 degrees F)	DOT specification cylinders identified in A6.4.1. and DOT-3HT, DOT-4D, DOT-4DA, DOT-4DS
Methylacetylene-propadiene, mixtures, stabilized (see note 2)	Not liquid full at 55 degrees C (131 degrees F)	DOT-4B240, without brazed seams, DOT-4BA240, without brazed seams, DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT-4BW240, DOT-4E240, DOT-4B240ET, DOT-3AL240
Methyl chloride	84	DOT-3, DOT-3A225, DOT-3AA225, DOT-3B225, DOT-3E1800, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, Cylinders complying with DOT-3A150, 3B150, and 4B150 manufactured before 7 December 1936 are also authorized.
Methyl mercaptan	80	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-4B240, DOT-4B240ET, DOT-3E1800, DOT-4BA240, DOT-4BW240
Nitrosyl Chloride	110	DOT-3BN400 only

<b>Table A6.1</b> <b>Name of Gas</b>	<b>Maximum Permitted Filling Density in Percent (See A3.3.2.6)</b>	<b>Cylinders Marked as Shown Below, Or of The Same Type With Higher Service Pressure</b>
Nitrous Oxide (see notes 3, 4, and 7)	68	DOT-3A1800, DOT-3AA1800, DOT-3AX1800, DOT-3AAX1800, DOT-3, DOT-3E1800, DOT-3T1800, DOT-3HT2000, DOT-39, DOT-3AL1800
Refrigerant gas, N.O.S. or Dispersant gas, N.O.S. (see notes 4 and 9)	Not liquid full at 55 degrees C (131 degrees F)	DOT-3A240, DOT-3AA240, DOT-3AL240, DOT-3B240, DOT-3E1800, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-39
Sulfur dioxide (see note 4)	125	DOT-3, DOT-3A225, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-39
Sulfur hexafluoride	120	DOT-3A1000, DOT-3AA25.2.10, DOT-3AAX2400, DOT-3, DOT-3AL1000, DOT-3E1800, DOT-3T1800
Sulfuryl fluoride	106	DOT-3A480, DOT-3AA480, DOT-3E1800, DOT-4B480, DOT-4BA480, DOT-4BW480
Tetrafluoroethylene, stabilized	90	DOT-3A1200, DOT-3AA1200, DOT-3E1800
Trifluorochloroethylene, stabilized	115	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-3E1800, DOT-4B300, DOT-4BA300, DOT-4BW300
Trimethylamine, anhydrous	57	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-3E1800

Table A6.1 Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.6)	Cylinders Marked as Shown Below, Or of The Same Type With Higher Service Pressure
Vinyl chloride (see note 2)	84	DOT-4B150 without brazed seams, DOT-4BA225 without brazed seams, DOT-4BW225, DOT-3A150, DOT-3AA150, DOT-3AL150, DOT-3E1800
Vinyl fluoride, stabilized	62	DOT-3A1800, DOT-3AA1800, DOT-3E1800, DOT-3AL1800
Vinyl methyl ether (see note 2)	68	DOT-4B150 without brazed seams, DOT-4BA225 without brazed seams, DOT-4BW225, DOT-3A150, DOT-3AA150, DOT-3B1800, DOT 3E1800

**Notes:**

1. Cylinders purchased after 1 October 1944 for the transportation of chlorine must contain no aperture other than that provided in the neck of the cylinder for attachment of a valve equipped with an approved safety device. Cylinders purchased after November 1, 1935 and charged with chlorine must not contain over 150 pounds of gas. **(T-0)**.
2. All parts of valve and safety devices in contact with contents of cylinders must be of a metal or other material, suitably treated if necessary, which will not cause formation of any acetylides. **(T-0)**.
3. DOT-3HT cylinders are authorized for use in aircraft only for a maximum service life of 24 years. They must be equipped with a frangible disc safety relief device, without fusible metal backing, and with a rated bursting pressure not over 9 percent of the minimum required test pressure of the cylinder with which the device is used. Ship only nonflammable gases in these cylinders and pack in strong outer packagings.
4. Refer to A3.3.2.7. for additional packaging requirements, if applicable.
5. Use of a DOT specification cylinder with a service pressure of 480 psi is not authorized.
6. Ensure each valve outlet is sealed by a threaded cap or a threaded solid plug.
7. Ensure DOT-3AL cylinders are equipped with brass or stainless steel valves and cleaned in compliance with Federal Specification RR-C-901c.
8. See A6.4.1. and A6.4.6. (Only DOT 2P is authorized).
9. See A6.4.6.

**A6.6. Liquefied Petroleum Gas** (see A3.3.2. for additional cylinder and filling requirements).  
Package liquefied petroleum gas as follows:

- A6.6.1. Use DOT 3, 3A, 3AA, 3AL, 3B, 3E, 4B, 4BA, 4B240ET, 4BW, 4E, or 39, cylinders. Ensure the internal volume of DOT 39 cylinders is not over 1.23 L (75 cubic inches). Comply with the requirements of Table A6.1. for the gases named.

A6.6.2. DOT 2P or 2Q Containers. Use DOT 2P or 2Q containers, packed in strong wooden or fiberboard boxes designed to protect valves from damage or accidental functioning under normal transportation conditions. Each completed container filled for shipment must have been heated until contents reached a minimum temperature of 54 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects. **(T-0)**. DOT 2P or 2Q containers with a maximum capacity of 31.83 cubic inches are authorized under the following conditions:

A6.6.2.1. Maximum filling pressure of 310.3 kPa (45 psig) at 21 degrees C (70 degrees F), and 724 kPa (105 psig) at 54 degrees C (130 degrees F) when equipped with safety devices which prevents rupture of the container and dangerous projection of a closing device when it is exposed to fire.

A6.6.2.2. Maximum filling pressure of 241 kPa (35 psig) at 21 degrees C (70 degrees F) and 689.5 kPa (100 psig) at 54 degrees C (130 degrees F).

A6.6.3. Foreign Cylinders. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.6.4. UN Specification cylinders marked with "USA" as country of approval.

**A6.7. Fire Extinguishers.** Fire extinguishers authorized below may be shipped secured in holders as part of a vehicle/equipment according to A3.3.2.13. Pack fire extinguishers that are not fastened in a designed holder in strong outer containers. Ship fire extinguishers in DOT specification cylinders identified in paragraphs A6.7.1. and A6.7.2. Ship fire extinguishers in non-DOT specification cylinders as identified in paragraphs A6.7.3. and A6.7.4. Fire suppression bottles in DOT specification 3HT, 4D, 4DA, or 4DS, use description "Liquefied Gases, UN1058"; "Compressed Gas, N.O.S., UN1956"; or the hazard classification assigned by the manufacturer. See paragraph A6.4.1. and Table A6.1.

A6.7.1. DOT 3A, 3AA, 3AL, 3E, 4B, 4BA, 4B240ET, or 4BW Cylinders. Use these cylinders provided:

A6.7.1.1. Cylinders contain only fire extinguishing agents such as ammonium phosphate, sodium bicarbonate, potassium bicarbonate, potassium imido dicarboxamide and bromochlorodifluoromethane or bromotrifluoromethane, which is commercially free from corroding components.

A6.7.1.2. Cylinders are charged with a nonflammable, nontoxic, noncorrosive, dry gas, having a dew point at or below minus 46.7 degrees C (minus 52 degrees F) at 101 kPa (1 atmosphere), to not more than the service pressure of the cylinder.

A6.7.1.3. Cylinders have an external corrosion-resistant coating.

A6.7.1.4. Cylinders are retested in accordance with Title 49 CFR Paragraph 178.209(j).

A6.7.1.5. Fire extinguisher, DOT 4BW240, on a cart does not require additional packaging.

A6.7.2. DOT 2P or 2Q Containers. Use DOT 2P or 2Q inner nonrefillable metal containers provided:

A6.7.2.1. The liquid portion of the gas plus any additional liquid or solid does not completely fill the container at 55 degrees C (130 degrees F).



- A6.7.2.2. The pressure in the container does not exceed 1250 kPa (181 psig) at 55 degrees C (130 degrees F). If the pressure exceeds 920 kPa (141 psig) at 55 degrees C (130 degrees F), but does not exceed 1100 kPa (160 psig) at 55 degrees C (130 degrees F), use a DOT 2P inner metal container. If the pressure exceeds 1100 kPa (160 psig) at 55 degrees C (130 degrees F) use a DOT 2Q inner metal container. The metal container must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 55 degrees C (130 degrees F). **(T-0)**.
- A6.7.2.3. Each completed inner container filled for shipment must have been heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defect. **(T-0)**.
- A6.7.3. Fire Extinguishers with a Small Amount of Compressed Gas. Must not contain more than 1660 kPa at 21 degrees C (241 psig at 70 degrees F). **(T-0)**. Fire extinguishers marked "MEETS DOT REQUIREMENTS" are excepted from DOT cylinder specification requirements provided:
- A6.7.3.1. They are shipped as inside containers. Use original manufacturer's packaging or suitable outer packaging to protect extinguisher during normal transportation.
- A6.7.3.2. The contents are not flammable, toxic, or corrosive.
- A6.7.3.3. Internal volume is not over 18 L (1,100 cubic inches). For fire extinguishers not over 900 mL (55 cubic inch) capacity, the liquid portion of the gas plus any additional liquid or solid must not completely fill the container at 55 degrees C (130 degrees F). **(T-0)**. Fire extinguishers over 900 mL (35 cubic inches) must not contain liquefied compressed gas. **(T-0)**.
- A6.7.3.4. Fire extinguishers manufactured on and after 1 January 1976 must be designed and fabricated with a burst pressure not less than six times its charged pressure at 21 degrees C (70 degrees F). **(T-0)**.
- A6.7.3.5. Fire extinguishers are tested to three times the charged pressure at 21 degrees C (70 degrees F), but not less than 825 kPa (120 psig) without failure before the initial shipment. For any subsequent shipments, they must meet retest requirements of 29 CFR Paragraph 1910.157(e). **(T-0)**.
- A6.7.4. FEU-1/M Extinguisher. Transport extinguisher (FEU-1/M) 37.8 L (10 gallon) capacity on military aircraft without special packing and crating. Use caution during handling and transportation to avoid damage to valves.
- A6.7.5. Foreign Fire Extinguishers. Foreign fire extinguishers meeting the requirements of A3.3.2.10.
- A6.7.6. UN Specification cylinders marked with "USA" as country of approval.
- A6.7.7. Large fire extinguishers include fire extinguishers mounted on wheels for manual handling; fire extinguishing equipment or machinery mounted on wheels or wheeled platforms or units transported similar to (small) trailers; and fire extinguishers composed of a non-rollable pressure drum and equipment, and handled, for example, by fork lift or crane when loaded or unloaded. Large fire extinguishers may be transported while unpackaged under the following conditions:

- A6.7.7.1. The general and hazard class specific requirements of attachment 3 are met;
- A6.7.7.2. The valves are protected in accordance with paragraph A3.3.2.3; and
- A6.7.7.3. Other equipment mounted on the fire extinguisher is protected to prevent accidental activation.

**A6.8. Refrigerating Machines, Air Conditioners, and Articles, Pressurized Hydraulic or Pneumatic** packaged as follows:

A6.8.1. Refrigerating Machines, Air Conditioners, and Components. Factory-tested refrigerating machines, air conditioners, and components are exempted from specification packaging, marking, and labeling except for the name of contents on the outer packaging, provided (see A3.3.2.9. for small quantities):

A6.8.1.1. Each pressure vessel is charged to not more than 2268 kg (5,000 pounds) of Group A1 refrigerant as classified in ANSI/ASHRAE Standard 15, or not more than 22.7 kg (50 pounds) of refrigerant other than Group A1.

A6.8.1.2. Machines containing two or more charged vessels may not contain more than 907 kg (2,000 pounds) of Group 1 refrigerant, or more than 45.4 kg (100 pounds) of refrigerant other than Group 1.

A6.8.1.3. Each pressure vessel is equipped with a safety relief device meeting the requirements of ANSI/ASHRAE Standard 15.

A6.8.1.4. Each pressure vessel is equipped with an individual shut-off valve at each opening except openings used for safety devices and with no other connection. Close shut-off valves during transportation.

A6.8.1.5. Pressure vessels are manufactured, inspected, and tested according to ANSI/ASHRAE Standard 15, or when over 152.4 mm (6 inches) internal diameter, according to American Society of Mechanical Engineers (ASME) Code.

A6.8.1.6. All parts subject to refrigerant pressure during shipment are tested under ANSI/ASHRAE Standard 15.

A6.8.1.7. The liquid portion of refrigerant, if any, does not completely fill any pressure vessel at 55 degrees C (130 degrees F).

A6.8.1.8. Filling densities prescribed in A3.3.2.6. are not exceeded.

A6.8.2. Articles, Pressurized Hydraulic or Pneumatic. The following apply to Articles, Pressurized, Hydraulic or Pneumatic (e.g., accumulators) containing nonliquefied, nonflammable gas, and nonflammable liquids or pneumatic accumulators containing nonliquefied, nonflammable gas, fabricated from materials that do not fragment upon rupture:

A6.8.2.1. Accumulators installed in motor vehicles, construction equipment, and assembled machinery, designed and fabricated with a burst pressure of not less than five times their charged pressure at 21 degrees C (70 degrees F) are exempt from the requirements of this manual.

A6.8.2.2. When charged to not more than 1380 kPa (200 psig) at 21 degrees C (70 degrees F), the following conditions apply:

A6.8.2.2.1. Each article must have a fluid space not exceeding 41L (2,500 cubic inches) under stored pressure. **(T-0).**

A6.8.2.2.2. Ship each article as an inside package. There are no specification requirements.

A6.8.2.2.3. Test each article, without evidence of failure or damage, to at least three times its charged pressure at 21 degrees C (70 degrees F) but not less than 120 psig (830 kPa) before initial shipment and before each refilling and reshipment.

A6.8.2.3. When charged over 1380 kPa (200 psig) at 21 degrees C (70 degrees F) the following conditions apply:

A6.8.2.3.1. Each article must have a fluid space not exceeding 41L (2,500 cubic inches) under stored pressure. **(T-0).**

A6.8.2.3.2. Test each article, without evidence of failure or damage, to at least three times its charged pressure at 21 degrees C (70 degrees F) but not less than 120 psig (830 kPa) before initial shipment and before each refilling and reshipment.

A6.8.2.3.3. Design and fabricate each article with a burst pressure of not less than five times its charged pressure when shipped.

**A6.9. Acetylene Gas** must be packaged as follows:

A6.9.1. DOT 8 or 8AL Cylinders. Ship in DOT 8 or 8AL cylinders with the following provisions:

A6.9.1.1. Ensure the cylinders consist of metal shells filled with a porous material, and this material is charged with a suitable solvent as identified in 49 CFR Sections 178.59 or 178.60 as appropriate.

A6.9.1.2. Ensure cylinders comply with the provisions of 49 CFR Paragraphs 173.303(a) through (e).

A6.9.2. Foreign Cylinders. Foreign cylinders meeting the requirements of A3.3.2.6.

A6.9.3. In UN Specification cylinders meeting the requirements of 49 CFR Paragraph 173.303(f) and marked with "USA" as country of approval.

**A6.10. Cigarette Lighters or Other Similar Devices Charged With Fuel** packaged as follows:

Do not ship any package containing a cigarette lighter or other similar ignition device charged with fuel and equipped with an ignition element, or any self-lighting cigarette, unless the design of the device and its packaging has been approved according to 2.3. or by the DOT. The DOT approval process is identified in 49 CFR Section 173.308. Ship a cigarette lighter or other similar device charged with a flammable gas according to the following:

A6.10.1. No more than 10 grams (0.35 fluid ounces) of liquefied gas may be loaded into each device.

A6.10.2. The liquid portion of the gas may not be over 85 percent of the volumetric capacity of each chamber at 15 degrees C (59 degrees F).

A6.10.3. Each device including closures must be capable of withstanding, without leakage or rupture, an internal pressure of at least two times the vapor pressure of the fuel at 55 degrees C (130 degrees F). **(T-0).**

A6.10.4. Place lighters in an inner packaging that is designed to prevent movement of the lighters and inadvertent ignition or leakage. The ignition device and gas control lever of each lighter must be designed, or securely sealed, taped, or otherwise fastened or packaged to protect against accidental functioning or leakage of the contents during transport. **(T-0)**. If lighters are packed vertically in a plastic tray, use a plastic, fiberboard or paperboard partition to prevent friction between the ignition device and the inner packaging.

A6.10.5. Pack lighters and their inner packagings tightly and secure against movement in any rigid non-bulk UN specification outer packaging authorized in 49 CFR Part 178 at the Packing Group II performance level.

A6.10.6. Lighter refills may not contain an ignition element but must contain a release device. **(T-0)**. Lighter refills may not exceed 4 fluid ounces capacity (7.22 cubic inches) or contain more than 65 grams of a Division 2.1 fuel. Pack lighter refills tightly and secure against movement in any rigid non-bulk UN specification outer packaging authorized in 49 CFR Part 178 at the Packing Group II performance level.

**A6.11. Cryogenic Liquids** packaged as follows:

A6.11.1. Handling Instructions. Store in cool, well-ventilated area away from fire hazards, direct rays of the sun, and organic or easily oxidizable materials such as grease and oil. Handle containers with extreme care. Avoid direct contact.

A6.11.2. Packaging Requirements. Ensure all containers are prepared in accordance with T.O. 37C2-8-1-127 and designed to hold low temperature liquefied gases and are strong enough to withstand all shocks and loading normally incident to air shipment and associated handling. Ship cryogenic liquids of argon, helium, neon, nitrogen, and oxygen according to filling density requirements in Figure A3.4. Ship hydrogen (minimum 95 percent parahydrogen) according to filling density requirements in Figure A3.5. Unless excepted in this paragraph, connect container to the aircraft's overboard vent system as required by A3.3.2.16.2. Protect container accessories against damage in handling.

A6.11.2.1. DOT 4L cylinders in a vertical position.

A6.11.2.2. Type TMU-27M, MIL-T-38170, or MA-1, trailer mounted, 189 L (50 gallon) capacity containers.

A6.11.2.3. C-1, 1892 L (500 gallons) capacity containers.

A6.11.2.4. Dewars, 25 L (6.6 gallon) capacity each. Not more than 6 per aircraft.

A6.11.2.5. Nonpressurized metal vacuum-type containers, dewars, 100 liter (26.42 gallon capacity) attached to nonskid base. Ship no more than one container per aircraft.

A6.11.2.6. NRU-5/E air-transportable 1514L (400 gallon tank) (MIL-T-38261).

A6.11.2.7. LS-160 container attached to shipping platform. Ship a maximum of one container per aircraft. Maximum 150 liters (39.63 gallons) nitrogen per container.

A6.11.2.8. TMU-70/M (MIL-A-85415) LOX servicing trailers equipped with absolute pressure relief valve.

A6.11.2.9. TMU-24E (MIL-T-27720), mounted on aircraft cargo pallet, 1514 L (400 gallons), liquid oxygen or liquid nitrogen storage and transfer tanks.

A6.11.2.10. LSHe-102, 109 L (28.79 gallon) capacity, attached to shipping skid equipped with an absolute pressure relief valve for air shipment. Authorized for liquid helium.

A6.11.2.11. LSHe-30, 30 L (7.92 gallon) capacity, packed in a specially designed shipping container (P/N 0305-0002) equipped with plastic foam pads. Ship no more than five containers per aircraft. Authorized for liquid helium and neon.

A6.11.2.12. LSNe-75, liquid neon container, with a maximum quantity of 75 L (19.81 gallon) attached to a shipping skid equipped with an absolute pressure relief valve.. Ship not more than two containers per aircraft.

A6.11.2.13. Liquid oxygen and liquid nitrogen in specification MIL-T-38170 containers vented to the outside of the aircraft. Monitor the container vent valve to make sure the pressure buildup within the container is not over 40 psig. Vent the container down to 5 psig whenever necessary during flight and close the valve when not venting.

A6.11.2.14. CRU-87/U, 10-liter, Portable Therapeutic Liquid Oxygen (PTLOX) Converters. Up to 25 PTLOX converters per aircraft may be shipped without overboard venting, except that C-21 aircraft is limited to 10 PTLOX converters without overboard venting.

A6.11.2.15. Foreign cylinders meeting the requirements of A3.3.2.10.

A6.11.2.16. UN Specification cylinders marked with "USA" as country of approval.

A6.11.2.17. CRU-50/A, 20-liter, Next-Generation Portable Therapeutic Liquid Oxygen (NPTLOX) Converters. Up to 25 Next-Generation Portable Therapeutic Liquid Oxygen (NPTLOX) converters per aircraft may be shipped without overboard venting aboard USAF transport aircraft.

A6.11.2.18. 500 Gallon liquid nitrogen (LIN)/liquid oxygen (LOX) Trailer, NSN 3655-01-626-3554RN and 3655-01-626-3553RN from partialC to total capacity of LIN or LOX. Ensure container is connected to the aircraft's overboard vent system as required by paragraph A3.3.2.16.2. Up to three containers may be carried as long as they are properly connected to the vent system.

**A6.12. Ethyl Chloride** packaged as follows: Package ethyl chloride in any of the following single or combination nonbulk packagings which meet the PG I performance level. (Outage for all containers must be 7.5 percent or more at 21 degrees C (70 degrees F)). **(T-0)**.

A6.12.1. Package in boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> glass, earthenware or metal <b>Note:</b> Not over 500 g (17.6 ounces) capacity each.	<b>Boxes:</b> ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), or reconstituted wood (4F), fiberboard (4G) <b>Note:</b> Gross weight of 4G may not exceed 30 kg (66 pounds).

A6.12.2. Package in drums as follows:

Inner packaging	Outer packaging
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Inner packaging not required	<b>Drum:</b> steel (1A1) not over 100 L (26 gallon) capacity each
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A6.12.3. DOT Cylinders. Any DOT specification cylinder prescribed for any compressed gas except acetylene. Cylinders made of aluminum alloy are not authorized.

A6.12.4. Package in capsules with a maximum net mass of 150 g (5.30 ounces) per capsule. The capsule must be free of faults liable to impair its strength. **(T-0)**. The leakproofness integrity of the closure must be maintained by a secondary means (e.g., cap, crown, seal, binding, etc.) capable of preventing any leakage of the closure while in transportation. **(T-0)**. Place capsules in a strong outer packaging suitable for the contents and must not exceed a gross mass of 75 kg (165 pounds). **(T-0)**.

**A6.13. Ethylene Oxide** packaged as follows: Silver mercury, or any of its alloys, or copper may not be used in any part of a packaging, valve, or other packaging appurtenance if that part, during normal conditions of transportation, may come in contact with ethylene oxide liquid or vapor. Copper alloys may be used only where gas mixtures do not contain free acetylene at any concentration that will form copper acetylene. All packaging and gaskets must be constructed of materials which are compatible with ethylene oxide and do not lower the auto-ignition temperature of ethylene oxide. **(T-0)**.

A6.13.1. Package in boxes as follows: Hermetically seal inner packagings and cushion in the outer packaging. After filling, determine each inner packaging to be leak-tight by placing the inner packaging in a hot water bath at a temperature, and for a period of time, sufficient to ensure that an internal pressure equal to the vapor pressure of ethylene oxide at 55 degrees C is achieved. Each completed package must meet PG I performance requirements. **(T-0)**.

Inner packaging	Outer packaging
Glass ampoules / vials <b>Note:</b> The capacity of each inner packaging may not exceed 100 g (3.5 ounces). <b>or</b> Metal receptacles <b>Note:</b> The capacity of each inner packaging may not exceed 340 g (12 ounces).	<b>Boxes:</b> wooden (4C1, 4C2, 4D, or 4F) or fiberboard (4G) <b>Note:</b> The total quantity in any outer packaging may not exceed 100 g (3.5 ounces), and the total quantity in any outer packaging containing only metal inner packagings may not exceed 2.5 kg (5.5 pounds).

A6.13.2. In DOT specification cylinders or UN pressure receptacles, as authorized for any compressed gas except acetylene. Pressurizing valves and insulation are required for cylinders over 4 L (1 gallon) capacity. Eductor tubes must be provided for cylinders over 19L (5 gallons) capacity. **(T-0)**. Cylinders must be seamless or welded steel (not brazed) with a nominal capacity of no more than 115 L (30 gallons) and must not be liquid full below 82 degrees C (180 degrees F). **(T-0)**. Before each refilling, test each cylinder for leakage at no less than 103.4 kPa (15 psig) pressure. In addition, equip each cylinder with a fusible type relief device with yield temperature of 69 °C to 77 °C (157 °F to 170 °F). The capacity of the relief device and the effectiveness of the insulation must be such that the charged cylinder will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method. **(T-0)**.

A6.13.3. Steel (1A1) Drums. In steel (1A1) drums of no more than 231 L (61 gallons) and meeting Packing Group I performance standards. The drum must be lagged, of all welded construction with the inner shell having a minimum thickness of 1.7 mm (0.068 inches) and the outer shell must have a minimum thickness of 2.4 mm (0.095 inches). **(T-0)**. Drums must be capable of withstanding a hydrostatic test pressure of 690 kPa (100 psig). **(T-0)**. Lagging must be of sufficient thickness so that the drum, when filled with ethylene oxide and equipped with the required pressure relief device, will not rupture when exposed to fire. **(T-0)**. The drum must not be liquid full below 85 degrees C (185 degrees F). **(T-0)**. Before each refilling, each drum must be pressure tested for leakage at no less than 103 kPa (15 psig). **(T-0)**. Each drum must be equipped with a fusible-type relief device with a yield temperature of 69 to 77 degrees C (157 to 170 degrees F). **(T-0)**. The capacity of the relief device and the effectiveness of the insulation must be such that the filled drum is capable of passing, without rupture, the test method described in CGA Pamphlet C-14 or other equivalent method. **(T-0)**.

**A6.14. Ethylamine (Monoethylamine, Aminoethane) packaged as follows:**

A6.14.1. Use metal drums (1A1) which meet PG I performance level requirements.

A6.14.2. Use any DOT specification cylinder prescribed for any compressed gas except acetylene.

**A6.15. Arsine; Cyanogen Chloride, Stabilized; Cyanogen, Liquefied; Germane; Liquefied Gas, Toxic; Phosgene; Phosphine packaged as follows. See paragraph 2.8. for additional information.**

A6.15.1. Handling Instructions. These items are extremely dangerous. Approved chemical safety mask and clothing must be available when handling this material and worn when handling leaking packages. **(T-0)**.

A6.15.2. Packaging Requirements. Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders. Specification 3A, 3AA, 3AL, 3D, and 33 cylinders not exceeding 57 kg (125 pounds) water capacity (nominal). Shipments of "Arsine" or "Phosphine" may not be packaged in a specification 3AL cylinder. Cylinders containing "phosgene" may not exceed a filling density of 125 percent (see A3.3.2.6.). The cylinder may not contain more than 68 kg (150 pounds) of phosgene. Also, test each filled cylinder for leakage before it is offered for transportation with absolutely no leakage. This test consists of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. During which time, make frequent examinations to identify any escape of gas. After the test has been accomplished do not loosen the valve of the cylinder before the cylinder is offered for transportation, and do not be loosen during transportation.

**A6.16. Bromoacetone; Methyl Bromide; Chloropicrin and Methyl Bromide, or Methyl Chloride Mixtures; Insecticide Gases, Toxic, N.O.S. packaged as follows. See paragraph 2.8. for additional information.**

A6.16.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Approved chemical safety mask and clothing must be available when handling this material, and worn when handling leaking packages. **(T-0)**.

A6.16.2. Packaging Requirements:

A6.16.2.1. Pack bromoacetone with inner glass receptacles or tubes in hermetically sealed metal receptacles in corrugated fiberboard cartons in the following boxes: steel (4A), aluminum (4B), other metal (4N) natural wood (4C1), natural wood with sift-proof walls (4C2), plywood (4D), or reconstituted wood (4F). Bottles must not contain over 500 g (17.6 ounces) of liquid each and must be cushioned in cans with at least 12.7 mm (.5 inches) of absorbent cushioning material. **(T-0)**. The total amount of liquid in the outer box may not exceed 11 kg (24 pounds). Packagings must conform to the PG I performance level. **(T-0)**.

A6.16.2.2. Pack bromoacetone, methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with a nonflammable, nonliquefied compressed gas in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinders having not over 113 kg (250 pounds) water capacity (nominal). However, this capacity does not apply to shipments of methyl bromide.

A6.16.2.3. Package methyl bromide mixtures containing up to 2 percent chloropicrin in a fiberboard (4G) box with inside metal cans containing not over 0.454 kg (1 pound) each, or inside metal cans with a minimum wall thickness of 0.178 mm (0.007 inch) containing not over 0.7945 kg (1 3/4 pounds) each. The 0.454 kg (1 pound) can must be capable of withstanding an internal pressure of 896.6 kPa (130 psig) without leakage or permanent distortion. **(T-0)**. Vapor pressure of the contents must not exceed 896.6 kPa (130 psig) at 55 degrees C (130 degrees F). **(T-0)**. The 0.7945 kg (1 3/4 pound) can must be capable of withstanding an internal pressure of 965.6 kPa (140 psig) without leakage or permanent distortion. **(T-0)**. Vapor pressure of the contents must not exceed 965.6 kPa (140 psig) at 55 degrees C (130 degrees F). Cans must not be liquid full at 55 degrees C (130 degrees F). Cans must be constructed of tinplate or lined with suitable material and must have concave or pressure ends. **(T-0)**.

**A6.17. Gas Identification Sets** must be packaged as follows: Gas identification sets containing toxic material meeting the requirements of the PG I performance level.

A6.17.1. Pack in hermetically sealed glass inner receptacles not over 40 ml (1.4 fluid ounces). Place each glass inner receptacle in a sealed fiberboard receptacle cushioned with absorbent material. Not more than 12 fiberboard receptacles may be placed in a 4G fiberboard box. No more than four fiberboard boxes, well-cushioned, may be placed in a steel cylinder. The cylinder must have a wall thickness of at least 3.7 mm (0.146 inches) and must have a hermetically sealed steel closure. **(T-0)**.

A6.17.2. When the toxic material is absorbed in a medium such as activated charcoal or silica gel, pack gas identification sets as follows:

A6.17.2.1. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 5 g (0.2 ounces), they may be packed in glass inner receptacles of not over 120 ml (4.1 fluid ounces) each. Pack each glass receptacle, cushioned with absorbent material in a hermetically sealed metal can. The metal can must have a wall thickness of not less than 0.30 mm (0.012 inch). **(T-0)**. Then pack metal cans in metal boxes (4A, 4B, or 4N), or wooden boxes (4C1, 4C2, 4D, or 4F) surrounded on all sides by at least 25 mm (1 inch) of dry sawdust. Not more than 100 ml (3.4 fluid ounces) or 100 g (3.5 ounces) of toxic materials may be packed in one outer wooden box.



A6.17.2.2. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 20 g (0.7 ounces), they may be packed in glass inner receptacles with screw-top closures of not less than 60 ml (2 fluid ounces) that are hermetically sealed. Twelve bottles containing toxic material not exceeding 100 ml (3.4 ounces) for liquids or 100 g (3.5 ounces) for solids may be placed in a plastic carrying case. Surround each glass receptacle with absorbent cushioning material and separate from each other with sponge rubber partitions. Place the plastic carrying case in a tightly fitted fiberboard box and then place in a tight fitting metal box (4A, 4B, or 4N), or wooden box (4C1, 4C2, 4D, or 4F).

**A6.18. Hexaethyl Tetraphosphate and Compressed Gas Mixtures; Insecticide Gases, Toxic, N.O.S.; Parathion and Compressed Gas Mixture; Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 Less Than or Equal to 200 Parts Per Million (ppm)); Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 over 200 but not Greater Than 5000 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Less Than or Equal to 200 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Over 200 but not greater than 5000 ppm) packaged as follows: See paragraph 2.8. for additional information.**

A6.18.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages.

A6.18.2. Packaging Requirements.

A6.18.2.1. Hexaethyl tetraphosphate, parathion, tetraethyl dithiopyrophosphate, and tetraethyl pyrophosphate may be mixed with a nonflammable compressed gas. This mixture may not contain more than 20 percent by weight of an organic phosphate and be packaged in DOT specification 3A240, 3AA240, 3B240, 4A240, 4B240, 4BA240, or 4BW240 cylinders meeting the following requirements:

A6.18.2.1.1. Each cylinder may not be charged with more than 5 kg (11.0 pounds) of the mixture. The maximum filling density of the cylinder may not exceed 80 percent of its water capacity.

A6.18.2.1.2. Charge each cylinder in compliance with A3.3.2.6.

A6.18.2.1.3. No cylinder may be equipped with an eduction tube or a fusible plug.

A6.18.2.1.4. No cylinder may be equipped with any valve unless the valve is a type approved by the DOT.

A6.18.2.2. Package cylinders must in a fiberboard box (4G) in a way to protect each valve or other closing device from damage. Except as provided in A6.17.2.2, no more than four cylinders may be packed in a box. Each box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point. **(T-0)**.

A6.18.2.3. Cylinders may be packed in a strong wooden box (4C1, 4C2, 4D, or 4F) and packed in a way to protect each valve or other closing device from damage. No more than

twelve cylinders may be packed in one outer wooden box. Each wooden box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point. **(T-0)**.

**A6.19. Packaging for Class 2.3 Materials, Poisonous by Inhalation (Hazard Zone A)** is as follows:

A6.19.1. Handling Instructions. These items are extremely dangerous. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages.

A6.19.2. Packaging Requirements. Package Class 2.3, PG I materials with an Inhalation Hazard Zone A as follows:

A6.19.2.1. In DOT cylinders as identified in 49 CFR Part 178 Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.3.2. **(T-0)**.

A6.19.2.2. Pack in an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The outer 1A2 and 1H2 drums must withstand a hydrostatic test pressure of 100 kPa (15 psi). The capacity of the inner drum must not exceed 220 L (58 gallons). The inner drum must also meet the following requirements:

A6.19.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR Section 178.605) of 550 kPa (80 psig).

A6.19.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR Section 178.604) using an internal air pressure at 55 degrees C (130 degrees F) of at least twice the vapor pressure of the material to be packaged.

A6.19.2.2.3. Have screw-type closures that are:

A6.19.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A6.19.2.2.3.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A6.19.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi). **(T-0)**.

A6.19.2.2.4. Meet the following minimum thickness requirements:

A6.19.2.2.4.1. If the capacity of the inner drum is less than or equal to 120 L (32 gallons) the minimum thickness of the inner drum is: 1.3 mm (0.051 inches) for 1A1 and 1N1 drums, 3.9 mm (0.154 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm (0.0622 inches) for the plastic inner container and 0.96 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.19.2.2.4.2. If the capacity of the inner drum is greater than 120 L (32 gallons) the minimum thickness of the inner drum is: 1.7 mm (0.067 inches) for 1A1 and 1N1 drums, 4.7 mm (0.185 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm (0.0622 inches) for the plastic inner container and 1.08 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.19.2.2.5. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. **(T-0)**.

A6.19.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. Pack the inner packaging system within a leak-tight packaging of metal or plastic, then pack in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle may not exceed 4 L (1 gallon). An inner receptacle that has a closure, must have the closure held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. **(T-0)**. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. **(T-0)**. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons). **(T-0)**.

**A6.20. Package Nitric Oxide as follows:** See paragraph 2.8. for additional information.

A6.20.1. Handling Instructions. Nitric oxide is extremely dangerous and poisonous. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages.

A6.20.2. Packaging Requirements. Pack nitric oxide in DOT 3A1800, 3AA1800, 3AL1800, or 3E1800 cylinders, charged to a pressure of not more than 5,170 kPa (750 psi) at 21 degrees C (70 degrees F). Ensure cylinders are equipped with a valve of stainless steel and a valve seat of material that is not deteriorated by contact with nitric oxide or nitrogen dioxide. Cylinders or valves may not be equipped with safety devices (pressure relief) of any type. Ensure valve outlets are sealed by a solid threaded cap or plug and an inert gasketing material. Clean cylinders as identified in 49 CFR Paragraph 173.337(b).

A6.20.2.1. Pack cylinders, DOT 3E1800, in strong wooden boxes to protect valves from injury or accidental functioning under conditions incident to transportation.

**A6.21. Package Ethyl Methyl Ether** in packaging meeting the requirements of the PG I performance level as follows:

A6.21.1. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> glass, earthenware, plastic, metal or glass ampoules	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A6.21.2. Package in drums or jerricans as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2) or plastic (1H1 or 1H2) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A6.21.3. Package in the following plastic inner receptacle composite packages:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel, aluminum, fiber or plastic (6HA1, 6HB1, 6HG1, 6HH1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, 6HG2)

A6.21.4. Package in the following glass, porcelain, or stoneware inner receptacle composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<b>Drums:</b> steel, aluminum or fiber (6PA1, 6PB1, 6PG1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, 6PG2) <i>or</i> solid or expanded plastic packaging (6PH1 or 6PH2)

A6.21.5. DOT Cylinders. Any DOT specification cylinders as prescribed for any compressed gas, except 3HT cylinders and those for acetylene.

**A6.22. Package Chemical Under Pressure N.O.S.** as follows: Offer in cylinder filled for transportation in accordance with the requirements of DOT cylinders and UN pressure receptacles in Attachment 3 and paragraph A6.4. and A6.5. as applicable. Where multiple specifications apply to a cylinder, follow the most restrictive requirements.

A6.22.1 Filling limits. Fill cylinders so that at 50 °C (122 °F) the non-gaseous phase does not exceed 95% of their water capacity and they are not completely filled at 60 °C (140 °F). When filled, the internal pressure at 65 °C (149 °F) may not exceed the test pressure of the cylinder. Take the vapor pressures and volumetric expansion of all substances in the cylinders into account.

A6.22.2 Minimum service pressure. The minimum service pressure must be in accordance with the design specifications of 49 CFR Part 178 for the propellant. **(T-0)**. In any case the minimum test pressure must not be less than 291 psig (20 bar). **(T-0)**.

A6.22.3 Periodic inspection. The maximum requalification test period for cylinders transporting chemical under pressure N.O.S. is 5 years.

**A6.23. Fuel Cell Cartridges.**

A6.23.1. The weight of the fuel cells may not exceed 1 kg. Package fuel cell cartridges in drums, jerricans or boxes as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> removeable head steel (1A2), removeable head aluminum (1B2), plywood (1D), fiber (1G), plastic (1H2), removeable head other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), other metal (4N)

**A6.24. Fuel Cell Cartridges Contained in Equipment.**

A6.24.1. UN specification packaging is not required. Protect fuel cells installed in equipment against short circuit, and protect the entire system against inadvertent operation. Fuel cell systems may not charge batteries during transport.

**A6.25. Fuel Cell Packed With Equipment.**

A6.25.1. UN specification packaging is not required. Pack fuel cells with equipment in inner packagings or place them in the outer packaging with cushioning material or divider(s) in order to protect fuel cartridges from damage during transportation. The maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.

**A6.26. Metal hydride storage systems.**

A6.26.1. The following packing instruction is applicable to transportable UN Metal hydride storage systems (UN3468) with pressure receptacles not exceeding 150 liters (40 gallons) in water capacity and having a maximum developed pressure not exceeding 25 MPa. Metal hydride storage systems must be designed, constructed, initially inspected and tested in accordance with ISO 16111. **(T-0)**. Mark steel pressure receptacles or composite pressure receptacles with steel liners in accordance with 49 CFR Paragraph 173.301b(f) which specifies that a steel UN pressure receptacle bearing an “H” mark must be used for hydrogen bearing gases or other gases that may cause hydrogen embrittlement. **(T-0)**. Requalification intervals must be no more than every five years as specified in 49 CFR Section 180.207 in accordance with the requalification procedures prescribed in ISO 16111. **(T-0)**.

**A6.27. Package Flammable gas powered engines and machinery** as follows: The following general requirements apply:

A6.27.1. Compliance With Technical Orders. Use service technical manuals to prepare items for shipment.

A6.27.2. Engines which are drained and purged according to the responsible technical manual, and containing no other hazardous material, are nonhazardous for transportation. Comply with paragraph A3.1.16.4.

A6.27.3. Where an engine or machine could possibly be handled in other than an upright position, secure the engines or machinery in a strong, rigid outer packaging in an orientation to prevent accidental leakage and prevent any movement during transport which would change in orientation or cause them to be damaged.

A6.27.4. Liquefied petroleum gas or compressed gas powered engines or equipment must have the gaseous fuel completely emptied from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator. **(T-0)**. Ensure tanks are securely closed. Purging is not required.

A6.27.5. Fuel cell powered engines or equipment. Secure and protect the fuel cell in a manner to prevent damage to the fuel cell. Describe equipment (other than vehicles, engines or mechanical equipment) such as consumer electronic devices containing fuel cells (fuel cell cartridges) as "Fuel cell cartridges contained in equipment."

A6.27.6. Accessorial hazards. Ensure installed components, equipment, and accessorial hazards (e.g., fire extinguishers, jerricans, etc.) are in properly configured and approved holders designed for use with the unit. The following applies:

A6.27.6.1. Secure batteries upright in designed holders except non-spillable batteries meeting as nonhazardous, may be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, secure them away from terminals, and protect the terminals.

A6.27.6.2. When loaded in a freight container, remove acid or alkali batteries and package according to A12.4. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Non-spillable and non-hazardous gel-type batteries may remain in the equipment holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit.

A6.28. UN3537, Articles containing flammable gas, N.O.S. and UN3538, Articles containing non-flammable, non toxic gas, N.O.S. are authorized when classified per paragraph A4.2.3., maximum net quantity per package 150kg, when packaged, or unpackaged as follows:

A6.28.1. When packaged, packagings meeting Packing Group II performance are required.

A6.28.2. Pack articles to prevent movement and inadvertent operation during normal conditions of transport.

Inner packaging	Outer packaging
<p><b>Receptacles:</b> that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastic materials must be properly secured. Any leakage of the contents must not substantially impair the protective properties of the article or of the outer packaging. <b>(T-0).</b></p> <p>Receptacles containing gases within articles must meet the appropriate requirements for compressed gasses or be capable of providing an equivalent level of protection. <b>(T-0).</b></p> <p>Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport. <b>(T-0).</b></p>	<p><b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2), other metal (4N)</p> <p><b>or</b></p> <p><b>Jerricans:</b> removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2)</p>

#### A6.28.3. Robust articles.

A6.28.3.1. Robust articles may be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use; or,

A6.28.3.2. Robust articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained.



## Attachment 7

## CLASS 3--FLAMMABLE LIQUIDS

**A7.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A7.2. through A7.9. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A7.2. through A7.9. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with inner/receptacle packaging and outer container options as mandated per each packaging paragraph. **(T-0)**. Not all packaging paragraphs are inclusive and packaging is based on category of flammable liquid, cylinder type and quantity shipped. This attachment contains information concerning the packaging for Class 3 material (flammable liquids). See Attachment 3 for other details concerning Class 3 material.

**A7.2. Packaging for Class 3 Materials** is as follows:

A7.2.1. Package in combination packagings with outer drums, boxes, jerricans, or barrels as follows:

Inner packaging	Outer packaging
<p><b>Receptacles:</b> glass, earthenware, plastic, or metal</p> <p><b>Note:</b> For PG I material, pack inner packagings in a rigid and leakproof receptacle or intermediate packaging containing sufficient absorbent material to absorb the entire contents of all inner packagings before packing the inner packaging(s) in the outer package.</p> <p><b>Note:</b> Ensure inner packaging or receptacle closures of combination packages containing liquids are held securely, tightly and effectively in place by secondary means. See A20.3.</p>	<p><b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)</p> <p><b>or</b></p> <p><b>Jerricans:</b> removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2)</p> <p><b>or</b></p> <p><b>Barrel:</b> wooden (2C2)</p> <p><b>Note:</b> Wood barrels not authorized for PG I material.</p>

A7.2.2. Package in single packaging drums, jerricans, or barrels as follows:

Inner packaging	Outer packaging
Not required	<p><b>Drums:</b> steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), fiber (1G) with liner, or plastic (1H1 or 1H2)  <b>Note:</b> Fiber drum with liner only authorized for PG II or PG III material.</p> <p><i>or</i></p> <p><b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)</p> <p><i>or</i></p> <p><b>Barrel:</b> wooden (2C1)  <b>Note:</b> Wooden Barrels not authorized for PG I material.</p>

A7.2.3. Package in composite packagings with plastic inner receptacles as follows:

Inner receptacle	Outer packaging
Plastic	<p><b>Boxes:</b> steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)</p> <p><i>or</i></p> <p><b>Drum:</b> steel, aluminum, fiber, plastic or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1)  <b>Note:</b> Plywood drum (6HD1) only authorized for PG II or PG III.</p>

A7.2.4. Package in composite packagings with glass, porcelain, or stoneware inner receptacles as follows:

Inner receptacles	Outer packaging
<b>Receptacle:</b> glass, porcelain or stoneware	<b>Drum:</b> steel, aluminum, fiber, plywood drum (6PA1, 6PB1, 6PG1 or 6PD1) or wickerwork hamper (6PD2) <b>Note:</b> Plywood drum (6PD1) and wicker work hamper (6PD2) only authorized for PG II or PG III. <i>or</i> <b>Box:</b> steel (6PA2), aluminum (6PB2), wooden (6PC), fiberboard (6PG2), solid plastic (6PH1), or expanded plastic packaging (6PH2)

A7.2.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except acetylene (DOT 8, DOT 8AL) and DOT 3HT.

A7.2.6. DOT 5L Jerrican. Drain DOT 5L jerry cans to the maximum extent possible.

A7.2.7. MIL-D-23119 Drum. MIL-D-23119 500-gallon capacity collapsible fabric drums authorized under mobility operations conducted according to DTR 4500.9-R, Part III. Drain five hundred (500) gallon fabric drums shipped on other than mobility missions to the greatest extent possible.

A7.2.8. Bulk Fuel. Except as authorized in this manual, servicing trucks, trailers, semitrailers, or storage tanks containing bulk fuel, or any bulk hazardous material may not be transported by air. The following draining/purging requirements apply, as appropriate:

A7.2.8.1. Purge bulk tanks for all liquids with a flash point below 38 degrees C (100 degrees F), regardless of whether the technical manual only requires draining. If other hazardous materials are present, certify to the appropriate packaging paragraph. If no other hazards are present, comply with paragraph A3.1.16.4. to identify purged tanks.

A7.2.8.2. Drain, but need not purge, liquids with a flash point at or above 38 degrees C (100 degrees F), unless the technical manual specifically requires purging. If other hazardous materials are present, certify to the appropriate packaging paragraph.

A7.2.8.3. Transport bulk combustible liquids flash points above 60 degrees C (140 degrees F) in UN specification packaging (e.g., IBCs) meeting air eligibility requirements of paragraph A3.1.7.2. for PG III.

**A7.3. Package Refrigerating Machines** as follows: A refrigerating machine assembled for shipment and containing 7 kg (15 pounds) or less of flammable liquid for operation in a strong, tight receptacle is excepted from specification packaging, marking, and labeling except for the PSN of the flammable liquid.

**A7.4. Package Aircraft Hydraulic Power Unit Fuel Tank** as follows:

A7.4.1. Handling Instructions. In the event of a leak during transportation of hydrazine, crew members use their aircraft oxygen masks in a positive pressure mode.

A7.4.2. Packaging Requirements. Aircraft hydraulic power unit fuel tanks containing a mixture of anhydrous hydrazine and monomethyl hydrazine (M86 fuel) and designed for installation as complete units in aircraft are excepted from specification packaging requirements if the units comply with one of the following:

A7.4.2.1. Units consisting of an aluminum pressure vessel made from tubing and having welded heads. Primary containment of the fuel within this vessel consists of a welded aluminum bladder having a maximum internal volume of 46 L (12 gallons). The outer vessel has a minimum design gauge pressure of 1,275 kPa (185 psig) and a minimum burst gauge pressure of 2,755 kPa (400 psig). Leak-check each vessel during manufacture and before shipment and ensure the vessel is found leak proof. Securely pack the complete inner unit in noncombustible cushioning material, and in a strong outer tightly closed metal packaging that adequately protects all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.4.2.2. Units consisting of an aluminum pressure vessel. Primary containment of the fuel within this vessel consisting of a welded hermetically sealed fuel compartment with an elastomeric bladder having a maximum internal volume of 46 L (12 gallons). The pressure vessel requires a minimum design gauge pressure of 2,860 kPa (415 psig) and a minimum burst gauge pressure of 5,170 kPa (750 psig). Leak-check each vessel during manufacture and before shipment and ensure the vessel is found leak proof. Securely pack the complete inner unit in noncombustible cushioning material, and in a strong outer tightly closed metal packaging that adequately protects all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

**A7.5. Packaging for Class 3 Materials, Poisonous by Inhalation (Hazard Zone A or B).** Package Class 3 materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A7.5.1. Handling Instructions. These items are extremely dangerous. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages.

A7.5.2. DOT Cylinders. Package in DOT specification cylinders as identified in 49 CFR Part 178 Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.3.2. **(T-0)**.

A7.5.3. Pack in an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. **(T-0)**. Ensure the outer 1A2 drum has a minimum thickness of 1.35 mm (0.053 inches). Ensure the outer 1H2 drum has a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, or 1N1) may not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, non-reactive material. Ensure there is a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum. There must also be at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. **(T-0)**. The inner drum must also meet all of the following requirements:

A7.5.3.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR Section 178.605) of 100 kPa (15 psig) for outer drums and 300 kPa (45psig) for inner drums.

A7.5.3.2. Satisfactorily withstand a leak proof test (as outlined in 49 CFR Section 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A7.5.3.3. Have screw-type closures that meet all the following requirements:

A7.5.3.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A7.5.3.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A7.5.3.4. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A7.5.3.5. For Zone A materials, meet the following minimum inner drum thickness requirements:

A7.5.3.5.1. 1A1 and 1N1 drums- 1.3 mm (0.051 inch)

A7.5.3.5.2. 1B1 drums- 3.9 mm (0.154 inch)

A7.5.3.5.3. 1H1 drums- 3.16 mm (0.124inch)

A7.5.3.5.4. 6HA1 drums- the plastic inner container must be 1.58 mm (0.0622 inch) and the outer steel drum must be 0.96 mm (0.0378 inch) **(T-0)**.

A7.5.3.6. For Zone B materials, meet the following minimum inner drum thickness requirements:

A7.5.3.6.1. 1A1 and 1N1 drums- 0.69 mm (0.027 inch)

A7.5.3.6.2. 1B1 drums- 2.79 mm (0.110 inch)

A7.5.3.6.3. 1H1 drums- 1.14 mm (0.045inch)

A7.5.3.6.4. 6HA1 drums- the plastic inner container must be 1.58 mm (0.0622 inch) and the outer steel drum must be 0.70 mm (0.027 inch) **(T-0)**.

A7.5.4. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. Pack inner packaging system within a leak-tight packaging of metal or plastic, then pack in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), solid plastic box (4H2), or metal box other than steel or aluminum (4N). The capacity of the inner receptacle may not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a screw-type closure, which is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. **(T-0)**. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. **(T-0)**. The total amount of liquid that can be packed in the outer container may not exceed 16 L (4 gallons).

**A7.6. Package Polyester Resin Kits** as follows: Polyester resin and fiberglass repair kits consist of two components: a base material in Class 3, PG II or III, and an organic peroxide activator. Only organic peroxides of Type D, E, or F not requiring temperature controls are authorized. Assign PG II or III according to the criteria for Class 3, applied to the base material. Ensure each component is separately packed in an inner packaging. The components may be placed in the same outer packaging provided they will not react dangerous in the event of leakage. Secure closures on inner packagings containing liquids by secondary means. The total quantity of activator and base material may not exceed 5 kg (11 pounds) per package for a Packing Group II base material. The total quantity of activator and base material may not exceed 10 kg (22 pounds) per package for a Packing Group III base material. The total quantity of polyester resin kits per package is calculated on a one-to-one basis (e.g., 1 L equals 1 kg).

A7.6.1. Package organic peroxides in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Plastic tube packaging <i>or</i> Flexible tube packaging <b>Note:</b> Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	<b>Drums:</b> steel (1A2), aluminum (1B2), fiber (1G), plastic (1H2), or other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wooden (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N)

A7.6.2. Package flammable liquids in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacle:</b> glass or earthenware, plastic, metal or aluminum <b>Note:</b> PG II base material limited to 5 L (1.3 gallons) in metal or plastic inner packagings and 1 L (0.3 gallons) in glass inner packagings. PG III base material limited to 10 L (2.6 gallons) in metal or plastic inner packagings and 2.5 L (0.66 gallons) in glass inner packagings	<b>Drums:</b> steel (1A2), aluminum (1B2), fiber (1G), plastic (1H2), or other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wooden (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N)

**A7.7. Fuel Cell Cartridges.**

A7.7.1. Package fuel cell cartridges in drums, jerricans or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacle:</b> cartridge	<b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2) plywood (1D), fiber (1G) plastic (1H2) or removable head other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N)

**A7.8. Fuel Cell Cartridges Contained in Equipment.**

A7.8.1. UN specification packaging is not required. Protect fuel cells installed in equipment against short circuit, and protect the entire system against inadvertent operation. Fuel cell systems may not charge batteries during transport.

A7.8.2. Protect the terminals of the installed fuel cells to prevent short circuit by use of protective coverings, taping, etc.

**A7.9. Fuel Cell Packed With Equipment.**

A7.9.1. UN specification packaging is not required. Pack fuel cells packed with equipment in inner packaging or placed in the outer packaging with cushioning material or divider(s) in order to protect fuel cartridges from damage during transportation. The maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.

**A7.10. Package Chlorosilanes** as follows: Packaging meeting the PG I or PG II performance standards is required.

A7.10.1. Package in the following combination drums, or boxes:

Inner packaging	Outer packaging
<b>Receptacles:</b> Glass, or steel	<b>Drums:</b> steel (1A2), plywood (1D), fiber (1G), or plastic (1H2) <i>or</i> <b>Boxes:</b> steel (4A), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A7.10.2. Package in the following composite drums:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel drum (6HA1),

A7.10.3. Package in the following single drums, or jerricans:

Inner packaging	Outer packaging
<b>Not required</b>	<b>Drums:</b> steel (1A1) <i>or</i> <b>Jerricans:</b> steel (3A1)

A7.10.4. Package in cylinders as prescribed for any compressed gas, except those for acetylene (DOT 8, 8AL), 3HT, and aluminum cylinders.

**A7.11. Package Flammable Liquid powered engines, machinery and SE as follows:**

A7.11.1. Compliance With Technical Orders. Use the equipment service or technical manual to prepare item for shipment.

A7.11.2. Fuel Limitations. Completely drain engine-powered SE of fuel. Up to 500 ml (17 ounces) of fuel may be left in engine components and fuel lines provided all lines and fuel tanks are securely closed to prevent leakage of fuel. Check the serviceability, proper installation and security of the vent caps on diesel generators with vertical, mast-type fuel vents. Drain and purge when required by the applicable technical manual. The following exceptions/additional restrictions apply:

A7.11.2.1. Drain engine-powered SE with large fuel systems that the shipper determines cannot be drained to 500 ml (17 ounces) within the mechanical limits of the equipment to the extent no free standing liquid remains in the fuel tank, lines, or system.

A7.11.2.2. When transported under the authority of **Chapter 3** of this manual, wheeled-engine powered SE may contain up to one-half tank of fuel. Ship only the minimum quantity of fuel consistent with operational requirements. Ship the Hobart-86 all models with no more than one-quarter tank of fuel and load with filler neck facing forward. Ensure tanks are securely closed. Drain non-wheeled engine powered SE so that no more than 500 ml (17 ounces) of residual fuel is remaining.

A7.11.2.3. Completely drain single axle equipment loaded with the tongue resting on the aircraft floor.

A7.11.2.4. Drain engines that are damaged or inoperable and purging cannot be accomplished, or proper purging facilities are unavailable to the maximum extent possible and install plugs, caps, and covers over all openings as required by technical directives.

A7.11.2.5. Engines which are drained and purged according to the responsible technical manual, and containing no other hazardous material, are nonhazardous for transportation. Comply with paragraph A3.1.16.4.

A7.11.2.6. Where an engine or machine could possibly be handled in other than an upright position, secure the engines or machinery in a strong, rigid outer packaging in an orientation to prevent accidental leakage and prevent any movement during transport which would change in orientation or cause them to be damaged.



A7.11.2.7. Ship the Aerial Bulk Fuel Delivery System (ABFDS) consisting of 3000 gallon bladders under the following conditions:

A7.11.2.7.1. Completely drain the bulk fuel bladders. Due to bladder construction there will be residual fuel remaining. Ensure bladders are drained as much as possible.

A7.11.2.7.2. Completely drain the pump module. No more than 500 ml (17 ounces) of fuel may be left in engine components.

A7.11.2.7.3. Securely close all vents and valves to prevent residual fuel leaks.

A7.11.2.7.4. When prepared in this manner, ABFDS may be stacked for shipment.

**Note:** When shipping AFBDS components separately such as the 3,000 gallon air transportable fuel bladders as stipulated in paragraph A7.11.2.7.1., refer to bulk fuel shipping container procedures identified in A7.2.9.2. For the AFBDS engine and pumping module without the 3,000 gallon fuel bladder, refer to paragraph A3.3.3.4. for shipment instructions.

A7.11.2.8. When loaded in a freight container, drain fuel tanks. Purge the fuel tank and system if required by the item's technical directive, or if the flash point of the fuel is less than 38 degrees C (100 degrees F). In the absence of specific draining and purging procedures:

A7.11.2.8.1. Completely drain all fuel.

A7.11.2.8.2. Run engine until it stalls.

A7.11.2.8.3. Allow fuel tanks and lines to remain open for 24 hours.

A7.11.2.8.4. Installed batteries must be non-spillable or non-regulated. **(T-0)**.

A7.11.2.9. When unit is susceptible to fuel spills or leakage (see paragraph A3.3.3.6.), unit must be drained and capped. **(T-0)**.

A7.11.2.10. Fuel cell powered engines or equipment. Secure and protect the fuel cell in a manner to prevent damage to the fuel cell. Describe equipment (other than vehicles, engines or mechanical equipment) such as consumer electronic devices containing fuel cells (fuel cell cartridges) as "Fuel cell cartridges contained in equipment."

A7.11.2.11. Engines and generators designed as part of, and integrally mounted to, or contained on a vehicle, trailer, or within a container or transporter that are required to operate during aircraft onload and offload to articulate, self-cool, or otherwise operate equipment necessary on/off loading, may be fueled no more than one-half full. Comply with paragraph A3.3.3.4 when determining actual fuel level requirements to meet operational needs.

A7.11.2.12. Lithium batteries. Securely fasten lithium batteries contained in vehicles, engines, or mechanical equipment in the battery holder of the vehicle, engine, or mechanical equipment, and protect in such a manner as to prevent damage and short circuits (e.g., by the use of non-conductive caps that cover the terminals entirely). Ensure lithium battery are of a type that has successfully passed each test in the UN Manual of Tests and Criteria. Prototype or low production lithium batteries may be approved by the Associate Administrator of the DOT.

A7.11.3. Accessorial hazards. Installed components, equipment, and accessorial hazards (e.g., fire extinguishers, jerricans, etc.) are authorized in properly configured and approved holders designed for use with the unit. The following applies:

A7.11.3.1. Secure batteries upright in designed holders except non-spillable batteries as nonhazardous, which may be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, secure away from terminals, and protect the terminals.

A7.11.3.2. When loaded in a freight container, remove acid or alkali batteries and package according to A12.4. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Non-spillable and non-hazardous gel-type batteries may remain in the equipment holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit.

**A7.12. UN3540, Articles containing flammable liquid, N.O.S.** are authorized when classified per paragraph A4.2.3., maximum net quantity per package 60 L, when packaged or unpackaged as follows:

A7.12.1. When packaged, packagings meeting Packing Group II performance are required.

A7.12.1.1. Pack articles to prevent movement and inadvertent operation during normal conditions of transport.

A7.12.1.2. Pack inner receptacles within their outer packaging with closures correctly oriented.

Inner packaging	Outer packaging
<p><b>Receptacles:</b> constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.</p> <p>Where there is no receptacle within the article, the article must fully enclose the dangerous goods and prevent their release under normal conditions of transport. <b>(T-0)</b>.</p>	<p><b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2), other metal (4N)</p> <p><b>or</b></p> <p><b>Jerricans:</b> removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2)</p>

A7.12.2. Robust articles.

A7.12.2.1. Robust articles may be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use; or,

A7.12.2.2. Robust articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained.

## Attachment 8

**CLASS 4--FLAMMABLE SOLIDS, SPONTANEOUSLY COMBUSTIBLE MATERIALS, AND DANGEROUS WHEN WET MATERIALS**

**A8.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A8.2. through A8.21. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A8.2. through A8.21. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with the inner/receptacle and outer container options as mandated per each packaging paragraph. **(T-0)**. Not all packaging paragraphs are inclusive and packaging container selection is based on the type of flammable solid type and quantity shipped. This attachment contains information concerning the packaging and general handling instructions for Class 4.1 (flammable solids), Class 4.2 (spontaneously combustible material), and Class 4.3 (dangerous when wet material). See Attachment 3 for other details concerning Class 4 material.

**A8.2. Packaging for Class 4 Liquids** is as follows:

A8.2.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<p><b>Receptacles:</b> glass, earthenware, plastic, metal, or glass ampoules  <b>Note:</b> For PG I material inner packagings packed in a rigid and leakproof receptacle or intermediate packaging containing sufficient absorbent material to absorb the entire contents of all inner packagings before packing the inner packaging(s) in the outer package.  <b>Note:</b> Ensure inner packaging or receptacle closures of combination packages containing liquids are held securely, tightly and effectively in place by secondary means. See A20.3.</p>	<p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or other metal (1N1 or 1N2)  <b>or</b>  <b>Barrel:</b> wood (2C2)  <b>Note:</b> Not authorized for PG I material.  <b>or</b>  <b>Jerrican:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)  <b>or</b>  <b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N)</p>

A8.2.2. Package in single packaging drums, jerricans, or barrels as follows:

Inner packaging	Outer packaging
Not required	<p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), fiber (1G) with liner, plastic (1H1 or 1H2), or metal other than steel or aluminum (1N1 or 1N2)</p> <p><b>Note:</b> Fiber drum (1G) not authorized for PG I materials.</p> <p><i>or</i></p> <p><b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)</p> <p><i>or</i></p> <p><b>Barrel:</b> wood (2C1)</p> <p><b>Note:</b> Wooden barrel (2C1) not authorized for PG I materials.</p>

A8.2.3. Package in composite packagings with plastic inner receptacles as follows:

Inner receptacle	Outer packaging
plastic	<p><b>Drum:</b> steel (6HA1), aluminum (6HB1), plywood (6HD1), fiber (6HG1), or plastic drum (6HH1)</p> <p><b>Note:</b> Plywood drum (6HD1) not authorized for PG I materials</p> <p><i>or</i></p> <p><b>Box:</b> steel (6HA2), aluminum (6HB2), wooden (6HC), plywood (6HD2), or fiberboard (6HG2)</p>

A8.2.4. Package in composite packagings with glass, porcelain or stoneware inner receptacles as follows:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	<p><b>Drum:</b> steel (6PA1), aluminum (6PB1), plywood (6PD1), wickerwork hamper (6PD2), or fiber (6PG1)</p> <p><b>Note:</b> Plywood drum or wickerwork hamper (6PD1 or 6PD2) not authorized for PG I material.</p> <p><i>or</i></p> <p><b>Box:</b> steel (6PA2), aluminum (6PB2), wooden (6PC), or fiberboard (6PG2) solid or expanded plastic packaging (6PH1 or 6PH2)</p>

A8.2.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except acetylene (DOT8, 8AL) and DOT 3HT.

**A8.3. Packaging for Class 4 Solids** is as follows: See also A3.3.4.2.

A8.3.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> glass or earthenware, plastic, metal or glass ampoules	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or other metal (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wood (2C2) <i>or</i> <b>Jerrican:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), or other metal (4N)

A8.3.2. Package in single packaging drums, jerricans, or barrels as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2) metal other than steel or aluminum (1N1 or 1N2) <b>Note:</b> Plywood (1D) not authorized for PG I material. <i>or</i> <b>Barrel:</b> wood (2C1 or 2C2) <b>Note:</b> Wooden barrels 2C1 or 2C2 not authorized for PG I material. <i>or</i> <b>Jerrican:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), steel (4A) with liner, aluminum (4B), aluminum (4B) with liner, natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) plastic (4H1 or 4H2) or metal other than steel or other metal (4N) <b>Note:</b> Steel boxes(4A) and aluminum boxes (4B) require liners for PG I material. Natural wood (4C1) ), plywood (4D), reconstituted wood (4F), or fiberboard (4G) boxes not authorized for PG I material

	<i>or</i> <b>Bags:</b> woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) <b>Note:</b> Bags not authorized for PG I material.
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A8.3.3. Package in composite packagings with plastic inner receptacles as follows:

Inner receptacle	Outer packaging
Plastic	<b>Drum:</b> steel (6HA1), aluminum (6HB1), plywood (6HD1), fiber (6HG1), or plastic (6HH1) drum <i>or</i> <b>Box:</b> steel (6HA2), aluminum (6HB2), wooden (6HC), plywood (6HD2), or fiberboard (6HG2) <b>Note:</b> Plastic receptacles in outer boxes are not authorized for PG I material.

A8.3.4. Package in composite packagings with glass, porcelain or stoneware inner receptacles as follows:

Inner receptacle	Outer packaging
Glass, porcelain or stoneware	<b>Drum:</b> steel (6PA1), aluminum (6PB1), plywood (6PD1), or fiber (6PG1) <i>or</i> <b>Box:</b> steel (6PA2), aluminum (6PB2), wooden (6PC), or fiberboard (6PG2) <i>or</i> expanded or solid plastic packaging (6PH1 or 6PH2) <b>Note:</b> Expanded or solid plastic packagings are not authorized for PG I material.

A8.3.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except DOT 8, 8AL, and DOT 3HT.

**A8.4. Class 4 Materials requiring CAA.** Prepare Class 4 materials referenced in Table A4.1. to this paragraph, according to a competent authority approval (CAA). Packaging must be in compliance with the CAA. (T-0). See paragraph 2.5. for more information on CAAs.

**A8.5. Package Pyrophoric Liquid Materials (Class 4.2)** as follows: See also A3.3.4.2.

A8.5.1. Steel or Nickel Cylinders. Specification steel or nickel cylinders prescribed for any compressed gas except acetylene having a minimum design pressure of 1206 kPa (175 psig); for UN3194 inorganic pyrophoric liquids DOT 3AL cylinders constructed of aluminum alloy 6061-T6 with a minimum marked service pressure of 1,800 psig and a maximum water capacity of 49 liters (13 gal) may be used. The following applies:

- A8.5.1.1. Ensure cylinders with valves are equipped with steel valve protection caps or collars, or
- A8.5.1.2. Pack in wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or plastic box (4H1 or 4H2). Secure cylinders to prevent movement in the box and when offered for transportation, load so that the pressure relief devices remain in the vapor space of the cylinder.
- A8.5.2. Steel boxes (4A), aluminum boxes (4B), wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fiberboard boxes (4G), or metal boxes, other than steel or aluminum (4N); steel drums (1A1 or 1A2), aluminum drums (1B1 or 1B2), plywood drums (1D), fiber drums (1G); or metal drums, other than steel or aluminum (1N1 or 1N2); or steel jerricans (3A1 or 3A2), or aluminum jerricans (3B1 or 3B2); with not more than four strong, tight metal cans with inner receptacles of glass or metal. Inner receptacles may not be over 1 L (0.3 gallons) capacity each. Inner receptacles require a positive screw cap closure with gasket. Cushion inner packagings on all sides with dry, incombustible absorbent material in a quantity sufficient to absorb the entire contents. Close the strong, tight metal cans by positive means, not by friction.
- A8.5.3. Steel drums (1A1 or 1A2), aluminum drums (1B1 or 1B2), fiber drums (1G), or metal drums, other than steel or aluminum (1N1 or 1N2); or steel jerricans (3A1 or 3A2), or aluminum jerricans (3B1 or 3B2); or steel boxes (4A), aluminum boxes (4B) or metal boxes, other than steel or aluminum (4N) not exceeding 220 L (58 gallons) capacity each with inner metal cans not over 4 L (1 gallon) capacity each, closed by positive means, not by friction.
- A8.5.4 Combination packagings consisting of the following:
- A8.5.4.1. Inner packaging. A 10 liter or 20 liter UN1A1 drum fabricated from stainless steel which has been certified to PG I having a minimum wall thickness of 1.9 mm; 4 each National Pipe Thread (NPT) or Vacuum Coupling Radiation (VCR) openings, each with a diameter of 6.3 mm; and, be fitted on the upper head with a center opening with a maximum diameter of 68.3 mm and the opening sealed with a threaded closure fabricated from 316 stainless steel. No more than two (2) inner drums may be placed inside the outer drum.
- A8.5.4.2. Outer packaging. A UN1A2 drum certified to the PG I performance level and a capacity not to exceed 208 L (55 gal). The drum must have a minimum wall thickness of 1.0 mm and the top head must be closed with a steel closing ring with a minimum thickness of 2.4 mm. **(T-0)**. No more than two (2) inner drums described in paragraph A8.5.4.1. may be placed inside the outer drum.



**A8.6. Package Diphenyloxide-4, 4-Disulphohydrazide; N, N Dinitroso-N, N Dimethyl Teraphthlamide (not more than 72 percent as a paste)** as follows: Temperature controls are not required. Maximum gross weight may not exceed 110 pounds (50 kg). Package in drums as follows:

Inner packaging	Outer packaging
Not required	<b>Drum:</b> fiber (1G) with a plastic liner or internal coating; or sift-proof fiber (1G)

**A8.7. Package 1,1 Azodi-(Hexahydrobenzonitrile); Benzene Sulfohydrazide; Benzene-1,3-Disulfohydrazide (not more than 52 percent as a paste); N,N-Dinitrosopentamethylenetetramine (not more than 82 percent with phlegmatizer)** as follows: Temperature controls are not required.

A8.7.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	<b>Drum:</b> fiber (1G) with a plastic liner or internal coating; or sift-proof fiber (1G) <b>Note:</b> Maximum gross weight is 50 kg (110 pounds).

A8.7.2. Package in boxes as follows:

Inner packaging	Outer packaging
<b>Receptacle:</b> single plastic bag	<b>Box:</b> fiberboard (4G) <b>Note:</b> Maximum gross weight is 50 kg (110 pounds).

A8.7.3. Package in boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> plastic boxes, plastic bottles, or jars <b>Note:</b> Maximum weight of inner packaging is 5 kg (11 pounds).	<b>Box:</b> fiberboard (4G) <b>Note:</b> Maximum gross weight is 40 kg (88 pounds).

**A8.8. Package 3-Chloro-4-Diethylaminobenzenediazonium Zinc Chloride; 4-Dipropylaminobenzenediazonium Zinc Chloride; Sodium 2-Diazo-1Naphthol-4-Sulphonate; Sodium 2-Diazo-1-Naphthol-5-Sulphonate** as follows: Temperature controls are not required.

A8.8.1. Package in drums as follows:

Inner packaging	Outer packaging
Not required	<b>Drum:</b> fiber (1G) with a plastic liner or internal coating <b>Note:</b> Maximum gross weight is 50 kg (110 pounds).

A8.8.2. Package in drums as follows:

Inner packaging	Outer packaging
<b>Receptacle:</b> plastic bag	<b>Drums:</b> steel removable head (1A2) or an aluminum removable head (1B2) <b>Note:</b> Maximum gross weight is 55 kg (121 pounds).

**A8.9. Package 2-Diazo-1-Naphthol-4-Sulphochloride and 2-Diazo-1-Naphthol-5-Sulphochloride** in drums as follows: Temperature controls are not required.

Inner packaging	Outer packaging
Not required	<b>Drum:</b> fiber (1G) with plastic liner or internal coating <b>Note:</b> Maximum gross weight is 50 kg (110 pounds).

**A8.10. Package Barium Azide, Wetted (with not less than 50 percent water by mass)** as follows: Pack barium azide, wetted (with not less than 50 percent water by mass) in the following packaging. Inner glass receptacles may not be over 0.5 kg (1.1 pounds) capacity each. Inner receptacles require rubber stoppers wire-tied for securement. If transportation is to take place when freezing weather is possible, ensure a suitable antifreeze solution is used to prevent freezing. Package in boxes or drums as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> glass	<b>Boxes:</b> wood (4C1, 4C2, 4D, or 4F) <i>or</i> <b>Drum:</b> fiber (1G)

**A8.11. Package Calcium Pyrophoric; Magnesium Diphenyl; Metal Catalyst, Dry; Pyrophoric Metals, N.O.S. and Pyrophoric Solids, N.O.S.** as follows:

A8.11.1. Inner receptacles with positive (not friction) means of closure. Inner metal receptacles may not contain more than 15 kg (33 pounds) each. Package in boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> metal	<b>Boxes:</b> wood (4C1, 4C2, 4D, or 4F)

A8.11.2. Inner receptacles with positive (not friction) means of closure. Inner metal receptacles may not contain more than 7.5 kg (17 pounds) each. Package in boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> metal	<b>Box:</b> fiberboard (4G)

A8.11.3. Inner receptacles with positive (not friction) means of closure. Inner metal receptacles may not contain more than 15 kg (33 pounds) each. Package in drums as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> metal	<b>Drums:</b> fiber (1G) or plywood (1D)

A8.11.4. Package in drums as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> metal, which have a positive (not friction) means of closure (not required for metal drums) <b>Note:</b> Inner receptacles may not contain more than 15 kg (33 pounds) each.	<b>Drum:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), or other metal (1N1 or 1N2) <b>Note:</b> For metal drums, gross weight may not exceed 150 kg (331 pounds) each.

A8.11.5. Package in boxes as follows:

Inner packaging	Outer packaging
Not required	<b>Boxes:</b> steel (4A), aluminum (4B), or other metal (4N) <b>Note:</b> May not contain more than 15 kg (33 pounds) each.

**A8.12. Package Films, Nitrocellulose Base (gelatin coated [except scrap])** as follows: Each reel in a tightly closed inner packaging with its cover securely held in place with adhesive tape or adhesive paper. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> metal can, polypropylene canister, or strong fiberboard	<b>Drums:</b> steel (1A2), aluminum (1B2), or plywood (1D), fiber (1G), or other metal (4A2) <b>Note:</b> Fiber drums (1G) may only be used for film not exceeding 600 m (1969 feet). <i>or</i> <b>Jerrican:</b> steel (3A2), or aluminum (3B2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or other metal (4N) <b>Note:</b> Fiberboard (4G) may only be used for film not exceeding 600 m (1969 feet).

**A8.13. Package Fusees (railway or highway)** as follows:

A8.13.1. General Requirements. Fusees that are equipped with spikes having reinforced ends to prevent penetration of the spikes through the outer packaging. Also, ensure the packages are capable of passing at least one drop test with the spike in a downward position.

A8.13.2. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A2), plywood (1D), or fiber (1G) <i>or</i> <b>Jerrican:</b> steel (3A2) <i>or</i> <b>Boxes:</b> wood (4C1, 4C2), plywood (4D), reconstituted (4F), fiberboard (4G)

**A8.14. Package Matches, Fusee; Matches, Safety (book, card, or strike-on-box); Matches Strike-Anywhere, and Matches, Wax Vesta** as follows: Matches must be of a type that will not ignite spontaneously when subjected to a temperature of 93.3 degrees C (200 degrees F) for 8 consecutive hours in a properly conducted laboratory test. **(T-0)**.

A8.14.1. Do not pack matches, strike-anywhere, in the same outer packaging with any other article except safety matches or wax vesta matches. Package safety matches or wax vesta matches in separate inside containers. Each inside packaging may not contain over 700 matches. Gross weight may not be over 30 kg (66 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.14.2. Do not pack fusee matches, in the same outer packaging with any other article except safety matches or wax vesta matches. Package safety matches or wax vesta matches in separate inside containers. Each inside packaging may not contain over 700 matches. Gross weight may not be over 30 kg (66 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.14.3. Tightly pack safety matches (strike-on-box, book, and card) or wax vesta matches in securely closed inside containers then packed in an outer packaging. Safety matches may be packed in the same outer packaging with non hazardous materials.

A8.14.4. Package in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> securely closed chipboard, fiberboard, wood, or metal	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G) or other metal (1N1 or 1N2) <i>or</i> <b>Jerrican:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wood (4C1, 4C2), plywood (4D), reconstituted (4F), fiberboard (4G) or other metal (4N)

**A8.15. UN3541, Articles containing flammable solid N.O.S.** are authorized when classified per paragraph A4.2.3., maximum net quantity per package 50 kg, when packaged, or unpackaged as follows:

A8.15.1. When packaged, packagings meeting Packing Group II performance is required.

A8.15.1.1. Pack articles to prevent movement and inadvertent operation during normal conditions of transport.

A8.15.1.2. Where there is no receptacle within the article, ensure the article fully encloses the dangerous goods and prevent their release under normal conditions of transport.

Inner packaging	Outer packaging
<p><b>Receptacles:</b> constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.</p>	<p><b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2), other metal (4N)</p> <p><b>or</b></p> <p><b>Jerricans:</b> removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2)</p>

A8.15.2. Robust articles.

A8.15.2.1. Robust articles may be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use; or,

A8.15.2.2. Robust articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained.

**A8.16. Package Phosphorus, White or Yellow, Dry, or Under Water, or in Solution** as follows:

A8.16.1. Phosphorus White or Yellow. Phosphorus white or yellow, when dry, must be cast solid and shipped in containers as follows:

A8.16.1.1. Steel, aluminum, or other metal drums (1A2, 1B2, 1N2) not over a 115 L (30 gallons) capacity each.

A8.16.1.2. In projectiles or bombs without bursting elements. **(T-0)**.

A8.16.2. Phosphorus White or Yellow in Water or Solution. Pack phosphorus, white or yellow, when in water or solution, in:

A8.16.2.1. Steel, aluminum, or other metal boxes (4A, 4B or 4N), or wooden boxes (4C1, 4C2, 4D, or 4F) with inside soldered or hermetically-sealed metal cans placed inside another soldered or hermetically-sealed metal can.

A8.16.2.2. Steel, aluminum, or other metal boxes (4A, 4B or 4N), or wooden boxes (4C1, 4C2, 4D, or 4F) with inside water-tight metal cans containing not over .5 kg (1 pound) of phosphorus with screw-top closures.

A8.16.2.3. Steel, aluminum, or other metal drums (1A1, 1B1, or 1N1) not over 250 L (66 gallons) capacity each.

A8.16.2.4. Steel, aluminum, or other metal drums (1A2, 1B2, or 1N2) not over 115 L (30 gallons) capacity each.

A8.16.3. White Phosphorus Igniters. Pack white phosphorus igniters one each in a hermetically-sealed (soldered) or watertight metal can, sealed airtight and positively fastened. Pack no more than 25 metal cans in a wooden box (4C1, 4C2, 4D, or 4F).

**A8.17. Smokeless Powder for Small Arms (100 pounds or less)** which has been reclassified to Class 4.1 in accordance with 49CFR Sections 173.56, 173.58, and 173.171 may be transported with the limitations and packaged as follows: The PSN "SMOKELESS POWDER FOR SMALL ARMS" is only valid for domestic movement. For international shipment use the PSN "POWDER, SMOKELESS" and package the material as required by the packaging paragraph for powder, smokeless. Only combination packaging with inner packagings not exceeding 3.6 kg (8 pounds) net mass packed in outer packaging of UN 4G fiberboard boxes meeting the Packing Group I standards are authorized. Arrange and protect inner packagings to prevent simultaneous ignition of the contents. The complete package must be of the same type that has been examined as required in 49 CFR Section 173.56 and meet A3.3.1. **(T-0)**. Not more than 45.4 kg (100 pounds) is allowed on the aircraft.

**A8.18. Package Batteries and Cells Containing Sodium** as follows: Ensure batteries and cells do not contain any hazardous material other than sodium, sulfur, or sodium compounds (e.g., sodium polysulfides, sodium tetrachloroaluminate, etc.). Do not offer batteries or cells for transportation at a temperature at which there is any liquid elemental sodium present in the battery or cell. Ensure the external battery temperature does not exceed 55 degrees C (130 degrees F). Ensure batteries are protected from external short circuit.

A8.18.1. Batteries must consist of cells secured within and fully enclosed by a metal casing. **(T-0)**. Ship unpackaged or in nonspecification protective packagings. UN specification containers are not required.

A8.18.2. Cells must consist of hermetically sealed metal casings that completely enclose the hazardous material. **(T-0)**. Pack cells with sufficient cushioning material to secure against movement; and to prevent contact between cells and between cells and the internal surfaces of the outer packaging. Pack cells in packaging that meets the PG II performance level. Package in drums or boxes as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), plastic (1H2), or other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N)

**A8.19. Package Polyester Resin Kits** as follows: Polyester resin and fiberglass repair kits consist of two components: a base material in Class 4.1, PG II or III, and an organic peroxide activator. Only organic peroxides of Type D, E, or F not requiring temperature controls are authorized. Assign PG II or III according to the criteria for Class 4.1, applied to the base material. Ensure each component is separately packed in an inner packaging. The components may be placed in the same outer packaging provided they will not react dangerous in the event of leakage. Secure closures on inner packagings containing liquids by secondary means. The total quantity of activator and base material may not exceed 5 kg (11 pounds) per package for a Packing Group II base material. The total quantity of activator and base material may not exceed 10 kg (22 pounds) per package for a Packing Group III base material. The total quantity of polyester resin kits per package is calculated on a one-to-one basis (e.g., 1 L equals 1 kg).

A8.19.1. Package organic peroxides in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
Plastic tube packaging <i>or</i> Flexible tube packaging <b>Note:</b> Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	<b>Drums:</b> steel (1A2), aluminum (1B2), fiber (1G), plastic (1H2), or other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wooden (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H2), or other metal (4N)

A8.19.2. Package flammable solid in drums, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacle:</b> glass or earthenware, plastic, metal or aluminum <b>Note:</b> PG II base material limited to 5 kg (11 pounds) in metal or plastic inner packagings and 1 kg (2.2 pounds) in glass inner	<b>Drums:</b> steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), plastic (1H2), or other metal (1N2) <i>or</i>

packagings. PG III base material limited to 10 kg (22 pounds) in metal or plastic inner packagings and 2.5 kg (5.5 pounds) in glass inner packagings	<b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wooden (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N)
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#### A8.20. Fuel Cell Cartridges.

A8.20.1. The weight of the fuel cells may not exceed 1 kg.

Inner packaging	Outer packaging
Not required	<b>Drums:</b> plywood (1D), fiberboard (1G), plastic (1H2) <i>or</i> <b>Jerricans:</b> plastic (3H2) <i>or</i> <b>Boxes:</b> wood (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H2)

#### A8.21. Fuel Cells Contained in Equipment

A8.21.1. UN specification packaging is not required. Pack fuel cells in strong outer container. Protect installed fuel cells in equipment against short circuit, and protect the entire system against inadvertent operation. Fuel cell systems may not charge batteries during transport.

A8.21.2. Protect the terminals of the installed fuel cells to prevent short circuit by use of protective coverings, taping, etc.

#### A8.22. Fuel Cells Packed With Equipment

A8.22.1. UN specification packaging is not required. Pack fuel cells in strong outer container in inner packagings or placed in the outer packaging with cushioning material or divider(s) in order to protect against damage that may be caused by the movement or placement of contents within the outer packaging. The maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.



## Attachment 9

**CLASS 5--OXIDIZING MATERIALS AND ORGANIC PEROXIDES**

**A9.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A9.3. through A9.10. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A9.3. through A9.10. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with the inner/receptacle and outer container selections as specified in each packaging paragraph. **(T-0).** Not all packaging paragraphs are inclusive and packaging selection is based on the type of oxidizing materials and organic peroxides shipped. This attachment contains information concerning the packaging and general handling instructions for Class 5.1 (oxidizing material) and Class 5.2 (organic peroxides). See Attachment 3 for other details concerning Class 5 material.

**A9.2. Organic Peroxides Table.** The Organic Peroxides Table (refer to 49 CFR Section 173.225 Table 1 to paragraph (c)) specifies, by technical name, the organic peroxides authorized for transportation. Ensure an organic peroxide identified by technical name in the organic peroxide table complies with all of the applicable provisions of the table. An organic peroxide not identified in the organic peroxide table by technical name or a new formulation of identified organic peroxides requires written approval from the DOT according to 49 CFR Section 173.128 before transportation.

**A9.3. Package Class 5.2 Organic Peroxides** as follows: Containers meeting PG II performance tests and UN performance markings are required. Corrosion resistant metal packagings or with protection against corrosion for substances with a Class 8 subsidiary risk are required. Packagings for UN3103 and UN3105 are limited to a net quantity of 1 L per inner packaging and 10 L per outer packaging. UN3107 and UN3109 are limited to a net quantity of 2.5 L per inner packaging and 25 L per outer packaging. Packagings for UN3104 and UN3106 are limited to a net quantity of 1 kg per inner packaging and 10 kg per outer packaging. UN3108 and UN3110 are limited to a net quantity of 2.5 kg per inner packaging and 25 kg per outer packaging.

A9.3.1. Package in drums, jerricans, or boxes as follows:

<b>Inner packaging</b>	<b>Outer packaging</b>
<b>Receptacles:</b> plastic	<b>Drums:</b> plywood (1D), fiber (1G) or plastic drum (1H1 or 1H2) <i>or</i> <b>Jerricans:</b> plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> natural wood (4C1 or 4C2), plywood (4D), or reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2) or other metal (4N)

**A9.4. Package Samples of Organic Peroxides** as follows: Samples of new organic peroxides or new formulations of identified organic peroxides for which complete test data is not available,

and which are being transported for testing and evaluation, may be transported and assigned a PSN for organic peroxide, Type C. Data available to the person offering the material for transportation must indicate that the sample would pose a threat no greater than that of an organic peroxide, Type B, and that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation. (T-0). Packaging requirements are as follows:

A9.4.1. Package the sample following the requirements of UN3103 or UN3104 as appropriate and the inner packages are limited to 0.5 L or 0.5 kg as appropriate.

A9.4.2. Use the PSN organic peroxide type C, liquid or organic peroxide type C, as applicable.

**A9.5. Package Class 5.1 Liquids** as follows: See also A3.3.5.

A9.5.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> Glass or earthenware, plastic or metal <b>Note:</b> For PG I material inner packagings packed in a rigid and leakproof receptacle or intermediate packaging containing sufficient absorbent material to absorb the entire contents of all inner packagings before packing the inner packaging(s) in the outer package. <b>Note:</b> Ensure inner packaging or receptacle closures of combination packages containing liquids are held securely, tightly and effectively in place by secondary means. See A20.3.	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or other metal (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wood (2C2) <b>Note:</b> Wood barrel (2C2) not authorized for PG I material. <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2) aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), or reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N)

A9.5.2. Package in single packagings of drums, barrels, or jerricans as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), or plastic drum (1H1 or 1H2) <i>or</i> <b>Barrel:</b> wood (2C1) <b>Note:</b> Wood barrel (2C1) not authorized for PG I material. <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A9.5.3. Package in the following composite packagings with plastic inner receptacles:

Inner receptacle	Outer packaging
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Plastic	<b>Drums:</b> steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH, or 6HD1) <b>Note:</b> Plywood drums not authorized for PG I material. <i>or</i> <b>Box:</b> steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)
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A9.5.4. Package in the following composite packagings with glass porcelain or stoneware inner receptacles:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<b>Drums:</b> steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) <i>or</i> solid or expanded plastic packaging (6PH1 or 6PH2) <i>or</i> plywood drum or wickerwork hamper (6PD1 or 6PD2) <b>Note:</b> Plywood drum or wickerwork hamper not authorized for PG I material.

A9.5.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except acetylene (DOT 8, 8AL) and DOT 3HT.

**A9.6. Package Class 5.1 Solids** as follows: See A3.3.5. for additional packaging requirements.

A9.6.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> Glass or earthenware, plastic or metal	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or metal other than steel or aluminum (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wood (2C2) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2) or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), or reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), or other metal (4N)

A9.6.2. Package in single packagings of drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2) or metal other than steel or aluminum (1N1 or 1N2) <b>Note:</b> Plywood drum not authorized for PG I material. <i>or</i> <b>Barrel:</b> wood (2C1 or 2C2) <b>Note:</b> Wood barrels not authorized for PG I material. <i>or</i> <b>Jerrican:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), steel with liner (4A), aluminum (4B), aluminum with liner (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N) <b>Note:</b> Steel (4A), aluminum (4B), plywood (4D), reconstituted wood (4F), natural wood (4C1) or fiberboard (4G) boxes not authorized for PG I material. <i>or</i> <b>Bags:</b> woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) <b>Note:</b> Bags not authorized for PG I material.

A9.6.3. Package in the following composite packagings with plastic inner receptacles:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) <i>or</i> <b>Boxes:</b> steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A9.6.4. Package in the following composite packagings with glass porcelain or stoneware inner receptacles:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<b>Drums:</b> steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) <i>or</i> expanded or solid plastic (6PH1 or 6PH2)

A9.6.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except acetylene (DOT 8, 8AL) and DOT 3HT.

**A9.7. Package Iodine Pentafluoride** as follows: Package in any DOT specification cylinder, except those specified for acetylene.

**A9.8. Package Oxidizing Substances, Solid, Self-Heating, N.O.S.; Oxidizing Substances, Solid, Flammable, N.O.S.; Oxidizing Substances, Solid, Water Reactive, N.O.S.** as follows: Ship according to a competent authority approval (CAA). See paragraph 2.5. for more information on CAAs.

**A9.9. Package Bromine Pentafluoride or Bromine Trifluoride** as follows:

A9.9.1. Handling Instructions. These items are extremely dangerous. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages.

A9.9.2. Packaging Requirements. Package bromine pentafluoride or bromine trifluoride in specification cylinders, 3A150, 3AA150, 3B240, 3BN150, 3E1800, 4B240, 4BA240, or 4BW240. Seal each valve outlet by a threaded cap or a threaded plug. No cylinder may be equipped with any pressure relief device. Overpack specification 3E1800 cylinders in a strong wooden box.

**A9.10. Oxygen Generators, Chemical.** An oxygen generator, chemical may be transported only under the following conditions:

A9.10.1. Approval. A chemical oxygen generator that is shipped with an explosive or non-explosive means of initiation attached must be classed and approved by the Associate Administrator in accordance with the procedures specified in 49 CFR Section 173.56. **(T-0)**.

- A9.10.2. Impact resistance. Ensure a chemical oxygen generator, without any packaging, is capable of withstanding a 1.8 meter drop onto a rigid, non-resilient, flat and horizontal surface, in the position most likely to cause actuation or loss of contents.
- A9.10.3. Protection against inadvertent actuation. A chemical oxygen generator must incorporate one of the following means of preventing inadvertent actuation:
- A9.10.3.1. A chemical oxygen generator that is not installed in protective breathing equipment (PBE):
- A9.10.3.1.1. Mechanically actuated devices must have two pins, installed so that each is independently capable of preventing the actuator from striking the primer; one pin and one retaining ring, each installed so that each is independently capable of preventing the actuator from striking the primer; or a cover securely installed over the primer and a pin installed so as to prevent the actuator from striking the primer and cover.
- A9.10.3.1.2. Electrically actuated devices must have the electrical leads mechanically shorted and the mechanical short must be shielded in metal foil.
- A9.10.3.1.3. Devices with a primer but no actuator must have a protective cover over the primer to prevent actuation from external impact.
- A9.10.3.2. A chemical oxygen generator installed in a PBE must contain a pin installed so as to prevent the actuator from striking the primer, and be placed in a protective bag, pouch, case or cover such that the protective breathing equipment is fully enclosed in such a manner that the protective bag, pouch, case or cover prevents unintentional actuation of the oxygen generator. **(T-0)**.
- A9.10.4. Packaging. Place a chemical oxygen generator and a chemical oxygen generator installed in equipment, (e.g., a PBE) in a rigid outer packaging that conforms to the requirements of either 49 CFR Part 178, Subparts L and M, at the Packing Group I or II performance level; or the performance criteria in Air Transport Association (ATA) Specification No. 300 for a Category I Shipping Container. In addition, with its contents, is capable of meeting the following additional requirements:
- A9.10.4.1. The Flame Penetration Resistance Test specified in 49 CFR Part 178, Appendix E.
- A9.10.4.2. The Thermal Resistance Test specified in 49 CFR Part 178, Appendix D.
- A9.10.5. A chemical oxygen generator is forbidden for transportation by both passenger-carrying and cargo-only aircraft after the manufacturer's expiration date; or after the contents of the generator have been expended.

## Attachment 10

**CLASS 6—TOXIC (POISONOUS) MATERIALS AND INFECTIOUS SUBSTANCES**

**A10.1. General Requirements.** For military members, failure to observe the provisions from paragraphs A10.2. through A10.10. and any subsequent paragraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to observe the provisions from paragraph A10.2. through A10.10. and any subsequent paragraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with cylinder specifications and/or inner/receptacle and outer container selection as specified in each packaging paragraph. **(T-0)**. Not all packaging paragraphs are inclusive and packaging selection is determined by the toxic materials or infectious substances and quantity shipped. This attachment contains information concerning the packaging of Class 6.1 toxic material. The term “toxic” and “poisonous” are used synonymously in this manual. See Attachment 3 for other details concerning Class 6 material.

**A10.2. Package Packing Group I Class 6.1 Toxic Materials** as follows:

A10.2.1. Handling Instructions. These items may produce extremely toxic vapors. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages. See paragraph 2.8. for additional requirements.

A10.2.2. Packaging Requirements. Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders meeting the requirements of A3.3.2. Specification 3A, 3AA, and 3AL cylinders may not exceed 57 kg (125 pounds) water capacity (nominal). Specification 3D and 33 cylinders may not exceed 127 kg (280 pounds) water capacity (nominal). Do not accept shipments of arsine or phosphine for transportation if packaged in a specification 3AL cylinder. Cylinders containing phosgene must not exceed a filling density of 125 percent. The cylinder may not contain more than 68 kg (150 pounds) of phosgene. Also, test each filled cylinder for leakage before it is offered for transportation to ensure there is absolutely no leakage. This test must consist of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. **(T-0)**. During which time, make frequent examinations to identify any escape of gas. After the test has been accomplished do not loosen the valve of the cylinder before the cylinder is offered for transportation, and do not loosen during transportation.

**A10.3. Package Bromoacetone, Methyl Bromide, Chloropicrin, and Methyl Bromide or Methyl Chloride Mixtures** as follows:

A10.3.1. Handling Instructions. These materials and mixtures are extremely dangerous poisons. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages. See paragraph 2.8. for additional information.

A10.3.2. Packaging Requirements.

A10.3.2.1. Package bromoacetone in a steel (4A), aluminum (4B) wooden box (4C1, 4C2), plywood (4D), reconstituted wood (4F) or other metal (4N) boxes with an inner glass

receptacle or tube in a hermetically-sealed metal receptacle in a corrugated fiberboard carton. A bottle may not contain over 500 g (17.6 ounces) of liquid and be cushioned inside the can with at least 12.7 mm (0.5 inch) of absorbent material. The total amount of liquid in the outer box may not exceed 11 kg (24 pounds). The package must be tested to the PG I performance level. **(T-0)**.

A10.3.2.2. Package bromoacetone, methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with non-flammable, non-liquefied compressed gas in a DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinder with a water capacity (nominal) not exceeding 113 kg (250 pounds). This capacity does not apply to shipments of methyl bromide. All cylinders must meet the requirements of A3.3.2. **(T-0)**.

**A10.4. Package Liquid Class 6.1 Materials** as follows:

A10.4.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<p><b>Receptacles:</b> Glass, earthenware, plastic, metal, or glass ampoules</p> <p><b>Note:</b> For PG I material pack inner packagings in a rigid and leakproof receptacle or intermediate packaging containing sufficient absorbent material to absorb the entire contents of all inner packagings before packing the inner packaging(s) in the outer package.</p> <p><b>Note:</b> Ensure inner packaging or receptacle closures of combination packages containing liquids are held securely, tightly and effectively in place by secondary means. See A20.3.</p>	<p><b>Drums:</b> steel (1A2), aluminum (1B2), metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or plastic (1H2)</p> <p><i>or</i></p> <p><b>Barrel:</b> wood (2C2)</p> <p><b>Note:</b> Wood barrels not authorized for PG I material.</p> <p><i>or</i></p> <p><b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2)</p> <p><i>or</i></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)</p>



A10.4.2. Package in single packaging drums, barrels, or jerricans as follows:

Inner packaging	Outer packaging
Not required	<p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), fiber (1G) with liner, plastic (1H1 or 1H2), or metal other than steel or aluminum (1N1 or 1N2)</p> <p><b>Note:</b> Fiber drum with liner only authorized for PG II and III material.</p> <p><i>or</i></p> <p><b>Barrel:</b> wood (2C1)</p> <p><b>Note:</b> Wood barrel not authorized for PG I material.</p> <p><i>or</i></p> <p><b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)</p>

A10.4.3. Package in the following composite packagings with plastic inner receptacles:

Inner receptacle	Outer packaging
Plastic	<p><b>Drums:</b> steel, aluminum, fiber, plastic (6HA1, 6HB1, 6HG1, or 6HH1), or plywood (6HD1)</p> <p><b>Note:</b> Plywood drum (6HD1) not authorized for PG I material.</p> <p><i>or</i></p> <p><b>Boxes:</b> steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)</p>

A10.4.4. Package in the following composite packages with glass, porcelain, or stoneware inner receptacles:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<p><b>Drums:</b> steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1)</p> <p><i>or</i></p> <p><b>Boxes:</b> steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)</p> <p><i>or</i></p> <p>solid or expanded plastic packaging (6PH1 or 6PH2)</p> <p><i>or</i></p> <p>plywood drum or wickerwork hamper (6PD1 or 6PD2)</p>

A10.4.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except specifications 8, 8AL (acetylene) and 3HT.

**A10.5. Package Solid Class 6.1 Materials** as follows:

A10.5.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> Glass, earthenware, plastic or metal <i>or</i> glass ampoules	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood drum (1D), fiber (1G), plastic (1H1 or 1H2), or metal other than steel or aluminum (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wood (2C2) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), or metal other than steel or aluminum (4N)

A10.5.2. Package in single packaging drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or metal other than steel or aluminum (1N1 or 1N2) <b>Note:</b> Plywood drum (1D) not authorized for PG I material. <i>or</i> <b>Barrel:</b> wood (2C1 or 2C2). <b>Note:</b> Wood barrels (2C1 or 2C2) not authorized for PG I material. <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), steel with liner (4A), aluminum (4B), aluminum with liner (4B), natural wood (4C1), natural wood sift-proof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) solid plastic (4H2), or metal other than steel or aluminum (4N) <b>Note:</b> Steel (4A) without liner, aluminum (4B) without liner, natural wood (4C1),

	plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) solid plastic (4H2), boxes not authorized for PG I material. <i>or</i> <b>Bags:</b> woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2) <b>Note:</b> Bags not authorized for PG I material.
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A10.5.3. Package in the following composite packages with plastic inner receptacles:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) <i>or</i> <b>Boxes:</b> steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A10.5.4. Package in the following composite packages with glass, porcelain, or stoneware inner receptacles:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<b>Drums:</b> steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2) <i>or</i> expanded or solid plastic packaging (6PH1 or 6PH2)

**A10.6. Package Class 6.1, PG I, Hazard Zone A and B (Poisonous by Inhalation)** as follows:

A10.6.1. Handling Instructions. These items are extremely dangerous. Make approved chemical safety mask and clothing available when handling this material, and wear when handling leaking packages.

A10.6.2. Hazard Zone A Packaging Requirements. Package Class 6.1, PG I materials with an Inhalation Hazard Zone A as follows:

A10.6.2.1. In seamless DOT or UN specification cylinders that conform to 49 CFR Section 173.40 and one of the specifications for cylinders in 49 CFR Part 178, Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Ensure cylinders also meet the requirements of A3.3.2.

A10.6.2.2. In an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Test both the inner and outer drum to the PG I performance level. An outer 1A2 drum requires a minimum thickness of 1.35 mm (0.053 inches). An outer 1H2 drum

requires a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum may not exceed 220 L (58 gallons). Ensure the outer drum (1A2 or 1H2) can withstand a hydrostatic test pressure of 100kPa (15 psig). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material which completely surrounds the inner packaging on all sides. Ensure the inner drum also meets the following requirements:

A10.6.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR Section 178.605) of 300 kPa (45 psig).

A10.6.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR Section 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.6.2.2.3. Have screw-type closures that meet all the following requirements:

A10.6.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.6.2.2.3.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A10.6.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. Ensure the cap seal is capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A10.6.2.2.4. Meet the following minimum thickness requirements:

A10.6.2.2.4.1. 1A1 and 1N1 drums has a minimum thickness of 1.3 mm (0.051 inch).

A10.6.2.2.4.2. 1B1 drums have a minimum thickness of 3.9 mm (0.154 inch).

A10.6.2.2.4.3. 1H1 drums have a minimum thickness of 3.16 mm (0.124 inch).

A10.6.2.2.4.4. 6HA1 drums the plastic inner containers have a minimum thickness of 1.58 mm (0.0622 inch) and the outer steel drums have a minimum thickness of 0.96 mm (0.0378 inch).

A10.6.2.3. Pack in combination packagings with an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal, securely cushioned with a nonreactive absorbent material packed within a leak-tight packaging of metal or plastic. The capacity of the inner receptacle may not exceed 4 L (1 gallon). An inner receptacle that has a closure requires a closure that is held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation. Pack the inner packaging system in an outer steel drum (1A2), aluminum drum (1B2), plywood drum (1D), fiber drum (1G), plastic drum (1H2), metal drum (other than steel or aluminum) (1N2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), solid plastic box (4H2) or metal box (other than steel or aluminum) (4N). Both the inner packaging system and the outer container each meeting the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container may not exceed 16 L (4 gallons).

A10.6.3. Hazard Zone B Packaging Requirements. Package Class 6.1, PG I materials with an Inhalation Hazard Zone B as follows:

A10.6.3.1. In seamless DOT or UN specification cylinders that conform to 49 CFR Section 173.40 and one of the specifications for cylinders in 49 CFR Part 178, Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Ensure cylinders also meet the requirements of A3.3.2.

A10.6.3.2. In an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum require testing to the PG I performance level. An outer 1A2 drum requires a minimum thickness of 1.35 mm (0.053 inches). An outer 1H2 drum requires a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum may not exceed 220 L (58 gallons). Ensure the outer drum (1A2 or 1H2) can withstand a hydrostatic test pressure of 100kPa (15 psig). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material which completely surrounds the inner packaging on all sides. The inner drum must also meet the following requirements:

A10.6.3.2.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR Section 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.6.3.2.2. Have screw-type closures that meet all the following requirements:

A10.6.3.2.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.6.3.2.2.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A10.6.3.2.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A10.6.3.2.3. Meet the following minimum thickness requirements:

A10.6.3.2.3.1. 1A1 and 1N1 drums must have a minimum thickness of 0.69 mm (0.027 inch).

A10.6.3.2.3.2. 1B1 drums must have a minimum thickness of 2.79 mm (0.110 inch).

A10.6.3.2.3.3. 1H1 drums must have a minimum thickness of 1.14 mm (0.045 inch).

A10.6.3.2.3.4. 6HA1 drums the plastic inner container must have a minimum thickness of 1.58 mm (0.0622 inch) and the outer steel drum must have a minimum thickness of 0.70 mm (0.027 inch). (T-0).

**A10.7. Package Tear Gas Candles** as follows: Any newly developed packaging requires approval from the DOT before initial transportation from the manufacturer. Package tear gas candles, tear gas grenades, and similar devices (with more than 2 percent tear gas substance by mass).

A10.7.1. Pack in steel (4A), aluminum (4B), metal-strapped natural wood box (4C1 or 4C2), metal-strapped plywood box (4D), metal-strapped reconstituted wood box (4F), or other

metal (4N). Pack functioning elements not assembled in grenades or devices in a separate compartment within the box, pack in inner boxes, then place inside the outer box, or pack in a separate outside wooden (4C1, 4C2, 4D, or 4F) box. Pack and cushion the elements so they cannot come into contact with each other or in contact with the walls of the box during transportation. No more than 50 items and 50 functioning elements can be packed in one outer container. The gross weight of the outer container may not exceed 35 kg (77 pounds). Tear gas devices can be shipped completely assembled provided the functioning elements are packed so that they cannot accidentally function. Package items completely assembled as specified in this paragraph.

A10.7.2. Pack in steel (1A2), aluminum (1B2), plastic (1H2) or other metal (1N2) drums. Pack functioning elements in a separate inner packaging or separate compartment. Pack no more than 24 items and 24 functioning elements in one outer drum. The gross weight of the outer container may not exceed 35 kg (77 pounds).

A10.7.3. DOT 2P and 2Q. Pack in inner containers meeting the DOT 2P or 2Q specification (inside nonrefillable metal containers), then package in a fiberboard box (4G). Place each inside container into fiberboard tubes with metal ends or a fiberboard box with suitable padding. Pack no more than 30 inner packagings in one outer fiberboard box. The gross weight may not exceed 16 kg (35 pounds).

**A10.8. Package Infectious Substances and Genetically Modified Microorganisms** as follows:

A10.8.1. Handling Instructions.

A10.8.1.1. Infectious Substance, Affecting Humans, UN2814. This material has the potential to cause disease in humans.

A10.8.1.2. Infectious Substance, Affecting Animals, UN2900. This material has the potential to cause disease in animals.

A10.8.2. The following requirements apply to all shipments of Category A and Category B (in cultures) infectious substances, and genetically modified microorganisms:

A10.8.2.1. Use inner packagings that consist of a leakproof primary receptacle, then place in a leakproof secondary packaging.

A10.8.2.2. Place absorbent material between the primary receptacle and the secondary packaging. If multiple primary receptacles are placed in a single secondary packaging they separate with enough absorbent material to make sure there is no contact between the primary receptacles. Ensure sufficient absorbent material to absorb the entire contents of all primary receptacles.

A10.8.2.3. Place this inner packaging in a rigid outer packaging.

A10.8.2.4. Ensure each package for infectious substances is capable of passing the tests specified in 49 CFR Section 178.609.

A10.8.2.5. Ensure each package is at least 100 mm (3.9 inches) in the smallest overall external dimensions.

A10.8.2.6. Ensure each package of infectious substances has an itemized list of the contents enclosed between the secondary packaging and the outer packaging.

- A10.8.2.7. For packages containing material that is unknown but suspected of meeting the criteria for inclusion in Category A and assignment to UN2814 or UN2900, show the words “Suspected Category A Infectious Substance” in parenthesis following the PSN on the itemized list of contents inside the outer package.
- A10.8.2.8. Whatever the intended temperature of shipment, ensure the primary receptacle or the secondary packaging used for infectious substances is capable of withstanding without leakage an internal pressure (which produces a pressure differential) of not less than 95 kPa (14 psi). Also, ensure the primary receptacle and the secondary packaging is capable of withstanding temperatures of -40 degrees C to +55 degrees C (-40 degrees F to +131 degrees F).
- A10.8.2.9. In addition to the requirements of this paragraph, personnel must also meet the requirements for biological select agents and toxins in the 42 CFR Part 73 (Department of Health and Human Services); 7 CFR Part 331 and 9 CFR Part 121 (Department of Agriculture). **(T-0)**.
- A10.8.2.10. Personnel transporting infectious substances, genetically modified microorganisms, or associated biological material must make advanced arrangements to ensure that all necessary permits are obtained prior to transport and that transport of the samples and specimens occurs without delay of delivery. **(T-0)**.
- A10.8.3. In addition to the requirements identified above, package infectious substances, genetically modified microorganisms, and genetically modified organisms as specified below. Exceptional cases, such as whole organs, may require special packaging. Guidance for packaging material that requires temperature control during shipment is contained in DLAI (JP) 4145.21/TB MED 284/NAVSUPINST 4610.31B, “Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment.”
- A10.8.3.1. Lyophilized substances. Primary receptacles of flame-sealed glass ampoules or rubber stopped glass vials fitted with metal seals.
- A10.8.3.2. Liquid or solid substances shipped at ambient temperatures or higher. Primary receptacles of glass, metal, or plastic. Provide a positive means of ensuring a leak proof seal, such as a heat seal, skirted stopper, or metal crimp seal. If screw caps are used, reinforce with adhesive tape.
- A10.8.3.3. Liquid or solid substances shipped refrigerated or frozen (ice, prefrozen packs, or dry ice.) Place ice or dry ice outside the secondary packagings. Provide interior supports to secure the secondary packagings in their original position after the ice or dry ice has dissipated. If ice is used, leak proof outer packaging is required. If dry ice is used, the outer packaging permitting the release of carbon dioxide gas is required. The primary receptacle and the secondary packaging must maintain their integrity at the temperature of the refrigerant used, as well as the temperatures and pressures of transport by aircraft to which they could be subjected if refrigeration were lost. **(T-0)**.
- A10.8.3.4. Liquid or solid substances shipped in liquid nitrogen. The primary receptacle and the secondary packaging must maintain their integrity at the temperature of the liquid nitrogen as well as the temperatures and pressures of transport by aircraft to which they could be subjected if refrigeration were lost. **(T-0)**. Refrigerated liquid nitrogen packagings must be metal vacuum insulated vessels or flasks vented to the atmosphere to

prevent any increase in pressure within the packaging. The use of safety relief valves, check valves, frangible discs, or similar devices in the vent lines is prohibited. Fill and discharge openings must be protected against the entry of foreign materials that might cause an increase in the internal pressure. Mark package orientation markings on the packaging. Design the packaging to prevent the release of any refrigerated liquid nitrogen irrespective of the packaging orientation. Meet all requirements for shipment of liquid nitrogen.

**A10.9. Package Biological Substances, Category B, (formerly Diagnostic Specimens) as follows:**

A10.9.1. Except as listed below, Biological Substances, Category B (includes patient/diagnostic specimens containing or believed to contain Biological Substances, Category B) are exempted from all other requirements of this manual (to include a Shipper's Declaration For Dangerous Goods) when offered for transportation or transported in accordance with this paragraph. A patient/diagnostic specimen meeting the definition of a patient specimen (see Attachment 1), and not containing or believed to contain infectious substance Category A or Category B is not regulated by this manual. A patient/diagnostic specimen meeting the definition of a hazard class is to be transported as required for that class. The following requirements apply to Biological Substances, Category B:

A10.9.1.1. Use packaging consisting of a primary receptacle, a secondary packaging, and a rigid outer packaging.

A10.9.1.2. Pack the primary receptacles in secondary packaging in such a way that, under normal conditions of transport, it cannot break, be punctured, or leak the contents into the secondary packaging.

A10.9.1.3. Secure secondary packagings in outer rigid packagings with suitable cushioning material such that any leakage of the contents will not impair the protective properties of the cushioning material or the outer packaging.

A10.9.1.4. Ensure completed package is capable of successfully passing the drop test in 49 CFR Section 178.603 at a drop height of at least 1.2 meters (3.9 feet).

A10.9.1.5. Mark the outer packaging clearly and durably in accordance with paragraphs A14.4.5.3. and A14.4.5.4.

A10.9.1.6. The minimum dimension of at least one surface of the outer packaging is 100 mm (3.9 inches) by 100 mm (3.9 inches).

A10.9.2. Liquid Biological Substances, Category B. Package liquid Biological Substances, Category B as follows:

A10.9.2.1. Pack in leakproof primary receptacles with a volumetric capacity of not more than 1 L (33.8 ounces).

A10.9.2.2. Place absorbent material between the primary receptacle and secondary packaging. If several fragile primary receptacles are placed in a single secondary packaging, they must be individually wrapped or separated so as to prevent contact between them. Ensure the absorbent material is of sufficient quantity to absorb the entire contents of the primary receptacles.



A10.9.2.3. Ensure the secondary packaging is leakproof.

A10.9.2.4. Ensure the primary receptacle or the secondary packaging is capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar, 14 psi) in the range of -40 degrees C to 55 degrees C (-40 degrees F to 130 degrees F).

A10.9.2.5. The maximum quantity contained in each outer packaging, including any material used to stabilize or prevent degradation of the samples, may not exceed 4 L (1 gallon). The outer packaging limitation does not include ice, dry ice, or liquid nitrogen when used to maintain the integrity of the material.

A10.9.3. Solid Biological Substances, Category B. Package solid Biological Substances, Category B as follows:

A10.9.3.1. Pack in siftproof primary receptacle that does not exceed the outer packaging weight limit.

A10.9.3.2. Then pack in siftproof secondary packaging.

A10.9.3.3. If several fragile primary receptacles are placed in a single secondary packaging, they wrap them individually or separate to prevent contact between them.

A10.9.3.4. Except for packages containing body parts, organs, or whole bodies, the outer packaging may not exceed 4 kg (8.8 pounds). This quantity excludes ice, dry ice, or liquid nitrogen, when used to ship specimens cold.

A10.9.3.5. If there is the possibility of residual liquid in the primary receptacle during transport, then use a packaging suitable for liquids, including absorbent material.

A10.9.4. Refrigerated or Frozen Specimens. The following applies:

A10.9.4.1. Liquid or solid substances shipped refrigerated or frozen (ice, prefrozen packs, or dry ice.) Place ice or dry ice outside the secondary packagings. Provide interior supports to secure the secondary packagings in their original position after the ice or dry ice has dissipated. If ice is used, ensure the outer packaging is leak proof. If dry ice is used, ensure the outer packaging permits the release of carbon dioxide gas.

A10.9.4.2. Liquid or solid substances shipped in liquid nitrogen. Ensure the primary receptacle and the secondary packaging maintains their integrity at the temperature of the liquid nitrogen as well as the temperatures and pressures of transport by aircraft to which they could be subjected if refrigeration were lost. Ensure refrigerated liquid nitrogen packagings are metal vacuum insulated vessels or flasks vented to the atmosphere to prevent any increase in pressure within the packaging. The use of safety relief valves, check valves, frangible discs, or similar devices in the vent lines is prohibited. Protect fill and discharge openings against the entry of foreign materials that might cause an increase in the internal pressure. Mark package orientation markings on the packaging. Design the packaging to prevent the release of any refrigerated liquid nitrogen irrespective of the packaging orientation. Ensure all requirements for shipment of liquid nitrogen are also be met.

**A10.10. Package Regulated Medical Waste, N.O.S.; Biomedical Waste, N.O.S.; Clinical Waste, Unspecified, N.O.S.; Medical Waste, N.O.S.** as follows: Use non bulk packagings that meet the PG II performance level.

A10.10.1. Package in the following drums, boxes, or jerricans:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2), or other metal (4N) <i>or</i> <b>Jerricans:</b> removable head steel (3A2), aluminum removable head (3B2), or plastic removable head (3H2)

A10.10.2. Additionally, prepare packages in such a manner as they will arrive at their destination in good condition, and present no hazard to persons or animals during transport.

A10.10.3. Packaging tests may be those appropriate for solids when there is sufficient absorbent material to absorb the entire amount of liquid present and the package is capable of retaining liquids. In all other instances accomplish the packaging tests appropriate for liquids.

A10.10.4. Ensure packagings intended to contain sharp objects, such as broken glass and needles are resistant to puncture and retain liquids under the performance test conditions for the packaging.

**A10.11. Package Chlorosilanes** as follows: Packaging meeting the PG I or PG II performance standard is required.

A10.11.1. Package in the following combination drums, or boxes:

Inner packaging	Outer packaging
<b>Receptacles:</b> glass, or steel	<b>Drums:</b> steel (1A2), plywood (1D), fiber (1G), or plastic (1H2) <i>or</i> <b>Boxes:</b> steel (4A), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A10.11.2. Package in the following composite drums:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel drum (6HA1)

A10.11.3. Package in the following single drums, or jerricans:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1) <i>or</i> <b>Jerricans:</b> steel (3A1)

A10.11.4. Package in Cylinders as prescribed for any compressed gas, except Specification 3HT and those prescribed for acetylene (8 and 8AL).

**A10.12. Toxins, Extracted From Living Sources, Liquid, N.O.S. or Toxins, Extracted From Living Sources, Solid, N.O.S.** Classify toxic substances derived from a plant, animal, or bacterial source which do not contain an infectious substance as Division 6.1 Toxins. Division 6.1 Toxins may be transported by Cargo Aircraft Only as specified in Table A4.1 and Table A4.2. Supplement the proper shipping name a technical name. Packing groups for Division 6.1 Toxic substances are assigned according to toxicity of the material and the degree of danger it poses. Packaging requirements for Division 6.1 Toxins are determined by the Packing Group assigned to them.

A10.12.1. Liquid Division 6.1 toxins are assigned to UN3172, Toxins, extracted from living sources, liquid, N.O.S.

A10.12.1.1. Package liquid Toxins in the following combination drums, or boxes adhering to the quantity per package limits shown:

Inner packaging	Outer packaging
<b>Receptacles:</b> glass, plastic or metal <b>Note:</b> limit the inner packaging quantity as follows: PG I - glass or plastic– 1.0 L, metal- 2.5 L PG II - glass or plastic– 2.5 L, metal– 5.0 L PG III - glass or plastic– 5.0 L, metal– 10.0 L	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or other metal (1N1 or 1N2) <b>or</b> <b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2), or other metal (4N) <b>or</b> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <b>Note:</b> limit the outer packaging quantity as follows: PG I – 30 L, PG II – 60 L, PG III – 220 L

A10.12.1.2. Package liquid Toxins in the following single drums, or jerricans adhering to the quantity per package limits shown:

Inner packaging	Outer packaging
<b>Not required</b>	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plastic (1H1 or 1H2), or other metal (1N1 or 1N2) <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <b>Note:</b> limit the outer packaging quantity as follows: PG I – 30 L, PG II – 60 L, PG III – 220 L

A10.12.1.3. Package liquid Toxins in the following composite packagings with plastic inner receptacles adhering to the quantity per package limits shown:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) <b>or</b> <b>Boxes:</b> steel, aluminum, wooden, plywood, fiberboard, or plastic (6HA2, 6HB2, 6HC, 6HD2, 6HG2, or 6HH2) <b>Note:</b> limit the outer packaging quantity as follows: PG I – 30 L, PG II – 60 L, PG III – 220 L

A10.12.2. Solid Division 6.1 Toxins are assigned to UN3462, Toxins, extracted from living sources, solid, N.O.S.

A10.12.2.1. Package solid Toxins in the following combination drums, boxes, or jerricans adhering to the quantity per package limits shown:

Inner packaging	Outer packaging
<b>Receptacles:</b> fiber, glass, paper bag, plastic, plastic bag or metal <b>Note:</b> limit the inner packaging quantity as follows: PG I – fiber, glass, paper bag, or plastic bag– 1.0 kg, plastic or metal– 2.5 kg PG II - fiber, glass, paper bag, or plastic bag– 2.5 kg, plastic or metal– 5.0 kg PG III - fiber, glass, paper bag, or plastic bag– 5.0 kg, plastic or metal– 10.0 kg	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or other metal (1N1 or 1N2) <b>or</b> <b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2), or other metal (4N) <b>or</b>

	<p><b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)</p> <p><b>Note:</b> limit the outer packaging quantity as follows: PG I – 50 kg, PG II – 100 kg, PG III – 200 kg</p>
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A10.12.2.2. Package solid Toxins in the following single drums, boxes, or jerricans adhering to the quantity per package limits shown:

Inner packaging	Outer packaging
Not required	<p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or other metal (1N1 or 1N2)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), or other metal (4N)</p> <p><b>Note:</b> boxes are not allowed for PG I materials</p> <p><b>or</b></p> <p><b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)</p> <p><b>Note:</b> Fit fiber, fiberboard, wood and plywood packagings with a suitable liner</p> <p><b>Note:</b> limit the outer packaging quantity as follows: PG I – 50 kg, PG II – 100 kg, PG III – 200 kg</p>

A10.12.2.3. Package solid Toxins in the following composite packagings with plastic inner receptacles adhering to the quantity per package limits shown:

Inner receptacle	Outer packaging
Plastic	<p><b>Drums:</b> steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel, aluminum, wooden, plywood, fiberboard, or plastic (6HA2, 6HB2, 6HC, 6HD2, 6HG2, or 6HH2)</p>

	<b>Note:</b> limit the outer packaging quantity as follows: PG I – 50 kg, PG II – 100 kg, PG III – 200 kg
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**A10.13. UN3546, Articles containing toxic substance, N.O.S.** are authorized when classified per paragraph A4.2.3., maximum net quantity per package 60 L for liquids and 100 kg for solids, when packaged, or unpackaged as follows:

A10.13.1. When packaged, packagings meeting PG II performance standards are required.

A10.13.1.1. Pack articles to prevent movement and inadvertent operation during normal conditions of transport.

A10.13.1.2. Pack inner receptacles containing liquids with closures in their outer packagings with their closures correctly oriented.

A10.13.1.3. Where there is no receptacle within the article, ensure the article fully encloses the dangerous goods and prevents their release under normal conditions of transport.

Inner packaging	Outer packaging
<b>Receptacles:</b> constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.	<b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2), other metal (4N) <i>or</i> <b>Jerricans:</b> removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2)

A10.13.2. Robust articles.

A10.13.2.1. Robust articles may be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use; or,

A10.13.2.2. Robust articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained.

## Attachment 11

## CLASS 7--RADIOACTIVE MATERIALS

**A11.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A11.2. through A11.12. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A11.2. through A11.12. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and comply with the outer container options as specified in packaging paragraph. (T-0). Not all packaging paragraphs are inclusive and packaging selection is determined by the type of radioactive material. This attachment contains information concerning the packaging and general handling instructions for Class 7 (Radioactive Material). See Attachment 3 for other details concerning Class 7 material.

**A11.2. Activity Limits for Type A and Type B Packages:**

A11.2.1. A Type A package may not contain a quantity of radioactivity greater than  $A_1$  (for special form radioactive material) or  $A_2$  for all other radioactive materials as listed in A11.4. Activity limits not listed in A11.4. are determined per 49 CFR Section 173.433.

A11.2.2. The limits on activity contained in a Type B(U) or Type B(M) package are those prescribed in A11.9. and A11.10. or in the applicable approval certificate in accordance with 49 CFR Sections 173.471, 173.472 or 173.473.

**A11.3. Determining  $A_1$  and  $A_2$  Values for Radionuclides:**

A11.3.1. For single radionuclides of known identity, the values of  $A_1$  and  $A_2$  are those given in A11.4. The values of  $A_1$  and  $A_2$  are also applicable for radionuclides contained in (a,n) or (h,n) neutron sources.

A11.3.2. Determine values of  $A_1$  and  $A_2$  for any single radionuclide of known identity that is not listed in A11.4. according to 49 CFR Section 173.433.

**A11.4. Table A11.1.** This table gives  $A_1$  and  $A_2$  values for radionuclides. This table also gives values on exempt material activity concentrations and exempt consignment activity limits for radionuclides. The information in this table is taken from 49 CFR Sections 173.435 and 173.436.

**Table A11.1. Table of A1 and A2 Values for Common Radionuclides.**

Symbol	Element and Atomic Number	A <sub>1</sub> (TBq) (Special Form)	A <sub>2</sub> (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Ac-225 <sup>a</sup>	Actinium (89)	0.8	0.006	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Ac-227 <sup>a</sup>		0.9	0.00009	1 x 10 <sup>-1</sup>	1 x 10 <sup>3</sup>
Ac-228		0.6	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Ag-105	Silver (47)	2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ag-108m <sup>a</sup>		0.7	0.7	1 x 10 <sup>1b</sup>	1 x 10 <sup>6b</sup>
Ag-110m <sup>a</sup>		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Ag-111		2	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Al-26	Aluminum (13)	0.1	0.1	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Am-241	Americium (95)	10	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Am-242m <sup>a</sup>		10	0.001	1 x 10 <sup>0b</sup>	1 x 10 <sup>4b</sup>
Am-243 <sup>a</sup>		5	0.001	1 x 10 <sup>0b</sup>	1 x 10 <sup>3b</sup>
Ar-37	Argon (18)	40	40	1 x 10 <sup>6</sup>	1 x 10 <sup>8</sup>
Ar-39		40	20	1 x 10 <sup>7</sup>	1 x 10 <sup>4</sup>
Ar-41		0.3	0.3	1 x 10 <sup>2</sup>	1 x 10 <sup>9</sup>
As-72	Arsenic (33)	0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
As-73		40	40	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
As-74		1	0.9	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
As-76		0.3	0.3	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
As-77		20	0.7	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
At-211	Astatine (85)	20	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Au-193	Gold (79)	7	2	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Au-194		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Au-195		10	6	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Au-198		1	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Au-199		10	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ba-131 <sup>a</sup>	Barium (56)	2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ba-133		3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ba-133m		20	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ba-140 <sup>a</sup>		0.5	0.3	1 x 10 <sup>1b</sup>	1 x 10 <sup>5b</sup>
Be-7	Beryllium (4)	20	20	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Be-10		40	0.6	1 x 10 <sup>4</sup>	1 x 10 <sup>6</sup>
Bi-205	Bismuth (83)	0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Bi-206		0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Bi-207		0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Bi-210		1	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Bi-210m <sup>a</sup>		0.6	0.02	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Bi-212 <sup>a</sup>		0.7	0.6	1 x 10 <sup>1b</sup>	1 x 10 <sup>5b</sup>
Bk-247	Berkelium (97)	8	0.0008	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Bk-249 <sup>a</sup>		40	0.3	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Br-76	Bromine (35)	0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Br-77		3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Br-82		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>



Symbol	Element and Atomic Number	A <sub>1</sub> (TBq) (Special Form)	A <sub>2</sub> (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
C-11	Carbon (6)	1	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
C-14		40	3	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Ca-41	Calcium (20)	Unlimited	Unlimited	1 x 10 <sup>5</sup>	1 x 10 <sup>7</sup>
Ca-45		40	1	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Ca-47 <sup>a</sup>		3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Cd-109	Cadmium (48)	30	2	1 x 10 <sup>4</sup>	1 x 10 <sup>6</sup>
Cd-113m		40	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Cd-115 <sup>a</sup>		3	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Cd-115m		0.5	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Ce-139	Cerium (58)	7	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ce-141		20	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Ce-143		0.9	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ce-144 <sup>a</sup>		0.2	0.2	1 x 10 <sup>2b</sup>	1 x 10 <sup>5b</sup>
Cf-248	Californium (98)	40	0.006	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Cf-249		3	0.0008	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Cf-250		20	0.002	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Cf-251		7	0.0007	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Cf-252		0.1	0.003	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Cf-253 <sup>a</sup>		40	0.04	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Cf-254		0.001	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Cl-36	Chlorine (17)	10	0.6	1 x 10 <sup>4</sup>	1 x 10 <sup>6</sup>
Cl-38		0.2	0.2	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Cm-240	Curium (96)	40	0.02	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Cm-241		2	1	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Cm-242		40	0.01	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Cm-243		9	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Cm-244		20	0.002	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Cm-245		9	0.0009	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Cm-246		9	0.0009	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Cm-247 <sup>a</sup>		3	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Cm-248		0.02	0.0003	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Co-55	Cobalt (27)	0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Co-56		0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Co-57		10	10	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Co-58m		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Co-58		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Co-60		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Cr-51	Chromium (24)	30	30	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Cs-129	Cesium (55)	4	4	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Cs-131		30	30	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Cs-132		1	1	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Cs-134		0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Cs-134m		40	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>

Symbol	Element and Atomic Number	A <sub>1</sub> (TBq) (Special Form)	A <sub>2</sub> (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Cs-135		40	1	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Cs-136		0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Cs-137 <sup>a</sup>		2	0.6	1 x 10 <sup>1b</sup>	1 x 10 <sup>4b</sup>
Cu-64	Copper (29)	6	1	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Cu-67		10	0.7	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Dy-159	Dysprosium (66)	20	20	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Dy-165		0.9	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Dy-166 <sup>a</sup>		0.9	0.3	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Er-169	Erbium (68)	40	1	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Er-171		0.8	0.5	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Eu-147	Europium (63)	2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Eu-148		0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Eu-149		20	20	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Eu-150 (short lived)		2	0.7	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Eu-150 (long lived)		0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Eu-152		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Eu-152m		0.8	0.8	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Eu-154		0.9	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Eu-155		20	3	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Eu-156		0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
F-18	Fluorine (9)	1	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Fe-52 <sup>a</sup>	Iron (26)	0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Fe-55		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>6</sup>
Fe-59		0.9	0.9	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Fe-60 <sup>a</sup>		40	0.2	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Ga-67	Gallium (31)	7	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ga-68		0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Ga-72		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Gd-146 <sup>a</sup>	Gadolinium (64)	0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Gd-148		20	0.002	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Gd-153		10	9	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Gd-159		3	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Ge-68 <sup>a</sup>	Germanium (32)	0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Ge-71		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>8</sup>
Ge-77		0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Hf-172 <sup>a</sup>	Hafnium (72)	0.6	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Hf-175		3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Hf-181		2	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Hf-182		Unlimited	Unlimited	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Hg-194 <sup>a</sup>	Mercury (80)	1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Hg-195m <sup>a</sup>		3	0.7	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Hg-197m		10	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>

Symbol	Element and Atomic Number	A <sub>1</sub> (TBq) (Special Form)	A <sub>2</sub> (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Hg-197		20	10	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Hg-203		5	1	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Ho-166	Holmium (67)	0.4	0.4	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>
Ho-166m		0.6	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
I-123	Iodine (53)	6	3	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
I-124		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
I-125		20	3	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
I-126		2	1	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
I-129		Unlimited	Unlimited	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
I-131		3	0.7	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
I-132		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
I-133		0.7	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
I-134		0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
I-135 <sup>a</sup>		0.6	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
In-111	Indium (49)	3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
In-113m		4	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
In-114m <sup>a</sup>		10	0.5	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
In-115m		7	1	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ir-189 <sup>a</sup>	Iridium (77)	10	10	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Ir-190		0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Ir-192		1 <sup>c</sup>	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Ir-194		0.3	0.3	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
K-40	Potassium (19)	0.9	0.9	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
K-42		0.2	0.2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
K-43		0.7	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Kr-81	Krypton (36)	40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Kr-85m		8	3	1 x 10 <sup>3</sup>	1 x 10 <sup>10</sup>
Kr-85		10	10	1 x 10 <sup>5</sup>	1 x 10 <sup>4</sup>
Kr-87		0.2	0.2	1 x 10 <sup>2</sup>	1 x 10 <sup>9</sup>
La-137	Lanthanum (57)	30	6	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
La-140		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
LSA		Note 4	Note 4		
Lu-172	Lutetium (71)	0.6	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Lu-173		8	8	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Lu-174m		20	10	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Lu-174		9	9	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Lu-177		30	0.7	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
MFP	Mixed Fission Products	Note 3	Note 3		
Mg-28 <sup>a</sup>	Magnesium (12)	0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Mn-52	Manganese (25)	0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Mn-53		Unlimited	Unlimited	1 x 10 <sup>4</sup>	1 x 10 <sup>9</sup>
Mn-54		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>

Symbol	Element and Atomic Number	A <sub>1</sub> (TBq) (Special Form)	A <sub>2</sub> (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Mn-56		0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Mo-93	Molybdenum (42)	40	20	1 x 10 <sup>3</sup>	1 x 10 <sup>8</sup>
Mo-99 <sup>a</sup>		1	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
N-13	Nitrogen (7)	0.9	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>9</sup>
Na-22	Sodium (11)	0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Na-24		0.2	0.2	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Nb-93m	Niobium (41)	40	30	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Nb-94		0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Nb-95		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Nb-97		0.9	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Nd-147	Neodymium (60)	6	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Nd-149		0.6	0.5	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ni-59	Nickel (28)	Unlimited	Unlimited	1 x 10 <sup>4</sup>	1 x 10 <sup>8</sup>
Ni-63		40	30	1 x 10 <sup>5</sup>	1 x 10 <sup>8</sup>
Ni-65		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Np-235	Neptunium (93)	40	40	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Np-236 (short lived)		20	2	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Np-236 (long lived)		9	0.02	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Np-237		20	0.002	1 x 10 <sup>0b</sup>	1 x 10 <sup>3b</sup>
Np-239		7	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Os-185	Osmium (76)	1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Os-191m		40	30	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Os-191		10	2	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Os-193		2	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Os-194 <sup>a</sup>		0.3	0.3	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
P-32	Phosphorus (15)	0.5	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>
P-33		40	1	1 x 10 <sup>5</sup>	1 x 10 <sup>8</sup>
Pa-230 <sup>a</sup>	Protactinium (91)	2	0.07	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Pa-231		4	0.0004	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Pa-233		5	0.7	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Pb-201	Lead (82)	1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Pb-202		40	20	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Pb-203		4	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Pb-205		Unlimited	Unlimited	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Pb-210 <sup>a</sup>		1	0.05	1 x 10 <sup>1b</sup>	1 x 10 <sup>4b</sup>
Pb-212 <sup>a</sup>		0.7	0.2	1 x 10 <sup>1b</sup>	1 x 10 <sup>5b</sup>
Pd-103	Palladium (46)	40	40	1 x 10 <sup>3</sup>	1 x 10 <sup>8</sup>
Pd-107		Unlimited	Unlimited	1 x 10 <sup>5</sup>	1 x 10 <sup>8</sup>
Pd-109		2	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Pm-143	Promethium (61)	3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Pm-144		0.7	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>

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Pm-145		30	10	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Pm-147		40	2	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Pm-148m <sup>a</sup>		0.8	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Pm-149		2	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Pm-151		2	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Po-210	Polonium (84)	40	0.02	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Pr-142	Praseodymium (59)	0.4	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Pr-143		3	0.6	1 x 10 <sup>4</sup>	1 x 10 <sup>6</sup>
Pt-188 <sup>a</sup>	Platinum (78)	1	0.8	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Pt-191		4	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Pt-193m		40	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Pt-193		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Pt-195m		10	0.5	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Pt-197m		10	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Pt-197		20	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Pu-236	Plutonium (94)	30	0.003	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Pu-237		20	20	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Pu-238		10	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Pu-239		10	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Pu-240		10	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
Pu-241 <sup>a</sup>		40	0.06	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Pu-242		10	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Pu-244 <sup>a</sup>		0.4	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Ra-223 <sup>a</sup>	Radium (88)	0.4	0.007	1 x 10 <sup>2b</sup>	1 x 10 <sup>5b</sup>
Ra-224 <sup>a</sup>		0.4	0.02	1 x 10 <sup>1b</sup>	1 x 10 <sup>5b</sup>
Ra-225 <sup>a</sup>		0.2	0.004	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Ra-226 <sup>a</sup>		0.2	0.003	1 x 10 <sup>1b</sup>	1 x 10 <sup>4b</sup>
Ra-228 <sup>a</sup>		0.6	0.02	1 x 10 <sup>1b</sup>	1 x 10 <sup>5b</sup>
Rb-81	Rubidium (37)	2	0.8	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Rb-83 <sup>a</sup>		2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Rb-84		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Rb-86		0.5	0.5	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Rb-87		Unlimited	Unlimited	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Rb (natural)		Unlimited	Unlimited	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Re-184	Rhenium (75)	1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Re-184m		3	1	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Re-186		2	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Re-187		Unlimited	unlimited	1 x 10 <sup>6</sup>	1 x 10 <sup>9</sup>
Re-188		0.4	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Re-189 <sup>a</sup>		3	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Re (natural)		Unlimited	Unlimited	1 x 10 <sup>6</sup>	1 x 10 <sup>9</sup>
Rh-99	Rhodium (45)	2	2	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>

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Rh-101		4	3	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Rh-102		0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Rh-102m		2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Rh-103m		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>8</sup>
Rh-105		10	0.8	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Rn-222 <sup>a</sup>	Radon (86)	0.3	0.004	1 x 10 <sup>1b</sup>	1 x 10 <sup>8b</sup>
Ru-97	Ruthenium (44)	5	5	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Ru-103 <sup>a</sup>		2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Ru-105		1	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Ru-106 <sup>a</sup>		0.2	0.2	1 x 10 <sup>2b</sup>	1 x 10 <sup>5b</sup>
S-35	Sulphur (16)	40	3	1 x 10 <sup>5</sup>	1 x 10 <sup>8</sup>
Sb-122	Antimony (51)	0.4	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>4</sup>
Sb-124		0.6	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Sb-125		2	1	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Sb-126		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Sc-44	Scandium (21)	0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Sc-46		0.5	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Sc-47		10	0.7	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Sc-48		0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
SCO		Note 5	Note 5		
Se-75	Selenium (34)	3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Se-79		40	2	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Si-31	Silicon (14)	0.6	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Si-32		40	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Sm-145	Samarium (62)	10	10	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Sm-147		Unlimited	Unlimited	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Sm-151		40	10	1 x 10 <sup>4</sup>	1 x 10 <sup>8</sup>
Sm-153		9	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Sn-113 <sup>a</sup>	Tin (50)	4	2	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Sn-117m		7	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Sn-119m		40	30	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Sn-121m <sup>a</sup>		40	0.9	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Sn-123		0.8	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Sn-125		0.4	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Sn-126 <sup>a</sup>		0.6	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Sr-82 <sup>a</sup>	Strontium (38)	0.2	0.2	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Sr-85m		5	5	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Sr-85		2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Sr-87m		3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Sr-89		0.6	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Sr-90 <sup>a</sup>		0.3	0.3	1 x 10 <sup>2b</sup>	1 x 10 <sup>4b</sup>
Sr-91 <sup>a</sup>		0.3	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Sr-92 <sup>a</sup>		1	0.3	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>

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T (All Forms) (see note)	Tritium (1)	40	40	1 x 10 <sup>6</sup>	1 x 10 <sup>9</sup>
Ta-178 (long lived)	Tantalum (73)	1	0.8	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Ta-179		30	30	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Ta-182		0.9	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Tb-157	Terbium (65)	40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Tb-158		1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Tb-160		1	0.6	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Tc-95m <sup>a</sup>	Technetium (43)	2	2	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Tc-96m <sup>a</sup>		0.4	0.4	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Tc-96		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Tc-97m		40	1	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Tc-97		Unlimited	Unlimited	1 x 10 <sup>3</sup>	1 x 10 <sup>8</sup>
Tc-98		0.8	0.7	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Tc-99m		10	4	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Tc-99		40	0.9	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
Te-121m	Tellurium (52)	5	3	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Te-121		2	2	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Te-123m		8	1	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Te-125m		20	0.9	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Te-127m <sup>a</sup>		20	0.5	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Te-127		20	0.7	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Te-129m <sup>a</sup>		0.8	0.4	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Te-129		0.7	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Te-131m <sup>a</sup>		0.7	0.5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Te-132 <sup>a</sup>		0.5	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Th-227	Thorium (90)	10	0.005	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Th-228 <sup>a</sup>		0.5	0.001	1 x 10 <sup>0b</sup>	1 x 10 <sup>4b</sup>
Th-229		5	0.0005	1 x 10 <sup>0b</sup>	1 x 10 <sup>3b</sup>
Th-230		10	0.001	1 x 10 <sup>0</sup>	1 x 10 <sup>4</sup>
Th-231		40	0.02	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Th-232		Unlimited	Unlimited	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
Th-234 <sup>a</sup>		0.3	0.3	1 x 10 <sup>3b</sup>	1 x 10 <sup>5b</sup>
Th (natural)		Unlimited	Unlimited	1 x 10 <sup>0b</sup>	1 x 10 <sup>3b</sup>
Ti-44 <sup>a</sup>	Titanium (22)	0.5	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
Tl-200	Thallium (81)	0.9	0.9	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Tl-201		10	4	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Tl-202		2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Tl-204		10	0.7	1 x 10 <sup>4</sup>	1 x 10 <sup>4</sup>
Tm-167	Thulium (69)	7	0.8	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Tm-170		3	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Tm-171		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>8</sup>
U-230 (fast lung absorption) <sup>a, d</sup>	Uranium (92)	40	0.1	1 x 10 <sup>1b</sup>	1 x 10 <sup>5b</sup>

Symbol	Element and Atomic Number	A <sub>1</sub> (TBq) (Special Form)	A <sub>2</sub> (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
U-230 (medium lung absorption) <sup>a, e</sup>		40	0.004	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-230 (slow lung absorption) <sup>a, f</sup>		30	0.003	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-232 (fast lung absorption) <sup>d</sup>		40	0.01	1 x 10 <sup>0b</sup>	1 x 10 <sup>3b</sup>
U-232 (medium lung absorption) <sup>e</sup>		40	0.007	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-232 (slow lung absorption) <sup>f</sup>		10	0.001	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-233 (fast lung absorption) <sup>d</sup>		40	0.09	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-233 (medium lung absorption) <sup>e</sup>		40	0.02	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
U-233 (slow lung absorption) <sup>f</sup>		40	0.006	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
U-234 (fast lung absorption) <sup>d</sup>		40	0.09	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-234 (medium lung absorption) <sup>e, f</sup>		40	0.02	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
U-234 (slow lung absorption) <sup>f</sup>		40	0.006	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
U-235 (all lung absorption types) <sup>a, d, e, f</sup>		Unlimited	Unlimited	1 x 10 <sup>1b</sup>	1 x 10 <sup>4b</sup>
U-236 (fast lung absorption) <sup>d</sup>		Unlimited	Unlimited	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-236 (medium lung absorption) <sup>e</sup>		40	0.02	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
U-236 (slow lung absorption) <sup>f</sup>		40	0.006	1 x 10 <sup>1</sup>	1 x 10 <sup>4</sup>
U-238 (all lung absorption types) <sup>d, e, f</sup>		Unlimited	Unlimited	1 x 10 <sup>1b</sup>	1 x 10 <sup>4b</sup>
U (natural)		Unlimited	Unlimited	1 x 10 <sup>0b</sup>	1 x 10 <sup>3b</sup>
U (enriched 20% or less) <sup>g</sup>		Unlimited	Unlimited	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
U (depleted)		Unlimited	Unlimited	1 x 10 <sup>0</sup>	1 x 10 <sup>3</sup>
V-48	Vanadium (23)	0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>5</sup>
V-49		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
W-178	Tungsten (74)	9	5	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
W-181		30	30	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
W-185		40	0.8	1 x 10 <sup>4</sup>	1 x 10 <sup>7</sup>
W-187		2	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
W-188 <sup>a</sup>		0.4	0.3	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Xe-122 <sup>a</sup>	Xenon (54)	0.4	0.4	1 x 10 <sup>2</sup>	1 x 10 <sup>9</sup>



Symbol	Element and Atomic Number	A <sub>1</sub> (TBq) (Special Form)	A <sub>2</sub> (TBq) (Other Form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq)
Xe-123		2	0.7	1 x 10 <sup>2</sup>	1 x 10 <sup>9</sup>
Xe-127		4	2	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>
Xe-131m		40	40	1 x 10 <sup>4</sup>	1 x 10 <sup>4</sup>
Xe-133		20	10	1 x 10 <sup>3</sup>	1 x 10 <sup>4</sup>
Xe-135		3	2	1 x 10 <sup>3</sup>	1 x 10 <sup>10</sup>
Y-87 <sup>a</sup>	Yttrium (39)	1	1	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Y-88		0.4	0.4	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Y-90		0.3	0.3	1 x 10 <sup>3</sup>	1 x 10 <sup>5</sup>
Y-91m		2	2	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Y-91		0.6	0.6	1 x 10 <sup>3</sup>	1 x 10 <sup>6</sup>
Y-92		0.2	0.2	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Y-93		0.3	0.3	1 x 10 <sup>2</sup>	1 x 10 <sup>5</sup>
Yb-169	Ytterbium (70)	4	1	1 x 10 <sup>2</sup>	1 x 10 <sup>7</sup>
Yb-175		30	0.9	1 x 10 <sup>3</sup>	1 x 10 <sup>7</sup>
Zn-65	Zinc (30)	2	2	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Zn-69m		3	0.6	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Zn-69		3	0.6	1 x 10 <sup>4</sup>	1 x 10 <sup>6</sup>
Zr-88	Zirconium (40)	3	3	1 x 10 <sup>2</sup>	1 x 10 <sup>6</sup>
Zr-93		Unlimited	Unlimited	1 x 10 <sup>3b</sup>	1 x 10 <sup>7b</sup>
Zr-95 <sup>a</sup>		2	0.8	1 x 10 <sup>1</sup>	1 x 10 <sup>6</sup>
Zr-97 <sup>a</sup>		0.4	0.4	1 x 10 <sup>1b</sup>	1 x 10 <sup>5b</sup>

**Table A11.1. Notes:**

<sup>a</sup> A<sub>1</sub> and/or A<sub>2</sub> values include contributions from daughter nuclides with half-lives less than 10 calendar days.

<sup>b</sup> Parent nuclides and their progeny included in secular equilibrium are listed in the following:

Sr-90 --- Y-90

Zr-93 --- Nb-93m

Zr-97 --- Nb-97

Ru-106 --- Rh-106

Cs-137 --- Ba-137m

Ce-134 --- La-134

Ce-144 --- Pr-144

Ba-140 --- La-140

Bi-212 --- Tl-208 (0.36), Po-212 (0.64)

Pb-210 --- Bi-210, Po-210

Pb-212 --- Bi-212, Tl-208 (0.36), Po-212 (0.64)

Rn-220 --- Po-216

Rn-222 --- Po-218, Pb-214, Bi-214, Po-214

Ra-223 --- Rn-219, Po-215, Pb-211, Bi-211, Tl-207

Ra-224 --- Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Ra-226 --- Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

Ra-228 --- Ac-228

Th-226 --- Ra-222, Rn-218, Po-214

Th-228 --- Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-229 --- Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209

Th-nat - Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-234 --- Pa-234m

U-230 --- Th-226, Ra-222, Rn-218, Po-214

U-232 --- Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

U-235 --- Th-231

0.36), Po-212 (0.64)

Th-229 --- Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209

Th-nat - Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-234 --- Pa-234m

U-230 --- Th-226, Ra-222, Rn-218, Po-214

U-232 --- Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

U-235 --- Th-231

U-238 --- Th-234, Pa-234m

U-nat --- Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

U-240 --- Np-240m

Np-237--- Pa-233

Am-242m --- Am-242

Am-243 --- Np-239

<sup>c</sup> The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.

<sup>d</sup> These values apply only to compounds of uranium that take the chemical form of UF<sub>6</sub>, UO<sub>2</sub>F<sub>2</sub> and UO<sub>2</sub>(NO<sub>3</sub>)<sub>2</sub> in both normal and accident conditions of transport.

<sup>e</sup> These values apply only to compounds of uranium that take the chemical form of UO<sub>3</sub>, UF<sub>4</sub>, UCl<sub>4</sub> and hexavalent compounds in both normal and accident conditions of transport.

<sup>f</sup> These values apply to all compounds of uranium other than those specified in (d) and (e) above.

<sup>g</sup> These values apply to unirradiated uranium only.

1. In Table A11.1, the symbols for the various radionuclides are styled thus "Ir-192". The alternative form of "192 Ir" is equally acceptable.

2. Tritium (T) is a synonym for the radionuclide Hydrogen-3.

3. For Mixed Fission Products values for A<sub>1</sub> and A<sub>2</sub> are calculated using the formula for mixtures found in 49 CFR Paragraph 173.433(h).

4. For Low Specific Activity (LSA) material, consult IATA, section 10.3.5.

5. For Surface Contaminated Objects (SCO) consult IATA, section 10.3.6.

6. Type A packages may not contain activities greater than the following values: for special form radioactive material: A<sub>1</sub>; or for all other radioactive materials: A<sub>2</sub>.

U-238 --- Th-234, Pa-234m

U-nat --- Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

U-240 --- Np-240m

Np-237--- Pa-233

Am-242m --- Am-242

Am-243 --- Np-239

<sup>c</sup> The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.

<sup>d</sup> These values apply only to compounds of uranium that take the chemical form of  $UF_6$ ,  $UO_2F_2$  and  $UO_2(NO_3)_2$  in both normal and accident conditions of transport.

<sup>e</sup> These values apply only to compounds of uranium that take the chemical form of  $UO_3$ ,  $UF_4$ ,  $UCl_4$  and hexavalent compounds in both normal and accident conditions of transport.

<sup>f</sup> These values apply to all compounds of uranium other than those specified in (d) and (e) above.

<sup>g</sup> These values apply to unirradiated uranium only.

1. In Table A11.1, the symbols for the various radionuclides are styled thus "Ir-192". The alternative form of "192 Ir" is equally acceptable.

2. Tritium (T) is a synonym for the radionuclide Hydrogen-3.

3. For Mixed Fission Products values for  $A_1$  and  $A_2$  are calculated using the formula for mixtures found in 49 CFR Paragraph 173.433(h).

4. For Low Specific Activity (LSA) material, consult IATA, section 10.3.5.

5. For Surface Contaminated Objects (SCO) consult IATA, section 10.3.6.

6. Type A packages may not contain activities greater than the following values: for special form radioactive material:  $A_1$ ; or for all other radioactive materials:  $A_2$ .

**A11.5. Excepted Packages.** An Excepted Package is a packaging used for containing radioactive material, that is designed to meet the general packaging requirements of A3.3.7. as applicable.

**A11.5.1. General Requirements.** Radioactive materials in limited quantities, instruments, manufactured articles, and empty packagings may be transported as excepted packages, provided that:

A11.5.1.1. The radiation level at any point on the external surface of the package is not over 5  $\mu$ Sv/h (0.5 mrem/h).

A11.5.1.2. The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in A3.3.7.6.

**A11.5.2. Exceptions.**

A11.5.2.1. Excepted packages are subject to the following:

A11.5.2.1.1. Package marking requirements in A14.4.6.2.

A11.5.2.1.2. Reporting accidents/incidents.

A11.5.2.1.3. The materials are packaged in strong, tight packages that will not leak any of the radioactive materials under normal transportation conditions. Ensure packaging meets the general requirements of A3.3.7.8.

A11.5.2.2. Excepted packages are not subject to the following:

A11.5.2.2.1. Specification Packaging.

A11.5.2.2.2. Marking requirements (except A14.4.6.2.).

A11.5.2.2.3. Shipper's Declaration for Dangerous Goods requirements.

A11.5.3. Other Hazards. For excepted packages of radioactive materials possessing any other dangerous characteristics, the other hazard takes precedence. Package as required by this manual relevant to the other hazard.

A11.5.4. Radioactive Materials in Limited Quantities. Radioactive material whose activities do not exceed the relevant exception limits listed in the column headed "Materials – Package Limits" in Table A11.2. may be transported in an excepted package, provided that:

A11.5.4.1. These materials are packaged in such a manner that, in conditions likely to be encountered during routine transport (incident-free conditions), there can be no leakage of radioactive material from the package.

A11.5.4.2. The package bears the marking "RADIOACTIVE" on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

A11.5.5. Instruments and Manufactured Articles. Instruments and manufactured articles (including clocks, electronic tubes, or apparatus) or similar devices having radioactive materials in gaseous or nondispersible solid form as a component part may be transported in an excepted package if:

A11.5.5.1. Each package meets the general requirements of A3.3.7.8.

A11.5.5.2. The activity of the instrument or article is not over the applicable limit listed in Table A11.2.

A11.5.5.3. The total activity per package is not over the applicable limit listed in Table A11.2.

A11.5.5.4. The active material is completely enclosed by a nonactive component.

A11.5.5.5. The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article is not over 0.1 mSv/h (10 mrem/h). The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.005 mSv/hour (0.5 mrem/hour), or, for exclusive use domestic shipments, 0.02 mSv/hour (2 mrem/hour).

A11.5.5.6. Each instrument or article is marked "RADIOACTIVE" except:

A11.5.5.6.1. Radioluminescent time-pieces or devices. **Note:** Some radioluminescent devices require marking as radioactive 10 CFR.

A11.5.5.6.2. Consumer products that either have received regulatory approval, following their sale to the end user or do not individually exceed the activity limit for an exempt consignment in Table A11.1. provided such products are transported in a package that bears the marking “RADIOACTIVE” on an internal surface in such a manner that warning of the presence of radioactive material is visible upon opening the package.

A11.5.5.7. The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material may not be considered to be an instrument or manufactured article).

**Table A11.2. Activity Limits for Limited Quantities Instruments and Articles.**

Nature of Contents	Materials	Instruments and	Articles
	Package Limits (Note 1)	Limits for each instrument and article (Note 1)	Package Limits (Note 1)
<b>Solids</b>			
Special Form	$10^{-3} A_1$	$10^{-2} A_1$	$A_1$
Other Form	$10^{-3} A_2$	$10^{-2} A_2$	$A_2$
<b>Liquids</b>			
Tritiated Water:			
<0.0037 TBq/liter (0.1 Ci/L)	37 TBq (1000 Ci)		
0.0037 TBq to 0.037 TBq/L (0.1 Ci to 1.0 Ci/L)	3.7 TBq (100 Ci)		
>0.037 TBq/L (1.0 Ci/L)	0.037 TBq (1 Ci)		
Other Liquids	$10^{-4} A_2$	$10^{-3} A_2$	$10^{-1} A_2$
<b>Gases</b>			
Tritium (Note 2)	$2 \times 10^{-2} A_2$	$2 \times 10^{-2} A_2$	$2 \times 10^{-1} A_2$
Special Form	$10^{-3} A_1$	$10^{-3} A_1$	$10^{-2} A_1$
Other Forms	$10^{-3} A_2$	$10^{-3} A_2$	$10^{-2} A_2$
<b>Notes:</b>			
1. For mixture of radionuclides see 49 CFR Paragraph 173.433(d).			
2. These values also apply to tritium in activated luminous paint and tritium absorbed on solid carriers.			

A11.5.6. Articles Manufactured from Natural Uranium, Depleted Uranium, or Natural Thorium. Manufactured articles, in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium, or unirradiated natural thorium, may be transported as an excepted package, provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

A11.5.7. Empty Packages. An empty packaging which had previously contained radioactive material may be transported as an excepted package if the following conditions are met:

A11.5.7.1. It is in a well-maintained condition and securely closed.

A11.5.7.2. The outer surface of any uranium or thorium in its structure is covered with an active sheath made of metal or some other substantial material.

A11.5.7.3. The level of internal non-fixed contamination does not exceed one hundred times the levels specified in A3.3.7.6. for an excepted package.

A11.5.7.4. Hazardous materials labels used on the package previously are removed or no longer visible.

A11.5.7.5. The 'Empty' label is applied to the package.

**A11.5.8. Activity Limit Per Package.**

A11.5.8.1. Excepted Package of Radioactive Material. For radioactive material other than articles manufactured of natural uranium, or natural thorium, an excepted package may not contain activities greater than the following:

A11.5.8.1.1. Where the radioactive material is enclosed in, or forms a component part of an instrument or other manufactured article, such as a clock or electronic apparatus, the limits specified in A11.5.5. for each individual item and each package respectively.

A11.5.8.1.2. Where the radioactive material is not so enclosed in or is not included as a component of an instrument or other manufactured article, the limits specified in A11.5.4.

A11.5.8.2. Manufactured Articles. For articles manufactured of natural uranium, depleted uranium, or natural thorium, an excepted package may contain any quantity of such material provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

**A11.6. Industrial Packaging.** Industrial Packaging may be used for Low Specific Activity (LSA) material and Surface Contaminated Objects (SCO). LSA and SCO materials may not be transported unpackaged.

A11.6.1. Activity Limit. The total activity in a single package of LSA material or in a single package of SCO must be so restricted that the radiation level specified in A11.6.5. is not exceeded, and the activity in a single package must also be so restricted that the activity limits for an aircraft specified in **Table A11.3** are not exceeded. A single package of non-combustible solid LSA-II or LSA-III material shall not contain an activity greater than 3,000 A<sub>2</sub>. **(T-0)**.

**Table A11.3. Aircraft Activity Limits for LSA Material and SCO in Industrial Packages.**

<b>Nature of Material</b>	<b>Activity Limit Per Aircraft</b>
LSA-I	No Limit
LSA-II and LSA-III non-combustible solids	No Limit
LSA-II and LSA-III combustible solids, and all liquids and gases	100 A <sub>2</sub>
SCO	100 A <sub>2</sub>

A11.6.2. Industrial Package Type 1. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR Section 173.411 is an Industrial Package Type 1 (Type IP-1).

A11.6.3. Industrial Package Type 2. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR Section 173.411 is an Industrial Package Type 2 (Type IP-2).

A11.6.4. Industrial Package, Type 3. A packaging or freight container containing LSA material or SCO that is designed to meet the requirements of 49 CFR Section 173.411 is an Industrial Package Type 3 (Type IP-3).

A11.6.5. LSA and SCO Quantity Limit. The quantity of LSA material or SCO in a single Industrial Package Type 1, Industrial Package Type 2, or Industrial Package Type 3 must be so restricted that the external radiation level at 3m (10 ft) from the unshielded material does not exceed 10 mSv/h (1 rem/h). **(T-0)**.

A11.6.6. LSA and SCO – Fissile. LSA material and SCO which is, or contains, fissile material, must meet the applicable requirements of either 49 CFR Section 173.457 or 10 CFR Part 71. **(T-0)**.

A11.6.7. LSA and SCO – Restrictions. Packages and Freight containers containing LSA material or SCO must meet the requirements of A3.3.7.6. and A3.3.7.18. LSA material in group LSA-I and SCO in group SCO-I must not be transported unpackaged. **(T-0)**.

A11.6.8. LSA and SCO – Integrity Limits. LSA material and SCO must be packaged in accordance with Table A11.4. **(T-0)**.



**Table A11.4. Industrial Package Integrity Requirements for LSA and SCO.**

Contents	Industrial Package Type	
	Exclusive Use	NOT Under Exclusive Use
LSA-I:		
Solid	Type 1	Type 1
Liquid	Type 1	Type 2
LSA-II		
Solid	Type 2	Type 2
Liquid and gas	Type 2	Type 3
LSA-III	Type 2	Type 3
SCO-I	Type 1	Type 1
SCO-II	Type 2	Type 2

**A11.7. Packages Containing Uranium Hexafluoride(fissile, fissile excepted, and nonfissile).** The mass of uranium hexafluoride in a package shall not have a value that would lead to a ullage smaller than 5% at the maximum temperature of the package as specified for the plant systems where the package is used. **(T-0)**. The uranium hexafluoride shall be in solid form and the internal pressure of the package shall be below atmospheric pressure when presented for transport. **(T-0)**. Prepare this material for military air shipment according to 49 CFR Section 173.420.

**A11.8. Authorized Type A Packages.** Use the following packages for shipment, if they do not contain quantities over A<sub>1</sub> or A<sub>2</sub> as appropriate:

A11.8.1. DOT 7A packaging. DOT 7A packaging designed according to the requirements of 49 CFR Section 178.350 in effect after 30 June 1983.

A11.8.2. Any Type A packaging authorized in 49 CFR Section 173.415.

A11.8.3. For fissile material, any Type A packaging that meets the applicable standards for fissile materials in 10 CFR Part 71 and authorized in 49 CFR Section 173.471.

A11.8.4. Type B, B(U), or B(M) Packaging. Any Type B, B(U), or B(M) packaging, authorized in A11.9.2.1. or A11.9.2.2.

A11.8.5. Foreign-Made Packaging. Any foreign-made packaging that meets the standards of IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and bears the marking "Type A" used for the import of radioactive materials. The packaging must conform to the requirements of the country of origin (as indicated by the packaging marking) and the IAEA regulations applicable to Type A packaging. **(T-0)**.

**A11.9. Type B Packages.**

A11.9.1. Activity Limits. Type B(U) and B(M) may not contain activities greater than the following:

A11.9.1.1. Low dispersible material - as authorized for the package design.

A11.9.1.2. Special Form Radioactive Material – 3,000 A<sub>1</sub> or 100,000 A<sub>2</sub>, whichever is lower.

A11.9.1.3. All other radioactive material – 3,000 A<sub>2</sub>.

A11.9.2. Authorized Packages. Use the following packages for shipment of quantities over A<sub>1</sub> or A<sub>2</sub>, as appropriate:

A11.9.2.1. Any Type B, Type B(U), or Type B(M) packaging that meets the applicable requirements in 10 CFR Part 71 and has been approved by the US Nuclear Regulatory Commission may be shipped per 49 CFR Section 173.471.

A11.9.2.2. Any Type B, B(U) or B(M) packaging that meets the applicable requirements of the regulations of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by DOT according to 49 CFR Section 173.473. Authorized only for export and import shipments.

#### **A11.10. Authorized Packaging-Fissile Materials.**

A11.10.1. Except as provided in A3.3.7.3.4.1., package fissile materials containing not more than A<sub>1</sub> or A<sub>2</sub> (as appropriate) in:

A11.10.1.1. Any packaging listed in A11.8., limited to radioactive materials specified in 10 CFR Part 71, Subpart C.

A11.10.1.2. Any other Type AF, Type BF, Type B(U)F, or Type B(M)F packaging for fissile radioactive materials that also meets the applicable standards for fissile materials in 10 CFR Part 71.

A11.10.1.3. Any other Type AF, Type B(U)F, or Type B(M)F packaging that also meets the applicable requirements for fissile material packaging in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR Section 173.473. Authorized only for export and import shipments.

A11.10.1.4. Any metal cylinder that meets the performance requirements of A11.5. and 49 CFR Section 178.350 for DOT 7A Type A packaging may be used for the transport of residual "heels" of enriched solid uranium hexafluoride without a protective overpack per Table A11.5.

A11.10.1.5. DOT 20PF-1, 20PF-2, 20PF-3 or 21PF-1A, 21PF-1B, or 21PF-2 phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of A3.3.7.9., A3.3.7.10., and the following:

A11.10.1.5.1. Handling procedures and packaging criteria complying with US Enrichment Corporation Report Number USEC-651 or ANSI N14.1 is required.

A11.10.1.5.2. Quantities of uranium hexafluoride are authorized as shown in Table A11.6., with each package assigned a minimum transport index as also shown.

**Table A11.5. Allowable Content of Uranium Hexafluoride (UF<sub>6</sub>) "Heels" in a Specification 7A Cylinder.**

Maximum Cylinder Diameter		Cylinder Volume		Maximum Uranium <sup>235</sup> Enrichment (Weight %)	Maximum "Heel" Weight Per Cylinder UF <sub>6</sub> Uranium <sup>235</sup>			
Inches	Centimeters	Cubic Feet	L		kg	(lb)	kg	(lb)
5	12.7	0.311	8.8	100.0	0.045	0.1	0.031	0.07
8	20.3	1.359	39	12.5	0.227	0.5	.019	0.04
12	30.5	2.410	68	5.0	0.454	1.0	.015	0.03
30	76	25.64	725	5.0	11.3	25	.383	0.84
48	122	108.9 (10 ton)	3084	4.5	22.7	50	.690	1.52
48	122	142.7 (14 ton)	4041	4.5	22.7	50	.690	1.52

A11.10.2. Fissile Radioactive Materials with Radioactive Content Over A1 or A2. Package in either:

A11.10.2.1. Type B(U) or B(M) packaging that meets the standards for packaging of fissile materials in 10 CFR Part 71, and is approved by the US Nuclear Regulatory Commission per 49 CFR Section 173.471.

A11.10.2.2. Type B(U) or B(M) packaging that meets the applicable requirements for fissile radioactive materials in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR Section 173.473. Authorized only for export and import shipments.

A11.10.2.3. DOT 20PF-1, 20PF-2, 20PF-3, 21PF-1A, or 21PF-1B phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of A3.3.7.9., A3.3.7.10., and the following:

A11.10.2.3.1. Handling procedures and packaging criteria complying with US Enrichment Corporation Report Number USEC-651 or ANSI Standard N14.1.

A11.10.2.3.2. Uranium hexafluoride in packaging and quantities authorized in 49 CFR Subparagraph 173.417(a)(2).

**A11.11. Special Arrangement (Competent Authority Approval).** If the radioactive material does not comply with any of the methods of packing provided in this manual, the material may be permitted to be transported by CAA. The provisions for carrying the radioactive material using a CAA must be approved by all countries concerned. **(T-0)**. These provisions must be adequate to ensure that the overall level of safety in transport and in-transit storage is at least equivalent to the level of safety which would be provided if all the applicable requirements of these regulations had been met. **(T-0)**. Each consignment must have multilateral approval. **(T-0)**.

**A11.12. Authorized Packaging-Pyrophoric Radioactive Materials.** Package pyrophoric radioactive materials in quantities not over A<sub>2</sub> per package in DOT Type 7A packagings constructed of materials that do not react nor be decomposed by the contents. Contents must be:

A11.12.1. In solid form and must not be fissile unless excepted by A3.3.7.3.4.2.

A11.12.2. Contained in sealed and corrosion resistant receptacles with positive closures (friction or slip-fit covers or stoppers are not authorized).

A11.12.3. Free of water and any contaminants that increase the reactivity of the material.

A11.12.4. Made inert to prevent self-ignition during transport by either:

A11.12.4.1. Mixing with large volumes of inerting materials such as graphite or dry sand, or other suitable inerting material, or blended into a matrix of hardened concrete.

A11.12.4.2. Filling the innermost receptacle with an appropriate inert gas or liquid.

A11.12.4.3. Pyrophoric Class 7 (Radioactive) materials transported by aircraft must be packaged in Type B packages. **(T-0)**.

## Attachment 12

## CLASS 8--CORROSIVE MATERIALS

**A12.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A12.2. through A12.14. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A12.2. through A12.14. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall not deviate from these provisions and fully comply with the inner/receptacle packaging and outer container selection as mandated in packaging paragraph. **(T-0)**. Not all packaging paragraphs are inclusive and packaging selection is determined by the type of corrosive material and quantity shipped. This attachment contains information concerning the packaging and general handling instructions for Class 8 (corrosive materials). See Attachment 3 for other details concerning Class 8 material.

**A12.2. Package Liquid Class 8 Materials** as follows:

A12.2.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<p><b>Receptacles:</b> Glass, earthenware, plastic, or metal</p> <p><b>Note:</b> For PG I material inner packagings packed in a rigid and leakproof receptacle or intermediate packaging containing sufficient absorbent material to absorb the entire contents of all inner packagings before packing the inner packaging(s) in the outer package.</p> <p><b>Note:</b> Inner packaging or receptacle closures of combination packages containing liquids held securely, tightly and effectively in place by secondary means. See A20.3.</p>	<p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G) plastic (1H1 or 1H2), or metal other than steel or aluminum (1N1 or 1N2)</p> <p><b>or</b></p> <p><b>Barrel:</b> wood (2C2)</p> <p><b>Note:</b> Wood barrel (2C2) not authorized for PG I material.</p> <p><b>or</b></p> <p><b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2) or plastic (3H1 or 3H2)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2), or other metal (4N)</p>

A12.2.2. Package in single packaging drums, barrels, or jerricans as follows:

Inner packaging	Outer packaging
Not required	<p><b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), fiber (1G) with liner, plastic (1H1 or 1H2) or metal other than steel or aluminum (1N1 or 1N2)</p> <p><b>Note:</b> Fiber drum (1G) with liner only authorized for PG II and III material.</p> <p><i>or</i></p> <p><b>Barrel:</b> wood (2C1)</p> <p><b>Note:</b> Wood barrel (2C1) not authorized for PG I material.</p> <p><i>or</i></p> <p><b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)</p>

A12.2.3. Package in the following composite packagings with plastic inner receptacles:

Inner receptacle	Outer packaging
Plastic	<p><b>Drums:</b> Steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1)</p> <p><b>Note:</b> Plywood drums not authorized for PG I material.</p> <p><i>or</i></p> <p><b>Boxes:</b> steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)</p>

A12.2.4. Package in the following composite packagings with glass, porcelain, or stoneware inner receptacles:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<p><b>Drums:</b> steel, aluminum or fiber (6PA1, 6PB1, or 6PG1)</p> <p><i>or</i></p> <p><b>Boxes:</b> steel, aluminum, wooden or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)</p> <p><i>or</i></p> <p>solid or expanded plastic packaging (6PH1 or 6PH2)</p> <p><i>or</i></p> <p>plywood drum or wickerwork hamper (6PD1, 6PD2)</p> <p><b>Note:</b> Plywood drum and wickerwork hamper not authorized for PG I material</p>

A12.2.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except those for acetylene (8, 8AL) and DOT 3HT.

**A12.3. Package Solid Class 8 Materials** as follows:

A12.3.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> Glass, earthenware, plastic, or metal	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or metal other than steel or aluminum (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wood (2C2) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), Natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic box (4H2), or metal other than steel or aluminum (4N)

A12.3.2. Package in single packagings of drums, barrels, jerricans, boxes, or bags as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), plastic (1H1 or 1H2), fiber (1G), or metal other than steel or aluminum (1N1 or 1N2) <b>Note:</b> Plywood (1D) is not authorized for PG I material. <i>or</i> <b>Barrel:</b> wood (2C1 or 2C2) <b>Note:</b> Wood barrels (2C1 or 2C2) not authorized for PG I material. <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel or steel with liner (4A), aluminum or aluminum with liner (4B), natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2) or metal other than steel or aluminum (4N)

	<p><b>Note:</b> Steel (4A), aluminum (4B), natural wood (4C1), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) boxes are not authorized for PG I material.</p> <p><i>or</i></p> <p><b>Bags:</b> woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); or paper, multiwall, water-resistant (5M2)</p> <p><b>Note:</b> Bags are not authorized for PG 1 material.</p>
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A12.3.3. Package in the following composite packagings with plastic inner receptacles:

Inner receptacle	Outer packaging
Plastic	<p><b>Drums:</b> steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)</p> <p><i>or</i></p> <p><b>Boxes:</b> steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)</p> <p><b>Note:</b> Boxes are not authorized for PG 1 material.</p>

A12.3.4. Package in the following composite packagings with glass, porcelain, or stoneware inner receptacles:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<p><b>Drums:</b> steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1)</p> <p><i>or</i></p> <p><b>Boxes:</b> steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)</p> <p><i>or</i></p> <p>expanded or solid plastic packaging (6PH1 or 6PH2)</p>

A12.3.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except those for acetylene (8, 8AL) and DOT 3HT.

**A12.4. Package Batteries, Wet, Filled with Acid; Batteries, Wet, Filled with Alkali; or Batteries, Wet, Non-spillable** as follows:



A12.4.1. Package to prevent a dangerous evolution of heat (e.g., an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence) and:

A12.4.1.1. Completely protect against short circuit with electrically nonconductive material and securely cushion electric storage batteries containing electrolyte acid or alkali corrosive battery fluid within the outer container,

A12.4.1.2. Separate batteries and battery-powered devices in a manner to prevent contact with other batteries or devices with electrically conductive materials,

A12.4.1.3. Place batteries inside an acid or alkali-proof liner (not mandatory for non-spillable batteries), adequately sealed to prevent leakage in the event of a spill, within the outer container as follows:

A12.4.1.4. Pack batteries so that the fill openings or vents, if any, are upward.

A12.4.1.5. Do not pack with other articles unless authorized by a specific packaging paragraph.

A12.4.1.6. However, batteries may be packed with portable searchlights, battery parts, or hydrometers, if properly cushioned and securely packed in a separate container.

A12.4.2. Pack batteries packed without other materials in boxes, drums, or jerricans as follows:

Inner packaging	Outer packaging
Not required	<b>Boxes:</b> wooden (4C1, 4C2, 4D, 4F), fiberboard (4G), or solid plastic (4H2) <i>or</i> <b>Drums:</b> plywood (1D), fiber (1G), or plastic (1H2) <i>or</i> <b>Jerrican:</b> plastic (3H2) <b>Note:</b> All outer packagings must meet PG II performance standards.

A12.4.3. Non-Spillable Batteries. Pack in strong outer packagings. To consider a battery non-spillable, it must withstand without leakage the vibration and pressure differential tests specified in 49 CFR Paragraph 173.159(f). **(T-0)**. Batteries meeting the additional requirement of NON Spillable are considered dry, and are not subject to any other requirements of this manual.

A12.4.4. Electrolyte, Acid, or Alkali Corrosive Battery Fluid, Packed with Storage Batteries Wet or Dry. Package as described below.

A12.4.4.1. Package in boxes with glass inner receptacles as follows:

Inner packaging	Outer packaging
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Glass receptacles <b>Note:</b> Not over 4.0 L (1 gallon) capacity each.	<b>Boxes:</b> wooden box (4C1, 4C2, 4D, 4F) <b>Note:</b> Maximum quantity is 8.0 L (2 gallons) each. Cushion and separate the inside containers from batteries by a strong solid wooden partition.
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A12.4.4.2. Package in boxes with plastic inner bottles as follows:

Inner packaging	Outer packaging
Plastic bottles <b>Note:</b> Not over 1 L (1 quart) capacity each.	<b>Boxes:</b> wooden box (4C1, 4C2, 4D, 4F) <b>Note:</b> Pack no more than 24 bottles, securely separated from storage batteries and filling kits in each package.

A12.4.4.3. Package dry storage batteries or battery charger devices in fiberboard boxes (4G) with inner receptacles containing battery fluid. Ensure complete package conforms to PG III requirements. Pack no more than 12 inner receptacles in one outer box. Maximum authorized gross weight is 34 kg (75 pounds).

A12.4.5. Batteries Packed without other materials (Domestic Shipments Only). The following nonspecification packagings are authorized for domestic only shipments of batteries packed without other materials:

A12.4.5.1. One to three batteries of not over 11.3 kg (25 pounds) each, packed in an outside box. Gross weight may not exceed 34 kg (75 pounds).

A12.4.5.2. A maximum of four batteries not over 7 kg (15 pounds) each may be packed in strong outside fiberboard or wooden boxes. Cushion and pack to prevent short circuits. Gross weight may not be over 30 kg (65 pounds).

A12.4.5.3. A maximum of five batteries not over 4.5 kg (10 pounds) each may be packed in an outside fiberboard or wooden box. Securely cushion and pack to prevent short circuits. Gross weight may not exceed 30 kg (65 pounds).

A12.4.5.4. Single batteries not over 34 kg (75 pounds) each, packed in five-sided slipcovers or in completely closed fiberboard boxes. Ensure slipcovers and boxes are of single or double-faced corrugated fiberboard of at least 91 kg (200 pounds) test strength. Fit the slipcover or the fiberboard box snugly and provide an inside top clearance of at least 1.3 cm (one-half inch) above battery terminals and filler caps with reinforcements in place. When assembled for shipment, the bottom edges of the slipcover may extend to the base of the battery and may not expose more than 25.4 mm (1 inch). Ensure the completed package (battery and box or slipcover) is capable of withstanding a top-to-bottom compression test without damage to the battery terminals, cell covers, or filler caps.

A12.4.5.5. Single batteries exceeding 34 kg (75 pounds) each may be packed in completely closed fiberboard boxes. Use double-wall corrugated fiberboard boxes of at least 181 kg (400 pounds) test, or solid fiberboard testing at least 181 kg (400 pounds). A box may have holes in its ends provided that the handholes will not materially weaken the box. Sides and ends of the box may not be less than 1.3 cm (0.5 inch); and use excelsior pads, corrugated fiberboard, or other suitable cushioning material. Protect the bottom of the

battery by a minimum of one excelsior or double-wall corrugated fiberboard pad. Protect the top of the battery by a wood frame, corrugated trays or scored sheets of corrugated fiberboard having minimum test of 91 kg (200 pounds), or other equally effective cushioning material. Ensure the top protection bears evenly on connectors and/or edges of the battery cover to facilitate stacking of batteries. No more than one battery may be placed in one box. The maximum authorized gross weight is 91 kg (200 pounds).

A12.4.5.6. Large electric storage batteries protected against short circuit and firmly secured to skids or pallets capable of withstanding the shocks normally incident to transportation. The height of the completed unit may not be greater than 1.5 times the width of the skid or pallet. Ensure the unit is capable of withstanding, without damage, a superimposed weight equal to two times the weight of the unit. If the weight of the unit is greater than 907 kg (2,000 pounds), ensure it withstands, without damage, a superimposed weight of 1814 kg (4,000 pounds). Do not rely on battery terminals to support any part of the superimposed weight and ensure terminals do not short out if an electrically conductive material is placed in direct contact with them. Mark and label each skid or pallet as required by Attachment 14 and Attachment 15.

**A12.5. Package Bombs, Smoke, Nonexplosive** as follows: Ship bombs, smoke, nonexplosive provided they are without ignition elements, bursting charges, detonating fuses, or other explosive components. Packaging meeting PG II performance standard is required. Package in steel (4A), aluminum (4B), wooden (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), or other metal (4N) boxes; or steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), plastic (1H2), or other metal (1N2) drums.

**A12.6.** UN3547, Articles containing corrosive substance, N.O.S. are authorized when classified per paragraph A4.2.3., maximum net quantity per package 30 L for liquids and 50 kg for solids, when packaged, or unpackaged as follows:

A12.6.1. When packaged, packagings meeting PG II performance standard is required.

A12.6.1.1. Pack articles to prevent movement and inadvertent operation during normal conditions of transport.

A12.6.1.2. Pack inner receptacles containing liquids with closures in outer packagings with their closures correctly oriented.

A12.6.1.3. Where there is no receptacle within the article, ensure the article fully encloses the dangerous goods and prevent their release under normal conditions of transport.

Inner packaging	Outer packaging
<p><b>Receptacles:</b> constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.</p>	<p><b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2)</p> <p><b>or</b></p> <p><b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2), other metal (4N)</p> <p><b>or</b></p> <p><b>Jerricans:</b> removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2)</p>

#### A12.6.2. Robust articles.

A12.6.2.1. Robust articles may be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use; or,

A12.6.2.2. Robust articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained.

**A12.7. Package Gallium** as follows: Package gallium metal in semi-rigid plastic inside packaging of not more than a 2.5 kg (5.5 pounds) net capacity each, then individually enclosed in a sealed bag of strong, leak-tight, and puncture-resistant material impervious to liquid gallium. Place the sealed bag in a wooden (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1, 4H2) or metal, other than steel or aluminum (4N) boxes or in a steel (1A1, 1A2), fiber (1G), plastic (1H1 or 1H2), or metal, other than steel or aluminum (1N1, 1N2) drum lined with a strong, leak-tight, and puncture-resistant material impervious to liquid gallium. If necessary to keep in a solid state, enclose this packaging in a strong, water-resistant outer packaging that contains dry ice or other means of refrigeration. Refrigerate the gallium sufficiently to maintain in a completely solid state during the entire anticipated time it will be in transportation to its destination. If a refrigerant is used, ensure all packaging materials are chemically and physically resistant to the refrigerant and have impact resistance at the low temperatures of the refrigerant used. If dry ice is used, ensure the outer package permits the release of carbon dioxide gas. Packaging meeting PG I performance standard is required. Manufactured articles, each not containing more than 100 mg (0.0035 ounce) of gallium and packaged so that the quantity per package does not exceed 1 g (0.35 ounce) are not subject to any other requirements of this manual (see paragraph A3.1.16.3.).

**A12.8. Package Hydrogen Fluoride** as follows: Package hydrogen fluoride (hydrofluoric acid, anhydrous) in cylinders, DOT 3, 3A, 3AA, 3B, 3BN, or 3E; also DOT 4B, 4BA, 4BW if not brazed. Filling density may not exceed 85 percent of the water weight capacity of the cylinder.

In place of the periodic volumetric expansion test required, cylinders used exclusively in this manner may be given a complete external visual inspection in conformance with 49 CFR Part 180, Subpart C at the time such periodic inspection becomes due and documented.

**A12.9. Package Mercury (Metallic and Articles Containing Mercury) as follows:**

A12.9.1. Handling Instructions. Mercury is poisonous in liquid and vapor form and can be absorbed through the skin at room temperature. It is corrosive to aluminum and its alloys. It expands on freezing, and may crack glass containers.

A12.9.2. Packaging Requirements. Packaging meeting the PG I performance standard is required. Pack inner containers with sufficient cushioning material to prevent breakage. Ensure either the inner packaging or the outer packaging has an inner liner or bags of strong leak-proof and puncture-resistant material, impervious to mercury, completely surrounding the contents and sealed which prevents the escape of mercury from the package irrespective of its position. Manufactured articles, each containing not more than 100 mg (0.0035 ounce) of mercury and packaged so that the quantity of mercury per package does not exceed 1 g (0.0035 ounce) are not subject to any other requirements of this manual (see paragraph A3.1.16.4.). Package mercury as follows:

A12.9.2.1. In inner earthenware, glass, or suitable plastic receptacles containing not more than 3.5 kg (7.7 pounds), glass ampoules containing not more than 0.5 kg (1.1 pounds), or iron or steel quicksilver flasks containing not more than 35 kg (77 pounds) of mercury. Package in outer steel (1A1, 1A2), plywood (1D), fiber (1G), or metal, other than steel or aluminum (1N1, 1N2) drums; steel jerricans (3A2); wooden (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H2), or metal, other than steel or aluminum (4N) boxes.

A12.9.2.2. Specification packagings are not required for manufactured articles or apparatuses containing mercury when packaged as follows:

A12.9.2.2.1. Manufactured articles or apparatus of which metallic mercury is a component part (manometers, pumps, thermometers, switches, etc.), except as otherwise covered in A12.9. Package these items in a strong outer packaging. The inner liner and cushioning requirements of A12.9.2. apply.

A12.9.2.2.2. Mercury switches and relays are excepted from this manual if they are of the totally enclosed leak-proof type in sealed metal or plastic units. Thermometers, switches, and relays each containing a total quantity of not more than 15 g (0.53 ounces) of mercury, are also excepted if installed as an integral part of a machine or apparatus and so fitted that damage or leakage of mercury is unlikely to occur under conditions normally incident to transport.

A12.9.2.3. Package electrons tubes, mercury vapor tubes, and similar tubes as follows:

A12.9.2.3.1. In strong outer packagings with all seams and joints sealed with self adhesive, pressure-sensitive tape that prevents the escape of mercury from the package. The maximum net quantity is 450 g (15.9 ounces) of mercury per package.

A12.9.2.3.2. Package tubes with more than 450 g (15.9 ounces) of mercury in strong outer packagings having sealed inner liners or bags of strong leak-proof and puncture-

resistant material impervious to mercury, completely surrounding the contents which prevents the escape of mercury from the package irrespective of its position.

A12.9.2.3.3. Tubes which do not contain more than 5 g (0.2 ounces) of mercury each and that are packed in the manufacturer's original packaging. Maximum total net quantity is 30 g (1.1 ounces) of mercury per package.

A12.9.2.3.4. Tubes which are completely jacketed in sealed leak-proof metal cases and are packed in the manufacturer's original packaging.

A12.9.2.4. Mercurial barometers complying with A12.9.2.2.1., that are loaded and unloaded from an aircraft under the supervision of, and are accompanied in flight by a US weather official or a similar US agency official (e.g., Air Weather Service personnel), are excepted from any other requirements of this manual.

**A12.10. Package Nitrating Acid Mixtures; Nitrating Acid Mixtures, Spent; or Nitric Acid** as follows: Do not package nitric acid exceeding 40 percent concentration with any other material. Package nitric acid as follows:

A12.10.1. Pack nitric acid in any concentration, which does not contain sulfuric acid or hydrochloric acid as impurities, in:

A12.10.1.1. Stainless steel drum (1A1). Do not ship containers weighing less than 85 percent of their original marked weight. Stainless steel used in drums must be at least 0.9 mm (.035 inches) for 55 L (15 gallon) nominal capacity, 1.2 mm (.047 inches) for 115 L (30 gallon) nominal capacity, and 1.5 mm (.059 inches) for 210 L (55 gallon) nominal capacity. **(T-0)**. Type 304 or other grades of equivalent corrosion-resistant steel in as-welded condition are authorized for nitric acid concentrations of up to and including 78 percent. In addition to the UN specification markings, the marking as specified in 49 CFR Subparagraph 173.158(b)(1) must be included on the drum. **(T-0)**. An example of this marking is: 304HT/1.9/2.7/TW55. For all other concentrations of nitric acid the following are authorized:

A12.10.1.1.1. Type 304 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.10.1.1.2. Stabilized type 347 in the as-welded condition.

A12.10.1.1.3. Stabilized type 347 stress-relieved (845-900 degrees C [1550-1650 degrees F]).

A12.10.1.1.4. Stabilized type 347 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.10.1.1.5. Other grades of equivalent corrosion resistance.

A12.10.1.2. Expanded plastic box (4H1), with inner glass receptacles not over 2.5 L (0.66 gallons) capacity each. Pack no more than four glass inner receptacles in one outer packaging.

A12.10.2. Pack nitric acid of 90 percent or greater concentration in a wooden box (4C1, 4C2, 4D, or 4F), with inner glass bottles not over 2.5 L (0.66 gallons) capacity each. Individually pack and cushion the inside containers in tightly closed metal containers, then pack in the outer container.

A12.10.3. Pack nitric acid, of 80 percent or greater concentration that does not contain sulfuric acid or hydrochloric acid as impurities, in an aluminum drum (1B1). Maximum quantity is 38 L (10 gallons).

A12.10.4. Package nitric acid of less than 90 percent concentration in steel (4A), aluminum (4B), natural wood (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or other metal (4N) boxes with inside glass bottles not over 2.5 L (0.66 gallons) capacity each.

A12.10.5. Package nitric acid of more than 70 percent concentration in outer steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), plastic (1H2) or metal, other than steel or aluminum (1N2) drums; plastic jerricans (3H2); steel (4A), aluminum (4B), Natural wood (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or metal, other than steel or aluminum (4N) boxes with inside containers:

A12.10.5.1. Glass or earthenware containers not over 1 L (1 quart) capacity each.

A12.10.5.2. Glass ampoules not over 0.5 L (1 pint) capacity each.

A12.10.6. Pack nitric acid of 70 percent or less concentration in outer steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), plastic (1H2) or metal, other than steel or aluminum (1N2) drums; plastic jerricans (3H2); steel (4A), aluminum (4B), Natural wood (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or metal, other than steel or aluminum (4N) boxes with inside containers:

A12.10.6.1. Glass or earthenware not over 2.5 L (0.66 gallon) capacity each.

A12.10.6.2. Plastic not over 2.5 L (0.66 gallon) capacity each further individually placed into tightly closed metal packaging.

A12.10.6.3. Glass ampoules not over 0.5 L (0.1 gallon) capacity each.

A12.10.7. Pack nitric acid of 70 percent or less concentration in composite packaging (6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PH1, 6PH2). Composite packaging 6HH1 and 6HA1 meeting the compatibility requirements of 49 CFR Paragraph 173.24(e) are also authorized.

A12.10.8. Pack nitric acid of 70 percent or less concentration in outer plastic box (4H1) with inside glass packaging containing not more than 2.5 L (0.66 gallon) each.

**A12.11. Package Class 8 Materials With an Inhalation Hazard (Hazard Zone A and B) as follows:**

A12.11.1. Handling Instructions. These items are extremely dangerous. Make available approved chemical safety mask and clothing when handling this material, and wear when handling leaking packages.

A12.11.2. Hazard Zone A Packaging Requirements. Package Class 8 materials with an Inhalation Hazard Zone A as follows:

A12.11.2.1. In seamless DOT or UN specification cylinders that conform to 49 CFR Section 173.40 and one of the specifications for cylinders in 49 CFR Part 178, Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Use cylinders meeting the requirements of A3.3.2.

A12.11.2.2. In an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Test both the inner and outer drum to the PG I performance level. Ensure

an outer 1A2 drum has a minimum thickness of 1.35 mm (0.053 inches). Ensure an outer 1H2 drum has a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum may not exceed 220 L (58 gallons). Ensure the outer drum (1A2 or 1H2) withstands a hydrostatic test pressure of 100kPa (15 psig). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material which completely surrounds the inner packaging on all sides. The inner drum must also meet the following requirements:

A12.11.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR Section 178.605) of 300 kPa (45 psig).

A12.11.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR Section 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.11.2.2.3. Have screw-type closures that meet all the following requirements:

A12.11.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.11.2.2.3.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A12.11.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.11.2.2.4. Meet the following minimum thickness requirements:

A12.11.2.2.4.1. 1A1 and 1N1 drums must have a minimum thickness of 1.3 mm (0.051 inch).

A12.11.2.2.4.2. 1B1 drums must have a minimum thickness of 3.9 mm (0.154 inch).

A12.11.2.2.4.3. 1H1 drums must have a minimum thickness of 3.16 mm (0.124 inch).

A12.11.2.2.4.4. 6HA1 drums the plastic inner container must have a minimum thickness of 1.58 mm (0.0622 inch) and the outer steel drum must have a minimum thickness of 0.96 mm (0.0378 inch). **(T-0)**.

A12.11.2.3. Pack in combination packagings with an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal, securely cushioned with a nonreactive absorbent material packed within a leak-tight packaging of metal or plastic. The capacity of the inner receptacle may not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a closure that is held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation. **(T-0)**. Pack the inner packaging system in an outer steel drum (1A2), aluminum drum (1B2), , plywood drum (1D), fiber drum (1G), plastic drum (1H2), metal drum (other than steel or aluminum) (1N2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), solid plastic box (4H2) or metal box (other than steel or aluminum) (4N). Ensure both the inner packaging system and the outer container each meets the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container may not exceed 16 L (4 gallons).



A12.11.3. Hazard Zone B Packaging Requirements. Package Class 6.1, PG I materials with an Inhalation Hazard Zone B as follows:

A12.11.3.1. In seamless DOT or UN specification cylinders that conform to 49 CFR Section 173.40 and one of the specifications for cylinders in 49 CFR Part 178, Subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Ensure cylinders also meet the requirements of A3.3.2.

A12.11.3.2. In an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Test both the inner and outer drum to the PG I performance level. Ensure an outer 1A2 drum has a minimum thickness of 1.35 mm (0.053 inches). Ensure an outer 1H2 drum has a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum may not exceed 220 L (58 gallons). Ensure the outer drum (1A2 or 1H2) withstands a hydrostatic test pressure of 100kPa (15 psig). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material which completely surrounds the inner packaging on all sides. The inner drum must also meet the following requirements:

A12.11.3.2.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR Section 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.11.3.2.2. Have screw-type closures that meet all the following requirements:

A12.11.3.2.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.11.3.2.2.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A12.11.3.2.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.11.3.2.3. Meet the following minimum thickness requirements:

A12.11.3.2.3.1. 1A1 and 1N1 drums must have a minimum thickness of 0.69 mm (0.027 inch).

A12.11.3.2.3.2. 1B1 drums must have a minimum thickness of 2.79 mm (0.110 inch).

A12.11.3.2.3.3. 1H1 drums must have a minimum thickness of 1.14 mm (0.045 inch).

A12.11.3.2.3.4. 6HA1 drums the plastic inner container must have a minimum thickness of 1.58 mm (0.0622 inch) and the outer steel drum must have a minimum thickness of 0.70 mm (0.027 inch). **(T-0)**.

**A12.12. Package Fuel Cell Cartridges** as follows:

A12.12.1. The weight of the fuel cells may not exceed 1 kg.

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A2), aluminum (1B2), plywood (1D), Fiber (1G), plastic (1H2), other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), plastic (3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), wood (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H2), other metal (4N)

### A12.13. Fuel Cells Contained in Equipment

A12.13.1. UN specification packaging is not required. Pack fuel cells in strong outer container. Protect installed fuel cells in equipment against short circuit, and protect the entire system against inadvertent operation. Fuel cell systems may not charge batteries during transport.

A12.13.2. Protect the terminals of the installed fuel cells to prevent short circuit by use of protective coverings, taping, etc.

### A12.14. Fuel Cells Packed With Equipment

A12.14.1. UN specification packaging is not required. Pack fuel cells in strong outer container. Pack fuel cells in inner packagings or pack in the outer packaging with cushioning material or divider(s) in order to protect against damage that may be caused by the movement or placement of contents within the outer packaging. The maximum number of fuel cell cartridges in the intermediate packaging may not be more than the number required to power the equipment plus two spares.

**A12.15. Package Chlorosilanes** as follows: Packaging meeting the PG I or PG II performance standard is required.

A12.15.1. Package in the following combination drums, or boxes:

Inner packaging	Outer packaging
<b>Receptacles:</b> Glass, or steel	<b>Drums:</b> steel (1A2), plywood (1D), fiber (1G), or plastic (1H2) <i>or</i> <b>Boxes:</b> steel (4A), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A12.15.2. Package in the following composite drums:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel drum (6HA1)

A12.15.3. Package in the following single drums, or jerricans:

<b>Inner packaging</b>	<b>Outer packaging</b>
<b>Not required</b>	<b>Drums:</b> steel (1A1) <i>or</i> <b>Jerricans:</b> steel (3A1)

A12.15.4. Package in Cylinders as prescribed for any compressed gas, except Specification 8, 8AL, and 3HT cylinders.

## Attachment 13

## CLASS 9--MISCELLANEOUS HAZARDOUS MATERIAL

**A13.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A13.2. through A13.18. and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A13.2. through A13.18. and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. This attachment contains a multitude of Class 9 commodities and personnel shall not deviate from unique packaging instructions provided. **(T-0)**. Not all packaging paragraphs are inclusive and packaging selection is based on the category of the hazard. This attachment contains information concerning the packaging and general handling instructions for Class 9 (Miscellaneous Hazardous Materials). See Attachment 3 for other details concerning Class 9 material.

**A13.2. Package Ammonium Nitrate Fertilizers; Benzaldehyde; Dibromodifluoromethane (Difluorodibromomethane); Environmentally Hazardous Substances, N.O.S.; Fish Meal, Stabilized; Fish Scrap, Stabilized; Hazardous Waste, N.O.S.; Other Regulated Substances; Polychlorinated Biphenyls (PCB); Zinc Dithionite, Zinc Hydrosulfite** as follows:

A13.2.1. Handling Instructions.

A13.2.1.1. Do not expose Dibromodifluoromethane to high temperature because, when it decomposes, toxic fumes are emitted. Store in a cool, ventilated area away from flame.

A13.2.1.2. Environmentally Hazardous Substances, N.O.S. technical name (Otto Fuel II) as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea.

A13.2.2. Package Class 9 Liquids as follows:

A13.2.2.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
<b>Receptacles:</b> Glass, earthenware, plastic, or metal	<b>Drums:</b> steel (1A2), aluminum (1B2), or metal, other than steel or aluminum (1N2), plywood (1D), fiber (1G), or plastic (1H2) <b>or</b> <b>Barrel:</b> wooden (2C2) <b>or</b> <b>Jerricans:</b> steel (3A2), aluminum (3B2) or plastic (3H2) <b>or</b> <b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2), or metal, other than steel or aluminum (4N)

A13.2.2.2. Package in single packaging drums, jerricans, or barrels as follows:

Inner packaging	Outer packaging
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), fiber (1G), plastic (1H1 or 1H2) or metal, other than steel or aluminum (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wooden (2C1) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A13.2.2.3. Package in following composite packagings with plastic inner receptacles:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A13.2.2.4. Package in following composite packagings with glass, porcelain, or stoneware:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<b>Drums:</b> steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) <i>or</i> expanded plastic packaging (6PH1 or 6PH2) <i>or</i> plywood drum or wickerwork hamper (6PD1 or 6PD2)

A13.2.2.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except acetylene (DOT 8, 8AL) and DOT 3HT.

A13.2.2.6. Fired exercise torpedoes or rockets, with no explosive components, containing Otto fuel II. Package in original or similar container authorized in Attachment 5.

A13.2.3. Package Class 9 Solids as follows:

A13.2.3.1. Package in combination packagings with outer drums, barrels, jerricans, or boxes as follows:

Inner packaging	Outer packaging
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<b>Receptacles:</b> Glass, earthenware, plastic, or metal	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2) or metal, other than steel or aluminum (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wooden (2C2) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2), or metal, other than steel or aluminum (4N)
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A13.2.3.2. Package in single packaging drums, barrels, jerricans, boxes, or bags as follows:

<b>Inner packaging</b>	<b>Outer packaging</b>
Not required	<b>Drums:</b> steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), fiber (1G), plastic (1H1 or 1H2), or metal, other than steel or aluminum (1N1 or 1N2) <i>or</i> <b>Barrel:</b> wooden (2C1 or 2C2) <i>or</i> <b>Jerricans:</b> steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2) <i>or</i> <b>Boxes:</b> steel (4A), steel with liner (4A), aluminum (4B), aluminum with liner (4B), natural wood (4C1), natural wood, sift-proof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2), or metal, other than steel or aluminum (4N) <i>or</i> <b>Bags:</b> woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2) <b>Note:</b> Bags are not authorized for PG I materials.

A13.2.3.3. Package in the following composite packagings with plastic inner receptacles:

Inner receptacle	Outer packaging
Plastic	<b>Drums:</b> steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) <i>or</i> <b>Boxes:</b> steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2) <b>Note:</b> Boxes are not authorized for PG I materials.

A13.2.3.4. Package in the following composite packagings with glass porcelain, or stoneware inner receptacles:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	<b>Drums:</b> steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1) <i>or</i> <b>Boxes:</b> steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2) <i>or</i> expanded or solid plastic packaging (6PH1 or 6PH2)

A13.2.3.5. DOT Cylinders. DOT specification cylinders as prescribed for any compressed gas, except acetylene (DOT 8, 8AL) and DOT 3HT.

A13.2.4. PCB Transformers. Palletize and tightly seal large transformers (over 400kg [886 pounds]) with PCB to prevent leakage. Place a large sheet of polyethylene under the transformer and extend it at least one quarter of the way up its sides. Provide enough absorbent material to absorb any leakage. These type transformers are exempt from UN specification packaging requirements.

### A13.3. Package Consumer Commodities as follows:

A13.3.1. The following applies:

A13.3.1.1. As of January 1, 2013, a “consumer commodity” when offered for transportation by aircraft may only include articles or substances of Class 2 (non-toxic aerosols only), Class 3 (Packing Group II and III only), Division 6.1 (Packing Group III only), UN3077, UN3082, UN3175, UN3334, and UN3335, provided such materials do not have a subsidiary hazard and are authorized aboard a passenger-carrying aircraft.

A13.3.1.2. Items are limited to those permitted as a limited quantity according to A19.3.2.

A13.3.1.3. Use a strong outer package. UN specification packaging is not required.

A13.3.1.4. Each final completed package may not exceed 30 kg G (66 pounds).

A13.3.1.5. Ensure completed packages containing breakable or brittle inner packages are capable of withstanding a 4 foot drop on solid concrete.

A13.3.1.6. Use packaging meeting general requirements of Attachment 3.

A13.3.2. Package Class 2 (Non-Toxic Aerosols) in packages meeting the following provisions:

A13.3.2.1. Limit Class 2 substances to inner non-refillable non-metal receptacles not exceeding 120 ml (4 fluid ounces) capacity each, or in inner non-refillable metal receptacles not exceeding 820 ml (28 fluid ounces) capacity each. Flammable aerosols may not exceed 500 ml (17 fluid ounces) capacity each. The following provisions apply to all aerosols under this paragraph:

A13.3.2.1.1. The pressure in the aerosol may not exceed 1,245 kPa at 55 degrees C (180 psi at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F) (**T-0**).;

A13.3.2.1.2. If the pressure in the aerosol exceeds 970 kPa at 55 degrees C (140 psi at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psi at 130 degrees F), use an inner metal DOT 2P, or IATA/ICAO IP7A or IP7B inner metal receptacle.

A13.3.2.1.3. If the pressure in the aerosol exceeds 1,105 kPa at 55 degrees C (160 psi at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psi at 130 degrees F), use an inner metal DOT 2Q or IATA/ICAO IP7A or IP7B receptacle.

A13.3.2.1.4. If the pressure in the aerosol exceeds 1,245 kPa at 55 degrees C (180 psi at 130 degrees F), use an inner metal IATA/ICAO IP7B receptacle. IP7B metal receptacles having a minimum burst pressure of 1,800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated above do not apply to the pressure within the capsule. The quantity of gas contained in the capsule is limited so the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into an aerosol.

A13.3.2.1.5. The liquid content may not completely fill the closed receptacle at 55 degrees C (130 degrees F).

A13.3.2.1.6. Ensure each aerosol exceeding 120 ml (4 fluid ounces) capacity has been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion or other defect.

A13.3.2.1.7. Protect the valves by a cap or other suitable means during transport.

A13.3.2.2. For aerosols containing a biological or medical preparation that may be deteriorated by a heat test and which are non-toxic and non-flammable, packed in inner non-refillable receptacles not exceeding 575 ml (19.4 fluid ounces) capacity each, the following provisions apply:

A13.3.2.2.1. The pressure in the aerosol may not exceed 970 kPa at 55 degrees C (140.7 psi at 130 degrees F).



A13.3.2.2.2. The liquid contents may not completely fill the closed receptacle at 55 degrees C (130 degrees F).

A13.3.2.2.3. Ensure one aerosol out of each lot of 500 or less, is heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion or other defect.

A13.3.2.2.4. Protect the valves by a cap or other suitable means during transport.

A13.3.3. Liquids. Inner packagings may not exceed 500 mL (16.9 ounces) each. Liquids may not completely fill an inner packaging at 55 °C.

A13.3.4. Solids. Inner packagings may not exceed 500 g (1.0 pounds) each.

**A13.4. Prepare Vehicles** as follows: The following general requirements apply:

A13.4.1. Compliance With Technical Orders. Use the vehicle service or technical manual to prepare item for shipment.

A13.4.2. Fuel Limitations. Comply with paragraph A3.3.3.4. when determining actual fuel level requirements to meet operational needs. Each liquid vehicle fuel tank may be no more than one-half full with the following **exceptions**:

A13.4.2.1. When the technical manual requires draining and purging.

A13.4.2.2. Drain and cap when unit is susceptible to fuel spills or leakage (see paragraph A3.3.3.6.).

A13.4.2.3. When loaded on the aircraft cargo ramp, drain vehicle fuel tank if the fuel tank openings cannot be located on the high side of the ramp.

A13.4.2.4. When palletized or loaded on a trailer, drain fuel tanks. Units palletized due to the aircraft's subfloor requirements may contain fuel in tank.

A13.4.2.5. When transported under the authority of **Chapter 3** of this manual, the following fuel limitations apply:

A13.4.2.5.1. Each liquid vehicle fuel tank may not exceed three-fourths full.

A13.4.2.5.2. Units on the aircraft cargo ramp or when loaded on the aircraft with a steep angle of ascent (e.g., KC-10, KC-135, KC-46) may not exceed one-half full per tank.

A13.4.2.5.3. Series M998 High Mobility Multi-Wheeled Vehicles (HMMWV) may face aft on the cargo ramp with the fuel tank opening on the low side of the ramp. Fuel (JP-8 or diesel only) may not exceed one-half tank. Ensure vehicles are equipped with a fuel injection delivery system, and an open vent line to allow pressure equalization during decompression.

A13.4.2.6. Drain fuel from boats and other watercraft loaded on trailers or palletized to the greatest extent possible. When transported or airdropped under the authority of **Chapter 3** of this manual, each integral fuel tank may be three-fourths full. During exercises/training (insertion, rescue, etc.), ensure fuel levels are the minimum amount necessary to meet mission objective, not to exceed three-fourths full. Only approved portable non-bulk fuel tanks may contain fuel.

- A13.4.2.7. Transport fueled helicopters and aircraft with fuel in each tank not to exceed 150 gallons or three-fourths full, whichever amount is least. Do not exceed one-half tank full for units loaded on the aircraft cargo ramp. Ensure fuel leakage does not occur during shipment. No special venting is required other than to maintain normal aircraft ventilation during flight. Seal vents according to the pertinent service technical directive. Load tanks to prevent fuel leakage when the loading configuration requires removal of external fuel tanks. When removed in this manner, the tanks are still considered a component of the aircraft or helicopter.
- A13.4.2.8. When aircraft wings are removed from aircraft body, completely drain fuel tanks within wings. Purging is not required. When transported with the original aircraft body, consider all pieces as a single unit for identification on the Shipper's Declaration form.
- A13.4.2.9. Unmanned aerial vehicles (UAV) prepared according to technical publications/manuals may be shipped drained but not purged. Remaining fuel levels will be as specified in the appropriate technical publication/manual. **(T-0)**.
- A13.4.2.10. When loaded in a freight container, drain vehicle fuel tank. Purge the fuel tank and system if required by the item's technical directive, or if the flash point of the fuel is less than 38 degrees C (100 degrees F). In the absence of specific draining and purging procedures:
- A13.4.2.10.1. Completely drain all fuel
  - A13.4.2.10.2. Run engine until it stalls
  - A13.4.2.10.3. Allow fuel tanks and lines to remain open for 24 hours.
  - A13.4.2.10.4. Ensure installed batteries are non-spillable or non-regulated. If battery is non-regulated and no other hazards are present (e.g., fire extinguisher), a Shipper's Declaration is not required. Comply with A3.1.16.
- A13.4.2.11. Ensure fuel servicing vehicles have refueling system bulk tank and lines purged (for liquids with a flash point less than 38 degrees C (100 degrees F)) or drained to the maximum extent possible (for liquids with a flash point at or above 38 degrees C (100 degrees F)) according to technical directives (technical orders, field manuals, etc.) so that no more than 5 gallons of fuel remains in the tank/lines.
- A13.4.2.12. Completely empty gaseous fuel from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator on liquefied petroleum gas or compressed gas powered vehicles. Ensure tanks are securely closed. Purging is not required.
- A13.4.2.13. Liquefied petroleum gas or compressed gas powered vehicles containing a DOT specification cylinder as the gaseous fuel tank do not require draining. Comply with all requirements of Attachment 6 for the material and cylinder specification. Tightly close and secure cylinder shut off valve. Completely empty lines and regulator of flammable gas and vapors.
- A13.4.2.14. Fuel cell powered vehicles. Secure and protect the fuel cell in a manner to prevent damage to the fuel cell. Describe equipment (other than vehicles, engines or mechanical equipment) such as consumer electronic devices containing fuel cells (fuel cell cartridges) as "Fuel cell cartridges contained in equipment."

A13.4.2.15. added: Liquid fueled vehicles rigged for airdrop or vehicles being transported as cargo to a staging area for a subsequent airdrop may be no more than three-fourths full. Do not load platforms containing vehicles rigged for airdrop with fuel tanks three-fourths full on the aircraft ramp.

A13.4.3. Accessorial hazards. Ensure installed components, equipment, and vehicle accessorial hazards (e.g., fire extinguishers, jerricans, etc.) are in properly configured and approved holders designed for use with the vehicle. The following applies:

A13.4.3.1. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment unless authorized by paragraph A5.2. Special Operations Forces and Joint Service Explosive Ordnance Disposal (EOD) units have an operational requirement and are authorized to load Hazardous Materials (HAZMAT) within unit vehicles for air shipment in accordance with the requirements established in DTR part III, Appendix H. Ensure these hazardous materials remain packaged unless authorized by paragraph A5.2.

A13.4.3.2. Secure batteries upright in designed holders except non-spillable batteries meeting as nonhazardous. Orient non-spillable batteries in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, they must be secured away from terminals, and the terminals protected.

A13.4.3.3. When loaded in a freight container, remove acid or alkali batteries and package according to A12.4. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Non-spillable and non-hazardous gel-type batteries may remain in the vehicle holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit.

A13.4.3.4. Drain engines, generators, and other equipment that are by design an approved part of an M-Series vehicle to the greatest extent possible (not to exceed 500 ml (17 ounces) except the tanks may be one-half full when the vehicle is transported under the authority of Chapter 3 of this manual. Always drain engines and generators mounted to a vehicle, SE or trailer for convenience of movement or handling to the greatest possible extent. Purging is not necessary unless required by the item's technical instructions. Use UN Specification packaging (e.g., jerricans) for transport of spare fuel whenever possible.

A13.4.3.5. Prepare aircraft and helicopters for transportation according to the requirements of the respective aircraft's shipping manual.

A13.4.3.5.1. Remove all munitions and explosives, other than those installed as permanent-type aircraft equipment, according to the pertinent aircraft technical order and A3.3.1.9.

A13.4.3.5.2. Emergency equipment (e.g., life vests, signal kits, etc.) required for safe operation of the aircraft, helicopter, or boat when transported according to DTR, Part III, do not require removal if secured in approved holders/racks.

A13.4.3.5.3. Fasten batteries securely in the holder provided, with the terminals protected in such a manner as to prevent damage or short circuits. When batteries are removed and shipped with the aircraft, accomplish packaging and certification according to A12.4.

A13.4.3.6. Air-bag modules installed as a vehicle component are not subject to any other requirements of this manual.

A13.4.3.7. Lithium batteries. Secure lithium batteries contained in vehicles, engines, or mechanical equipment in the battery holder of the vehicle, engine, or mechanical equipment, and protect in such a manner as to prevent damage and short circuits (e.g., by the use of non-conductive caps that cover the terminals entirely). Prototype or low production lithium batteries securely installed, each lithium battery must be of a type that has successfully passed each test in the UN Manual of Tests and Criteria, or approved by the Associate Administrator of the DOT. **(T-0)**.

**A13.5.** UN3548, Articles containing miscellaneous dangerous goods, N.O.S. are authorized when classified per paragraph A4.2.3., maximum net quantity per package 60 L for liquids and 100 kg for solids, when packaged, or unpackaged as follows:

A13.5.1. When packaged, packagings meeting Packing Group II performance standard is required.

A13.5.1.1. Pack articles to prevent movement and inadvertent operation during normal conditions of transport.

A13.5.1.2. Pack inner receptacles containing liquids with closures correctly oriented in their outer packagings.

A13.5.1.3. Where there is no receptacle within the article, ensure the article fully encloses the dangerous goods and prevent their release under normal conditions of transport.

Inner packaging	Outer packaging
<p><b>Receptacles:</b> constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging.</p>	<p><b>Drums:</b> removable head steel (1A2), removable head aluminum (1B2), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), or removable head plastic (1H2)  <b>or</b>  <b>Boxes:</b> steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2), other metal (4N)  <b>or</b>  <b>Jerricans:</b> removable head steel (3A2), plastic removable head (3H2), or aluminum removable head (3B2)</p>

A13.5.2. Robust articles.

A13.5.2.1. Robust articles may be transported in strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use; or,

A13.5.2.2. Robust articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained.

**A13.6. Package Battery Powered Equipment and Vehicles** as follows: Prepare items powered by wet cell or non-spillable batteries (includes items with batteries as an installed integral component e.g., tactical shelters, trailers, etc.) as follows:

A13.6.1. Use vehicle or equipment service technical manuals to prepare items for shipment.

A13.6.2. Secure batteries upright in designed holders except non-spillable batteries meeting as nonhazardous, may be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, secure them away from terminals, and protect the terminals. Remove the battery and ship according to A12.4. if the item is likely to be shipped in other than an upright position.

A13.6.3. Securely fasten original installed equipment in properly configured and approved holders. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment.

A13.6.4. Protect the batteries of wheelchairs equipped with non-spillable batteries against short circuits and securely attach to the wheelchair or remove and box. Specification packaging is not required.

A13.6.5. Wheelchairs equipped with spillable batteries for carriage on aircraft in cargo compartments that can accommodate upright loading and storage of the wheelchairs must be secured in an upright position in the cargo compartment. **(T-0)**. Ensure batteries remain installed and securely attached to the chair. Protect the terminals against short circuits. Deactivate wheelchairs by removing connections at battery terminals or by otherwise disconnecting their power source. Remove the battery and ship according to A12.4. if the item is likely to be shipped in other than an upright position.

A13.6.6. Lithium batteries. Securely fasten lithium batteries contained in vehicles, engines, or mechanical equipment in the battery holder of the vehicle, engine, or mechanical equipment, and be protect in such a manner as to prevent damage and short circuits (e.g., by the use of non-conductive caps that cover the terminals entirely). Prototype or low production lithium batteries securely installed, each lithium battery must be of a type that has successfully passed each test in the UN Manual of Tests and Criteria, or approved by the Associate Administrator of the DOT. **(T-0)**.

**A13.7. Lithium Cells and Batteries.**

A13.7.1. Ensure lithium cells and batteries meet the requirements of paragraph A3.3.9.2. except paragraph A3.3.9.2.3.

NOTE: When certifying to AFMAN 24-604 the requirement not to exceed 30% state of charge is not applicable.

A13.7.2. Package cells and batteries as follows:

A13.7.2.1. Package cells and batteries in combination packagings with non-metallic inner packagings that completely enclose the cell or battery, and separate the cells or batteries from contact with equipment, other devices, or conductive materials (e.g., metal) in the packaging. Pack inner packaging inside an outer metal box (4A, 4B, or 4N), wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or solid plastic box (4H1 or 4H2), metal drum (1A2, 1B2, or 1N2), fiber drum (1G), plastic drum (1H2), plywood drum (1D), plastic

jerrican (3H2), or metal jerrican (3A2 or 3B2). Packaging meeting PG II performance level is required. UN Specification packaging is not required when individual spare batteries are hand-carried according to Chapter 3 of this manual.

A13.7.2.2. Batteries exceeding 12 kg. Individual batteries or battery assemblies exceeding a gross weight of 12 kg (26.5 lbs.) employing a strong, impact-resistant outer casing and assemblies of such batteries, may be packed in strong outer packagings, in protective enclosures (e.g., in fully enclosed wooden slatted crates) or on pallets or other handling devices, instead of packages meeting the UN performance packaging requirements identified in paragraph A13.7.2.1. above. Secure batteries to prevent inadvertent movement, and ensure the terminals do not support the weight of other superimposed elements. Identify batteries or battery assemblies packaged in this manner as "P4" for movement with passengers.

A13.7.2.3. Large packagings. The following large packagings meeting the PG II performance level are authorized for a single battery: metal packaging fitted with an electrically non-conductive lining material (50A, 50B, 50N), rigid plastic (50H), wooden (50C, 50D, 50F), rigid fiberboard (50G).

A13.7.3. Do not place lithium batteries (UN3480 and UN3090 only) in the same package or overpack as hazardous materials classified in Class 1 (other than Division 1.4S), Division 2.1, Class 3, Division 4.1 or Division 5.1.

#### **A13.8. Lithium Batteries Contained in Equipment.**

A13.8.1. Ensure lithium cells and batteries meet the requirements of paragraph A3.3.9.2. except paragraph A3.3.9.2.3.

A13.8.2. UN specification packaging is not required. Pack equipment with installed lithium batteries in an outer packaging constructed of suitable material of adequate strength and design in relation to the capacity and intended use of the packaging, unless the lithium cells or batteries are afforded equivalent protection by the equipment in which they are contained. Secure the equipment within the outer packaging to prevent movement, short circuit, and accidental operation during transport.

A13.8.2.1. Package additional cells or batteries in accordance with A13.7.2.

A13.8.2.2. If package contains cells or batteries in equipment and other cells or batteries packed with equipment, mark the package with the proper shipping name "Lithium metal batteries packed with equipment" or "Lithium ion batteries packed with equipment" as appropriate.

A13.8.2.3. Securely fasten lithium batteries contained in vehicles, engines, or mechanical equipment in the battery holder of the vehicle, engine, or mechanical equipment and protect in such a manner as to prevent damage and short circuits (e.g., by the use of non-conductive caps that cover the terminals entirely).

A13.8.3. For airdrop missions authorized according to Chapter 3 of this manual, pack electronic equipment hand carried in a rucksack, in a shipping (airdrop) container, or as a door bundle depending on mission requirements. Shipper's Declaration for Dangerous Goods certification is not required.

#### **A13.9. Lithium Batteries Packed With Equipment.**

- A13.9.1. Ensure Lithium cells and batteries meet the requirements of paragraph A3.3.9.2. except paragraph A3.3.9.2.3.
- A13.9.2. Pack the cells or batteries in inner packagings that completely enclose the cell or battery and prevent short circuits, including shifting that could lead to short circuits. The inner packagings are then placed in outer packagings as follows:
- A13.9.2.1. Pack in packagings that meet the Packing Group II performance requirements as specified in paragraph A13.7.2. then pack with equipment. OR
- A13.9.2.2. Pack in with equipment in packagings that meet the Packing Group II performance requirements as specified in paragraph A13.7.2.
- A13.9.2.3. Large packagings. The following large packagings meeting the PG II performance level are authorized for batteries packed with a single piece of equipment: metal packaging fitted with an electrically non-conductive lining material (50A, 50B, 50N), rigid plastic (50H), wooden (50C, 50D, 50F), rigid fiberboard (50G).
- A13.9.3. For missions authorized according to Chapter 3 of this manual, electronic equipment may be hand carried in a rucksack, packed in a shipping (airdrop) container, or in a door bundle depending on mission requirements. Shipper's Declaration for Dangerous Goods certification is not required.

**A13.10. Package Carbon Dioxide, Solid (Dry Ice) as follows:**

- A13.10.1. Handling Instructions. Dry ice is extremely cold and will damage human tissue on contact. Store only in well ventilated areas. Never store in hermetically or tightly sealed containers. To minimize carbon dioxide concentration within the aircraft during ground operations, open the cargo/ access doors and emergency escape hatches for maximum ventilation.
- A13.10.2. Packaging Requirements.
- A13.10.2.1. Wrap in kraft paper, secure with tape, and pack in fiberboard boxes, polystyrene foam containers or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging. UN specification packaging is not required.
- A13.10.2.2. Prepare DOD medical shipments requiring use of dry ice according to DLAR 4145.21/TB MED 284/NAVSUPINST 4610.31A, *Preparation of Medical Material Requiring Freeze or Chill Environment for Shipment*.
- A13.10.2.3. Prepare non-hazardous shipments requiring dry ice according to technical directives or industry standards. Ensure outer packaging is fiberboard boxes, polystyrene foam containers, or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent build-up of pressure that could rupture the packaging. UN specification packaging is not required.

**A13.11. Package Magnetized Material as follows:**

- A13.11.1. Handling Instructions. Do not store magnetic materials suitable for military airlift closer than 4.6 m (15 feet) to compass sensing devices or other devices unduly affected by magnetic fields.

A13.11.2. Packaging Requirements. Shield magnetic materials when required to reduce magnetic field strength to not greater than 5.25 milligauss or two degrees deviation of a magnetic compass at a distance of 4.6 m (15 feet). Ensure that meters used to measure the magnetic field are properly operational, and whenever possible, that the item be measured by two different devices. Provide blocking and bracing as required. Additional packaging details are included in TO 00-25-251. Package magnetic tubes individually in compliance with MIL-E-75. Package magnetically susceptible items to make sure that the distance between the magnetic surface and outside of the innermost container is no less than the protective distance required, and in no instance less than 102 mm (4 inches). UN specification packaging is not required. Magnetic material that has a magnetic field strength greater than 0.00525 gauss at 4.6m (15 feet) is forbidden for air movement.

**A13.12. Package Life-Saving Appliances** as follows: Life-saving appliances, self-inflating or nonself-inflating, include (but are not limited to) life raft kits, life vest kits, survival kit assemblies, ejection seats, non-ejection seats, and parachutes that contain small quantities of hazardous material that are required as part of the survival equipment. Kit contents may include, but are not limited to, flammable items (fire starter and matches), ammunition items (cartridges and shells), pyrotechnics (signal flares), and nonflammable compressed gas cylinders (carbon dioxide and breathing oxygen).

A13.12.1. Handling Instructions. Store in cool, well-ventilated areas away from fire hazards and sources of heat or ignition. Do not drop or rough handle.

A13.12.2. Packaging Requirements:

A13.12.2.1. Pack kits in weather-resistant fiberboard or other securely closed strong outer container. Pack hazardous materials contained in the kit in inner packaging that is adequate to prevent accidental activation. Suitably cushion the inner packagings to prevent movement. Packagings meeting the general requirements of A3.1. is required. UN specification packaging is not required.

A13.12.2.2. Individually assigned kit hand carried by a crewmember. This paragraph applies only to support operations involving recovery of inoperable aircraft or return of a flight crewmember as a passenger to maintain accountability of an individually assigned kit. For unit deployments see paragraph 3.5. or transport as palletized cargo according to A13.12.2.1. This does not apply to contract passenger or commercial aircraft. The following applies:

A13.12.2.2.1. Package life-saving appliances in a strong outer container or A-3 bag. The requirements of A13.12.2.1. for inner packing and cushioning apply.

A13.12.2.2.2. Individual assigned kits may be handcarried by crew members. Crew members inform the Air Terminal Operations Center, when transporting life-saving appliances in this manner. Store items directed by the transporting aircraft commander.

A13.12.2.2.3. When prepared and handcarried according to this paragraph, no other requirements of this manual apply while in kit is in possession of the crewmember.

**A13.13. Package Dangerous Goods in Apparatus or Machinery** as follows: Apply this description only to apparatus or machinery containing hazardous material as an integral component of the item. This description may also be used for items that are normally a part of an end item or required to serve an operational function, but are removed and shipped separately



(e.g., fuel tanks or bladders). Do not use this description for machinery or apparatus for which a PSN already exists in Table A4.1. The following applies:

A13.13.1. For other than fuel system components, apparatus or machinery may only contain hazardous materials permitted as limited quantities under A19.3., or authorized magnetized material, or gasses of Division 2.2 without subsidiary hazard, but excluding refrigerated liquefied gasses.

A13.13.2. If more than one hazardous material is present, the material may not be capable of reacting dangerously together.

A13.13.3. The total net quantity of hazardous materials contained in one package may not exceed the following:

A13.13.3.1. 1 kg (2.2 pounds) for solids

A13.13.3.2. 500 ml (17 ounces) for liquids

A13.13.3.3. 0.5 kg (1.1 pounds) for Class 2.2 gases

A13.13.4. Secure or cushion receptacles containing hazardous material to prevent breakage or leakage and to control movement within the item during transport. Cushioning material may not react dangerously with or have protective properties adversely affected by any leakage.

A13.13.5. Ensure that, in the event of damage to receptacles, no leakage of the hazardous material from the apparatus or machinery is possible. A leak-proof liner is required for articles that are completely drained of liquid but not purged. Seal or cap all openings and lines according to applicable technical directives.

A13.13.6. Ensure Class 2.2 gases are in authorized cylinders according to Attachment 6.

A13.13.7. Pack in strong outer packagings unless the receptacles containing the hazardous material are adequately protected by the construction of the apparatus or machinery. UN specification packaging is not required.

**A13.14. Package Class 9 Materials** as follows: UN specification packaging is not required for material packaged according to this paragraph. Use any appropriate non-bulk packaging that meets the requirements of Attachment 3 to ship liquid or solid material. The following applies.

A13.14.1. Provide enough outage for packagings of 208 L (55 gallon) capacity or less, so that the packaging is not liquid full at 54 degrees C (130 degrees F).

A13.14.2. Make sure that when a liquid or solid has an absolute vapor pressure over 110 kPa (16 psi) at 38 degrees C (100 degrees F) the primary packaging is capable of withstanding the inside vapor pressure at 54 degrees C (130 degrees F) without leakage.

A13.14.3. Package material that may cause a hazard in transportation due to its reaction with water in either an inner or outer waterproof packaging.

**A13.15. Package Air Bag Inflators, Air Bag Modules, and Seat-Belt Pretensioners** as follows:

Item are classified as Class 9 are approved by DOT according to 49 CFR Section 173.166. Package in boxes, drums, or jerricans as follows:

Inner packaging	Outer packaging
Not required.	<b>Boxes:</b> steel (4A), aluminum (4B), wooden (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1 or 4H2), or other metal (4N) <i>or</i> <b>Drums:</b> steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), plastic (1H2), or other metal (1N2) <i>or</i> <b>Jerricans:</b> steel (3A2), aluminum (3B2), or plastic (3H2)

**A13.16. Package Asbestos (Hydrated Mineral Silicates)** as follows: Asbestos blue, Adsorbed gas. A gas which when packaged for transport is adsorbed onto a solid porous material resulting in an internal receptacle pressure of less than 101.3 kPa at 20 °C and less than 300 kPa at 50 °C. brown, or white, includes any of the following hydrated mineral silicates: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, actinolite asbestos, and every product containing any of these materials. Ensure asbestos is loaded, handled, unloaded, and any contamination of aircraft removed in such a manner that minimizes occupational exposure to airborne particles released incident to transportation. Packaging meeting the general packaging requirements of A3.1. is required. UN specification packaging is not required. Package asbestos in:

A13.16.1. Rigid, leak tight packaging such as metal, plastic, or fiber drums.

A13.16.2. Bags or other nonrigid packaging that are dust and sift-proof. Ensure the packages are palletized and unitized by methods such as shrink-wrapping in plastic or wrapping in fiberboard secured by strapping.

A13.16.3. Bags or other nonrigid packaging that are dust and sift-proof in strong outer fiberboard or wooden boxes.

**A13.17. Package Polymeric Beads, Expandable and Plastic Molding Compound** as follows:

Pack polymeric beads or granules, expandable, evolving flammable vapor and plastic molding compound in dough, sheet or extruded rope form, evolving flammable vapor in boxes or drums as follows:

Inner packaging	Outer packaging
Sealed plastic liner	<b>Boxes:</b> steel (4A), aluminum (4B), wood (4C1 or 4C2), plywood (4D), fiberboard (4G), reconstituted wood (4F), plastic (4H1 or 4H2), or other metal (4N) <b>or</b> <b>Drums:</b> plywood (1D) or fiber (1G) <b>Note:</b> Vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1H1, 1H2, 1N1, or 1N2) may also be used (without liner).

**A13.18. Package Chemical or First Aid Kits** as follows:

A13.18.1. **Applicability.** Chemical kits and first aid kits contain one or more compatible items of hazardous materials in boxes, cases, *etc.* that, for example, are used for medical, analytical, diagnostic, testing, or repair purposes. A13.18.1.1. For transportation by aircraft, the kits may only contain quantities of hazardous materials authorized as excepted quantities or as limited quantities in §§ 173.4a and 173.27(f), respectively. The packing group assigned to the chemical kit and first aid kit as a whole must be the most stringent packing group assigned to any individual substance in the kit. The packing group must be shown on the shipping paper. Where the kit contains only hazardous materials to which no packing group is assigned, the packagings shall meet the Packing Group II performance level and the packing group does not have to be indicated on the shipping paper. Materials forbidden for transportation by passenger aircraft or cargo aircraft may not be included in the kits. A13.18.1.2. Ensure the contents of the kit is of such a nature and so packed that there is no possibility of the mixture of contents causing dangerous evolution of heat or gas. A13.18.1.3. The only hazardous materials authorized in the kits are substances authorized as limited quantities according to A19.3.2., and excepted quantities according to A19.2., provided the inner packaging requirements of A19.2.3. are met.

A13.18.2. Package as follows:

A13.18.2.1. Except for Division 5.2, in inner receptacles of no more than 250 mL (8.5 fluid ounces) for liquids or 250 g (9 ounces) for solids. For Division 5.2 (organic peroxide) Type D, E and F (only), inner receptacles of no more than 125 mL for liquids or 250 g for solids.

A13.18.2.2. The total quantity of hazardous material in any one kit may not exceed 1 L (1 quart) for liquids or 1 kg (2.2 pounds) for solids. The total quantity of dangerous goods in any one package may not exceed 10 kg (22 pounds).

A13.18.2.3. Protect inner receptacles from other materials in the kit and pack in wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), expanded plastic (4H1), solid plastic (4H2), fiberboard (4G), steel (4A), or aluminum (4B) box.

A13.18.3. Refer to Table A19.2., **Note** 1 for limited quantities of hazardous material in Chemical or First Aid Kits.

**A13.19 Capacitors.**

A13.19.1. Ensure capacitors, including capacitors containing an electrolyte that does not meet the definition of any hazard class or division as defined in this manual, conform to the following requirements:

A13.19.1.1. Ensure capacitors not installed in equipment are transported in an uncharged state;

A13.19.1.2. Protect each capacitor against a potential short circuit hazard in transport as follows:

A13.19.1.2.1. When a capacitor's energy storage capacity is less than or equal to 10 Wh or when the energy storage capacity of each capacitor in a module is less than or equal to 10 Wh, protect the capacitor or module against short circuit or fit with a metal strap connecting the terminals; or

A13.19.1.2.2. When the energy storage capacity of a capacitor or a capacitor in a module is more than 10 Wh, fit the capacitor or module with a metal strap connecting the terminals;

A13.19.1.3. Capacitors containing an electrolyte that meets the definition of one or more hazard class or division as defined in this part, design them to withstand a 95 kPa (0.95 bar, 14 psi) pressure differential;

A13.19.1.4. Design and Construct capacitors to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Contain any liquid that is released upon venting by the packaging or by the equipment in which a capacitor is installed; and

A13.19.1.5. Mark capacitors with the energy storage capacity in Wh.

A13.19.2. Securely cushion and pack capacitors within strong outer packagings. Capacitors installed in equipment may be offered for transport unpackaged or on pallets, when the capacitors are afforded equivalent protection by the equipment in which they are contained.

A13.19.3. Capacitors containing an electrolyte not meeting the definition of any hazard class or division as defined in this manual, including when installed in equipment, are not subject to any requirements of this manual other than those in A13.19.1. above.

A13.19.4. Capacitors containing an electrolyte that meets the definition of one or more hazard class or division as defined in this manual, with an energy storage capacity of 10 Wh or less are not subject to any requirements of this manual, other than those in A13.19.1. above, when they are capable of withstanding a 1.2 m (3.9 feet) drop test unpackaged onto a rigid, non-resilient, flat and horizontal surface without loss of contents.

A13.19.5. Capacitors containing an electrolyte meeting the definition of one or more hazard class or division as defined in this manual, that are not installed in equipment, and with an energy storage capacity of more than 10 Wh are subject to the requirements of this manual.

A13.19.6. Capacitors installed in equipment and containing an electrolyte meeting the definition of one or more hazard class or division as defined in this manual, not subject to any requirements of this manual, other than those in A13.19.1. above, provided the equipment is packaged in a strong outer packaging and in such a manner as to prevent accidental functioning of the capacitors during transport. Large, robust equipment containing capacitors

may be offered for transport unpackaged or on pallets when the capacitors are afforded equivalent protection by the equipment in which they are contained.

**A13.20. UN3530, Engine, internal combustion, or Machinery, internal combustion** This entry is for engines and machines with internal combustion engines powered by fuels that are marine pollutants but do not meet the criteria of any other Class or Division. The following general requirements apply:

A13.20.1. Compliance With Technical Orders. Use the equipment service technical manual to prepare items for shipment.

A13.20.2. Fuel Limitations. Completely drain engine-powered SE of fuel. Up to 500 ml (17 ounces) of fuel may be left in engine components and fuel lines provided all lines and fuel tanks are securely closed to prevent leakage of fuel. Drain and purge when required by the applicable technical manual. The following exceptions/additional restrictions apply:

A13.20.2.1. Drain engine-powered SE with large fuel systems that the shipper determines cannot be drained to 500 ml (17 ounces) within the mechanical limits of the equipment to the extent no free standing liquid remains in the fuel tank, lines, or system.

A13.20.2.2. When transported under the authority of **Chapter 3** of this manual, wheeled-engine powered SE may contain up to one-half tank of fuel. Ship only the minimum quantity of fuel consistent with operational requirements. Ensure tanks are securely closed. Drain non-wheeled engine powered SE so no more than 500 ml (17 ounces) of residual fuel is remaining.

A13.20.2.3. Completely drain single axle equipment loaded with the tongue resting on the aircraft floor.

A13.20.2.4. Ensure engines that are damaged or inoperable and purging cannot be accomplished, or proper purging facilities are unavailable are drained to the maximum extent possible and install plugs, caps, and covers over all openings as required by technical directives.

A13.20.2.5. Engines which are drained and purged according to the responsible technical manual, and containing no other hazardous material, are nonhazardous for transportation. Comply with paragraph A3.1.16.4.

A13.20.2.6. Where an engine or machine could possibly be handled in other than an upright position, secure the engines or machinery in a strong, rigid outer packaging in an orientation to prevent accidental leakage and prevent any movement during transport which would change in orientation or cause them to be damaged.

A13.20.2.7. When loaded in a freight container, drain fuel tanks. Purge the fuel tank and system if required by the item's technical directive, or if the flash point of the fuel is less than 38 degrees C (100 degrees F). In the absence of specific draining and purging procedures:

A13.20.2.7.1. Completely drain all fuel.

A13.20.2.7.2. Run engine until it stalls.

A13.20.2.7.3. Allow fuel tanks and lines to remain open for 24 hours.

A13.20.2.7.4. Ensure installed batteries are non-spillable or non-regulated.

A13.20.2.8. When unit is susceptible to fuel spills or leakage (see paragraph A3.3.3.6.), drain and cap unit.

A13.20.3. Accessorial hazards. Ensure installed components, equipment, and accessorial hazards (e.g., fire extinguishers, jerricans, etc.) are in properly configured and approved holders designed for use with the unit. The following applies:

A13.20.3.1. Secure batteries upright in designed holders except non-spillable batteries meeting as nonhazardous, may be oriented in a manner to fit designed holder. Protect the terminals of installed batteries to prevent short circuit by use of battery boxes, protective covers, taping, etc. If battery cables are disconnected, secure them away from terminals, and protect the terminals.

A13.20.3.2. When loaded in a freight container, remove acid or alkali batteries and package according to A12.4. Do not ship packaged wet-cell batteries inside a freight container unless accessible during flight. Non-spillable and non-hazardous gel-type batteries may remain in the equipment holder provided they remain upright and the cables are disconnected. Tape the ends of the cables/terminals to prevent short circuit.

## Attachment 14

## MARKING HAZARDOUS MATERIALS

**A14.1. General Requirements.**

A14.1.1. Mark hazardous materials according to MIL-STD-129 and this manual.

A14.1.2. Labels may be used to meet marking requirements to the extent they meet all application, placement, size, legibility, and durability requirements for marking.

A14.1.3. To the greatest extent possible, place packages on aircraft pallets (e.g., 463L) and within vehicles/trailers so that markings required by this attachment and labels required by Attachment 15 are visible.


A14.1.4. When an aircraft pallet or vehicle/trailer contains like items, ensure at least one package has required markings/labels visible. When placement on an aircraft pallet, on a vehicle/trailer or within a freight container prevents marking and labeling to be visible, use a marking board according to A14.3.11.

A14.1.5. Use a marking board according to A14.3.11. to identify unpackaged large and robust Class 1 articles which are marked with a Proper Shipping Name authorized prior to 1 January 1990.

A14.1.6. The full name and address of the shipper and consignee is required. Attachment of a shipping label as required by MIL-STD-129 meets this requirement.

**A14.2. UN Packaging Specification Markings.** UN specification markings are mandatory for all packages of hazardous materials unless exempted by paragraph A3.1.1. or a separate approval. A description of the codes and sequence of information contained in the UN specification marking is identified in Table A14.1. for non-bulk packagings and Table A14.2 for large packagings (explosives only). A sample of how the UN specification markings look is in Figure A14.1., Figure A14.2., Figure A14.3., and Figure A14.4.

**Table A14.1. UN Specification Marking Codes and Sequence of Instruction.**


	The symbol used to certify that the packaging complies with UN recommendations. For embossed metal packagings the capital "UN" can be applied as the symbol.	
<b>4G</b>	This is a two to four position code.	
	The first position indicates the type of packaging and will be one of the following numbers:	
		1 = Drum
		2 = Wooden barrel
		3 = Jerrican
		4 = Box
		5 = Bag
		6 = Composite packaging
		7 = Pressure receptacle

	The second position indicates the type of material that the container is made of. For composite packagings, two capital letters (second and third positions) is used to indicate the type of materials. The first letter indicates the material of the inner receptacle and the second letter indicates the material of the outer packaging. For combination packagings, only the code for the outer packaging is used. The following letters indicate the type of materials:
	A = Steel (all types and surface treatments)
	B = Aluminum
	C = Natural wood
	D = Plywood
	F = Reconstituted wood
	G = Fiberboard
	H = Plastic materials
	L = Textile
	M = Paper, multi-wall
	N = Metal (other than steel or aluminum)
	P = Glass, porcelain, or stoneware
	The third position (fourth position for composite packagings) is a number indicating the category of packaging within the same type (e.g., 1A1 [non-removable head steel drum], 1A2 [removable head steel drum], 6HG1 [plastic receptacle with outer fiber drum] 6HG2 [plastic receptacle with outer fiberboard box]). <b>Note:</b> 4A1, 4A2, 4B1, and 4B2 are obsolete UN codes, but may continue to appear as part of the markings. Composite packagings with natural wood outers have no fourth position number indicating category within the type.
<b>The following special codes may follow the packaging type code:</b>	
<b>V</b>	Special packaging meeting the tests specified in 49 CFR Subparagraph 178.601(g)(2).
<b>W</b>	Packaging of the same type as specified by the UN requirements, but not meeting the same general construction requirements. The transport of such packagings is subject to written approval from the competent authority. For approval see 49 CFR Paragraph 178.601(h).
<b>U</b>	Packagings meeting the requirements of 49 CFR Subparagraph 178.609(i)(3)
<b>Class 6.2</b>	Packaging s meeting the requirements of 49 CFR Section 178.609
<b>X1.4 or X15</b>	Identified first is the PG the configuration has been successfully tested too. X is used for PG I. Y is used for PG II. Z is used for PG III. Items of a lesser (less hazardous) PG may be packaged in a packaging that has been tested to a higher PG provided the requirements of the test report are complied with. For single packagings, the relative density, rounded off to the first decimal follows the PG, for which the container has been tested. This may be omitted when the relative density does not exceed 1.2. for packagings without inner packagings intended to contain liquids. For packagings intended to contain solids or inner packagings, the PG is followed by the maximum gross weight, in kilograms, that the packaging configuration has been tested.



<b>100 or S</b>	For single packagings intended to contain liquids, the next marking indicates the maximum test pressure, in kPa, rounded down to the nearest 10 kPa which the container was tested (hydraulic test). For packagings intended to contain solids or inner packagings, use the letter "S." For air shipment of packagings intended to contain inner packagings, see A3.1.7.1. Also, if the inner packaging is plastic ensure the requirements of A3.1.3. are met.
<b>11</b>	The last two digits of the year during which the packaging was manufactured. Packagings of types 1H1, 1H2, 3H1, and 3H2 are also marked with the month of manufacture. The month of manufacture may be marked on the packaging in a different place than the UN specification packaging marking.
<b>USA</b>	The country authorizing the allocation of the mark.
<b>***</b>	The symbol of the party responsible for ensuring that the UN requirements have been met. The symbol is registered with the US DOT, Office of Hazardous Materials Transportation. In place of a symbol, the in-the-clear name of the party responsible for ensuring the UN requirements have been met can be used. The Department of Defense uses the symbol "DOD."
Reconditioned packagings are marked to indicate they have been properly reconditioned. This marking is applied near the initial marking and replaces the country and symbol of the party responsible for ensuring the UN requirements have been met, or be in addition to the initial marking. After reconditioning a packaging, the reconditioner applies the following markings in sequence:	
<b>USA</b>	The country in which the reconditioning was conducted.
<b>***</b>	The name or registered symbol of the reconditioner.
<b>93</b>	The year the packaging was reconditioned.
<b>R</b>	Enter the letter "R."
<b>L</b>	Enter the letter "L" for every packaging successfully passing the leakproofness test.

**Table A14.2. Large Packaging UN Specification Marking Codes and Sequence of Instruction.**

	The symbol used to certify that the packaging complies with UN recommendations. For embossed metal packagings the capital "UN" can be applied as the symbol.
<b>50A</b>	This is a three position code.
	The first two positions indicate the type of packaging and is one of the following numbers:
	50 = Rigid large packaging
	51 = Flexible large packaging
	The third position indicates the type of material that the container is made of. The following letters indicate the type of materials:
	A = Steel (all types and surface treatments)
	B = Aluminum
	C = Natural wood
	D = Plywood

	F = Reconstituted wood
	G = Fiberboard
	H = Plastic materials
	M = Paper, multi-wall
	N = Metal (other than steel or aluminum)
The following special codes may follow the packaging type code:	
<b>W</b>	Packaging of the same type as specified by the UN requirements, but not meeting the same general construction requirements. The transport of such packagings is subject to written approval from the competent authority. For approval see 49 CFR Section 178.955.
<b>X</b>	Identified the PG the configuration has been successfully tested too. X is used for PG I. Y is used for PG II. Z is used for PG III. Items of a lesser (less hazardous) PG may be packaged in a packaging that has been tested to a higher PG provided the requirements of the test report are complied with.
<b>MM YY</b>	The month (designated numerically) and year (last two digits) of manufacture.
<b>USA</b>	The country authorizing the allocation of the mark.
<b>***</b>	The symbol of the party responsible for ensuring that the UN requirements have been met. The symbol is registered with the US DOT, Office of Hazardous Materials Transportation. In place of a symbol, the in-the-clear name of the party responsible for ensuring the UN requirements have been met can be used. The Department of Defense uses the symbol "DOD."
<b>2500</b>	The stacking test load in kilograms (kg). For Large Packagings not designed for stacking the figure "0" is shown.
<b>1000</b>	The maximum permissible gross mass or for flexible Large Packagings, the maximum net mass in kg.

Figure A14.1. Sample of UN Non-bulk Specification Packaging Marking for Solids.

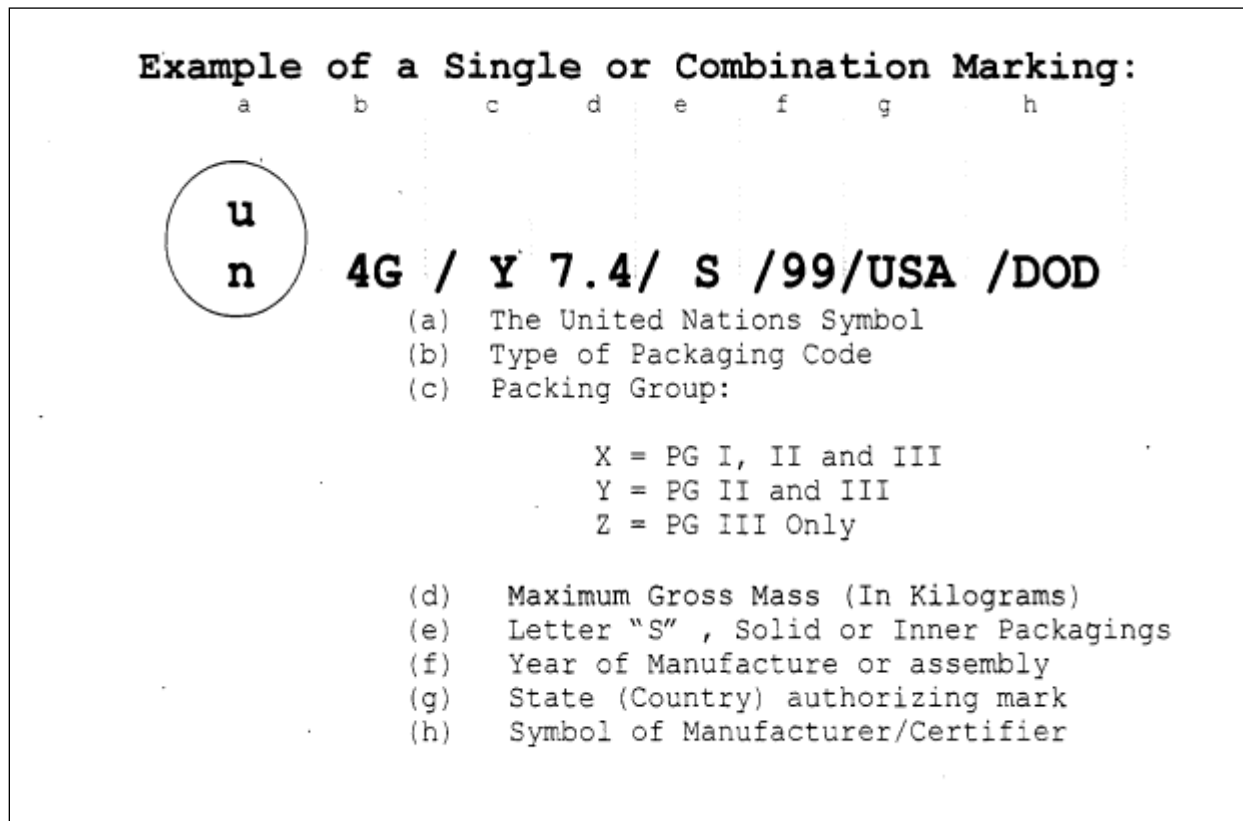


Figure A14.2. Sample of UN Non-bulk Specification Packaging Marking for Liquids

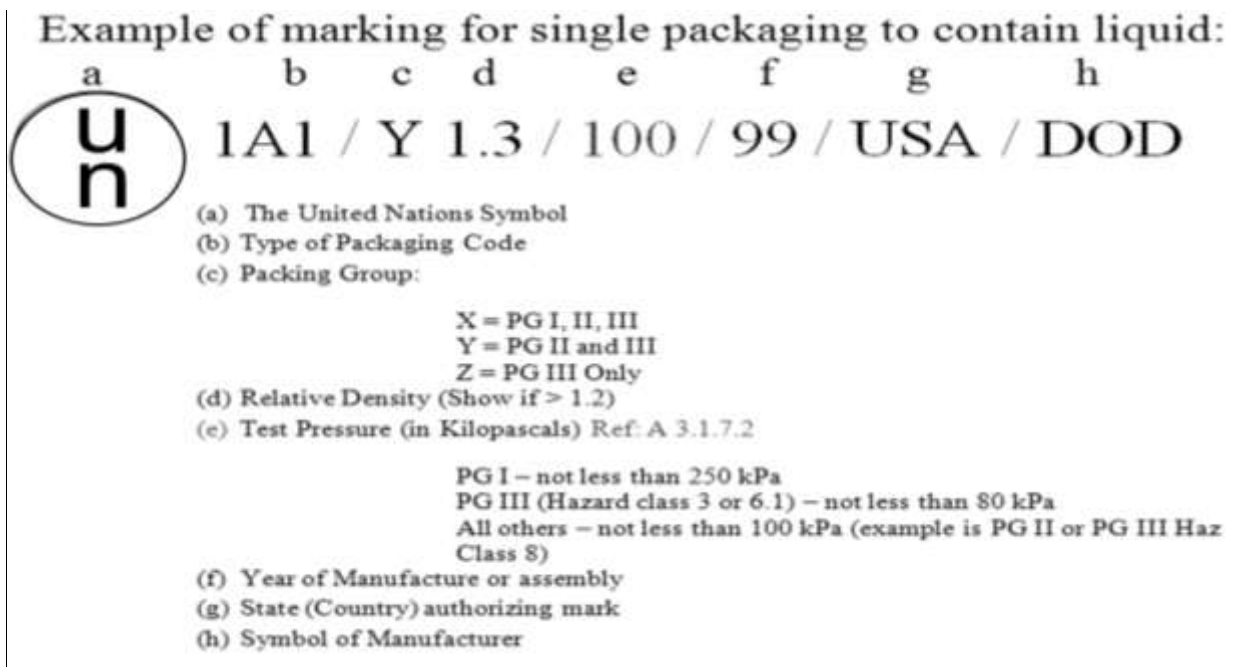


Figure A14.3. Sample of UN Specification Marking for UN Pressure Receptacles.

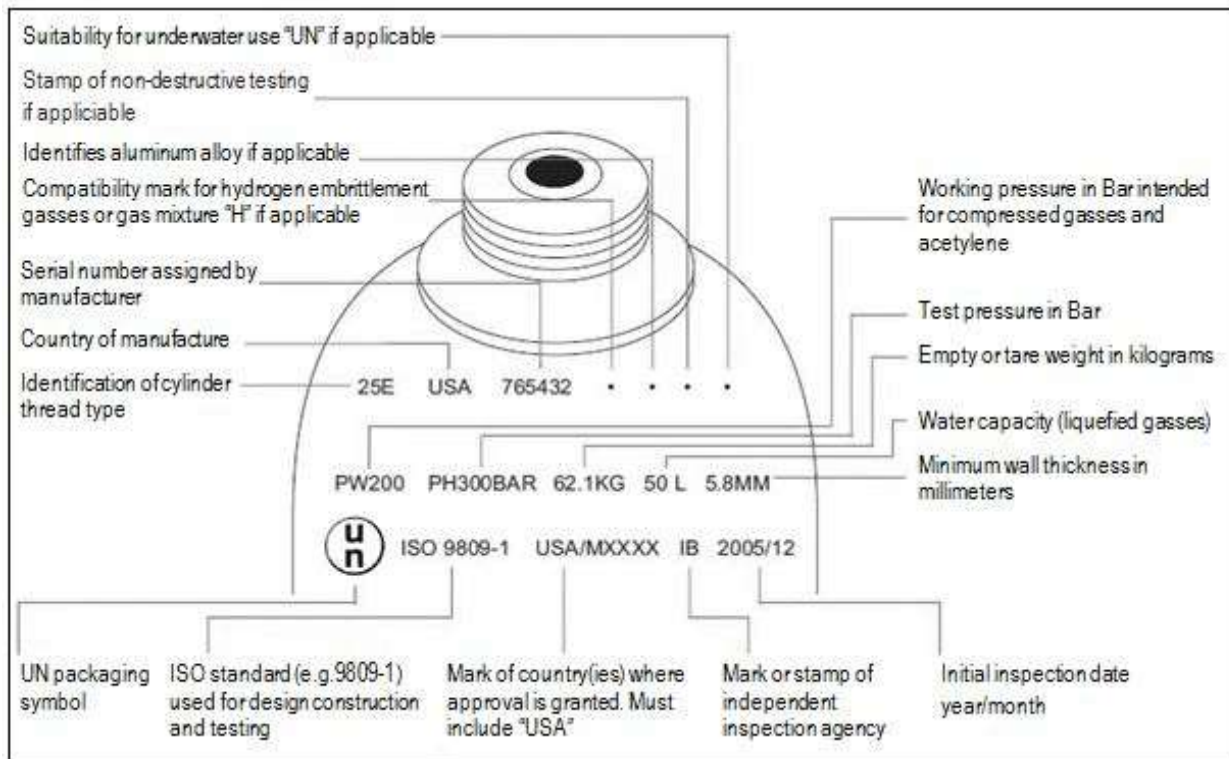
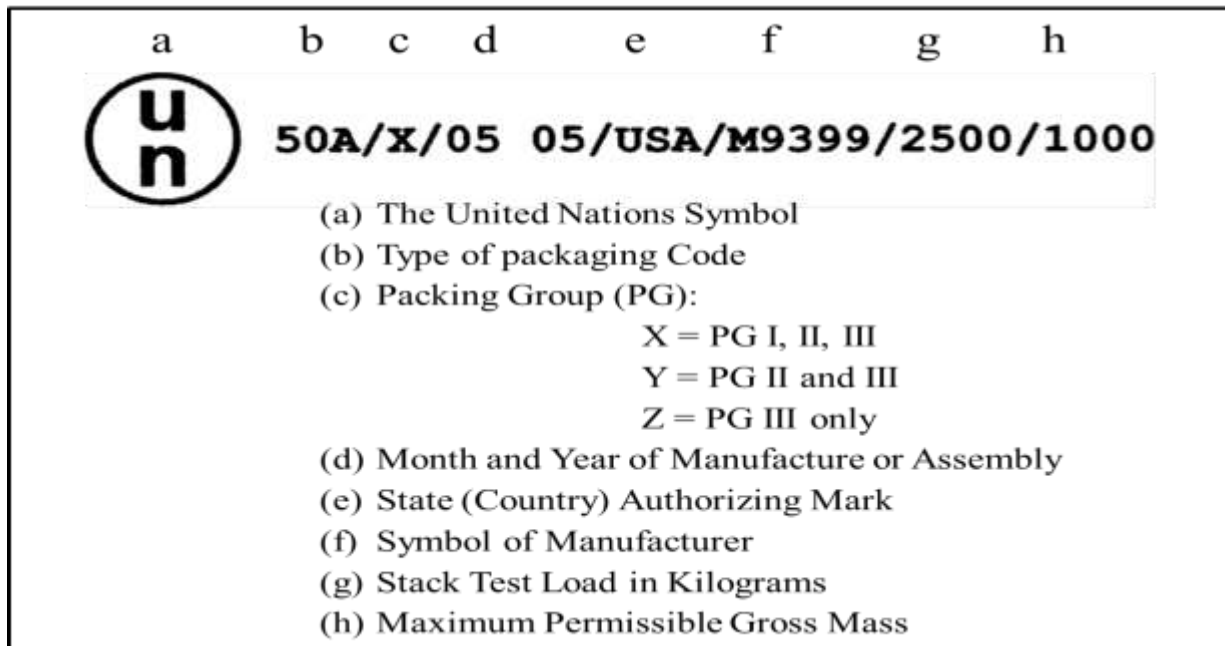


Figure A14.4. Sample of UN Large Packaging Specification Packaging Marking



**A14.3. General Hazard Communication and Handling Markings.**

A14.3.1. Proper Shipping Name and Identification Number. Unless otherwise specified, mark all packages, including overpacks, containing hazardous materials with the PSN and identification number shown in the alphabetical listing of items in Table A4.1. The identification number marking preceded by “UN”, “NA”, or “ID” as appropriate is marked in characters at least 12 mm (0.47 inches) high. Packages with a maximum capacity of 30 liters (8 gallons) or less, 30 kg (66 pounds) maximum net mass, or cylinders with a water capacity of 60 liters (16 gallons) or less are marked with characters at least 6 mm (0.24 inches) high. Packages with a maximum capacity of 5 liters (1.32 gallons) or 5 kg (11 pounds) or less are marked in a size appropriate for the size of the package.

A14.3.1.1. Unless excepted by this attachment, articles not requiring packaging require the PSN and identification number displayed on the item itself or on a cradle, handling, storage or launching device.

A14.3.1.2. Mark the appropriate technical name in parenthesis following the proper shipping name when required by A4.5.3.

A14.3.1.3. Italicized descriptive words (see A4.5.3.) used as part of the PSN are optional.

A14.3.1.4. Accessorial hazards do not require marking.

A14.3.1.5. Do not use abbreviations except "w" (with), "w/o" (without), and "N.O.S." (Not Otherwise Specified).

A14.3.2. Hazardous Substance. Mark all packages containing a hazardous substance with the letter “RQ” in association with the PSN. If the PSN does not identify the hazardous substance by name, mark one of the following descriptions on the package , in parentheses, in association with the PSN:

A14.3.2.1. The technical name of the hazardous substance.

A14.3.2.2. The waste stream number.

A14.3.2.3. The letters “EPA” followed by the word “ignitability,” “corrosivity,” “reactivity,” or “EP toxicity,” as appropriate, or the corresponding “D” number, as appropriate.

A14.3.3. Hazardous Waste. Mark hazardous waste shipments according to this manual, 49 CFR Part 172, 40 CFR Section 262.32, and MIL-STD-129. Proper Shipping Name does not require the word “waste” if the package bears the EPA markings as prescribed in 40 CFR Section 262.32.

A14.3.4. Inhalation Hazard. Mark each package containing any material that is poisonous by inhalation "Inhalation Hazard." The marking is not required if the words “INHALATION HAZARD” appear on the label.

A14.3.5. Permits, CAAs, and COEs. Mark each package authorized by a DOT Special Permits, or a COE with permit or COE number. CAAs are marked with the approval number in association with the PSN and ID number, if required by the CAA. A package marked with a DOT Exemption number (e.g., “DOT E-4368”) is authorized in place of a Special Permit number provided use is allowed by the accompanying Special Permit document required by paragraph 2.4.

- A14.3.6. Orientation Marking (This Side Up). Pack inside containers used to ship liquid hazardous material within a combination packaging or overpack with filling holes up.
- A14.3.6.1. Mark with orientation arrows meeting the requirements of 49 CFR Section 172.312, on two opposite sides of the outer package or overpack and ensure the arrows point in the correct upright direction. Orientation labels may be used to meet this marking requirement. The lettering "THIS SIDE UP", "THIS END UP" or "UP" may be used in conjunction with orientation labels.
- A14.3.6.2. This requirement does not apply to materials in inside metal cans of the nonrefillable type with spun-in head and base without replaceable caps or other closing device, liquids contained in manufactured articles which are leak-tight in all orientations, and packages with hermetically-sealed inner packagings.
- A14.3.6.3. Orientation Markings are not required for single packaging when package orientation is obvious (e.g., drums, barrels, etc) or on freight containers.
- A14.3.7. When an overpack (generally wooden or fiberboard) is used to consolidate one or more air eligible packages to form a single unit for convenience of handling or storage during transportation, apply markings required by this manual for individual containers, with the exception of UN specification markings. Also, mark "OVERPACK" on the outer container. The "OVERPACK" marking is at least 12 mm (0.5 inches) high.
- A14.3.8. Freight Containers. Freight containers do not require PSN and UN numbers of the contents. Ensure contents are accessible (see paragraph 1.11) and be labeled to indicate the hazard class/division of the contents, and if the contents are cargo aircraft only in accordance with Attachment 15. A marking board may be used in lieu of applying markings directly to the freight container. (see A14.3.11).
- A14.3.9. Unitized Cargo. Ensure identical hazardous materials unitized on a warehouse pallet or skid has at least one package with the UN specification markings exposed on the outside of the unit load (unless exempt by paragraph A3.1.1.).
- A14.3.10. Shrink Wrap Packages. When stretch or shrink wrap film is used to secure a warehouse pallet or skid, ensure proper shipping name, identification number, and UN specification markings (if applicable) are visible. Use pressure-sensitive labels or a marking board to identify contents if proper shipping name and identification number markings are not visible on one or more packages. If UN specification markings are not visible on at least one of like packages, comply with A14.3.7.
- A14.3.11. Marking Boards. Marking boards (wood, fiberboard, tags, etc.) may only be used in lieu of individual package markings required by this attachment and labels required by Attachment 15 for items on warehouse pallets/skids prepared according to Service approved unit load drawings under both the following conditions:
- A14.3.11.1. When it is determined to be impractical or uneconomical to mark/re-mark each package on a pallet or skid.
- A14.3.11.2. The entire pallet/skid need not be broken down at any time during transportation until delivery to the customer.
- A14.3.12. Limited Quantities. In addition to proper shipping name and UN identification number, and other markings required by this attachment, mark packages used for hazardous

materials in limited quantities with the limited quantities marking identified in the following Figure.

**Figure A14.5. Limited Quantity Marking**



A14.3.12.1. Ensure the marking is durable, legible and of a size relative to the package as to be readily visible. Apply the marking on at least one side or one end of the outer packaging. Ensure the width of the border forming the square-on-point is at least 2 mm and the minimum dimension of each side is 100 mm unless the package size requires a reduced size marking that may be no less than 50 mm on each side and the width of the border forming the square on point may be reduced to a minimum of 1 mm.

A14.3.12.2. The top and bottom portions of the square-on-point and the border forming the square-on-point is black and the center white or of a suitable contrasting background and the symbol "Y" is black and located in the center of the square-on-point and clearly visible.

A14.3.13. Excepted Quantities. Mark packages used for hazardous materials in excepted quantities as required by A19.2.13. Excepted quantities do not require other package markings required by this attachment.

A14.3.14. Consumer Product Warnings. An article, package, or container may bear a manufacturer's consumer warning symbol or statement. Presence of such a symbol or statement does not necessarily mean the article or contents meet the classification criteria as a hazardous material for military air transportation. Reference the Hazardous Material Information Resource System (HMIRS) or the product's Safety Data Sheet if hazard classification information is needed.

A14.3.15. Engines and machinery UN3528, UN3529, and UN3530 do not require markings unless packaged, crated, or otherwise enclosed to prevent ready identification.

**A14.4. Marking Requirements Applicable to Class.** These markings are in addition to the General Markings required by A14.3.

A14.4.1. Class 1.

A14.4.1.1. Containers packaged before January 1, 1990 may be shipped both domestically and internationally by military air without the UN specification markings according to paragraph A3.3.1.10. Comply with all other marking requirements of this attachment. Ensure packages requiring a DOT or military/federal specification number specified by packaging paragraph in Attachment 27 are properly marked.

A14.4.1.2. Mark packages of explosives with an EX number or National Stock Number (as listed in the Joint Hazard Classification System) for each explosive. This does not apply if the explosive has an interim hazard classification issued according to A3.3.1.4. The EX

number need not be marked when not required by 49 CFR Section 173.56. The EX number is an explosive classification approval number, it is not the same as a DOT-SP number.

A14.4.1.3. Mark "THIS SIDE UP" on the top of packages of explosives containing liquids capable of being improperly oriented.

A14.4.1.4. When explosives are installed according to A3.3.1.9., mark the following statement near each explosive device: "WARNING - EXPLOSIVE DEVICE EMBEDDED IN \*\*\*" (\*\*\*) identifies location of device; e.g., window, door, frame, etc).

A14.4.1.5. Display the PSN and UN number on explosives authorized by this manual to be shipped unpacked. That marking may be on the item, its cradle, or handling, storage, or launching device. This marking is not required for items hand-carried (see paragraph 3.5.), unpackaged for airdrop (see A5.2.1.), or secured in a tactical vehicle or equipment (see A5.2.2.).

A14.4.1.6. For Grandfathered shipments, mark packages with DOT or military/federal specification number when specified by packaging paragraph in Attachment 27.

#### A14.4.2. Class 2.

A14.4.2.1. For ethylene oxide prepared and certified according to A6.13.3., mark the top head of the drum "THIS END UP."

A14.4.2.2. Mark fire extinguishers prepared and certified according to A6.7.3. to indicate year of test and "MEETS DOT REQUIREMENTS." The words "This extinguisher meets all requirements of 49 CFR Section 173.306" may be displayed in place of "MEETS DOT REQUIREMENTS" on extinguishers manufactured before January 1, 1976.

A14.4.2.3. Each outer packaging of cryogenic liquids prepared and certified according to A6.11. require orientation arrows to indicate upright position and special orientation instructions marked on the cylinder (e.g., THIS END UP). Ensure cryogenic liquids meet the marking requirements in 49 CFR Section 178.57. The total rate of venting in standard cubic feet per hour (SCFH) is marked on the top head or valve protection band in letters at least one-half inch high as follows "VENT RATE\*\*SCFH" (with the asterisks replaced by the number representing the total rate of venting, in SCFH). Packages meeting ICAO packing instruction 202 are marked with the words "DO NOT DROP – HANDLE WITH CARE," and place the words "KEEP UPRIGHT" at 120 degree intervals around the package or on each side of the package.

A14.4.2.4. Mark outer package "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS" for the following:

A14.4.2.4.1. Aerosols and compressed gases prepared and certified according to A6.2.

A14.4.2.4.2. Refrigerant gases or engine-starting fluid prepared and certified according to A6.4.6. and A6.4.7.

A14.4.2.4.3. Receptacles and cylinders identified in A3.3.2.7. requiring a strong outer packaging.

A14.4.2.4.4. Cylinders packaged according to A3.3.2.3.2 to protect valves from damage or accidental functioning during transport.



A14.4.2.4.5. Liquefied Petroleum Gas prepared according to A6.6.2.

A14.4.2.5. Aerosols (UN1950) may be marked with a PSN authorized by 49 CFR, IATA, or ICAO, not identified in Table A4.1.

A14.4.2.6. Mark cylinders containing unodorized Liquefied Petroleum Gas (LPG) “NON-ODORIZED” or “NOT ODORIZED” in letters not less than 6.3 mm (0.25 inches) in height near the marked proper shipping name. This marking is not required on Specification 2P or 2Q container or a Specification 39 cylinder containing LPG.

A14.4.3. DELETED

A14.4.4. Class 5.

A14.4.4.1. For bromine pentafluoride or bromine trifluoride prepared and certified according to A9.. using a DOT 3E1800 cylinder, mark the outer packaging "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

A14.4.4.2. Oxygen generator, chemical. Mark the outside surface of a chemical oxygen generator to indicate the presence of an oxygen generator (e.g., “oxygen generator, chemical”). Clearly mark the outside surface of equipment containing a chemical oxygen generator that is not readily apparent (e.g., a sealed passenger service unit) to indicate the presence of the oxygen generator (example: “Oxygen Generator Inside”).

A14.4.5. Class 6.

A14.4.5.1. Permanently mark outside plastic containers used as single or composite packaging for materials meeting the definition of Division 6.1 toxic (poisonous materials), by embossment or other durable means, with the word "POISON" or “TOXIC” in letters of at least 6.3 mm (1/4 inch) in height. Additional text or symbols may be included in the marking. The marking is located within 15 cm (6 inches) of the packaging's closure.

A14.4.5.2. Mark Category A Infectious Substance meeting the requirements specified in 49 CFR Section 178.609 as follows:

A14.4.5.2.1. A UN specification marking affixed by the manufacturer with the text “Class 6.2” noted per packaging manufacturer requirements. Class 6.2 packaging may also include the letter “U” inserted immediately following the packaging identification code marking in the UN specification marking when the packaging meets the requirements of 49 CFR Subparagraph 178.609(i)(3).

A14.4.5.2.2. Mark all packages containing infectious substances durably and legibly on the outside of the package with the name and telephone number or a person responsible for the shipment.

A14.4.5.3. For packages containing UN3373, mark outer packagings with the words “BIOLOGICAL SUBSTANCE, CATEGORY B.” and “UN3373.” Mark UN3373 within a square-on-point shaped border with each side at least 50mm (2 inches). Ensure the width of the border line is at least 2mm, and the letters and numbers are at least 6mm in height. Ensure the background is of a contrasting color from the package.

A14.4.5.4. Packages containing “BIOLOGICAL SUBSTANCE, CATEGORY B” are marked to identify name and phone number for contact in an emergency.

#### A14.4.6. Class 7.

A14.4.6.1. General Requirements. In addition to other markings required by this attachment, the following markings are required on all Excepted packages, Types IP-1, IP-2, IP-3, Type A, Type B(U) or Type B(M) packages:

A14.4.6.1.1. Mark each package of radioactive materials over 50 kg (110 pounds) to show the gross weight including the unit of measurement marked on the outside of the package.

A14.4.6.1.2. When dry ice is used as a refrigerant, mark the PSN, UN Number, and net quantity on the outer package.

A14.4.6.1.3. Markings are at least 12 mm high, except for packages of 30 L or 30 kg capacity or less have a minimum height of 6 mm.

#### A14.4.6.2. Excepted Packages.

A14.4.6.2.1. Mark packages containing radioactive material meeting the definition of an excepted package with "Radioactive Material, Excepted Package." A commercial label may be used for this marking.

A14.4.6.2.2. For limited quantities prepared and certified according to A11.5.4., the package is not required to be marked with the PSN provided it is marked with the identification number preceded by the letters "UN" within a diamond.

#### A14.4.6.3. Industrial Packages.

A14.4.6.3.1. Mark each package of radioactive material that meets the requirements for Types IP-1, IP-2, or IP-3 packaging on the outside of the package with the words "TYPE IP-1" "TYPE IP-2" or "TYPE IP-3" as appropriate. Do not mark a package that does not meet these requirements.

A14.4.6.3.2. Mark on the outside of Type IP-1, Type IP-2, or Type IP-3 packaging with the international vehicle registration code of the country of origin of the design. The international vehicle registration code for packages designed in the United States is the symbol "USA."

A14.4.6.3.3. Mark on the outside of Type IP-1, Type IP-2, or Type IP-3 packaging with the name of the package manufacturer, or other identification markings as required by approval certificate issued by the competent authority.

#### A14.4.6.4. Type A Packages.

A14.4.6.4.1. Mark each package of radioactive material that meets the requirements for a Type A package with the words "TYPE A". Do not mark a package that does not meet these requirements.

A14.4.6.4.2. Mark on the outside of Type A packagings with the international vehicle registration code of the country of origin of the design. The international vehicle registration code for packages designed in the United States is the symbol "USA."

A14.4.6.4.3. Mark on the outside of Type A packages with the name of the package manufacturer, or other identification markings as required by approval certificate issued by the NRC or the US Competent Authority.

A14.4.6.5. Type B Packages.

A14.4.6.5.1. Mark each package of radioactive material that meets the requirements for Type B(U) or Type B(M) packaging on the outside of the package with the words "TYPE B(U)" or "TYPE B(M)" as appropriate. Do not mark a package that does not meet these requirements.

A14.4.6.5.2. Identification mark allocated to the design by the NRC or the US Competent Authority.

A14.4.6.5.3. Serial number to uniquely identify each packaging which conforms to the design.

A14.4.6.5.4. Mark each outer packaging with a trefoil radiation symbol meeting the requirements of 49 CFR Part 172 Appendix B.

A14.4.7. Class 8.

A14.4.7.1. Mark the outer container of chemical kits prepared and certified according to A12.6. "CHEMICAL KITS" or "FIRST AID KITS" as applicable.

A14.4.8. Class 9.

A14.4.8.1. Wheelchairs for which the battery is removed and boxed for shipment according to A13.6., mark the outer container containing the battery "THIS SIDE UP." This applies any time a battery is authorized to be removed from its holder, boxed, and shipped with equipment.

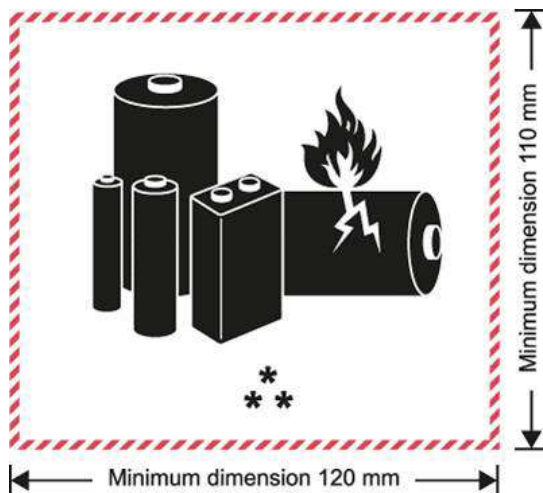
A14.4.8.2. Unless packaged, crated, or otherwise enclosed to prevent ready identification, the marking of the article or equipment of Class 9 with the proper shipping name and identification number is not required.

A14.4.8.3. Dangerous Goods in Machinery or Apparatus. For items shipped under the PSN "Dangerous Goods in Machinery" or "Dangerous Goods in Apparatus" mark the PSN and UN number on the machinery, apparatus, or packaging (unless exempted by A14.4.8.).

A14.4.8.4. Dry Ice. For checked baggage, mark package with "DRY ICE" or "CARBON DIOXIDE, SOLID" and net mass, or an indication the net mass is less than 2.5 kg (5.5 pounds). For all other packages, mark the outer package with "DRY ICE" or "CARBON DIOXIDE SOLID," "UN1845," and the net mass of the dry ice.

A14.4.8.5. Excepted Lithium Batteries. Mark each package with the lithium battery mark. This requirement would not apply to a package containing button cell batteries installed in equipment (including circuit boards) or when no more than four lithium cells or two lithium batteries are installed in the equipment.

**Figure A14.6. Lithium Battery Mark**



A14.4.8.5.1. The mark is in the form of a rectangle with hatched edging. The mark may be not less than 120 mm (4.7 inches) wide by 110 mm (4.3 inches) high and the minimum width of the hatching is be 5 mm (0.2 inches) except markings of 105 mm (4.1 inches) wide by 74 mm (2.9 inches) high may be used on a package containing lithium batteries when the package is too small for the larger mark;

A14.4.8.5.2. The symbols and letters are black on white or suitable contrasting background and the hatching is red; and

A14.4.8.5.3. The “\*” is be replaced by the appropriate UN number(s) and the “\*\*\*” is replaced by a telephone number for additional information.

A14.4.8.5.4. Lithium metal cells and batteries (UN3090) are forbidden for transport aboard commercial passenger-carrying aircraft by 49 CFR. Mark the outer container(s) “LITHIUM METAL BATTERIES – FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT” or label them with a “CARGO AIRCRAFT ONLY” label to be eligible for both commercial and military aircraft. Markings do not prohibit the movement of passengers on military or contracted cargo aircraft.

**Attachment 15****LABELING HAZARDOUS MATERIALS**

**A15.1. General Requirements.** Unless otherwise specified in this manual, apply the appropriate labels to the outer packaging of packages containing hazardous materials.

A15.1.1. Use labels meeting the commercial color and specifications outlined in 49 CFR Sections 172.411 through 172.450, ICAO, or IATA. Do not use labels that are easily confused by their use, shape, and color, with the standard labels prescribed.

A15.1.2. Labels are diamond-shaped with each side at least 10 cm (4 inches) long and have a solid line border 6.3 mm (0.25 inches) from the edge. "UN3373" labels may be 5 cm (2 inches) long.

A15.1.3. The hazard class and division number is at least 6.3 mm (0.25 inches) and not greater than 12.7 mm (0.5 inches). The label text is at least 7.6 mm (0.3 inches) and in capitalized Roman letters.

A15.1.4. It is the shipping activity's responsibility to establish procedures to locally fund for and procure hazardous material labels and commercial forms.

A15.1.5. Accessorial hazards do not require labels.

A15.1.6. Comply with paragraph 1.10.8. to ensure visibility of hazard labels during transportation. If hazard labels required by this attachment are not visible due to placement (located in the middle of an aircraft pallet, cargo bed covered by a tarp, within a freight container, etc), apply required labels to a marking board placed/attached to identify presence of each hazard classification.

A15.1.7. Engines and machinery UN3528, UN3529, and UN3530 do not require labeling unless packaged, crated, or otherwise enclosed to prevent ready identification.

**A15.2. Hazard Labels.**

A15.2.1. Affix to the outer packaging or (overpack) a primary hazard label and a subsidiary hazard label(s) (if required) based on the hazard classification/subsidiary hazard provided in columns 4 and 5 of Table A4.1. unless exempted by A15.4. Include the hazard class or division number in the bottom corner of the label(s). Labels that do not have the class or division number preprinted may be stamped or overprinted with the appropriate hazard class/division number in the bottom corner of the label.

A15.2.1.1. For explosives, include the division number and compatibility group letter. Ensure the compatibility group letter is a capitalized Roman letter.

A15.2.1.2. For Division 5.1 oxidizers and Division 5.2 organic peroxides, include the division number in the bottom corner of the label.

A15.2.2. Unless otherwise directed in this manual, attach labels to the part of the package bearing the PSN if package size is adequate. If package size is not adequate, use an overpack. Label packages requiring a Radioactive Material label ("Category I-White", "Category II-Yellow" or "Category III-Yellow") on two opposite sides.

- A15.2.3. Do not place labels over any identifying data on the container. Remove or obliterate any irrelevant labeling already on the packaging.
- A15.2.4. When hazardous materials are placed in an overpack, the appropriate primary hazard label, subsidiary hazard label(s) and handling label(s) for each class is applied to the outer package or container. If the primary hazard or subsidiary hazard label(s) of another component of the overpack already adequately identifies a primary or subsidiary hazard it is not necessary to apply an additional label.
- A15.2.5. When hazardous materials are palletized on a 463L or warehouse pallet, ensure the label is clearly visible.
- A15.2.6. Position hazardous cargo loaded in the back of a vehicle so the labels are clearly visible, or apply the labels for each hazard loaded in the back of the vehicle to a marker board that is clearly visible.
- A15.2.7. Label each Limited Quantity package for each dangerous good contained in the package.
- A15.2.8. Excepted Quantities do not require hazard labels. See A19.2.13 for package marking requirements.
- A15.2.9. Label hazardous waste with the appropriate hazard label and properly completed hazardous waste label.
- A15.2.10. For items shipped under the PSN "Dangerous Goods in Machinery" or "Dangerous Goods in Apparatus" apply Package Orientation (This Way Up) labels to opposite vertical sides when required to ensure liquid hazardous materials remain in their intended orientation. If machinery or apparatus contains a magnetized material apply both a Class 9 (Miscellaneous) and a "Magnetized Material" label.
- A15.2.11. A label(s) is not required for domestic shipments when use is exempted by a DOT special permit. For international shipments, apply the correct label(s).
- A15.2.12. Do not apply hazard labels to a package containing material that is not regulated.
- A15.2.13. When consolidating loads, apply labels required by this attachment for individual packages directly to stretch or shrink wrapping used or to a marking board (A14.3.11). Orientation labels are not required if stretch or shrink wrap prevents incorrect loading of packages/containers.

### **A15.3. Handling Labels.**

- A15.3.1. Apply a "Cargo Aircraft Only" label on packaging (to include overpacks) not permitted on passenger aircraft as identified in column 7 of Table A4.1. Also apply to marking boards according to A15.1.6., when applicable, if label is not visible.
- A15.3.2. The "Cargo Aircraft Only" label is not required on cargo shipped according to A17.3 (exceptions for Operations Conducted According to DTR 4500.9R, Part III, Mobility) unless diverted as identified in A17.3.5.
- A15.3.3. Apply a "Magnetized Material" label on packages containing magnetized material. An additional Class 9 label is not required. Also apply to marking boards according to A15.1.6., when applicable, if label is not visible.

A15.3.4. Apply an "Empty" label when the packaging meets the requirements of paragraph A3.1.16. Remove, obliterate, destroy, or completely cover any previously applied hazard labels from the container or cylinder when shipped as empty. New or reconditioned cylinders do not require an "Empty" label but mark or tag them to indicate they are empty.

A15.3.5. Apply "Keep Away From Heat" label to each outside package containing self-reactive substances of Class/Division 4.1 or organic peroxides of Class/Division 5.2.

A15.3.6. Labels required by 49 CFR, ICAO, or IATA may be affixed even if not required by this manual.

A15.3.7. A marking board may be used in lieu of applying a handling label(s) directly to a freight container (see A14.3.11).

A15.3.8. Apply labels required for large packagings or overpacks on two opposite sides. Large packagings are defined as a packaging or overpack having a volume of 1.8 m<sup>3</sup> (64 cubic feet) or more.

#### **A15.4. Labeling Requirements Applicable to Hazard Classes.**

A15.4.1. Class 1. For unitized, containerized, or palletized loads of like items with the same hazard classification, division and compatibility group, only one of the required hazard label(s) needs to be applied and visible.

A15.4.2. Class 2.

A15.4.2.1. For packages containing oxygen, compressed; or oxygen, refrigerated liquid, a label with the word "OXYGEN" may be used in place of a label with the word "OXIDIZER," if the letter size and color are the same as those required for oxidizer. Alternatively, an "OXYGEN" label may be used in place of the "NONFLAMMABLE GAS" and "OXIDIZER" labels required in Table A4.1.

A15.4.2.2. Apply a nonflammable compressed gas label to each exterior container of recoil mechanisms or artillery gun mounts prepared and certified according to A6.5.13. However, when shipped as an integral part of the complete weapon system, the nonflammable compressed gas label may be on the weapon or its exterior cover.

A15.4.3. Class 3. All flammable liquids, whose vapor pressure (Reid test) is more than 110 kPa (16 psi) at 38 degrees C (100 degrees F), require a "white bung label," 76 x 127 mm (3 by 5 inches), affixed near the bung or closure of the container.

A15.4.4. Class 4. A division 4.1 subsidiary hazard label is not required on a package bearing a division 4.2 label.

A15.4.5. Class 6.

A15.4.5.1. Label PG I or II material with either a "TOXIC" or "TOXIC INHALATION HAZARD" label as appropriate.

A15.4.5.2. Label Hazard Zone A or B material with a "TOXIC INHALATION HAZARD" label.

A15.4.5.3. Ensure material classified as an infectious substance, that also meets the definition of a Class 2.3 toxic material or a radioactive material, is also labeled with a

"TOXIC GAS" (or INHALATION HAZARD) label or "RADIOACTIVE" label as appropriate.

A15.4.5.4. Label all Category A infectious substance packagings and Medical Waste, Category A packagings with an "INFECTIOUS SUBSTANCE" label.

A15.4.6. Class 7.

A15.4.6.1. Hazard Label. Ensure each package requiring a "RADIOACTIVE" label has two of these labels affixed to opposite sides of the package. The proper label to affix to a package of radioactive material is based on the radiation level at the surface of the package and the transport index. The proper category of label is determined according to Table A15.1. The first step is to determine the maximum radiation level at a distance of 1 meter from the external surfaces of the package, overpack or freight container, the value determined is multiplied by 100. The final step is the figure obtained in step 1 is rounded up to the first decimal place, except that a value of 0.05 or less may be considered as zero. Apply the highest category label required for any of the two determining conditions. Radioactive Category I-White is the lowest category and Category III-Yellow is the highest. For example: a package with a transport index of 0.8 and a maximum surface radiation level of 0.6 mSv/h (60 mrem/h) bears a Category III-Yellow label (see Table A15.1.)

**Table A15.1. Radioactive Label Requirements. (See Note 1).**

<b>Transport Index (TI)</b>	<b>Maximum Radiation Level at any Point on the External Surface</b>	<b>Label Category (see Note 1)</b>
0 (see Note 2)	Less than or equal to 0.005 mSv/h (0.5 mrem/h)	I - White
More than 0 but not more than 1 (see Note 2)	More than 0.005 mSv/h (0.5 mrem/h) but less than or equal to 0.5 mSv/h (50 mrem/h)	II - Yellow
More than 1 but not more than 10	More than 0.5 mSv/h (50 mrem/h) but less than or equal to 2 mSv/h (200 mrem/h)	III - Yellow
More than 10 (see Note 3)	More than 2 mSv/h (200 mrem/h) but less than or equal to 10 mSv/h (1000 mrem/h)	III – Yellow
<b>Notes:</b> 1. The category of label is shown in Key 17 of the Shipper's Declaration for Dangerous Goods form and the correct label is applied to radioactive materials packages. Any package containing a "highway route controlled quantity" is labeled as radioactive Category III-Yellow. 2. If the measured TI is not greater than 0.05, the value quoted may be zero. 3. If the TI is greater than 10, the package or overpack may be transported by SAAM airlift only (see Attachment 24)		

A15.4.6.2. Subsidiary hazard Label. Label each package containing a radioactive material that also meets the definition of one or more additional hazards, as required by this



attachment for the radioactive material and for each additional hazard. For example, label solid nitrates of uranium or thorium, "RADIOACTIVE" and "OXIDIZER." Subsidiary hazard labels are not required for an uncompressed gas that is non-flammable and non-toxic.

A15.4.6.3. Label Marking. Mark the contents, activity, and for Category II and III yellow labels, the transport index on the label. Additionally, mark the CSI on the CSI label. Enter the following information in the blank spaces by legible printing (manual or mechanical), using a durable weather resistant means of marking:

A15.4.6.3.1. Contents. Mark the contents as follows:

A15.4.6.3.1.1. Except for LSA-I material, the symbol of the radionuclide as listed in Table A11.1. Symbols that conform to established radiation protection terminology are authorized, (e.g.,  $^{99}\text{Mo}$ ,  $^{60}\text{Co}$ , etc).

A15.4.6.3.1.2. For mixtures of radionuclides, or for different individual radionuclides packed together in the same package, the most restrictive radionuclides are listed to the extent that space on the line permits.

A15.4.6.3.1.3. LSA (except LSA-1) or SCO has the symbol of the radionuclide followed by "LSA-II", "LSA-III", "SCO-I", "SCO-II" as appropriate.

A15.4.6.3.1.4. For LSA-I material, only "LSA-I" is required to be marked.

A15.4.6.3.2. Activity. Express units in appropriate international units of Becquerels (Bq) or Terabecquerels (TBq). The customary units, e.g., curies (Ci), millicuries (mCi), or microcuries (uCi) may be included in parenthesis following the international units. Abbreviations are authorized. For a fissile material, the weight in grams or kilograms of the fissile radioisotope also may be inserted.

A15.4.6.3.3. Transport Index (TI). For Category II and Category III yellow labels only, mark the Transport Index in the box provided. It is rounded up to one decimal place (see Attachment 1).

A15.4.6.3.4. Criticality Safety Index (CSI).

A15.4.6.3.4.1. Mark the Criticality Safety Index label with the CSI as stated in the certificate of approval for special arrangement or the certificate of approval for the package design, issued by the NRC or the US Competent Authority, in the box provided.

A15.4.6.3.4.2. For overpacks and freight containers, the CSI on the label is the sum of the criticality safety indexes of the individual packages in the freight container or overpack as stated in the certificate of approval for the package design issued by the NRC or the US Competent Authority.

A15.4.6.3.5. Overpacks and Freight Containers. When one or more packages of radioactive material are placed within an overpack, label the overpack as prescribed in this paragraph except as follows:

A15.4.6.3.5.1. The content entry on the label may state "See Shipper's Declaration" in place of the names of the radionuclides unless each inside package contains the same radionuclide(s).

A15.4.6.3.5.2. The activity entry on the label is determined by adding together the number of becquerels of the radioactive materials packages contained in the overpack.

A15.4.6.3.5.3. For an overpack, determine the TI by adding together the transport indexes of the radioactive materials packages contained in the overpack. For a rigid overpack, the TI may alternatively be determined by direct measurement as prescribed in this paragraph; however, only the person who initially offered the packages contained within the overpack for shipment may take the measurement.

A15.4.6.3.5.4. Determine the category of Class 7 label for the overpack from Table A15.1. using the TI derived from the requirements in this paragraph and the maximum surface radiation level on the surface of the overpack.

A15.4.6.3.5.5. Use the category of the Class 7 label of the overpack and not that of any contained packages in accordance with Table 1 of 49 CFR Paragraph 172.504(e) to determine when the transport vehicle requires placarding.

#### A15.4.7. Class 8.

A15.4.7.1. Ensure wet-cell batteries prepared and certified according to A12.4. have "Package Orientation" labels indicating the upright position (top) of the container, if not already marked on the container as specified in A14.3.6.

A15.4.7.2. Label Chemical or First Aid Kits prepared in accordance with A12.6. with the primary hazard label and any subsidiary hazard labels applicable to each individual hazard within the kit.

A15.4.7.3 Packages displaying a Class 8 label need not display a Division 6.1 subsidiary hazard label if the toxicity of the material is based solely on the corrosive destruction of tissue rather than systematic poisoning.

#### A15.4.8. Class 9.

A15.4.8.1. Vehicles do not require a label unless packaged, crated, or otherwise enclosed to prevent ready identification.

A15.4.8.2. Certify items containing both limited quantity radioactive and magnetic characteristics to the radioactive material. Although limited quantity radioactive material is exempt from labeling, apply a magnetic material label to the shipping container.

A15.4.8.3. Affix a Class 9 Miscellaneous label for Dry Ice or Carbon Dioxide, Solid to the package. Include the proper shipping name, UN identification number, and amount of the dry ice on the package. Follow all additional requirements noted in Section A.3.3.9.6 and A14.4.8.4.

**Attachment 16****AREA PLACARDING**

**A16.1. General Requirements.** Placard the area surrounding aircraft transporting any hazardous materials when parked according to Table A16.1. or Service directives. If Service directives do not contain specific procedures for placarding, use the following guidance:

A16.1.1. Use placards that meet the general design, size, and color specifications of 49 CFR Section 172.519.

A16.1.2. For explosives, fire and chemical hazard symbols specified in DESR 6055.9 may be used in place of placards.

A16.1.3. Conspicuously display placards at the front, rear, and both sides of the aircraft unless emergency response access is restricted. Then post placards at entry points.

A16.1.4. Park aircraft transporting DOD Class 1.1, 1.2, and 1.3 explosives and any material identified as Inhalation Hazard Zone A in a remote area. Placarding is still required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.1.5. Park aircraft transporting all other types of hazardous materials in a placarded area. However, placarding is not required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

**A16.2. Responsibility for Placards.**

A16.2.1. Military hosts are responsible for placarding at military bases.

A16.2.2. At nonmilitary airfields, the agency delivering cargo to the aircraft, or off loading cargo is responsible for making arrangements with the airport manager for identifying the cargo, isolating parking and loading, placarding, firefighting, and disaster response. Arrangements for using en route nonmilitary airfields is the responsibility of the activity having operational control of the aircraft.

A16.2.3. It is the shipping activity's responsibility to establish procedures to locally procure and fund for hazardous material placards.

A16.2.4. The nomenclature of the placards is shown in Table A16.1.

Table A16.1. Placard Requirements.

Placards Required for Parked Area Aircraft Containing Hazardous Cargo		
Hazard Class or Division – Placard for Any Quantity		Type of Placard
	1.1	EXPLOSIVES 1.1
	1.2	EXPLOSIVES 1.2
	1.3	EXPLOSIVES 1.3
	2.3	TOXIC GAS
	4.3	DANGEROUS WHEN WET
	5.2 (Organic peroxide, Type B, liquid or solid temperature controlled)	ORGANIC PEROXIDE
	6.1 (Inhalation Hazard Zone A or B)	TOXIC INHALATION HAZARD
	7 (Radioactive Category III-Yellow label only)	RADIOACTIVE
Hazard Class or Division - (Placard for 1,001 pounds or more aggregate gross weight)		Type of Placard
	1.4	EXPLOSIVES 1.4
	1.5	EXPLOSIVES 1.5
	1.6	EXPLOSIVES 1.6
	2.1	FLAMMABLE GAS
	2.2	NONFLAMMABLE GAS
	3	FLAMMABLE
	4.1	FLAMMABLE SOLID
	4.2	SPONTANEOUSLY COMBUSTIBLE
	5.1	OXIDIZER
	5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
	6.1 (other than inhalation hazard, Zone A or B)	TOXIC
	6.2	NONE REQUIRED
	8	CORROSIVE
<p><b>Notes:</b> 1. Use the explosive placard representing highest hazard. For example, if the area contains both Class 1.1 and 1.2, use the Explosive 1.1 placard. Otherwise, placard for each hazard or comply with note 3 below.</p> <p>2. The aggregate gross weight is the total gross weight of the compatible packages comprising the shipment or different shipments of the same classification.</p> <p>3. For those hazard classes located in the lower portion of the table, placarding is not required if the aggregate gross weight of the packages of those classes is less than 454 kg (1001 pounds). A "DANGEROUS" placard may be used in place of the separate placards for two or more categories of hazardous material found in the lower portion of the table. When 1000 kg (2205 pounds) or more of one category of material from the lower portion of the table is loaded, the specific placard for that Material is required, and a "DANGEROUS" placard may not be used to represent that material.</p>		

**Attachment 17****CERTIFYING HAZARDOUS MATERIALS**

**A17.1. Shipper's Certification.** Unless specifically exempted in this manual, the shipping activity must complete a shipper's certification according to this attachment for all military air shipments of hazardous materials. **(T-0)**.

**A17.1.1. Certifying Official.**

A17.1.1.1. An individual qualified according to A25.3. is required to inspect the hazardous materials prior to accomplishing the Shipper's Declaration for Dangerous Goods form.

A17.1.1.2. When transportation personnel are required to certify an item that requires special preparation (munitions, engines, etc), the item specialist or preparing activity provides documentation indicating that the item is prepared properly for air shipment. Develop local procedures to determine acceptable documentation.

A17.1.2. Certification Reference. Certify hazardous materials to a packaging reference in this manual. Hazardous material may be certified as required for air transport to the ICAO, IATA, or 49 CFR under the following conditions:

A17.1.2.1. Comply with all requirements of the certifying document.

A17.1.2.2. Certified on a "Shipper's Declaration for Dangerous Goods" standard commercial form.

A17.1.2.3. Materials prepared passenger/cargo aircraft are assigned P5.

A17.1.2.4. Materials prepared cargo aircraft only are assigned P4.

A17.1.2.5. See A17.2.6. for multiple mode shipments.

**A17.2. Shipper's Declaration for Dangerous Goods Certification.**

A17.2.1. Forms Required. Complete shipper's certification on the "Shipper's Declaration for Dangerous Goods" standard commercial form. Two styles of the commercial form may be used. One style is designed with the "Nature and Quantity of Dangerous Goods" section left open for continuous printing. The other style is designed in a columnar format with the "Nature and Quantity of Dangerous Goods" section blocked and formatted with headings specifying each key entry (Figure A17.1.). It is the shipping activity's responsibility to establish procedures to locally procure and fund for the Shipper's Declaration for Dangerous Goods form.

A17.2.1.1. Obtain the form through the procurement system from commercial vendors specializing in hazardous material transportation supplies.

A17.2.1.2. The form may be locally produced depending on local capabilities and economic feasibility.

A17.2.1.3. Use a form meeting the format, size, and color specifications outlined in IATA, Section 8-Documentation.

A17.2.2. Copies Required. Complete and sign at least three Shipper's Declaration for Dangerous Goods (SDDG) forms. It is acceptable to receive two signed copies for ICAO-

- TI/IATA SDDG certifications. Make additional copies as required. A17.2.2.1. Attach one certification form to the copy of the manifest that is placed on the aircraft.
- A17.2.2.2. Attach one certification form to the originating station file manifest. Intransit or enroute terminals may reproduce (photocopy) the Shipper's Declaration for Dangerous Goods form for their station file if required.
- A17.2.2.3. Place one certification form in a waterproof envelope and attach to the number one piece of the shipment.
- A17.2.2.4. Ensure the three original forms (two original for ICAO-TI/IATA) used to offer hazardous material for military air transportation has the vertical red hatch border and certifying official's signature. Carbon signatures are acceptable.
- A17.2.2.5. Additional copies may be forwarded with the shipment. Vertical red hatch border is not required for any additional copies.
- A17.2.3. Form Completion. Complete the Shipper's Declaration for Dangerous Goods form either manually (hand printed), mechanically (typewriter), or digitally (computer). The form may be completed by a combination of manual, mechanical, and digital means, as required, providing all entries are clear and legible. However, when possible, the shipping activity should complete the form entirely manually, mechanically, or digitally. When the forms are completed in combination, each manual entry must be provided with a signature of all individuals completing the information next to, above or below the entry. Incorrect punctuation, spelling (other than Proper Shipping Name), or entries that touch column separating lines on the form is not justification for frustrating hazardous cargo. Entries may be either in upper or lower case or combination.
- A17.2.3.1. Use Table A17.1. for detailed instructions on accomplishing the shipper's certification form for nonradioactive and radioactive shipments. Use Table A17.2. to determine if a Shipper's Declaration for Dangerous Goods is required for radioactive shipments.
- A17.2.3.1.1. For forms with the "Nature and Quantity of Dangerous Goods" in columnar format, enter information in the appropriate column according to Table A17.1.
- A17.2.3.1.2. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, enter the basic description according to Table A17.1. Example: "UN2744, Cyclobutyl chloroformate, 6.1 (8,3), PG II."
- A17.2.3.1.3. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, use two oblique strokes, e.g., "/", to separate sequences of information or place each sequence on a separate line. Separate information within a sequence with a comma. See Figure A17.1. to identify separation of each sequence.
- A17.2.3.2. Hazardous materials with different proper shipping names/UN numbers may be shipped under the same transportation control number (TCN). Complete a Shipper's Declaration for Dangerous Goods according to this attachment to identify each proper shipping name/UN number identified by the TCN (see A17.4.2. and A17.3. for exceptions). A single Shipper's Declaration for Dangerous Goods may be used for compatible and/or multiple like items shipped under one TCN.

- A17.2.3.3. The certifying official may make pen and ink changes to any key. Someone other than the certifying official may make pen and ink changes to Keys 1 (only to the telephone number and not to the address), 2, 3, 5, 8, 9, and 19 without affecting the certification. Personnel (including certifying official) making a change to any key sign next to, above, or below the change. Additional relevant information may be added to Key 19 by someone other than the certifying official, provided all copies reflect the additional information and they are signed. Ensure all entries are durable, clear, and legible on all copies. Shipments may be frustrated if any entry on the form is not clear and legible. If the Shipper's Declaration for Dangerous Goods form is rejected, accomplish the correction as described in this paragraph or complete an entirely new form and present to the shipping activity.
- A17.2.3.4. Leave blank any key that does not require an entry (e.g., Key 14 when there is no subsidiary hazard).
- A17.2.3.5. If the Shipper's Declaration for Dangerous Goods does not contain sufficient space in any one key to accommodate all of the required information, use an additional Shipper's Declaration as an extension page. Ensure each page shows the page number and total number of pages (Key 4). Ensure all pages have the vertical red hatch border.
- A17.2.4. Not Enough Copies or No Copies. In instances where there are not enough copies of the Shipper's Declaration for Dangerous Goods, a certified "true copy" may be placed with the station file manifest. When making a true copy:
- A17.2.4.1. Annotate all the information verbatim from the original Shipper's Declaration for Dangerous Goods.
- A17.2.4.2. Use the information in the signature block from the original form and annotate it on the true copy, (e.g., John Doe, 2 Oct 11). On the reverse side of the form, type or clearly print the words "True Copy" and the name of the individual who is certifying the form to be a true copy. This official signs the form in longhand above the typed or printed name. The individual preparing a "true copy" need not be qualified according to A25.3. to certify the Shipper's Declaration for Dangerous Goods as a true copy.
- A17.2.5. Split Shipments. When a shipment is split according to procedures identified in DTR 4500.9-R.
- A17.2.5.1. Someone other than the certifying official may change key 5 and key 16 entry for number of packages only. The individual making the change signs above it.
- A17.2.5.2. All other entries in key 16 (e.g., type of packaging and net quantity) may only be changed by the certifying official.
- A17.2.5.3. Prepare a "true copy" according to A17.2.4. Ensure the original shipper's certification form accompanies the aircraft manifest with the first shipment. Attach a split shipment "true copy" to aircraft manifest and station manifest for subsequent shipments. Ensure each Shipper's Declaration reflects the correct TCN and number of packages.
- A17.2.5.4. Enter statement, "Shipment split at XXX (use Air terminal three letter code) in accordance with DTR 4500.9-R, Part II" on reverse side of all Shipper's Declaration forms.
- A17.2.6. Multiple Mode Shipments. Shipments certified to the ICAO, IATA, or 49 CFR for shipment by air may use the same Shipper's Declaration for Dangerous Goods for both the

commercial and military segments of air transport. Ensure shipments prepared for surface movement, are packaged, marked, labeled, and certified to ICAO, IATA, or 49 CFR for shipment by air, or to this document prior to onward air movement.

A17.2.7. Classified Information. Follow DTR 4500.9-R, Part II, Chapter 205 and MIL-STD-129 for marking and documenting classified hazardous materials. If the information to be entered on the Shipper's Declaration is classified, the following procedures apply:

A17.2.7.1. Complete the signed original in detail, including essential classified data, and attach to the manifest that is placed on the aircraft. Once the classified information is applied, the Shipper's Declaration for Dangerous Goods carries the same classification as the highest classification of the entered information.

A17.2.7.2. The manifest on the aircraft carries the same classification as the classified information until the classified Shipper's Declaration for Dangerous Goods is detached and handled according to applicable security regulations.

A17.2.7.3. Complete the station file copy in detail except for the classified information. Enter the following statement in "Additional Handling Information" (Key 19): "See aircraft commander's copy of Shipper's Declaration for Dangerous Goods for complete information."

A17.2.8. Secondary Load. Complete a Shipper's Declaration of Dangerous Goods according to this attachment for each secondary load.

A17.2.9. Emergency Telephone Number. DOD activities enter the applicable telephone number(s) in Key 19. Enter the phone number only one time if the number applies to each hazardous material on the manifest. Include the area code and international access code when appropriate.

A17.2.9.1. For Class 1 material, contact The Army Operations Center, +1(703) 695-4695/4696 (COLLECT), or DSN 312-225-4695/4696. Ask for the Watch Desk.

A17.2.9.2. For radioactive material, contact:

A17.2.9.2.1. Army: +1(703) 695-4695/4696 (COLLECT) or DSN 312-225-4695/4696.

A17.2.9.2.2. Air Force: +1(202) 767-4011 (COLLECT)

A17.2.9.2.3. Navy / Marines: +1(757) 887-4692, or DSN (312) 953-4692

A17.2.9.2.4. DLA: +1(717) 770-5283 (COLLECT)

A17.2.9.3. For or Biological Warfare Materials: +1(410) 306-4100 or DSN 458-4100.

A17.2.9.4. For all other hazardous materials, enter the domestic and international contact numbers for the DOD Emergency Response Hotline:

A17.2.9.4.1. Domestic: 1-800-851-8061 (toll free)

A17.2.9.4.2. International: +1-804-279- 3131(collect)

A17.2.9.5. Shipments originating from non-DOD activities use a company, safety organization, or other contact telephone number applicable to the material shipped. In which case, comply with 49 CFR Section 172.604.



A17.2.9.6. The following proper shipping names do not require an emergency telephone number: Battery powered equipment; Battery powered vehicle; Carbon dioxide, solid; Castor bean; Castor flake; Castor meal; Castor pomace; Consumer commodity; Dry ice; Engine, fuel cell, flammable gas powered; Engine, fuel cell, flammable liquid powered; Engine, internal combustion; Engine, internal combustion, flammable gas powered; Engine, internal combustion, flammable liquid powered; Fish meal, stabilized; Fish scrap, stabilized; Krill Meal, PG III; Machinery, internal combustion; Machinery, fuel cell, flammable gas powered; Machinery, fuel cell, flammable liquid powered; Machinery, internal combustion, flammable gas powered; Machinery, internal combustion, flammable liquid powered; Refrigerating machine; Vehicle, flammable gas powered; Vehicle, flammable liquid powered; Wheelchair, electric.

**A17.3. Exceptions for Operations Conducted According to DTR 4500.9-R, Part III, *Mobility*.**

Prepare the Shipper's Declaration for Dangerous Goods according to this manual for mobility operations. The following exceptions may be used for tactical, contingency, and emergency operations (to include exercises) and other deployment operations conducted according to DTR 4500.9-R, Part III, or when Chapter 3 of this manual is authorized.

A17.3.1. Complete and sign at least two copies of the Shipper's Declaration for Dangerous Goods Form. Attach one form to the copy of the manifest that is placed on the aircraft and one copy to the originating station file manifest.

A17.3.2. A single Shipper's Declaration for Dangerous Goods may be used to identify and certify more than one type of hazardous material (except radioactive material) when shipped under a single mobility TCN (DTR 4500.9-R, Part III, Appendix H).

A17.3.3. Certification is not required for hand-carried hazardous materials authorized according to paragraph 3.5.

A17.3.4. The following **exceptions** may be made when completing the Shipper's Declaration for Dangerous Goods according to Table A17.1.

A17.3.4.1. Keys 1, 2, 8, and 9. Enter the shipper/consignee address and the three digit airport code or airport name. If departure/destination location is classified, enter "WORLDWIDE MOBILITY" for the classified location(s).

A17.3.4.2. Key 5. Enter the transportation control number (TCN), developed according to DTR 4500.9-R, Part III – Appendix H.

A17.3.4.3. Key 7. Although the label is not required on the cargo, delete the "Passenger and Cargo Aircraft" block in Key 7 if the material is cargo aircraft only. If different hazardous materials are entered on the Shipper's Declaration according to A17.3.4.4 use the most restrictive "P" Code to complete Key.

A17.3.4.4. Keys 11-18. Different hazardous materials may be entered when prepared as a single shipment unit.

A17.3.4.5. Key 19. Complete Key 19 according to this attachment and Table A17.1. for individual items.

A17.3.5. Diverting Hazardous Materials to Nontactical Airlift. Hazardous materials certified for mobility operations may be diverted to nontactical airlift without completion of a new Shipper's Declaration for Dangerous Goods provided the following conditions are met:

A17.3.5.1. All hazardous materials packaged according to manual which are part of a single shipment are compatible according to Table A18.1. and Table A18.2.

A17.3.5.2. Hazardous materials which are part of the single shipment unit are compatible with all other hazardous materials according to Table A18.1. and Table A18.2.

A17.3.5.3. Vehicle and equipment fuel levels do not exceed limits authorized for nontactical airlift.

A17.3.5.4. Use provisions of A17.2.4. when extra copies of the Shipper's Declaration for Dangerous Goods are needed.

#### **A17.4. General Certification Requirements.**

A17.4.1. Empty Packaging. Packagings considered empty according to paragraph A3.1.16. do not require a Shipper's Declaration for Dangerous Goods form. Follow procedures specified in paragraph A3.1.16.4. **Note:** When purging equipment/facilities are not present at a given location, ensure items are properly packaged and certified as hazardous materials.

A17.4.2. Kits.

A17.4.2.1. When more than one PSN is authorized to be packaged in a single container(s) as a "kit" (see Attachment 1, definition of "Kit"), complete information in Keys 11-18 for each PSN. This does not apply to an item classified and described in Table A4.1. as a "KIT" (e.g., FIRST AID KITS, CHEMICAL KITS, POLYESTER RESIN KITS, etc).

A17.4.2.2. See Key 19 instructions for additional requirements.

A17.4.3. Excepted Quantities. A Shipper's Declaration for Dangerous Goods is not required for excepted quantities prepared according to A19.2. Annotate the shipping papers "Dangerous Goods in Excepted Quantities" and mark the package as required by A19.2.3. Passenger restrictions do not apply to items in excepted quantities.

#### **A17.5. Certification Requirements Applicable to Class.**

A17.5.1. Class 1.

A17.5.1.1 Identify fired exercise torpedoes or rockets, no longer containing explosive components, with OTTO Fuel II residue remaining as "Environmentally Hazardous Substance Liquid, N.O.S. (OTTO Fuel II)" and prepare according to A13.2.2.15.

A17.5.1.2. When shipping unpackaged explosives as specified in paragraph A5.2.

A17.5.1.2.1. Complete Keys 11 through 15 according to Table A17.1 for each different PSN/UN Number.

A17.5.1.2.2. Complete Key 16 and 17, according to the Table A17.1. for unpackaged explosives.

A17.5.1.3. When secured in authorized packaging and loaded on a tactical vehicle as an operational component according to specified procedures in a technical manual or publication, cite appropriate packaging reference from Attachment 5.

A17.5.1.4. Use the DOD Joint Hazard Classification System (JHCS) to complete certification information unless a final/Interim Hazard Class or a DOT approved classification is used according to A3.3.1.4. The NEW listed in JHCS or an IHC is the

maximum allowed for that item. Due to different manufacturer's and lot numbers, it is acceptable for the SDDG to show an actual NEW less than the maximum.

A17.5.1.5. If a warehouse pallet includes like items (same PSN and Identification Number) in both UN Specification and Grandfathered packaging, complete Keys 16 and 17 as specified in this manual for individual packages or containers.

A17.5.2. Class 2.

A17.5.2.1. Fire Extinguishers. Fire extinguishers removed from an authorized holder of a vehicle or equipment being airdropped do not require separate certification. Identify as an accessorial hazard of the vehicle or equipment. Package the fire extinguisher in a strong outer container. This only applies to the fire extinguisher that is assigned as an installed component of the vehicle or equipment. Package and certify spare/stowed cylinders according to this manual.

A17.5.2.2. See paragraph A17.5.6. all accessorial requirements for Vehicles, Engine Internal Combustion, Fuel Devices (Class 2 and Class 3) and other Support Equipment.

A17.5.3. Class 3.

A17.5.3.1. Spare fuel in UN Specification jerricans (see A3.3.3.3) when transported in approved, permanently configured and mounted holders may be certified as part of a vehicle or SE (see A17.5.6.1.1.2.).

A17.5.3.2. See paragraph A17.5.6. all accessorial requirements for Vehicles, Engine Internal Combustion, Fuel Devices (Class 2 and Class 3) and other Support Equipment.

A17.5.4. Class 6.

A17.5.4.1. A Shipper's Declaration for Dangerous Goods is not required for Biological Substances, Category B, UN3373 provided:

A17.5.4.1.1. The package is marked "Biological Substance, Category B".

A17.5.4.1.2. "UN3373" is contained within a square-on-point label of contrasting color displayed on the outer packaging.

A17.5.4.1.3. Hazardous materials (in Packing Group II or III) used to stabilize or prevent degradation of the sample does not exceed 30 mL (1 ounce) or 30 g (1 ounce) in each inner packaging.

A17.5.4.1.4. The completed package meets requirements of A10.9.

A17.5.5. Class 7.

A17.5.5.1. Packages marked "Radioactive Material, Excepted Package" according to A14.4.6.2. do not require a Shipper's Declaration For Dangerous Goods.

A17.5.6. Class 9.

A17.5.6.1. Vehicles, Engines Internal Combustion, Fuel Devices, and Other Equipment.

A17.5.6.1.1. For items prepared according to A13.4., A13.6., or A13.20. identify the primary hazard Class 9 description in keys 11-14. See Table A17.1, Key 19 instructions for description of accessorial hazards.

- A17.5.6.1.1.1. Engines and generators mounted, secured or carried as an accompanying load on a vehicle, SE or trailer for convenience of movement or handling are considered secondary loads, and require a separate certification.
- A17.5.6.1.1.2. A separate certification is not required for spare fuel in UN specification jerricans secured in permanently configured and approved holders of the transporting vehicle or equipment. DOT 5L jerricans secured in permanently configured and approved holders may be documented in the same manner provided they are drained to the greatest extent possible. See Table A17.1, Key 19 instructions for description of accessorial hazards.
- A17.5.6.1.2. Drained and purged repairable engines and fuel devices are not hazardous for transportation. Follow procedures specified in paragraph A3.1.16.4.
- A17.5.6.1.3. Certification is not required for movement of wheelchairs with patients.
- A17.5.6.1.4. Ensure dual-powered vehicles (designed to operate on both flammable liquid and gas) meet the requirements of A13.4. for each fuel tank. Describe as "Vehicle, Flammable Liquid Powered".
- A17.5.6.1.5. Describe vehicles fueled with a combustible liquid (flashpoint greater than 60 degrees C) as "Vehicle, Flammable Liquid Powered".
- A17.5.6.1.6. If a vehicle, equipment, machinery, or apparatus contains magnetized material with a magnetic field strength greater than 0.002 gauss or more, measured at 2.1m (7 feet) from the source describe the magnetized material accessorial hazard as required by Key 19 instructions. Magnetic material that has a field strength greater than 0.00525 gauss at 4.6m (15 feet) from the source is forbidden for air movement.
- A17.5.6.1.7. When wings and/or external fuel tanks are removed from an aircraft or helicopter to facilitate loading on the transport aircraft, consider all pieces as a single unit for identification on the Shipper's Declaration for Dangerous Goods form.
- A17.5.6.2. **Dry Ice.** When dry ice is used as a refrigerant for another hazardous material, identify the dry ice as an accessorial hazard on Shipper's Declaration form as required by Key 19 instructions. When used in this manner, the dry ice shipping description is not required to be entered in the Nature and Quantity of Dangerous Goods (Keys 11-18) of the Shipper's Declaration for Dangerous Goods. Ensure packaging meets the requirements of A13.10.

**Table A17.1. Step-by step Instructions for Completing Shipper's Declaration for Dangerous Goods Form.**

**Key 1. Shipper.** Enter the address and telephone number where the hazardous material was certified or "Worldwide Mobility" IAW A17.3..

**Key 2. Consignee.** Enter the six-digit Department of Defense Activity Address Code (DODAAC) and/or the in-the-clear geographical location of the ultimate consignee, or "Worldwide Mobility" according to A17.3. For infectious substances, enter also the name and telephone number of a responsible person for contact in an emergency.

**Key 3. Air Waybill No.** The aircraft manifest number to which the Shipper's Declaration for Dangerous Goods will be attached may be entered in this key. This number need not be entered by the shipper. It may be entered by the accepting operator at the time it is assigned. This key may also be left blank.

**Key 4. Page...of...Pages.** Enter the page number and total number of pages of the Shipper's Declaration for Dangerous Goods form. Enter "Page 1 of 1 Pages" or leave blank if there are no extension pages.

**Key 5. Shipper's Reference Number.** Enter the 17-character transportation control number (TCN).

**Key 6. Optional Block.** Inspection activity annotates date of inspection and acceptance for air movement according to A28.1.2. Shipper unit cargo identification information may also be entered.

**Key 7. Shipment Within Passenger Aircraft and Cargo Aircraft Limitations.** Use the following to determine limitations:

7.1. If the shipment is acceptable for movement on both passenger and cargo aircraft ("P5" in Table A4.1., Column 7), delete "Cargo Aircraft Only."

7.2. If the shipment is allowed only by cargo aircraft ("P1" "P4" in Table A4.1., Column 7), delete "Passengers and Cargo Aircraft."

7.3. If the shipment is certified to a special approval document which identifies the mode of transportation as Cargo Aircraft Only, delete "Passengers and Cargo Aircraft." This applies even if the PSN is identified as a "P5" in Table A4.1., Column 7.

7.4. If the shipment is certified to a Special Approval document which identifies the mode of transportation as acceptable by either Passenger Aircraft or Cargo Aircraft Only, use the "P" code from Table A4.1., Column 7 to determine passenger limitations.

7.5. The "shipment" refers to all hazards, primary or secondary, covered by the declaration.

**Key 8. Airport of Departure.** Enter the three-digit Port of Embarkation (POE) and/or the in-the-clear geographical location of the airport of departure. Enter "Worldwide Mobility", if applicable, IAW A17.3..

**Key 9. Airport of Destination.** Enter the three-digit Port of Debarkation (POD) and/or the in-the-clear geographical location of the airport of destination. Enter "Worldwide Mobility", if applicable, according to A17.3.

**Key 10. Shipment Type.**

10.1. Delete "Radioactive" if the shipment contains no radioactive material.

10.2. Delete "Nonradioactive" if the shipment contains radioactive material.

**Key 11. UN, NA, OR ID No.** Enter the UN, North American (NA), or identification number (ID) given in column 2 of Table A4.1. Include the UN, NA, or ID prefix and the

number. Enter the following information, if applicable, in association with the basic description:

11.1. The letters "RQ" for a hazardous substance. Enter the letters "RQ" before the basic description (see A4.4.).

**Key 12. Proper Shipping Name.** Enter the PSN shown in Table A4.1. Enter the following information, if applicable, in association with the PSN:

12.1. Technical name, in parentheses, when required by Attachment 4. If a mixture or solution of two or more hazardous materials, enter the technical names of at least two components most predominately contributing to the hazards of the mixture or solution.

12.2. For materials which are toxic (poisonous) by inhalation, without regard to hazard classification, enter the words "TOXIC-INHALATION HAZARD" and "ZONE A", "ZONE B", "ZONE C", or "ZONE D" for gases, or "ZONE A" or "ZONE B" for liquids, as appropriate. The word "TOXIC" need not be repeated if it is already identified in the PSN (e.g., enter "INHALATION HAZARD" and the appropriate zone).

12.3. The word "Waste" preceding the PSN for a hazardous material that is a hazardous waste.

12.4 Enter the words "EMPTY UNCLEARED" or "RESIDUE LAST CONTAINED" before or after the proper shipping name for empty packagings containing residue of dangerous goods.

**Key 13. Class and Division.** Enter the hazard class and division number given in column 4 of Table A4.1.

13.1. For Class 1 material, enter hazard class, division and compatibility group. Other information assigned in the DOD Joint Hazard Classification System (JHCS) or classification approval document (e.g., Interim Hazardous Class, (IHC) to include a Subdivision (for division 1.2 materials) and the Inhabited Building Distance (IBD) expressed in feet may be placed on a separate line beneath the Key 11-16 information or in Key 19. Include some indication that this information is a DOD IBD and/or subdivision (e.g., "DOD IBD "). When the Class Division is listed with 3 positions (1.2.2) on the JHCS or IHC document, the third position is listed as storage information. The storage information is not required on SDDG.

13.2. A storage Compatibility Group (CG) letter for non-Class 1 material, when assigned in JHCS or on an IHC may be placed on a separate line beneath the Key 11-16 information or in Key 19. Include some indication that this information is a DOD compatibility group (e.g., "DOD GC 4.2G").

13.3. For a single item with more than one hazard, enter the hazard class number of the item's primary hazard.

**Key 14. Subsidiary hazard.** Enter the subsidiary hazard if given in column 5 of Table A4.1. in parenthesis following primary hazard classification (e.g., 8 (3,6.1). Subsidiary hazards may be identified by sources other than Table A4.1 (e.g., SDS). If the subsidiary hazard was obtained by a source other than Table A4.1, annotate the source in key 19. For

example: "Subsidiary hazard Assigned Per SDS." Class 1 items identified in the JHCS or by Service approved interim hazard classification as also requiring a Radioactive Material label identifies the radioactive material subsidiary hazard identified (e.g., 1.2E (7)).

**Key 15. Packing Group.** Enter the applicable Packing Group (PG) given in column 6 of Table A4.1.

**Key 16. Quantity and Type of Packing.**

16.1. Nonradioactive shipments enter:

16.1.1. The number of packages (of same type and content) and their type of packaging.

16.1.2. Type of packaging listed in this key is the authorized packaging identified in the packaging paragraph. Identify the type of packaging by text description of the outer packaging. UN Specification code is optional. For example: 1 fiberboard box x 3 kg (6.6 pounds); 1 fiberboard box (4G) x 3 kg (6.6 pounds), etc.

16.1.3. For specifically named self-propelled vehicle and mechanical apparatus enter nomenclature or basic description of the item (e.g., truck, generator, etc.). Entering a specific M-Series or commercial model number or a specific description (e.g., 50 KW, 60 HZ for generator), in addition to the basic description, is optional. The basic description may be used for items not requiring an outer package or container (e.g., cylinders) according to this manual.

16.1.4. The weight, volume, or other applicable measure of the actual hazardous material (per package).

16.1.4.1. Do not include any nonhazardous content of the shipment.

16.1.4.2. Enter the net quantity in metric measurement units. The equivalent English unit of measure may be entered in parenthesis immediately following the metric unit.

16.1.4.3. Show the quantity per package immediately following the number and type of package (e.g., 2 wooden boxes x 4.5 kg (10 pounds); 1 fiberboard box (4G) x 5 L (1.3 gallons); 2 cylinders X 15 kg).

16.1.4.4. For explosives enter the Transportation "Net Explosive Weight (NEW)" in metric weight per package or per warehouse pallet or skid (e.g., 3 wooden boxes x 120 kg (264.6 pounds) NEW; or 1 warehouse pallet x 200 kg (441 pounds) NEW). Entry of pounds in association with metric weight is preferred but not required. The NEW listed in JHCS or an IHC is the maximum allowed for that item. It is acceptable for the SDDG to show an actual NEW less than the maximum. It is acceptable to round up (to the right of the decimal point) the net explosives weight (NEW) listed in the Joint Hazard Classification System (JHCS) or other classification document required by A3.3.1.4 when completing Key 16. Example: 0.06432 kg NEW may be shown as "0.07 kg NEW" in Key 16. If, the "Net Explosive QD Weight (NEWQD)", used for aircraft parking and intransit storage, is different than the transportation NEW, enter the NEWQD in Key 19.

16.1.4.5. When shipping unpackaged explosives as specified in paragraph A5.2., enter the total net explosives weight per PSN/UN Number (e.g., "On Airdrop Platform X 50 Kg N.E.W", "In Ready Racks X 15 Kg N.E.W", and "In ISU X 30 Kg N.E.W. ").

16.1.4.6. For items classified as a non-explosive that contain explosive components (e.g., 3L, 3J, 8S, etc.) use the quantity of the assigned predominate hazard.

16.1.4.7. Express in kilograms (pounds), not pounds per square inch, the quantity of compressed gas unless otherwise specified in this instruction. When certifying to A6.2. "Aerosols," A6.3. "Small Receptacles Containing Compressed Gases," A6.7. "Fire Extinguishers," A6.10. "Cigarette Lighter or Other Similar Devices Charged with Fuel," and A13.3. "Consumer Commodity" (Aerosols) other units of measure; (e.g., fluid ounces, gallons, or ounces) are specified and may be shown on this form. See also A26.5.

16.1.5. Limited Quantity enter either:

16.1.5.1. The type of package and net weight of the hazardous material, or,

16.1.5.2. Where the letter "G" follows the quantity in Table A19.2., Per Package column, enter the the type of package and the gross weight of the package. Enter the letter "G" after the unit of measurement. (e.g., 1 wooden box x 28 kg G)

16.1.6 When an overpack is used for handling purposes and prevents identification of contents and/or UN specification markings, enter the words "Overpack Used" or "All Packed in One (type of package)". Identify the number of overpacks if more than one is used. "Overpack Used" may alternatively be entered following the Packaging Instruction (Key 17), or applicable authorizations (Key 18) when the open continuous printing form is used. Entering the total quantity per each overpack is optional.

16.1.7. For magnetized material, enter the number and type of packaging. No entry for net quantity is required. Weight or size of container is optional.

16.1.8. When an item is described in Table A4.1. as a "KIT", enter the aggregate quantity of hazardous materials in Key 16.

16.1.9. Multiple-Element Gas Containers:

16.1.9.1. Enter the total number of Multiple-Element Gas Container(s) and the quantity in each container (e.g., 1 Multiple-Element Gas Container X 40 kg)

16.1.9.2. When shipping Multiple-Element Gas Containers, use appropriate packaging paragraph from Attachment 6 to identify DOT or UN cylinder

16.1.9.3. Cylinders which are not manifolded to form a single unit are certified as individual cylinders (e.g., 4 DOT 3AA Cylinders X 10 kg).

16.1.10. For life-saving appliances, Class 9, prepared according to A13.12., show a specific description and the number of the items packaged for shipment. For example; "1 wooden box x 3 self-inflating life vests".

16.2. Radioactive shipments enter:

16.2.1. Name or symbol of the radionuclide in the material.

16.2.2. Description of the physical and chemical form of the material, if it is not in special form (generic chemical description is acceptable for chemical form). If special form, enter "Special Form."



16.2.3. The number of packages (of same type and content), the type of package, and the activity contained in each package in terms of Becquerel or Terabecquerel. The equivalent customary unit of measure (e.g., Ci, mCi, or uCi) may be included in parenthesis.

### **Key 17. Packaging Instructions.**

17.1. Nonradioactive shipments enter:

17.1.1. The packaging paragraph from the applicable packaging reference authorized in A17.1.2. used to prepare the material for shipment.

17.1.1.1. AFMAN 24-604, use packaging paragraph in Table A4.1, Column 8 (e.g., "A9.8.", "A13.5.", etc) or Attachment 27 (e.g., "A27.2.", "A27.9.", etc.). Use of sub-paragraphs from this manual (e.g., "A5.23.1) are not required when completing this key but, if used, ensure the sub-paragraph used properly identifies the package, container, or shipment configuration.

17.1.1.2. IATA, Dangerous Goods Regulations, use packing instruction from Section 4, "List of Dangerous Goods" (e.g., "806", "134", etc.)

17.1.1.3. ICAO, Technical Instructions, use packing instructions from Table 3-1, "Dangerous Goods List" (e.g., "309", "619", etc.)

17.1.1.4. 49 CFR, use packaging reference from Part 173 specified in the Hazardous Materials Table (49 CFR Section 172.101, Column 8b), (e.g., 173.62, 173.202, etc)

17.1.2. If the packaging has been approved by a DOT Special Permit, CAA, COE, or waiver cite the approval number (e.g., AFMC 24-204-96-09; COE NA-84-505; DOT-SP 3849; etc.). When the packaging requirement is included as part of the explosives hazard classification approval document enter the EX number.

17.1.3. If a UN packaging specification certified package is overpacked to meet air eligibility requirements, cite A3.1.7.3. and the applicable packaging paragraph for the material.

17.1.4 Consumer Commodities enter "A13.3." when an item is classified as a "Consumer Commodity" regardless of the original hazard classification of the substance within an individual inner packaging or receptacles.

17.1.5 Limited Quantities enter "A19.3" when an item, regardless of original classification, is packaged as a limited quantity. If an item, in a limited quantity, is packaged under a Special Permit, CAA, COE, or waiver enter the special authorization approval in place of "A19.3."

17.1.6. For captured ammunition and ammunition with unknown characteristics shipped according to A3.3.1.7., include in key 17 the reference to A3.3.1.7. and the applicable packaging paragraph from Table A4.1. (e.g., "A3.3.1.7./A5.20."). Include a copy of the EOD safety certification (EOD refer to Joint Service EOD Technical Manual 60A-1-1-7 for an example). Comply with A17.2.7. for classified information.

17.1.7. When shipping unpackaged explosives as specified in paragraph A5.2., enter "A5.2."

17.1.8 When Class 1 materials are secured in authorized packaging and loaded on a tactical vehicle as an operational component according to specified procedures in a technical manual or publication, cite appropriate packaging reference from Attachment 5.

17.2. Radioactive shipments enter (see Figure A17.2., steps 5 and 6 for assistance):

17.2.1. Packaging paragraph from Table A4.1 used to prepare the material for shipment.

17.2.2. Category of the package (e.g., "I-White," "II-Yellow," or "III-Yellow").

17.2.3. The transport index, preceded by the prefix "Ti", assigned each package having a "Radioactive Yellow-II" or "Radioactive Yellow-III" label and dimensions of each package, including dimensional units (for drums, the capacity is acceptable (e.g., 55 gallons)).

17.2.4. The fissile class. If the package is exempt enter the words "Fissile Exempt."

### **Key 18. Authorization.**

18.1. Nonradioactive shipments enter:

18.1.1. When applicable, enter the words "Limited Quantity" or "LTD. QTY."

18.2. Radioactive shipments enter Approval Identification Markings (if relevant). List the package identification markings of any of the documents listed below issued by a competent authority. Include the words "attached" to indicate that the documents are attached to the declaration form.

18.2.1. Special form approval certificate.

18.2.2. Type B package design approval certificate.

18.2.3. Type B(M) package shipment approval certificate.

18.2.4. Fissile material package design approval certificate.

18.2.5. Fissile material package shipment approval certificate.

18.2.6. Special arrangement approval certificate.

18.2.7. Any similar documents.

### **Key 19. Additional Handling Information. Enter:**

#### **19.1. General**

19.1.1. The PSN and hazard class of each accessorial hazard for items with multiple hazards. In addition, the quantity of each accessorial hazard in metric units, U.S. standard units may follow the metric units in parenthesis, show if specifically required by any of the following block 19 instructions (e.g., fuel, dry ice). Use of the words "Class" or "Class/Division" in describing hazard classification (e.g., "Class 3") is optional.

19.1.2. Handling instructions, when specified by a packaging paragraph. Only enter if the handling instruction applies to the material being shipped.

19.1.3. For shipments packaged and transported under the authority of a CAA (Packaging or Hazard Classification), annotate "PACKAGING AUTHORIZED BY COMPETENT AUTHORITY OF THE UNITED STATES OF AMERICA (USA)." If the CAA is from a

country other than the USA, annotate that country in place of USA on the shipping papers. If the CAA does not have a number assigned to it, certify the shipment to A5.3. (see paragraph 2.5.2.). Ensure a copy of the CAA accompanies the shipment.

19.1.4. Enter the 24-hour Emergency Response number(s) for the hazardous material listed on the Shipper's Declaration for Dangerous Goods. See paragraph A17.2.9. for Emergency Response numbers used by DOD activities.

19.1.5. When use of hazard class label(s) are exempted by a DOT Special Permit (DOT-SP) for a domestic shipment, annotate "Hazard Class Label (or Labels) exempted by DOT-SP (enter permit number, e.g., DOT-SP XXXX).

### **19.2 Kits.**

19.2.1. Identify that the item is a kit. This does not apply to an item classified and described in Table A4.1. as a "KIT" (e.g., FIRST AID KITS, CHEMICAL KITS, POLYESTER RESIN KITS, etc).

19.2.2. If shipping a kit consisting of more than one container, enter the statement: "contained in kit piece number \*\*\*\*" (replace "\*\*\*\*" with the piece number which contains the hazardous material).

### **19.3. Class 1**

19.3.1 If, the "Net Explosive QD Weight (NEWQD)", used for aircraft parking and intransit storage, is different than the transportation NEW, enter the NEWQD (e.g., "NEWQD: 22.23kg").

19.3.2. Identify any munition or ordnance item containing OTTO Fuel II as a propellant with the following entry: "Contains Otto Fuel II as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea."

19.3.3 When explosives are installed or embedded according to A3.3.1.9., use the article's overall description as the proper shipping name (e.g., Vehicle, Flammable Liquid Powered for an aircraft containing the engine). Identify all installed or embedded explosive components as accessorial hazards by entering PSN, hazard class/division, and NEW.

19.3.4. For items containing liquid or hypergolic fuel that is corrosive and/or toxic include the following statement in Key 19: "Exercise extreme caution in handling this item. Keep well ventilated, away from sparks, fire hazards, and oxidizing materials. Vapors are toxic when inhaled. Liquid is corrosive." Add one of the following statements:

19.3.4.1. "Leak detection indicator not required"

19.3.4.2. "Monitor leak indicator according to shipper provided instructions."

19.3.4.3. "Technical escort required."

19.3.5. For Grandfathered munitions certified according to Attachment 27, add the statement: "Government-owned goods packaged before January 1, 1990."

### **19.4. Class 2**

19.4.1. For Class 2 materials add the appropriate statement "Ship valve up in vertical position" or "Ship in horizontal position" to indicate compliance with A3.3.2.4.

19.4.2. For fire extinguishers secured in a holder according to A3.3.2.13. of non-regulated equipment, certify the fire extinguisher(s) according to the instructions in this table. Identify the equipment which the fire extinguisher is attached (e.g., trailer) in this Key.

19.4.3. Cryogenic Liquids. For cryogenic liquids prepared according to A6.11 enter venting instructions. This is not required if venting procedures are provided in a separate instruction accompanying the shipment. Include the location and description of the vent valve. If the cylinder is empty and purged, venting is not required; comply with paragraph A3.1.16.4. For regulated cylinders, include one of the following statements for venting the unit:

19.4.3.1. "Vent container to outside of aircraft. Aircrew members monitor vent valves during flight."

19.4.3.2. "Container is excepted from venting."

19.4.4. Vehicles, Engines and other Equipment prepared according to A13.4. or A13.6., See 19.8. and document all additional assessorial hazards.

### **19.5. Class 3**

19.5.1. Class 3, Vehicles, Engines and other Equipment prepared according to A13.4. or A13.6., See 19.8. and document all additional assessorial hazards.

### **19.6 Class 4 and Class 5**

19.6.1. Enter the control and emergency temperatures for temperature controlled Division 4.1 and 5.2 materials.

19.6.2. For Division 4.1 Self-Reactive Substances and Division 5.2 Organic Peroxides enter the following statement: "Protect from direct sunlight and all sources of heat and place in adequately ventilated area".

19.6.3. For a Division 4.1 (polymerizing substance and self-reactive) material or a Division 5.2 (organic peroxide) material enter the following additional information, as appropriate:

19.6.3.1. If notification or competent authority approval is required, enter a statement of approval of the classification and conditions of transport.

19.6.3.2. For Division 4.1 (polymerizing substance and self-reactive) and Division 5.2 (organic peroxide) materials that require temperature control during transport, add the words "TEMPERATURE CONTROLLED" as part of the proper shipping name, unless already part of the proper shipping name. Include the control and emergency temperature.

19.6.3.3. Include the word "SAMPLE" in association with the basic description when a sample of a Division 4.1 (polymerizing substance and self-reactive) material or Division 5.2 (organic peroxide) is offered for transportation.

### **19.7. Class 7**

19.7.1. For radioactive Category II-Yellow and Category III-Yellow, enter : "Radioactive material is intended for use in, or incident to, research, medical diagnosis, or treatment" when applicable (see special provision A507).

**19.8. Class 9**

19.8.1. Vehicles, and Other Equipment prepared according to A13.4. or A13.6.:

19.8.1.1. Enter the PSN, hazard class, and net quantity of flammable fuel within tanks and/or system. For example; "Fuel, Aviation, Turbine Engine, Class 3, 38 L". When an item is completely drained (but not purged) , the shipper's estimate of the quantity of fuel remaining in the unit may be entered. Refer to A3.3.3.4. for authorized fuel levels.

19.8.1.2. Enter the PSN and hazard class for accessorial hazards (batteries, mounted cylinders and fire extinguishers, installed engine starting fluid, etc). Show number of accessorial hazards. For example; "1 each - Batteries, Wet, Filled with Acid, 8", 6.8 kg (15 lb) or "2 each - Fire Extinguishers, 2.2", 1.9 kg (4 lb) each.

19.8.1.3. Identify any integral installed fire suppression systems as a accessorial hazard.

19.8.1.4. Identify mounted engines and generators that are by design an approved part of an M-Series vehicle as an accessorial hazard (also identify hazardous components such as batteries).

19.8.1.5. Enter the name and quantity of any non-hazardous fuel in vehicles or equipment tanks.

19.8.1.6. When an item is drained and purged of any flammable liquid, but is being certified due to another hazard, enter "Drained and Purged."

19.8.1.7. Include the statement "non-hazardous battery installed" if applicable.

19.8.1.8. Reference to the technical directive used to prepare the item for military air shipment is not required, except for fuel servicing equipment and vehicles drained in accordance with technical directives (technical orders, field manuals, etc.). In this case, indicate the directive used: "Drained IAW T.O. XX-XX-XX"

19.8.1.9. For UN specification jerricans secured in permanently configured and approved holders of the transporting vehicle or equipment. Identify PSN, hazard class, the number of jerricans and quantity of fuel in each jerrican for the transporting vehicle or equipment. Example - "4 Jerricans. Diesel Fuel, Class 3, X 2 Jerricans 19 L"(5 gal) each, Gasoline, Class 3, "X 2 Jerricans 19 L (5 gal) each.". Note: DOT 5L jerricans secured in permanently configured and approved holders may be documented in the same manner provided they are drained to the greatest extent possible.

19.8.1.10. For vehicles, equipment, machinery, or apparatus containing magnetized material with a magnetic field strength greater than 0.002 gauss or more, measured at 2.1m (7 feet) from the source, enter "Contains Magnetized Material."

19.8.2. For Dangerous Goods in Machinery or Apparatus, enter the PSN, hazard class, and net quantity of hazardous materials in a solid, liquid, or gaseous state contained within the article.

19.8.3. For life-saving appliances, Class 9, prepared according to A13.12., enter the PSN and hazard class of each hazardous component within the shipping container.

19.8.4. When dry ice is used as a refrigerant for another hazardous material, identify the dry ice as an accessorial hazard by entering the PSN, hazard class, and net quantity.

**Key 20. Name of Signatory.** Enter the name of the official signing the form. Military rank may be included.

**Key 21. Date.** Enter the date the material was certified.

**Key 22. Signature.** The official who certifies that the shipment complies with the requirements of this instruction signs the form. Signature may be either written manually, by mechanical entry, or by a digital method. In all cases, ensure the individual who signs the certification statement personally inspects the HAZMAT item being certified.

**Table A17.2. Determining Certification Requirements for Class 7.**

**Step 1.** Determine the Radionuclide and Type of Package. Turn to A11.3. Find the radionuclide, its name, and the maximum radioactive quantity (TBq or Ci) that can be shipped in a type A package. If a type B container is required, go to Step 3.

**Step 2.** Determine if a Shipper's Declaration for Dangerous Goods is Required. Turn to Table A11.2. Determine the maximum quantity that can be shipped as a limited quantity. This amount is a fraction of the quantity listed in Table A11.1. If the item shipped qualifies as an excepted package, a Shipper's Declaration for Dangerous Goods is not required, comply with A11.10. and A11.11. Go to Step 3 if the material is not a limited quantity.

**Step 3.** Enter the Information Required in Key 16. Make a note of the transport index, but do not enter it in Key 16.

**Step 4.** Determine the Proper Shipping Name (PSN). Select the applicable PSN from Table A4.1. Complete the appropriate keys using the information found in Table A4.1., columns 2 through 4. Do not complete Key 17 at this point. Make a note of all the basic paragraphs listed in column 8.

**Step 5.** Select the Packaging Paragraph. Determine the correct packaging paragraph from the list made in Step 4 based on the type of package used. Determine the paragraph based on the particular container used. Enter this information as the first entry in Key 17.

**Step 6.** Determine the Label Requirements. Use the transport index, the surface reading, and fissile class, if appropriate, to determine the labels required by Attachment 15. Enter the label required as the category of package entry in Key 17, immediately following the packaging paragraph. Enter the transport index and any remaining information required to complete Key 17.

**Step 7.** Complete the Remaining Keys of the Shipper's Declaration for Dangerous Goods. Step-by-step instructions for completing the Shipper's Declaration for Radioactive Material are identified in Table A17.1.

Figure A17.1. Completed Samples of the Shipper's Declaration for Dangerous Goods.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS						
SHIPPER  Key 1  PHONE NUMBER:				AIR WAYBILL NO. Key 3  PAGE OF PAGES Key 4  SHIPPER'S REFERENCE NUMBER TCN: Key 5		
CONSIGNEE  Key 2				Key 6		
COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR				<b>WARNING</b>  Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties		
<b>TRANSPORTATION DETAILS</b> THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR:				AIRPORT OF DEPARTURE:		
(DELETE NON-APPLICABLE) Key 7 <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">PASSENGER AND CARGO AIRCRAFT</div> <div style="border: 1px solid black; padding: 2px;">CARGO AIRCRAFT ONLY</div> </div>				Key 8		
AIRPORT OF DESTINATION:				SHIPMENT TYPE: (DELETE NON-APPLICABLE) Key 10 <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">NON-RADIOACTIVE</div> <div style="border: 1px solid black; padding: 2px;">RADIOACTIVE</div> </div>		
Key 9						
NATURE AND QUALITY OF DANGEROUS GOODS						
DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE OF PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
Key 11	Key 12	Key 13/14	Key 15	Key 16	Key 17	Key 18
ADDITIONAL HANDLING INFORMATION  Key 19						
EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 / 1-804-279-3131						
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.				NAME/TITLE OF SIGNATORY  Key 20  PLACE AND DATE Key 21  SIGNATURE (see warning above) Key 22		

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<b>SHIPPER'S CHECKLIST</b> (TO BE USED IN CONJUNCTION WITH AFMAN24-204(I), ATTACHMENT 2)	
<b>1. - SHIPPER'S DECLARATION</b> _____ THREE ORIGINAL DOCUMENTS (TWO FOR MOBILITY) _____ SHIPPERS ADDRESS AND PHONE NUMBER _____ TCN _____ AIRCRAFT LIMITATIONS IDENTIFIED _____ AIRPORT DEPARTURE _____ AIRPORT DESTINATION _____ SHIPMENT TYPE _____ CORRECT ERN FOR COMMODITY _____ NAME AND TITLE OF PREPARER _____ PLACE AND DATE CERTIFIED _____ SIGNATURE _____ PEN/INK CHANGES SIGNED  <b>2. - CARGO IDENTIFICATION</b> _____ UN/ID NUMBER _____ PSN _____ CLASS/DIVISION (SUBSIDIARY RISK, IF APPLICABLE) _____ PACKING GROUP, IF APPLICABLE _____ NUMBER AND TYPE OF PACKAGES _____ NET QUANTITY PER PACKAGE IN METRIC (UNLESS OTHER MEASUREMENTS AUTHORIZED) _____ NET QUANTITY OF EXPLOSIVES (CLASS 1) IDENTIFIES N.E.W. OF PACKAGE OR PALLET IN METRIC _____ RADIOACTIVE ONLY _____ ACTIVITY PER PACKAGE GIVEN IN BECQUERELS _____ NAME AND SYMBOL OF MATERIAL _____ MATERIAL PHYSICAL AND CHEMICAL FORM _____ CATEGORY OF PACKAGE _____ TRANSPORT INDEX _____ PACKAGING PARAGRAPH FROM ATTACHMENT 5-13 OR 27 _____ OTHER PACKAGING REFERENCE USED _____ COE (COPY PROVIDED) _____ CAA (COPY PROVIDED) _____ WAIVER (COPY PROVIDED) _____ 49CFR _____ IATA/ACAO _____ EXEMPTION (COPY PROVIDED)  <u>IF APPLICABLE</u> _____ PSN (ADDITIONAL INFORMATION, AS REQUIRED) _____ TECHNICAL NAME _____ "RQ" USED TO IDENTIFY A HAZARDOUS SUBSTANCE _____ "WASTE" IF MEETING A DEFINITION _____ "INHALATION HAZARD - (AND ZONE)" _____ USE OF OVERPACKS IDENTIFIED ("OVERPACK USED") _____ PACKAGES MEETING LIMITED QUANTITY _____ CRYOGENIC VENTING REQUIREMENTS _____ SECONDARY HAZARDS IDENTIFIED BY PSN, CLASS/DIVISION, NET QUANTITY _____ HANDLING INSTRUCTIONS	<b>3. - PACKAGING-INNER (COMBINATION PACKAGES)</b> _____ ABSORBENT MATERIAL USED IAW ATTACHMENT 20 OR WHEN DIRECTED BY PACKAGING DIRECTIVE _____ RECEPTACLES/PACKAGES, CONTAINING LIQUIDS, ORIENTATED IN UPRIGHT POSITION _____ INSIDE RECEPTACLES/PACKAGES, CONTAINING LIQUIDS, VERIFIED AS MEETING "AIR ELIGIBLE" TEST PRESSURE REQUIREMENTS _____ SECONDARY CLOSURES USED _____ LEAK PROOF LINERS USED _____ ACID PROOF LINERS USED FOR WELL-CELL BATTERIES  <b>4. - PACKAGING- OUTER</b> _____ SERVICEABLE (NO DAMAGE THAT WOULD ALLOW LOSS OF CONTENTS) _____ UN SPECIFICATION OUTER CONTAINER PACKAGING USED AND CLOSED IAW _____ DoD POP PROGRAM _____ MANUFACTURER'S SUPPLIED METHOD OR REPORT _____ SPI _____ STRONG OUTSIDE CONTAINER USED (WHEN AUTHORIZED) _____ PACKAGING WAIVER _____ SINGLE PACKAGING (FOR LIQUIDS) MEETS PRESSURE REQUIREMENTS _____ ULLAGE (FOR LIQUIDS)  <b>5. - MARKING</b> _____ PSN AND UN/ID NUMBER  <u>IF APPLICABLE</u> _____ UN SPECIFICATION _____ "AIR ELIGIBLE" OR SYMBOL FOR COMBINATION PACKAGES CONTAINING LIQUIDS _____ "RQ" OR "WASTE" IN ASSOCIATION WITH PSN _____ "INHALATION HAZARD" (IF NOT PART LABEL) _____ "ORIENTATION" ARROWS _____ "LIMITED QUANTITY" _____ OVERPACKS IDENTIFIED _____ DOT-E, COE, AND CAA (IF REQUIRED) NUMBER _____ FLASHPOINT  <b>6. - LABELING</b> _____ PRIMARY RISK _____ SUBSIDIARY RISK (IF APPLICABLE) _____ "CARGO AIRCRAFT ONLY" (IF APPLICABLE)

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(Back Side)



## SHIPPER'S DECLARATION FOR DANGEROUS GOODS



<b>Shipper</b> <div>Key 1</div>		Air Waybill No. <div>Key 3</div>			
		Page of Pages <div>Key 4</div>			
		Shipper's Reference No. (optional) <div>Key 5</div>			
<b>Consignee</b> <div>Key 2</div>		<div>Key 6</div>			
Two completed and signed copies of this Declaration must be handed to the operator.					
<b>TRANSPORT DETAILS</b>		<b>WARNING</b> Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.			
This shipment is prescribed for: <div>Key 7</div>		Airport of Departure (optional): <div>Key 8</div>			
<table border="1"><tr><td>PASSENGER AND CARGO AIRCRAFT</td><td>CARGO AIRCRAFT ONLY</td></tr></table>		PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY	Airport of Destination (optional): <div>Key 9</div>	
PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY				
		Shipment type: (delete non-applicable) <table border="1"><tr><td>NON-RADIOACTIVE</td><td>RADIOACTIVE</td></tr></table> <div>Key 10</div>		NON-RADIOACTIVE	RADIOACTIVE
NON-RADIOACTIVE	RADIOACTIVE				
<b>NATURE AND QUANTITY OF DANGEROUS GOODS</b> UN Number or Identification Number, Proper Shipping Name, Class or Division (subsidiary hazard), Packing Group (if required) and all other required information.					
<div>Key 11, Key 12, Key 13/Key 14, Key 15, Key 16, Key 17, Key 18</div>					
Additional Handling information: <div>Key 19</div>					
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.		Name of Signatory: <div>Key 20</div> Date: <div>Key 21</div> Signature (See warning above): <div>Key 22</div>			

SHIPPER'S DECLARATION FOR DANGEROUS GOODS						
SHIPPER TRAFFIC MANAGEMENT FLIGHT 5236 CHASE ST. WRIGHT PATTERSON AFB, OH 45433-5501  PHONE NUMBER: (937) 257 4409                      DSN: 787-4409				AIR WAYBILL NO.  PAGE <u>1</u> OF <u>1</u> PAGES  SHIPPER'S REFERENCE NUMBER TCN: FB230080609103XXX		
CONSIGNEE FB5612 436 ABW LRS RAMSTEIN AB, GERMANY  COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR				<b>WARNING</b>  Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties  SHIPMENT TYPE: (DELETE NON-APPLICABLE) <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px 5px;">NON-RADIOACTIVE</div> <div style="border: 1px solid black; padding: 2px 5px;"><del>RADIOACTIVE</del></div> </div>		
<b>TRANSPORTATION DETAILS</b> THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE)						
<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 2px 5px;">PASSENGER AND CARGO AIRCRAFT</div> <div style="border: 1px solid black; padding: 2px 5px;"><del>CARGO AIRCRAFT ONLY</del></div> </div>		AIRPORT OF DEPARTURE: DOV DOVER AFB, DE				
AIRPORT OF DESTINATION: RAMSTEIN AB, GERMANY						
NATURE AND QUALITY OF DANGEROUS GOODS						
DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE OF PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
RQ UN1573	CALCIUM ARSENATE	6.1	II	1 METAL DRUM x 0.6 KG	A10.5	
<b>ADDITIONAL HANDLING INFORMATION</b>  2 EACH BATTERIES WET, FILLED WITH ACID, 8, 13.6kg 1 EACH FIRE EXTINGUISHER, 2.2, 1.9 kg						
EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 / 1-804-279-3131						
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.				NAME/TITLE OF SIGNATORY Austin Stewart WATT HOUSE FOREMAN  PLA <u>1</u> ID DATE <u>1</u> WPA, OH                      29 Jul 2024  SIGNATURE <i>Austin Stewart</i> <small>(see warning above)</small>		

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SHIPPER'S DECLARATION FOR DANGEROUS GOODS						
<b>SHIPPER</b> TRAFFIC MANAGEMENT FLIGHT 5236 CHASE ST. WRIGHT PATTERSON AFB, OH 45433-5501  PHONE NUMBER: (937) 257 4409  DSN: 787-4409				<b>AIR WAYBILL NO.</b>  PAGE <u>1</u> OF <u>1</u> PAGES  <b>SHIPPER'S REFERENCE NUMBER</b> TCN: FB230080609009XXX		
<b>CONSIGNEE</b> FB5612 435 ABW LRS RAMSTEIN AB, GERMANY						
COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR				<b>WARNING</b>  Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties		
<b>TRANSPORTATION DETAILS</b> THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE)  <div><input type="checkbox"/> PASSENGER AND CARGO AIRCRAFT</div> <div><input checked="" type="checkbox"/> <del>HAZARDOUS MATERIALS ONLY</del></div>				<b>AIRPORT OF DEPARTURE:</b> DOV DOVER AFB, DE		
<b>AIRPORT OF DESTINATION:</b> RAMSTEIN AB, GERMANY				<b>SHIPMENT TYPE: (DELETE NON-APPLICABLE)</b>  <div><input type="checkbox"/> NON-RADIOACTIVE</div> <div><input checked="" type="checkbox"/> <del>RADIOACTIVE</del></div>		
NATURE AND QUALITY OF DANGEROUS GOODS						
DANGEROUS GOODS IDENTIFICATION				QUANTITY AND TYPE OF PACKING	PACKING INST	AUTHORIZATION
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP			
UN3166	VEHICLE, FLAMMABLE LIQUID POWERED	9		2 TRUCKS	A13.4	
<b>ADDITIONAL HANDLING INFORMATION</b> GASOLINE, 3, 18.92 LITERS (8.6 lbs.) 1 EACH, AEROSOLS, FLAMMABLE, 2.1, 1 kg (1 lb.) 1 EACH, FIRE EXTINGUISHER, 2.2, 1.82 kg, (4 lbs.) NON-HAZARDOUS BATTERIES INSTALLED  EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 / 1-804-279-3131						
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that <u>all</u> of the applicable air transport requirements have been met.				<b>NAME/TITLE OF SIGNATORY</b> RACHEL NEFF Supervisory Packaging Specialist		
				<b>PLACE AND DATE</b> WPAFB, OH 29 Jul 2024  <b>SIGNATURE</b> <u>Rachel Neff</u> (see warning above)		

DAF FORM 7507, 20250131 PRESCRIBED BY DAFI24-605V2 REPLACES AMC IMT 1033, WHICH IS OBSOLETE

DAF FORM 7507, 20250131 PRESCRIBED BY DAFI24-605V2 REPLACES AMC IMT 1033, WHICH IS OBSOLETE

SHIPPER'S DECLARATION FOR DANGEROUS GOODS								
<b>SHIPPER</b> TRAFFIC MANAGEMENT FLIGHT 5236 CHASE STREET WRIGHT PATTERSON AFB, OH. 45433-5501  PHONE NUMBER: (937) 257-4409      DSN: 787-4409				<b>AIR WAYBILL NO.</b>  PAGE <u>1</u> OF <u>1</u> PAGES  SHIPPER'S REFERENCE NUMBER TCN: FB230080609001XXX				
<b>CONSIGNEE</b> FB5612 435 ABW LRS RAMSTEIN AB, GERMANY								
COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR				<b>WARNING</b>  Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties				
<b>TRANSPORTATION DETAILS</b> THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE)  <table border="1"><tr><td>PASSENGER AND CARGO AIRCRAFT</td><td><del>HAZARDOUS MATERIALS ONLY</del></td></tr></table>				PASSENGER AND CARGO AIRCRAFT	<del>HAZARDOUS MATERIALS ONLY</del>	AIRPORT OF DEPARTURE: DOV DOVER AFB, DE		
PASSENGER AND CARGO AIRCRAFT	<del>HAZARDOUS MATERIALS ONLY</del>							
AIRPORT OF DESTINATION: RAMSTEIN AB, GERMANY				SHIPMENT TYPE: (DELETE NON-APPLICABLE)  <table border="1"><tr><td>NON-RADIOACTIVE</td><td><del>HAZARDOUS MATERIALS</del></td></tr></table>			NON-RADIOACTIVE	<del>HAZARDOUS MATERIALS</del>
NON-RADIOACTIVE	<del>HAZARDOUS MATERIALS</del>							
<b>NATURE AND QUALITY OF DANGEROUS GOODS</b>								
<b>DANGEROUS GOODS IDENTIFICATION</b>				<b>QUANTITY AND TYPE of PACKING</b>				
UN or ID NO.	PROPER SHIPPING NAME	CLASS or DIVISION (SUBSIDIARY RISK)	PACKING GROUP	QUANTITY AND TYPE of PACKING	PACKING INST	AUTHORIZATION		
UN2990	LIFE – SAVING APPLIANCES <u>SELF INFLATING</u>	9		1 Fiberboard Box - <u>X3 Inflatable Rafts</u>	A13.12.			
<b>ADDITIONAL HANDLING INFORMATION</b> Store in cool, well-ventilated areas away from fire hazards and sources of heat or ignition. Do not drop or rough handle. CARBON DIOXIDE, 2.2, .5 kg, (1.2 lbs.) FLARES, AERIAL, 1.3G, .5 kg (1 lb.) MATCHES, STRIKE ANYWHERE, 4.1, .5 kg (1 lb.) EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 1-804-279-3131								
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that all of the applicable air transport requirements have been met.				NAME/TITLE OF SIGNATORY David Huff, Packaging and Creating Supervisor  PLACE AND DATE WP AFB, OH. 45433 / 26 July 2024  SIGNATURE <i>David Huff</i> (see warning above)				

SHIPPER'S DECLARATION FOR DANGEROUS GOODS						
<b>SHIPPER</b> TRAFFIC MANAGEMENT FLIGHT 5236 CHASE ST. WRIGHT PATTERSON AFB, OH 45433-5501  PHONE NUMBER: (937) 257 4409                      DSN: 787-4409				<b>AIR WAYBILL NO.</b>  PAGE <u>1</u> OF <u>1</u> PAGES  <b>SHIPPER'S REFERENCE NUMBER</b> TCN: FB230080619101XXX		
<b>CONSIGNEE</b> FB5612 435 ABW LRS RAMSTEIN AB, GERMANY						
COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE HANDED TO THE OPERATOR				<b>WARNING</b>  Failure to comply in all respects with applicable Hazardous Materials/Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties		
<b>TRANSPORTATION DETAIL 3</b> THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR: (DELETE NON-APPLICABLE)				<b>AIRPORT OF DEPARTURE:</b> DOV DOVER AFB, DE		
<input type="checkbox"/> PASSENGER AND CARGO AIRCRAFT		<input checked="" type="checkbox"/> <del>CARGO AIRCRAFT ONLY</del>		<b>SHIPMENT TYPE: (DELETE NON-APPLICABLE)</b>  <input type="checkbox"/> NON-RADIOACTIVE <input checked="" type="checkbox"/> <del>RADIOACTIVE</del>		
<b>AIRPORT OF DESTINATION:</b> RAMSTEIN AB, GERMANY						
<b>NATURE AND QUALITY OF DANGEROUS GOODS</b>						
<b>DANGEROUS GOODS IDENTIFICATION</b>				<b>QUANTITY AND TYPE OF PACKING</b>	<b>PACKING INST</b>	<b>AUTHORIZATION</b>
<b>UN or ID NO.</b>	<b>PROPER SHIPPING NAME</b>	<b>CLASS or DIVISION (SUBSIDIARY RISK)</b>	<b>PACKING GROUP</b>			
UN3528	Engine, Internal Combustion, Flammable Liquid Powered	3		1 Hobart -86 Generator	A7.11.2.2	
<b>ADDITIONAL HANDLING INFORMATION</b>  FUEL, AVIATION, CLASS 3, 61 LITERS (16 gal) 1 - FIRE EXTINGUISHER, CLASS 2.2, 1.9 kg 1 - <u>BATTERIES</u> WET, FILLED WITH ACID, CLASS 8, 13.6kg						
<b>EMERGENCY TELEPHONE NUMBER: 1-800-851-8061 / 1-804-279-3131</b>						
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations. I declare that <u>all</u> of the applicable air transport requirements have been met.				<b>NAME/TITLE OF SIGNATORY</b> MORGAN SEARCY WAREHOUSE FOREMAN		
				<b>PLACE AND DATE</b> WPAFB, OH                      29 Jul 2024  <b>SIGNATURE</b> <i>Morgan Searcy</i> (see warning above)		

DAF FORM 7507, 20250131, PRESCRIBED BY DAFI24-605V2, REPLACES AMC IMT 1033, WHICH IS OBSOLETE

## Attachment 18

### COMPATIBILITY

**A18.1. General Requirements.** For military members, failure to obey the mandatory provisions from paragraphs A18.2 through A18.4 and any provisions of mandatory subparagraph(s) hereunder is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Civilian employees who fail to obey the provisions from paragraph A18.2 through A18.4 and any provisions of mandatory subparagraph(s) hereunder are subject to administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions. Personnel shall follow specific segregation /compatibility and deviation instructions for movement of hazardous cargo via military airlift. **(T-0).** Packages containing hazardous materials that might react dangerously with one another may not be loaded or transported in a position that would allow interaction between the material in the event of leakage. Use segregation requirements for hazardous material on military aircraft identified in Table A18.1. and Table A18.2. to determine segregation requirements.

A18.1.1. Table A18.1. details segregation requirements for all hazardous materials.

A18.1.2. Table A18.2. specifies compatibility requirements for Class 1.

A18.1.3. Paragraph A18.4. specifies compatibility requirements for tactical and contingency operations under the authority of Chapter 3.

**A18.2. Segregation Requirements for All Hazardous Materials.** Table A18.1 indicates the explosives and other hazardous materials that may not be loaded, transported, or stored together.

A18.2.1. Only the primary hazard class or division are considered for segregation. Do not use subsidiary hazards and accessorial hazards to determine segregation requirements when using Table A18.1.

A18.2.2. The absence of any hazard class or a blank space in the table indicates that no restrictions apply.

A18.2.3. The letter "X" at an intersection of horizontal and vertical columns indicates that these articles may not be loaded, transported, or stored together. For example, in Table A18.1., Class 3 flammable liquids, may not be loaded, transported, or stored with Class 1.1.

A18.2.4. The letter "O" at an intersection of horizontal and vertical columns indicates that these articles may not be loaded together unless separated by a 463L pallet position or not less than a distance of 2.2 m (88 inches) in all directions. For example, Class 8 corrosive liquids loaded on a 463L pallet, may not be transported with Class 4.1 flammable solids on an adjoining pallet. If loaded in a logistic rail mode (e.g., C-17), separate these items by 2.2 m (88 inches) and locate on different pallets.

A18.2.5. The "\*" at an intersection of horizontal and vertical columns indicates that segregation among different Class 1 materials is identified in Table A18.2.

A18.2.6. Be sure to check notes for compatibility.

**A18.3. Segregation Requirements for Class 1 Materials.** Table A18.2. identifies Class 1 materials that may not be loaded, transported, or stored together.

A18.3.1. A blank space in the table indicates that no restrictions apply.

A18.3.2. The letter "X" at an intersection of horizontal and vertical columns shows that these articles may not be loaded or stored together. For example, do not load or store Class 1.2C with Class 1.2H.

A18.3.3. Unless otherwise authorized, do not pack explosives in the same outer packaging with other articles. Explosives of the same compatibility group or authorized combination of compatibility groups but a different class number may be packed together, provided that the whole package is treated as though its entire contents were comprised of the lower class number (higher hazard). For example, treat a mixed package of Class 1.2D explosives and Class 1.4D explosives as Class 1.2D explosives. However, when Class 1.5D is packed together with Class 1.2D, treat the whole package as Class 1.1D (for compatibility).

A18.3.4. Incompatible explosives may be packed together when approved according to TB 700-2/ NAVORDINST 8020.8B/TO 11A-1-47/DLAR 8220.1, *DOD Explosive Hazard Classification Procedures* or paragraph 2.3.2.

A18.3.5. Do not use subsidiary hazards to determine compatibility requirements when using Table A18.2.

A18.3.6. IATA or 49 CFR certified air shipments packaged within the same outer package or overpack using the appropriate IATA or 49 CFR Part 175 or 176 segregation may be accepted for military aircraft without unpacking and repacking. Segregate those IATA or 49 CFR packages from other packages certified to AFMAN 24-604 using the appropriate segregation in this attachment.

A18.3.7. Be sure to check notes for compatibility.

**A18.4. Chapter 3 Segregation/Compatibility.** The requirements of Table A18.1. and Table A18.2. may be deviated from when transporting cargo approved to be airlifted using provisions of Chapter 3, consistent with operational requirements. Normally incompatible hazardous materials may be transported on the same aircraft when separated to the maximum extent possible. Compatibility waivers are not required. Use Chapter 3 segregation/compatibility, to include complete round rigging, for exercises only when there is an intent to use or fire explosives and ammunition. The following restrictions are mandatory:

A18.4.1. Explosives in compatibility groups A, J, K, and L can only be shipped with material in compatibility group S and Class 9.

A18.4.2. Fissile class III radioactive materials (Class 7) cannot be loaded, transported, or stored on the same aircraft with any other hazardous material.

A18.4.3. Class 1.1, 1.2, and 1.3 cannot be shipped with any Inhalation Hazard Zone A material.

A18.4.4. Class 1.1, 1.2, and 1.3 cannot be shipped with Class 6.1 poisonous liquids, PG I.

A18.4.5. Cyanides or cyanide mixtures (Class 6.1) cannot be loaded, transported, or stored with any corrosive Class 8 material.



Table A18.1. Revised: Segregation Table for Hazardous Materials.

Class or Division Note 7, Note 10	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 Gas Zone A	2.3 Gas Other than Zone A	3	4.1	4.2	4.3	5.1	5.2	6.1 Liquid PG I Zone A	7	8 Liquid Only	9 UN 3480, 3090 Only
Notes		1, 6, 11, 12	11, 12	11, 12	11, 12	11	9, 11		12	12	11 12	11, 12	12	12	1, 11, 12	12	4, 12	2, 3	4, 5, 6, 8	11, 12
1.1 and 1.2	1, 6, 11, 12	*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	X	X	0
1.3	11, 12	*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	0	X	0
1.4	11, 12	*	*	*	*	*	0		0	0	0		0				0		0	0
1.5	11, 12	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X	0
1.6	11	*	*	*	*	*														0
2.1	9, 11	X	X	0	X				X	0			0	0	0	0	0	0	0	0
2.2					X															
2.3 Zone A	12	X	X	0	X		X				X	X	X	X	X	X			X	
2.3 Other than Zone A	12	X	X	0	X		0				0	0	0	0	0	0			0	
3	11, 12	X	X	0	X				X	0		0	0	0	0	0	X			0
4.1	11, 12	X	X		X				X	0	0						X		0	0
4.2	12	X	X	0	X		0		X	0	0						X		X	
4.3	12	X	X		X		0		X	0	0						X		0	
5.1	1, 11, 12	X	X		X		0		X	0	0						X		0	0
5.2	12	X	X		X		0		X	0	0						X		0	
6.1 Liquid PG I Zone A	4, 12	X	X	0	X		0				X	X	X	X	X	X			X	
7	2, 3	X	0		X		0													
8 Liquid Only	4, 5, 6, 8	X	X	0	X		0		X	0		0	X	0	0	0	X			
9 UN3480, UN3090 Only	11, 12	0	0	0	0	0	0				0	0			0					

**Notes:**

1. Ammonium nitrate fertilizer may be loaded, transported, or stored with Class 1.1 or 1.5 materials.
2. Do not load, transport, or store fissile class III radioactive material (Class 7) on the same aircraft with any other hazardous material.
3. Normal uranium, depleted uranium, and thorium metal in solid form radioactive materials (Class 7) may be loaded and transported with Class 1.1, 1.2, and 1.5 (explosives).
4. Do not load, transport, or store cyanides or cyanide mixtures (Class 6.1) with any Class 8 materials.
5. Separate nitric acid (Class 8) in carboys by 2.2 m (88 inches) in all directions from other corrosives materials in carboys when loaded on the same aircraft.
6. Do not load, transport, or store charged electric storage batteries (Class 8) on the same aircraft with any Class 1.1 or 1.2.
7. Ship the following materials with each other and with all other hazardous materials without compatibility restrictions (ensure compliance with Notes 4, 5, and 6):
  - 7.1. Class 6.1 toxic solids and liquids (other than PG I, zone A) See Note 4 concerning restrictions for cyanides or cyanide mixtures.
  - 7.2. Class 8 solids
  - 7.3. Class 9
  - 7.4. Excepted Quantities
  - 7.5. Containers or articles drained but not purged containing 500 ml (17 ounces) or less of Class 3
8. Class 8 corrosive liquids may not be loaded above or adjacent to Class 4 (flammable solid) material or Class 5 (oxidizing) material.
9. Class 2.1 aerosol cans may be shipped with other incompatible items when separated in all directions by a minimum of 88 inches.
10. Items classified by a predominate hazard other than Class 1 but contain small amounts of explosive materials and assigned an explosive compatibility letter for storage may be shipped with Class 1 material according to Table A18.2. For example Class 4.2G may be shipped with Class 1.3G.
11. added: Segregate lithium batteries (UN3480 and UN3090 only) from hazardous materials classified in Class 1 (other than Division 1.4S), Division 2.1, Class 3, Division 4.1 or Division 5.1.
12. Segregation is not required between UN3528 and other hazardous materials.

**Table A18.2. Compatibility Table for Class 1 (Explosive) Materials.**

Compatibility Group	A	B	C	D	E	F	G	H	J	K	L	N	S
<b>Notes</b>													
<b>A</b>		X	X	X	X	X	X	X	X	X	X	X	X
<b>B 1, 2, 8</b>	X		X	X	X	X	X	X	X	X	X	X	
<b>C 8</b>	X	X				X	X	X	X	X	X		
<b>D 8</b>	X	X				X	X	X	X	X	X		
<b>E 8</b>	X	X				X	X	X	X	X	X		
<b>F 3</b>	X	X	X	X	X		X	X	X	X	X	X	
<b>G 4, 5, 7, 8</b>	X	X	X	X	X	X		X	X	X	X	X	
<b>H</b>	X	X	X	X	X	X	X		X	X	X	X	
<b>J</b>	X	X	X	X	X	X	X	X		X	X	X	
<b>K</b>	X	X	X	X	X	X	X	X	X		X	X	
<b>L 6</b>	X	X	X	X	X	X	X	X	X	X		X	X
<b>N</b>	X	X				X	X	X	X	X	X		
<b>S 7, 8</b>	X										X		

**Notes:**

1. Group "B" explosives UN0255, UN0257, UN0267, and UN0361 may be loaded and transported with groups "C," "D," and "E" explosives on cargo aircraft only. Passenger deviations are not authorized.
2. Group "B" explosives packaged in an EOD MK 663, MOD 0 container may be loaded and transported with groups "C" through "H" and group "S" explosives.
3. Group "F" explosives UN0292 may be loaded and transported with groups "C," "D," and "E" explosives on cargo aircraft only. Passenger deviations are not authorized.
4. Group "G" explosives UN0019, UN0300, UN0301, and UN0325 may be loaded and transported with all other explosives compatible with group "S" explosives on cargo aircraft only. Passenger deviations are not authorized.
5. Group "G" explosives UN0009, UN0018, UN0314, UN0315, UN0317, UN0319, and UN0320 may be transported with groups "C," "D," and "E" explosives on cargo aircraft only. Passenger deviations are not authorized.
6. Group "L" explosives may only be loaded and transported with an identical item.
7. Class 1.1 and 1.2 explosives may not be shipped with UN0333, UN0334, UN0335, UN0336, and UN0337.
8. Class 1.4, Compatibility Groups B and G may be loaded and transported together or with Class 1.4 Compatibility Groups C, D, and E on cargo aircraft only.

**A18.5. Classification Codes and Compatibility Groups of Explosives.** The classification code for an explosive consists of the class number followed by the compatibility group letter. Compatibility group letters are used to specify the controls required for transportation and

storage and to prevent the additional hazard that might occur if certain types of explosives are transported or stored together. Ensure all explosives entering the Defense Transportation System are assigned a final or interim hazard classification according to A3.3.1.4. Compatibility groups and classification codes for the various types of explosive substances and articles are identified in Table A18.3. Compatibility groups assigned to non-class 1 items are used for permanent storage and do not apply while item is in the Defense Transportation System.

**Table A18.3. Classification Codes.**

<b>Description of Substances or Article to be Classified</b>	<b>Compatibility Group</b>	<b>Classification Code</b>
Primary explosive substance	A	1.1A
Article containing a primary explosive substance and not containing two or more effective protective features	B	1.1B 1.2B 1.4B
Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance	C	1.1C 1.2C 1.3C 1.4C
Secondary detonating explosive substances or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective protective features	D	1.1D 1.2D 1.4D 1.5D
Article containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid)	E	1.1E 1.2E 1.4E
Article containing a secondary detonating explosive substance with its means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid) or without propelling charge.	F	1.1F 1.2F 1.3F 1.4F
Pyrotechnic substance or article containing a pyrotechnic substance, or article containing both an explosive substance and illuminating, incendiary, tear-producing or smoke producing substance (other than a water-activated article or one containing white phosphorus, phosphide or flammable liquid or gel or hypergolic liquid).	G	1.1G 1.2G 1.3G 1.4G
Article containing both an explosive and white phosphorus	H	1.2H 1.3H
Article containing both an explosive substance and flammable liquid or gel	J	1.1J 1.2J 1.3J

Description of Substances or Article to be Classified	Compatibility Group	Classification Code
Article containing both an explosive substance and a toxic chemical agent	K	1.2K 1.3K
Explosive substance or article containing an explosive substance and presenting a special risk (e.g., due to water-activation or presence of hypergolic liquids phosphides or pyrophoric substances) needing isolation of each type.	L	1.1L 1.2L 1.3L
Articles containing only extremely insensitive detonating substances	N	1.6N
Substance or article so packed or designed that any hazardous effects arising from accidental functioning are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package.	S	1.4S

**A18.6. Joint Service Explosive Ordnance Disposal.** Joint Service EOD maintains an airlift compatibility waiver - accomplished annually. This is a joint US Air Force, US Navy and US Marine Corps coordinated compatibility waiver authorized for use strictly aboard organic channel airlift movements (e.g., non-tactical, non-contingency, and non-emergency airlift mission, Chapter 2 of this manual). This waiver does not authorize airlift of incompatible hazardous material aboard missions outlined in Chapter 3 of this manual. The approval to airlift the incompatible materials is based, in part, on cargo information provided by HTC (EOD/FPJ), DSN (318) 439-4246. This approval authorizes airlift of these incompatible hazardous materials aboard operationally controlled AMC, Naval Logistics Office (NALO), US Marine Corps and US military cargo aircraft. This waiver does not apply to contract (commercial) aircraft operating under DOT-SP 7573.

**Attachment 19****EXCEPTED AND LIMITED QUANTITIES**

**A19.1. Quantities.** Excepted and limited quantities are authorized on military aircraft according to paragraph 2.7. These small quantities of hazardous materials are exempted from certain requirements of this manual as identified in this attachment. The provisions in this attachment do not apply to radioactive materials. See Attachment 11 for requirements applicable to radioactive material in accepted packaging or limited quantity of material. De minimis quantities in accordance with 49 CFR Section 173.4b or IATA 2.6.10 are authorized.

**A19.2. Excepted Quantities.** Small quantities of hazardous materials are exempt from the specification packaging, marking, labeling, certification and compatibility requirements of this manual if the provisions of this paragraph are met. Excepted quantities may be certified to this paragraph or to the most current ICAO or IATA.

A19.2.1. Do not ship the following material as an excepted quantity:

A19.2.1.1. Class 1 material.

A19.2.1.2. Class 2, division 2.1 and 2.3; division 2.2 material having a subsidiary hazard; or aerosols.

A19.2.1.3. Material having a primary or subsidiary hazard of Class 4 in PG I.

A19.2.1.4. Class 4.1 self-reactive material.

A19.2.1.5. Material having a primary or subsidiary hazard of Class 5 in PG I, except when contained in a chemical kit or first aid kit.

A19.2.1.6. Material having a primary or subsidiary hazard of Class 6.1, in PG I, by reason of inhalation toxicity.

A19.2.1.7. Class 6.2 Infectious substances.

A19.2.1.8. Class 7 Radioactive material other than when radioactive material is excepted packages with an associated risk of another class.

A19.2.1.9. Material having a primary or secondary risk of Class 8 in PG I, UN2803 and UN2809.

A19.2.1.10. Magnetized Material (Class 9), Carbon Dioxide Solid, and Lithium Batteries. Lithium battery exceptions are authorized in paragraph A3.3.9.2.3.

A19.2.1.11. Hazardous material contained within a device that is a component part of an otherwise nonhazardous item (except for temperature sensing devices) such as mercury switches in electrical equipment. Prepare the hazardous material according to the requirements for the hazard. If the material is not regulated as a hazardous material, ship the item as general cargo.

A19.2.1.12. Material identified as “Cargo Aircraft Only” in Table A4.1.

A19.2.2. Maximum Net Quantity for Excepted Quantities. The maximum net quantity of hazardous material that is allowed in each inner packaging and the total net quantity allowed in each outer packaging are given in Table A19.1. Refer to A19.2.1. to determine if the

material qualifies for the excepted quantities provision and that Table A19.1. is applicable. If the quantity limitations of Table A19.1. are exceeded, the excepted quantity provision may not be used and prepare the material according to the requirements for the individual material.

**Table A19.1. Excepted Quantity Limits for Inner and Outer Packaging.**

Class of Primary or Subsidiary hazard	Packing Group	Quantity Limits	
		Inner Packagings	Outer Packagings
2.2	See (note 1) and (note 2)	See (note 1) and (note 2)	See (note 1) and (note 2)
3	Packing Group I, II and III	30 mL	PG I 300 mL PG II 500 mL PG III 1 L
4	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L
5 (note 3)	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L
6	Packing Group I, II and III	PG I 1g or 1 mL PG II 1g or 1 mL PG III 30g or 30 mL	PG I 300g or 300 mL PG II 500g or 500 mL PG III 1 kg or 1 L
8 (note 4)	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L
9 (note 5)	Packing Group II and III	30 g or 30 mL	PG II 500 g or 500 mL PG III 1 kg or 1 L

**Notes:**

1. Packing groups are not used for this hazard class.
2. For inner packaging, the quantity contained in each receptacle may not exceed a water capacity of 30 mL. For outer packaging, the sum of the water capacities of all the inner packaging may not exceed 1 L.
3. Applies only to organic peroxides when contained in a chemical kit or a first aid kit.
4. Class 8, UN1774, UN2794, UN2795, UN2800, UN2803, UN2809, UN3028 and UN3477 are not permitted in excepted quantities.
5. For Class 9 material, if no PG is given in Table A4.1., use PG II quantities.

A19.2.3. Inner Packaging. Ensure each inner packaging is plastic (with a minimum thickness of 0.2 mm), glass, earthenware, or metal. The inner packaging may not react with, or be decomposed by, the material contained therein.

A19.2.4. Closures. Closures must be held securely, tightly, and effectively in place with tape, self-shrink plastic, wire, or other positive means. **(T-0)**.

A19.2.5. Liquids. Liquids must not completely fill inner packaging at a temperature of 55 degrees C (130 degrees F). (T-0).

A19.2.6. Intermediate Packaging. Securely pack each inner packaging in an intermediate packaging with cushioning material. (T-0). The intermediate packaging must completely contain the contents in case of breakage or leakage, regardless of packaging orientation. For liquid hazardous material, the intermediate packaging must contain sufficient absorbent material to absorb the entire contents of the inner packaging. (T-0).

A19.2.7. Outer Packaging. Securely pack the intermediate packaging in a strong, rigid, outer packaging (e.g., fiberboard, wood).

A19.2.8. Overpacks. Overpacks may be used and may contain packages of nonhazardous material. Ensure all material in the same outer packaging and overpack are compatible.

A19.2.9. Dimensions of Outer Package. Ensure two of three outside dimensions of the outer package measure at least 100 mm (4 inches). If the outer package is in the shape of a cylinder, ensure it has a minimum height and diameter of 100 mm (4 inches) each.

A19.2.10. Other Hazardous Materials and Materials in Excepted Quantities. A package containing hazardous material in excepted quantities may not contain other hazardous material that are regulated by this manual (requires a Shipper's Declaration for Dangerous Goods).

A19.2.11. Different Materials in One Outer Packaging. When different hazardous materials are contained in one outer packaging, use the formula listed below to determine the quantities that can be included in one outer packaging. Ensure the quantities of different hazardous materials contained in each outer packaging are such that "Q" is less than or equal to 1.0, "Q" is calculated using the formula:

$$n_1/M_1 + n_2/M_2 + n_3/M_3 \dots = Q$$

( $n_1$ ,  $n_2$ , etc. is the actual net quantity of each different hazardous material.  $M_1$ ,  $M_2$ , etc. is the maximum net quantity permitted for the material and packing group in the outer packaging according to Table A19.1.) For example:

A19.2.11.1. There are 15 inner packages at 20 ml each of Class 3, PG II, and 5 inner packages at 30 ml each of Class 8, PG II in one outer packaging:  $300 \text{ ml}/500 \text{ ml} + 150 \text{ ml}/500 \text{ ml} = 0.6 + 0.3 = 0.9$ . The result is less than 1.0, so the material can be shipped in one outer packaging.

A19.2.11.2. There are 5 inner packages at 30 ml each of Class 3, PG II, and 15 inner packages at 30 g each of Class 8, PG II in one outer packaging:  $150 \text{ ml}/500 \text{ ml} + 450 \text{ g}/500 \text{ g} = 0.3 + 0.9 = 1.2$ . The result is greater than 1.0, so the item cannot be shipped in one outer packaging.

A19.2.12. Package Performance Tests. Ensure the complete package (inner plus outer packaging), is capable of withstanding the test specified in A19.2.12.1. without breakage or leakage of the inner packaging and without significant reduction in effectiveness. Carry out tests on the packaging prepared as for transport. Ensure inner receptacles contain at least 95 percent of their capacity for solids and 98 percent of their capacity for liquids. The material to be transported in the packaging may be replaced by another material, except where this would invalidate the results of the tests. When another material is substituted for a solid, use



a material having the same physical characteristics (e.g., mass, grain size) as the material to be shipped. When another material is substituted in the drop test for liquids, use a material with a relative density (specific gravity) and viscosity similar to the material to be shipped.

A19.2.12.1. For packaging with six sides (e.g., fiberboard box), the following free drops onto a solid, unyielding, flat, and horizontal surface from 1.8 m (6 feet) is required. Each test may be performed on different but identical containers.

A19.2.12.1.1. One drop flat on the bottom.

A19.2.12.1.2. One drop flat on the top.

A19.2.12.1.3. One drop flat on the long side.

A19.2.12.1.4. One drop flat on the short side.

A19.2.12.1.5. One drop on a corner at the junction of three intersecting edges.

A19.2.12.2. For cylindrical packaging, the following free drops onto a solid, unyielding flat and horizontal surface from 1.8 m (6 feet) is required:

A19.2.12.2.1. One drop diagonally on the top chime with the center of gravity directly above the point of impact.

A19.2.12.2.2. One drop diagonally on the base chime.

A19.2.12.2.3. One drop flat on the side.

A19.2.12.3. A force applied to the top surface for a duration of 24 hours, equivalent to the weight of identical packages if stacked to a height of 3 m (10 feet), including the test sample.

A19.2.13. Package Marking. Mark excepted quantities of hazardous materials packaged, marked, and otherwise offered and transported in accordance with this paragraph durably and legibly with the following marking:

**Figure A19.1. Excepted Quantity Package Marking**



A19.2.13.1. Replace the “\*” with the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. Replace the “\*\*\*” with the name of the shipper or consignee if not shown elsewhere on the package.

A19.2.13.2. The marking may not be less than 100 mm (3.9 inches) by 100 mm (3.9 inches), and be durable and clearly visible. Ensure the hatchings and symbol are of the same color red or black, and on a white background or contrasting color.

A19.2.13.3. Markings, labels, and documentation required by attachments 14, 15, and 17 do not apply to these shipments.

**A19.3. Dangerous Goods in Limited Quantities.** Limited quantities may be certified to this paragraph or to the most current ICAO or IATA. Comply with all requirements of the document used including the inner packaging and outer packaging quantity limits. Pack limited quantities in good quality combination packagings using only the inner and outer packaging combinations authorized. Ensure the packagings also meet the general packaging requirements of Attachment 3. Single packagings, including composite packagings, are not permitted. The gross weight of a "limited quantity" package may not exceed 30 Kg (66 pounds). Quantity limits may not exceed the amounts authorized by Table A19.2. If all the requirements of this paragraph and the quantity limits of Table A19.2. are met, the combination packaging need not meet (or be marked) with the UN packaging specification requirements.

A19.3.1. Dangerous Goods not Permitted in Limited Quantities:

A19.3.1.1. Materials forbidden in Table A4.1.

A19.3.1.2. All materials in PG I.

A19.3.1.3. Class 1 and 7 materials except as provided in 49 CFR Section 173.63.

A19.3.1.4. Class 2.3 and 6.2.

A19.3.1.5. Class 2.1 and 2.2 materials (other than UN1950, UN2037, UN3478, and UN3479).

A19.3.1.6. Refrigerated liquefied gases.

A19.3.1.7. Class 4.1 self-reactive substances.

A19.3.1.8. Class 4.2 or any material with a subsidiary hazard of 4.2.

A19.3.1.9. Class 8 materials with UN numbers of 2794, 2795, 2803, 2809 or 3028.

A19.3.1.10. Class 9 materials except those specifically authorized in A19.3.2.

A19.3.1.11. Materials identified as "Cargo Aircraft Only" in Table A4.1.

A19.3.2. Dangerous Goods Permitted in Limited Quantities:

A19.3.2.1. Cartridges, small arms, and Cartridges power device (used to project fastening devices) Division 1.4S as provided in 49 CFR Section 173.63.

A19.3.2.2. Aerosols UN1950 and UN2037 of Class 2.1 and 2.2 without a subsidiary hazard or fuel cell cartridge UN3478 and UN3479.

A19.3.2.3. Gases of Class 2.2 without a subsidiary hazard (excluding refrigerated liquefied gases).

A19.3.2.4. Class 3 (excluding PG I).

A19.3.2.5. Class 4.1 (excluding PG I and Class 4.1 self-reactive substances).

A19.3.2.6. Class 4.3 solids only (excluding PG I).

A19.3.2.7. Class 5.1 (excluding PG I).

A19.3.2.8. Class 5.2 only when contained in a "Polyester Resin Kit (UN3269)," "Chemical Kit (NA 1760)" or "First Aid Kit" (excluding PG I).

A19.3.2.9. Class 6.1 (excluding PG I).

A19.3.2.10. Class 8 (excluding PG I, UN2794, UN2795, UN2803, UN2809, UN3028, and UN 3506).

A19.3.2.11. Only the following items of Class 9: Ammonium Nitrate Fertilizers (UN2071), Benzaldehyde (UN1990), Environmentally Hazardous Substance Solid N.O.S. (UN3077), Environmentally Hazardous Substance Liquid N.O.S. (UN3082), Chemical Kit or First Aid Kit (UN3316), Dibromodifluoromethane (UN1941), Aviation regulated liquid, N.O.S. (UN3334), and Aviation regulated solid, N.O.S. (UN3335).

A19.3.3. Different Dangerous Goods in Limited Quantities in one Package. When different dangerous goods in limited quantities are packed together in one outer packaging, the maximum quantities are as follows:

A19.3.3.1. Class 3 and 8, and Class 4.1, 4.3 (solid), 5.1, 5.2, and 6.1 may not exceed the lowest net quantity per package (of the most restrictive single material in the package) as listed in Table A19.2. For calculation purposes, when a package contains both liquid and solids, convert the quantities for the liquids into kilograms in order to determine that the permitted maximum net quantity per package has not been exceeded. The "Q" value formula is not applicable for limited quantities.

A19.3.3.2. Class 2 and 9, when packed without any other dangerous goods, the gross weight of the package may not exceed 30 Kg (66 pounds).

A19.3.3.3. Class 2 and 9, when packed with other dangerous goods, may not exceed 30 Kg (66 pounds). In addition, the maximum net quantity of all the other dangerous goods (other than class 2 and 9) may not exceed the requirements of A19.3.3.1.

A19.3.4. Package Performance Tests. Test requirements for limited quantity packages are as follows:

A19.3.4.1. Ensure the package, as prepared for transport, is capable of withstanding a 1.2 m (4 foot) drop test onto a rigid, nonresilient, flat, horizontal surface, in a position most likely to cause the most damage. After the test, the package may not show any damage that is likely to affect safety during transport and there may be no leakage from the inner packagings.

A19.3.4.2. Ensure each package offered for transport is capable of withstanding a force applied to the top surface of the package (for a duration of 24 hours) equivalent to the total weight of identical packages if stacked to a height of 3 m (10 feet). The stack height includes the test sample. There cannot be any significant reduction in the package's effectiveness and there cannot be any breakage or leakage of any inner packaging.

A19.3.4.3. Ensure packaging for liquids meet air-eligible requirements of A3.1.7.

**Table A19.2. Limited Quantity Limits - Classes 2 Through 9.**

Class or Division	Packing Group	Physical State	Inner Packaging	Per Package
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1.4S	See 49 CFR Section 173.63			
2	--	Gas (note 2)	120 mL (notes 3 and 4)	30 kg G (note 4)
3	II	Liquid	500 mL	1 L
	III	Liquid	5 L	10 L
4.1	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
4.3	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
5.1	II	Liquid	100 mL	500 mL
	II	Solid	500 g	2.5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	10 kg
5.2	--	Liquid	30 mL	1 kg
	--	Solid	100 g	1 kg
6.1	II	Liquid	100 mL	1 L
	II	Solid	500 g	1 kg
	III	Liquid	500 mL	2 L
	III	Solid	1 kg	10 kg
8 (note 1)	II	Liquid	100 mL	500 mL
	II	Solid	500 g	5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	5 kg
9 (note 1)	III	Liquid/Solid	5 L	30 kg G

**Notes:**

1. Chemical or First Aid Kits: In inner receptacles of no more than 30 ml for liquids or 100g for solids. The total quantity of hazardous materials in any one kit may not exceed 1 kg.
2. For gases, the quantity is the water capacity of the inner packaging.
3. Aerosols containing only a nontoxic substance or substances in inner nonrefillable metal or plastic receptacles, the capacity of the inner packaging may not exceed 1000 mL (34 fluid ounces).
4. Non-flammable, non-toxic heat sensitive aerosols in inner nonrefillable metal or plastic receptacles, the capacity of the inner packaging may not exceed 575 mL (19 fluid ounces) with a gross of 25 kg.

A19.3.5. Marking, Labeling and Certification. Mark, label, and certify limited quantity packages as required by Attachments 14, 15, and 17 of this manual.

## Attachment 20

**ABSORBENT, CUSHIONING, AND CLOSURE REQUIREMENTS**

**A20.1. General Requirements.** Ensure all of the packaging materials are not capable of reacting adversely with the contents of the package and are noncombustible. Do not use asbestos. Ensure the absorbent materials, cushioning, and closures are the same or greater than the type and quantities specified in the applicable test report.

**A20.2. Cushioning Requirements.** Pack, secure and cushion inner packagings of combination packagings to prevent their breakage or leakage and to control their shifting within the outer packaging under conditions normally incident to transportation. Cushioning material may not be capable of reacting dangerously with the contents of the inner packagings or having its protective properties significantly weakened in the event of leakage. When overpacking individual packagings for consolidation that already meet air-eligibility requirements, secure and position the packagings against damage using appropriate means.

**A20.3. Closures.** Construct the body and closure of any packaging to be able to adequately resist the effects of temperature and vibration occurring in conditions normally incident to air transportation. Ensure inner packaging or receptacle closures of combination packages containing liquids are held securely, tightly and effectively in place by secondary means. Examples of such secondary methods include: Adhesive tape, friction sleeves, welding or soldering, locking wires, locking rings, induction heat seals, and child-resistant closures. Design the closure device so that it is unlikely that it can be incorrectly or incompletely closed. Closures requirements are as follows:

A20.3.1. Packing Group I. An inner packaging containing liquids of Packing Group I must have a secondary means of closure applied, and must be packed in accordance with A20.4.

A20.3.2. Packing Groups II and III. When a secondary means of closure cannot be applied or is impracticable to apply to an inner packaging containing liquids of Packing Groups II and III, this requirement may be satisfied by securely closing the inner packaging and placing it in a leakproof liner or bag before placing the inner packaging in its outer packaging.

**A20.4. Absorbent materials.** Comply with the specific packing instructions which may require absorbent materials for certain materials and packaging configurations. Packing Group I liquid hazardous materials of Classes 3, 4, or 8, or Divisions 5.1 or 6.1 that are packaged in combination packagings and offered for air transport in glass, earthenware, plastic, or metal inner packagings require using absorbent material as follows:

A20.4.1. Inner packagings packed in a rigid and leakproof receptacle or intermediate packaging containing sufficient absorbent material to absorb the entire contents of all inner packagings before packing the inner packaging(s) in the outer package.

A20.4.2. Absorbent material may not react dangerously with the liquid.

A20.4.3. For single or composite packagings that have met the UN packaging specification test requirements (including the hydrostatic pressure test), absorbent material is not required.

**A20.4.4. Determining the amount of absorbent required.** Absorption capacity varies based on material and design, reference absorbent specification data to determine absorption capacity for specific material used. Use **Table A20.1** as a guide to determine the amount of absorbent

material required. Absorbent materials other than those listed in the table are authorized as long as they meet the absorbent requirement.

A20.4.4.1. The amounts identified in **Table A20.1** are the minimum requirements. When exact quantities of absorbent materials are not found in **Table A20.1**, make an approximation based on quantities listed.

A20.4.4.2 When the applicable test report or packing instruction identifies an amount larger than **Table A20.1**, use the larger amount.

A20.4.4.3. When placing loose-fill materials (e.g., vermiculite) into the container, consider settling of the loose-fill materials during transportation. Use enough loose-fill material, and firmly tamp to compensate for any settling that may occur.

A.20.4.5. Absorbent materials should not be used as cushioning or to secure inner packagings so as to prevent breakage or leakage, or to control inner packaging shifting within the outer packaging under conditions normally incident to transportation.

**Table A20.1. Absorbent Material Requirements.**

If each inner packaging quantity is	Then to ship, use for each inner packaging:					
	Vermiculite, Type 1 <sup>1</sup> , Grade 3 (fine), or Grade 4 (super fine)		Diatomaceous Earth		Absorbent Sheet Materials	Cellulosic particulate
	On sides	On top and bottom	On sides	On top and bottom	On sides On top and bottom	On sides On top and bottom
.50 L (1 pt)	2.5 cm (1.0 in.)	3.8 cm (1.5 in.)	5.0 cm (2.0 in.)	11.5 cm (4.5 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite
1.0 L (1 qt)	2.5 cm (1.0 in.)	5.0 cm (2.0 in.)	5.0 cm (2.0 in.)	14.0 cm (5.5 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite
2.5 L (1/2 gal)	3.8cm (1.5 in.)	5.0 cm (2.0 in.)	7.5 cm (3.0 in.)	14.0 cm (5.5 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite

If each inner packaging quantity is	Then to ship, use for each inner packaging:					
	Vermiculite, Type 1 <sup>1</sup> , Grade 3 (fine), or Grade 4 (super fine)		Diatomaceous Earth		Absorbent Sheet Materials	Cellulosic particulate
	On sides	On top and bottom	On sides	On top and bottom	On sides On top and bottom	On sides On top and bottom
4 L (1 gal)	3.8 cm (1.5 in.)	6.5 cm (2.5 in.)	10.0 cm (4.0 in.)	15.5 cm (6.0 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite
7.6 L (2 gal)	5.0 cm (2.0 in.)	10.0 cm (4.0 in.)	11.5 cm (4.5 in.)	24.0 cm (9.5 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite
20.0 L (5 gal)	7.5 cm (3.0 in.)	15.5 cm (6.0 in.)	15.5 cm (6.0 in.)	34.5 cm (13.5 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite
24.6 L (6.5 gal)	9.0 cm (3.5 in.)	16.5 cm (6.5 in.)	18.0 cm (7.0 in.)	37.0 cm (14.5 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite
49.3 L (13 gal)	10.0 cm (4.0 in.)	19.0 cm (7.5 in.)	20.5 cm (8.0 in.)	39.5 cm (15.5 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite
56.8 L (15 gal)	11.5 cm (4.5 in.)	20.5 cm (8.0 in.)	24.0 cm (9.5 in.)	46.0 cm (18.0 in.)	Completely wrap each inner packaging <sup>2</sup> ; for capacity, follow manufacturer's instructions	For capacity, use manufacturer's instructions; if unknown, same as vermiculite

If each inner packaging quantity is	Then to ship, use for each inner packaging:					
	Vermiculite, Type 1 <sup>1</sup> , Grade 3 (fine), or Grade 4 (super fine)		Diatomaceous Earth		Absorbent Sheet Materials	Cellulosic particulate
	On sides	On top and bottom	On sides	On top and bottom	On sides On top and bottom	On sides On top and bottom

**Note 1.** For density and grading of vermiculite Type 1, Grade 3 (fine), or Grade 4 (super fine) see ASTM C516; for physical characteristics of vermiculite see A-A-52450, VERMICULITE, ABSORBENT (FOR PACKAGING LIQUID HAZARDOUS MATERIALS).

**Note 2.** If additional absorbent is required, position pads, rolls, sheets, etc. throughout packaging design per test report or in void space if not stated in test report.



## Attachment 21

**BRIEFING AGENCY REQUIREMENTS**

**A21.1. Briefing Agency.** This attachment outlines the information that the briefing agency is required to provide to the aircraft commander (or designated representative) according to paragraph 1.2.9.

**A21.2. Informational Requirements.** The briefing agency is required to advise the aircraft commander (or designated representative) of:

A21.2.1. The identification number, PSN, hazard class, and PG prescribed in this manual for each hazardous material aboard the aircraft.

A21.2.2. The total quantity in weight or volume.

A21.2.3. The location of the hazardous item in the aircraft.

A21.2.4. Net explosive weight (NEW) of Class 1.1, 1.2, and 1.3 explosives, or of Class 1.4, 1.5, and 1.6 explosives when required.

A21.2.5. The requirement for escorts, couriers, and protective equipment.

A21.2.6. The number of passengers permitted aboard the aircraft.

A21.2.7. The procedures to use in an emergency when identified in Key 19 of the Shipper's Declaration For Dangerous Goods.

A21.2.8. Use of DOT-SP 7573 and DOT-SP 9232 and provide copy of these special permits, as applicable to AMC contract air carriers.

A21.2.9. Transport of incompatible explosives and other hazmat approved according to paragraph 2.3.2. Provide an indication of the compatibility waiver and issuing authority to the aircrew commander (or designated representative).

**A21.3. Notification Statements.** The briefing agency includes a statement on the hazardous cargo manifest when transporting hazardous materials on aircraft. Apply these statements by programmed wording, rubber stamps, or typewriter. Examples are provided below.

A21.3.1. Air terminal inspection certification statement: "ALL HAZARDOUS MATERIALS COVERED BY THIS MANIFEST HAVE BEEN INSPECTED AND FOUND TO BE PACKAGED IN THE PROPER OUTSIDE CONTAINER, FREE OF VISIBLE DAMAGE AND LEAKS, AND IS PROPERLY CERTIFIED." (Air terminal representative signature).

A21.3.2. Aircrew briefing certification statement: "I HAVE BEEN BRIEFED ACCORDING TO AFMAN 24-604 ON HAZARDOUS CARGO COVERED BY THIS MANIFEST." (Aircraft crewmember signature)

**A21.4. Post Briefing Responsibilities.** After receiving the briefing, the aircraft commander (or designated representative):

A21.4.1. Signs the cargo manifest.

A21.4.2. Returns the signed copy, with the attached Shipper's Declaration for Dangerous Goods to the terminal record-keeping activity for retention.

- A21.4.3. When crew changes occur, terminal personnel briefs the oncoming aircraft commander or designated representatives required by A21.2. The briefing covers all hazardous materials (onload and throughload).
- A21.4.4. For throughload hazardous cargo, the oncoming aircraft commander (or designated representative) signs a copy of the throughload manifest indicating that the briefing has been received.
- A21.4.5. Keeps the manifest, reflecting the certification for a hazardous cargo briefing, according to current files, maintenance, and disposition instructions.

## Attachment 22

**PASSENGER MOVEMENT ON AIRCRAFT TRANSPORTING HAZARDOUS MATERIALS**

**A22.1. Passenger Eligibility.** Table A4.1., column 7 provides passenger eligibility codes that identify passenger movement restrictions with hazardous materials.

A22.1.1. Use Table A4.1. and Table A4.2. to determine passenger movement eligibility with a specific material.

A22.1.2. Do not move passengers with cargo coded as "Cargo Aircraft Only" unless exempted by this manual. Obtain a passenger deviation when required by this attachment. Passenger deviations may not be issued for contracted commercial aircraft.

A22.1.3. Aircraft transporting personnel located in the same compartment with hazardous materials, which may produce toxic, corrosive, or irritating fumes or has the capability to displace oxygen, must be equipped with serviceable supplemental oxygen equipment and oxygen supply for all personnel in addition to the aircraft's emergency oxygen system. Supplemental oxygen is not required when transporting Air, refrigerated liquid; and Engines, internal combustion. **(T-0)**.

A22.1.4. Participants in tactical, contingency, emergency, or deployment operations, including exercises transported on military organic aircraft according to DTR 4500.9-R, Part III are not considered passengers for the purposes of this manual. Also, applies to military aircraft operating a Special Assignment Airlift Mission (SAAM) providing an exclusive service for movement of unit personnel and their associated cargo.

A22.1.5. Do not transport medical evacuees or release passenger seats to non-participants if any one of the provisions of paragraph 3.6 are being used. Refer to Attachment 23 for contract airlift of personnel under DOT-SP 9232.

A22.1.6. Passenger Deviations. Move passengers with hazardous materials coded as "Cargo Aircraft Only" consistent with operational requirements. Prevent exposure of passengers to the hazardous material. A deviation authorizing the movement of passengers with cargo aircraft only material is granted only for exceptional cases.

A22.1.6.1. MAJCOM, Numbered Air Force, or Service having operational control of the aircraft establishes procedures for approving passenger deviations.

A22.1.6.2. When a deviation has been approved, type, print, or stamp on all copies of the passenger manifest the following information: "AUTHORITY TO MOVE PASSENGERS WITH CARGO AIRCRAFT ONLY CODED MATERIAL IS APPROVED. DEVIATION NUMBER:\_\_\_\_\_."

A22.1.6.3. Separate passengers from the hazardous cargo.

A22.1.6.4. An aircrew member provides surveillance to ensure passengers are safe and maintain a maximum distance from the hazardous cargo.

A22.1.6.5. Deviations are not required for:

A22.1.6.5.1. Participants (see Attachment 1)

A22.1.6.5.2. Guards.

A22.1.6.5.3. Couriers.

A22.1.6.5.4. Technical escorts responsible for cargo.

A22.1.6.5.5. Maintenance personnel assigned to support the aircraft transporting the hazardous material.

A22.1.6.5.6. DOD duty/space required passengers transported with material coded P4 in column 7 of Table A4.1.

**A22.1.7. Radioactive Material Passenger Loading Restrictions.**

A22.1.7.1. Packages with a radioactive Category II-Yellow or Category III-Yellow label may not be transported on aircraft carrying passengers unless:

A22.1.7.1.1. The total transport index is not over 50.

A22.1.7.1.2. The transport index is not over 3.0 for a package required to be labeled radioactive Category III-Yellow.

A22.1.7.1.3. The radioactive material is intended for use in, or incident to, research, medical diagnosis, or treatment.

A22.1.7.2. Separate radioactive material requiring a label from personnel and passengers by the greatest distance possible.

A22.1.7.3. Do not carry passengers on aircraft transporting Type B(M) packages.

**A22.2. Carriage of Hazardous Materials by Passengers.** Passengers may not carry hazardous materials on military aircraft. The **exceptions** listed below are not subject to any other requirements of this manual (nonregulated) when carried by a crewmember or passenger.

A22.2.1. Material in aerosol containers (non-radioactive medicinal and toilet articles or other Div. 2.2 {nonflammable gas} with no subsidiary hazard) not exceeding 500 ml (17 fluid ounces) or 0.5 kg (18 ounces) per container when carried in crewmember or passenger baggage (including carry-on baggage), unless they are classified as poisonous or irritating material. The total quantity of the excepted articles carried by any crewmember or passenger in carry-on or checked baggage may not exceed 2 kg (70 ounces) or 2 l (68 fluid ounces).

A22.2.2. Oxygen, or any hazardous material used for the generation of oxygen, carried for medical use by a passenger on a military aircraft must be an approved cylinder as listed in Attachment 6. **(T-0)**. Spare cylinders are not authorized. Portable oxygen concentrators approved by the FAA may also be used by passengers. Passengers, other than duty passenger medical patients, must have a physician's medical certificate as similarly required by FAA identifying need for supplemental oxygen. **(T-0)**. Comply with 14 CFR Sections 121.574 or 135.91 for DOD contracted civilian passenger aircraft.

A22.2.3. For human beings or animals with an implanted medical device, such as a heart pacemaker, that contains radioactive material, lithium batteries, or with radio-pharmaceuticals, that have been injected or ingested.

A22.2.4. Small compressed gas cylinders of Division 2.2 worn by passengers for the operation of mechanical limbs. Spare cylinders of a similar size for the same purpose, in sufficient

quantities to ensure an adequate supply for the duration of the journey are authorized in carry-on and checked baggage.

A22.2.5. Electronic devices acceptable for consumer use that contain lithium batteries. Includes, but not limited to laptop computers, cameras, cell phones, watches, etc.

A22.2.5.1. Ensure each installed or spare lithium battery is of a type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, Sub-section 38.3 and each spare lithium battery is individually protected so as to prevent short circuits (e.g., by placement in original retail packaging, by otherwise insulating terminals by taping over exposed terminals, or placing each battery in a separate plastic bag or protective pouch).

A22.2.5.2. There is no limit on the number lithium ion (rechargeable) batteries not exceeding 100 Watt-hour (Wh) per battery or lithium metal (non-rechargeable) batteries not exceeding 2 grams of lithium per battery when installed in a device or carried as spares.

A22.2.5.3. Portable medical electronic devices (e.g., automated external defibrillators (AED), nebulizer, continuous positive airway pressure (CPAP), etc.) may contain lithium metal batteries exceeding 2 grams, but not exceeding 8 grams. No more than two lithium metal batteries each exceeding 2 grams, but not exceeding 8 grams, may be carried as spare batteries for portable medical electronic devices in carry-on baggage and must be carried with the portable medical electronic device the spare batteries are intended to operate. **(T-0)**.

A22.2.5.4. Portable electronic devices may contain lithium ion batteries exceeding 100 Wh, but not exceeding 160 Wh and no more than two individually protected lithium ion batteries each exceeding 100 Wh, but not exceeding 160 Wh, may be carried per person as spare batteries in carry-on baggage. Do not place spare lithium ion and lithium metal batteries in checked baggage. Devices with installed lithium ion and lithium metal batteries placed in carry-on or checked baggage must be packed to prevent accidentally activation during transport. **(T-0)**.

A22.2.5.5. Battery-powered portable electronic smoking devices (e.g., e-cigarettes, e-cigs, e-cigars, e-pipes, e-hookahs, personal vaporizers, electronic nicotine delivery systems) when carried by passengers for personal are allowed on one's person or in carry-on baggage only.

A22.2.5.6. Carry articles containing lithium metal or lithium ion cells or batteries the primary purpose of which is to provide power to another device as spare batteries in accordance with the provisions of this paragraph.

A22.2.6. Catalytic hair curlers (curling irons) containing hydrocarbon gas such as butane may be carried in carry-on baggage only. Securely fit the safety cover over the heating element. Gas refills are not permitted. Not more than one curler per person is authorized.

A22.2.7. Alcoholic beverages not exceeding 70 percent alcohol by volume, when packed in receptacles of less than 5 L may be in carry-on or checked baggage.

- A22.2.8. Dry ice, in quantities not exceeding 2.5 kg (5.5 pounds) per passenger when used to pack perishables in carry-on or checked baggage, provided the package permits the release of carbon dioxide gas.
- A22.2.9. Safety matches or a lighter carried by an individual for use by the individual. However, lighters containing unabsorbed liquid fuel (other than liquefied gas), lighter fuel and lighter refills are not permitted on one's person or in checked or carry-on baggage. For lighters powered by lithium batteries (e.g., laser plasma lighters, tesla coil lighters, flux lighters, arc lighters and double arc lighters), ensure each battery is of a type which meets the requirements of each test in the UN Manual of Tests and Criteria, Part III, Subsection 38.3. Take measures to prevent unintentional activation of the heating element while on board the aircraft. Recharging of the devices and/or the batteries on board the aircraft is not permitted. Each battery may not exceed 2 grams of lithium content for lithium metal batteries, or a Watt-hour (Wh) rating of 100 Wh for lithium ion batteries
- A22.2.10. Packaged small arms cartridges (in Class 1.4S), in quantities authorized in DTR 4500.9-R, , Part I may be in checked baggage. Do not combine allowances for more than one passenger into one or more packages.
- A22.2.11. Wheelchairs or other battery-powered mobility devices with spillable or non-spillable batteries, provided that the battery is disconnected, battery terminals are insulated to prevent accidental short circuits and the battery is securely attached to the wheelchair or mobility device may be carried in checked baggage. Load and store batteries attached to these devices with their filling holes upright. A wheelchair or other mobility aid equipped with a lithium ion battery, when carried as checked baggage, provided:
- A22.2.11.1. Ensure the lithium ion battery is of a type that successfully passed each test in the UN Manual of Tests and Criteria.
- A22.2.11.2. The aerial port inspects the wheelchair or other mobility aid to ensure no obvious defects, the battery terminals are protected from short circuits (e.g., enclosed within a battery housing), the battery is securely attached to the mobility aid, and electrical circuits are isolated.
- A22.2.11.3. The wheelchair or other mobility aid is loaded and stowed in such a manner to prevent its unintentional activation and protect its battery from short circuiting.
- A22.2.11.4. The wheelchair or other mobility aid is protected from damage by the movement of baggage, mail, service items, or other cargo.
- A22.2.11.5. Where a lithium ion battery-powered wheelchair or other mobility aid is specifically designed to allow its battery to be removed by the user (e.g., collapsible), remove the battery according to instructions provided owner or its manufacturer. Carry the battery in carry-on baggage only. Protect battery terminals from short circuits (by placement in original retail packaging or otherwise insulating the terminal e.g., by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch).
- A22.2.11.6. The battery may not exceed 300 Watt-hour (Wh). A maximum of one spare battery not exceeding 300 Wh or two spares not exceeding 160 Wh each may be carried.

A22.2.11.7. The flight crew is notified as to the location of the lithium ion battery or batteries aboard the aircraft.

A22.2.12. A mercury barometer or thermometer carried by a representative of a government weather bureau or other similar official agency may be in carry-on baggage. However, package the barometer or thermometer in a strong outer packaging, having a sealed inner liner or a bag of strong leak proof and puncture-resistant material impervious to mercury, which prevents the escape of mercury from the package irrespective of its position.

A22.2.13. A single self-inflating personal safety device such as a life jacket or vest fitted with no more than two small gas cartridges (containing no hazardous material other than a Div. 2.2 gas) for inflation purposes plus no more than two spare cartridges. The personal safety device and spare cartridges may be carried in carry-on or checked baggage, and packed in such a manner that it cannot be accidentally activated.

A22.2.14. Battery powered heat-producing articles (e.g., battery-operated equipment such as diving lamps and soldering equipment) as checked or carry-on baggage only. Ensure the heat-producing component, the battery, or other component (e.g., fuse) is isolated to prevent unintentional activation during transport. Protect any battery that is removed against short circuit by placement in original retail packaging or by otherwise insulating terminals (e.g., by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch). Ensure lithium batteries comply with the requirements of paragraph A22.2.5.

A22.2.15. Scuba diving tanks containing not more than 25 pounds per square inch at 21 degrees C (70 degrees F) may be shipped as checked baggage. Affix a tag or label to the tank by a dive shop or certified individual to indicate service was performed.

A22.2.16. Fuel cells used to power portable electronic devices (e.g., cameras, cellular phones, laptop computers and camcorders) and spare fuel cell cartridges when transported personal use. Fuel cells and fuel cell cartridges may contain only Division 2.1 liquefied flammable gas, or hydrogen in a metal hydride, Class 3 flammable liquid (including methanol), Division 4.3 water-reactive material, or Class 8 corrosive material. The quantity of fuel in any fuel cell or fuel cell cartridge may not exceed 200 mL (6.76 ounces) for liquids, 120 mL (4 fluid ounces) for liquefied gases in non-metallic fuel cell cartridges or 200 mL (6.76 ounces) for liquefied gases in metal fuel cell cartridges, 200 g (7 ounces) for solids. For hydrogen in metal hydride, the fuel cell cartridges are limited to a water capacity of 120 mL (4 fluid ounces) or less. No more than two spare fuel cell cartridges may be carried by a passenger or crew member as follows:

A22.2.16.1. Fuel cell cartridges containing Class 3 flammable liquid (including methanol) and Class 8 corrosive material in carry-on or checked baggage.

A22.2.16.2. Division 2.1 liquefied flammable gas or hydrogen in a metal hydride and Division 4.3 water-reactive material in carry-on baggage only.

A22.2.16.3. Fuel cells containing fuel are permitted in carry-on baggage only.

A22.2.16.4. Fuel cell cartridges containing hydrogen in a metal hydride must meet the requirements in 49 CFR Paragraph 173.230(d). **(T-0)**.

- A22.2.16.5. Refueling of a fuel cell aboard an aircraft is not permitted except that the installation of a spare cartridge is allowed.
- A22.2.16.6. Each fuel cell and fuel cell cartridge must conform to IEC 62282-6-100 and IEC 62282-6-100 Amend 1 and must be marked with a manufacturer's certification that it conforms to the specification. **(T-0)**. In addition, mark each fuel cell cartridge with the maximum quantity and type of fuel in the cartridge.
- A22.2.16.7. Interaction between fuel cells and integrated batteries in a device must conform to IEC 62282-6-100 and IEC 62282-6-100 Amend 1. **(T-0)**. Fuel cells whose sole function is to charge a battery in the device are not permitted.
- A22.2.16.8. Fuel cells must be of a type that do not charge batteries when the consumer electronic device is not in use and must be durably marked by the manufacturer with the wording: "APPROVED FOR CARRIAGE IN AIRCRAFT CABIN ONLY" to indicate that the fuel cell meets this requirement. **(T-0)**.



## Attachment 23

## USE OF CONTRACT AIR CARRIERS

**A23.1. Contract Air Carriers.** Airlift of military hazardous materials utilizing contract air carriers approved by HQ Air Mobility Command (HQ AMC) to transport hazardous materials is authorized according to Department of Transportation Special Permits (DOT-SP) 7573 and 9232, DTR 4500.9-R, Part III, 49 CFR Paragraph 173.7(a), and this manual. If practical review and certify dangerous goods to options listed in MSDDC CA-23-11-02/0080 to facilitate expeditious and uninterrupted transportation of DOD HAZMAT/dangerous goods offered throughout the DTS.

**A23.2. DOT-SP 7573.** The DOD is authorized to transport hazardous materials via AMC commercial contract cargo aircraft under the authority of DOT-SP 7573 according to the following conditions:

A23.2.1. The pilot in charge is notified in writing that the permit is being used and a copy of DOT-SP 7573 must accompany the shipment. **(T-0)**. See Attachment 21 for the statement required on the hazardous cargo manifest and briefing requirements.

A23.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-SP 7573 Applies."

A23.2.3. Hazardous material shipments are in complete compliance with this manual.

A23.2.4. Segregation compatibility requirements of Table A18.1. and Table A18.2. apply.

A23.2.5. Comply with A6.27., A7.11., A13.4., or A13.20. for vehicle and SE fuel levels.

A23.2.6. Ensure compliance with all other requirements of the permit.

**A23.3. DOT-SP 9232.** Comply with DOT-SP 9232 and this manual. USTRANSCOM is approval authority for this permit. USTRANSCOM may implement all or only portions of DOT-SP 9232 or apply additional restrictions when permit is used during a declared national emergency; in defense crisis conditions which require the activation of any state of the Civil Reserve Air Fleet (CRAF) program, or the use of foreign-flag aircraft made available to the United States Government (USG) pursuant to formal security agreements between the USG and the involved foreign government; or during rapid deployment of US armed forces.

A23.3.1. Cargo Aircraft. The following special provisions apply:

A23.3.1.1. Comply with provisions of DOT-SP 7573 and A23.2. (with the **exception** of stamping or marking shipping papers "DOT-SP 7573 Applies").

A23.3.1.2. Stamp or mark shipping papers (cargo manifest), DOT-SP 9232 Applies."

A23.3.1.3. Based on operational requirements, segregation requirements of A18.4. may be used.

A23.3.1.4. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, or containers.

A23.3.2. Passenger Aircraft. The following special provisions apply:

A23.3.2.1. Package and certify hazardous materials shipped as cargo according to this manual.

A23.3.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-SP 9232 Applies."

A23.3.2.3. Individual issue hazardous materials may only be removed from outer packaging when needed to meet operational requirements. The troop commander identifies to the aircraft commander (or designated representative) in writing, any hazardous materials removed from outer packaging, that are in rucksacks or field packs, which are not already included on the cargo manifest. Identify hazardous materials by PSN, hazard class, UN identification number, PG, and net quantity. Package hazardous materials to prevent accidental initiation or release.

A23.3.2.4. Load hazardous materials only in the cargo compartment. Hazardous materials (including small arms ammunition) are not authorized in the passenger compartment.

A23.3.2.5. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, and containers.

**A23.4. Use of Passenger Carrying Aircraft.** When requirements dictate movement of hazardous materials as cargo on commercial passenger aircraft, contracted to AMC, for other than a national emergency, ensure the material is prepared according to 49 CFR Parts 100-199. Type and quantity of material authorized is according to 49 CFR Section 172.101 for passenger carrying aircraft. This manual may be used for hazardous materials certification. Do not transport hazardous materials in passenger compartment.

**Military Surface Deployment and Distribution Command**  
**Customer and Carrier Advisory**  
**November 2, 2023**  
**CA-23-11-02/0080**

**Subject:** Dangerous Goods Preparation/Certification Documents for DoD International Shipments

**Purpose:** Facilitate expeditious and uninterrupted transport of Department of Defense (DoD) hazardous materials/dangerous goods offered for movement throughout the Defense Transportation System (DTS)

**Be Advised:** Commercially contracted air carriers comprise a large amount of air transport capability for the DoD. International air transportation cargo clearance rules and regulations, and adherence with DoD Foreign Clearance international country overfly and landing permit approval guidance, may result in delays with aircraft with limited routing alternatives towards their scheduled destinations.

Please consider using the optional methods notated below to facilitate more efficient movement for DoD cargo submissions, including hazardous materials/dangerous goods, while minimizing potential delays in route. These options pertain to providing certain documentation such as compliant shippers declarations, beforehand.

**Option 1.** Prioritize providing *International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air (TI)* or *International Air Transport Association (IATA) Dangerous Goods Regulations (DGR)* prepared and certified shipments and shippers declaration certification documents for all shipments IATA-compliant.

**Option 2.** Provide a complementary ICAO TI/IATA DGR compliant shippers declaration certification to accompany primary AFMAN 24-604 prepared and certified shipments and shippers' declaration certifications.

**Option 3.** When certifying using an AFMAN 24-604 packaging paragraph within the shippers' declaration, include a corresponding ICAO TI/IATA DGR packaging paragraph in Block 19 of the shippers' declaration document.

**NOTE:** These options are not mandatory. **However, if neither of the above options are used, shipments may be interrupted, delayed and/or blocked for long periods awaiting international airlift approval.**

**HQ AMC POC:** AMC/A4TC, DSN 779-4434/Commercial 618-229-4434  
[amc.a4tcp@us.af.mil](mailto:amc.a4tcp@us.af.mil)

**Expiration:** N/A

**Category:** TPS/AA&E/HAZMAT

Figure A23-1

## Attachment 24

### SPECIAL CARGO REQUIREMENTS

**A24.1. Material Requiring SAAM Airlift.** This attachment identifies requirements for technical escorts and other extensive protective measures for extremely hazardous materials. The provisions of this attachment apply to the following shipments:

A24.1.1. Material identified in Table A4.1. as Special Provision 1 (P1) which include, but are not limited to, Class 6.1, PG I, hazard zone A and Class 2.3 hazard zone A toxic material, and Infectious Substances, Affecting Humans.

A24.1.2. Class 1, compatibility group K.

A24.1.3. Fissile Class III Radioactive Material.

A24.1.4. Class 7, Category III-Yellow material with a Transport Index greater than 10.

A24.1.5. Any other material determined to need technical escorts for safety concerns.

A24.1.6. The movement of contaminated human remains (CHR), classified as a Class 6.1, 6.2 or 7 hazard, can be approved with current MAW. CHR will only be transported on military aircraft in accordance with a current Military Airlift Waiver (MAW). Contact Army Focal Point for further information. Point of contacts are found in 3.8.

#### **A24.2. Transportation Requirements.**

A24.2.1. Transport the materials identified in A24.1. by Special Assignment Airlift Mission (SAAM) on military organic aircraft. Process SAAM requests, cargo clearance, and appropriate confirmations according to DTR 4500.9-R.

A24.2.2. When Class 6.1, PG I, hazard zone A and Class 2.3, hazard zone A toxic materials, or Infectious Substances, Affecting Humans (UN2814) are shipped by air, the consignor is required to furnish or ensure availability of:

A24.2.2.1. Complete protective clothing and equipment for all aircrew members.

A24.2.2.2. Qualified technical escort personnel, applicable decontamination and detection equipment or supplies, and suitable first-aid equipment or supplies to cope with leaking containers during airlift.

A24.2.3. Fissile class III shipments and Class 7. Incorporate transportation controls for Category III-Yellow material with a Transport Index greater than 10 that are performed by the shipper or carrier, as appropriate, to provide nuclear criticality safety.

A24.2.3.1. Transport Fissile class III and Class 7, Category III-Yellow material with a Transport Index greater than 10, on aircraft assigned to the exclusive use of the shipper with a specific restriction for the exclusive use to be provided in the appropriate arrangements between shipper and carrier and with instructions to that effect issued with the shipping papers.

A24.2.3.2. Protect Fissile class III against loading, storing, or transporting that shipment with any other fissile material and any other packages of radioactive material requiring one of the labels prescribed in Attachment 15.

A24.2.4. **Exceptions.** Service focal points may waive SAAM requirements for the following:

A24.2.4.1. Liquids with a mist Inhalation Zone A, PG I hazard, less than 5 L per package, and solids with a toxic Inhalation hazard Zone A, PG I hazard, less than 15 kg per package. Passenger prohibition code "P2" applies.

A24.2.4.2. Infectious Substance, Affecting Humans (UN2814) less than 4 L or 4 kg per package. Passenger prohibition code "P2" applies.

**A24.3. Technical Escorts.** Furnish technical escorts when service regulations (or cargo clearance arrangements) require it, or when the shipping activity's medical or flight safety personnel dictate. The shipping activity initiates action to furnish the qualified personnel, when they are required. They also furnish technical escorts or other personnel to accompany shipments of infectious substances (etiologic agents) or plant quarantine materials per A10.8. When the shipping activity is required to furnish qualified personnel, the activity also initiates action to furnish all required protective clothing and equipment for crew members, in addition to the appropriate decontamination, detection, and emergency first-aid equipment. The escort has complete jurisdiction over the cargo as it pertains to normal security, safety, protection of personnel, repair, and disposal of containers. However, in the following situations, escort authorities are primarily technical advisors, and are subordinate to:

A24.3.1. The aircraft commander in matters of flight operations and safety.

A24.3.2. The base installation commander in matters affecting the safety and mission of the command.

**A24.4. Shipping Documents for Infectious Substances.** As indicated in A3.3.6.2.9, personnel must ensure all necessary transfer documents required by the 42 CFR, 7 CFR, 9 CFR, and applicable biosurety regulations are appropriately signed and emplaced prior to transport of Infectious Substances. **(T-0)**. Both the shipper and the receiver must ensure advanced arrangements are made prior to transfer/transport of samples and that all necessary import/export permits are obtained prior to transport of infectious substances. **(T-0)**. An etiologic agent and plant quarantine material shipment record must accompany all shipments of infectious substances (etiologic agents) transported under the provisions of this attachment. **(T-0)**. The consignor (shipper) must prepare this record. **(T-0)**. If the shipping document is classified, it must be in the custody of the technical escort or other qualified personnel accompanying the shipment. **(T-0)**. In the absence of accompanying personnel, and if the document is not classified, the shipper places the original and one copy in the outermost container of the number one package.

**A24.5. Aircrew Jettison Criteria.** For cargo consisting of Class 6.1, PG I, hazard zone A toxic material; Class 2.3, hazard zone A toxic material; infectious substances; biological agents; or radioactive material (other than excepted quantities), the jettison criteria are as follows:

A24.5.1. May not be jettisoned over land.

A24.5.2. May not be jettisoned over water unless the cargo, in addition to size criteria, weighs at least 1.6 g/cm<sup>3</sup> (100 lbs/ft<sup>3</sup>) to ensure sinking. Also, jettison the cargo at least 19.3 kilometers (12 miles) offshore, and preferably beyond a shelf, in water 100 fathoms (600 feet) or more in depth. The aircraft commander is given a predeparture briefing on acceptable jettisoning locations based on the above criteria. When cargo is jettisoned to decrease weight, jettison all other cargo before hazardous cargo.

A24.5.3. When cargo is leaking and is beyond control of the escort to repair or neutralize, the escort must inform the aircraft commander. **(T-0)**. The decision of jettisoning rests with the aircraft commander. In this instance, the commander may jettison the cargo over water without regard to weight or depth criteria.

A24.5.4. When the cargo weighs less than  $1.6 \text{ g/cm}^3$  (100 lb./ft<sup>3</sup>) or when size of cargo would not permit inflight jettisoning, base the model of aircraft selected for overwater missions on two-engine performance from equal time point (ETP) to destination. Aircraft performance is based on aircraft remaining airborne when all cargo except the hazardous cargo is jettisoned.

## Attachment 25

**HAZARDOUS MATERIALS INITIAL AND REFRESHER TRAINING**

**A25.1. Training General Requirements.** This attachment identifies the hazardous material training required by paragraph 1.3. Commanders assign hazardous material workers into one of four functional groups. Training requirements are based on functional group. This approach provides basic hazardous materials training applicable to all personnel at the entry level. Trainers then provide more detailed training to supplement the basic level of training based on specific job responsibilities.

**A25.2. Training for Noncertifying Officials.** Train individuals according to the following general areas of responsibility. Unless otherwise required by Service/Agency directives, training may be performed locally. Develop training specific to the individual's hazardous material duties. The courses listed are suggested DOD courses that may be used to satisfy the applicable level of training. Telephone contact numbers are listed the first time the training location is identified. Commercial or other government sources may also be used for training other than Preparer level to the extent it satisfies the required level of training.

A25.2.1. Handlers. Trainers ensure training covers basic hazardous material familiarization, awareness, and communication requirements. This includes hazard classification, marking, labeling, placarding, documentation, compatibility, and safety (including emergency response information). Required training also include handling and job (function) specific requirements.

A25.2.1.1. HAZMAT Familiarization and Safety in Transportation (9E-F69/920-F37) Web Based Training, U.S. Army Defense Ammunition Center, McAlester OK 74501. Telephone DSN 956-8961 or commercial (918) 420-8961.

A25.2.1.2. Storage and Handling of Hazardous Materials (R511), DLA Training Center (DTC), Columbus, OH 43213-1430. Telephone DSN 850-5969 or commercial (614) 692-5969/ (800) 458-7903/ E-mail: [mailto: INFO@dtc.dla.mil](mailto:INFO@dtc.dla.mil).

A25.2.1.3. Triennial Storage and Handling of Hazardous Material Recurrent (R611), DLA Center for Training, Education, and Development (DCTED), 380 Morrison Road, Columbus, OH 43213-1430. Telephone DSN 850-5986 or commercial (614) 692-5986/(800) 458-7903 / E-mail: [mailto: INFO@dpcso.dla.mil](mailto:INFO@dpcso.dla.mil).

A25.2.1.4. Hazardous Material Handler Refresher online at MyLearning, <https://lms-jets.cce.af.mil/moodle/course/view.php?id=2474>, Expeditionary Center, Air Transportation Branch, USAF MOS/MOLT. Telephone DSN:650-7303/Commercial:(609) 754-7303.

A25.2.1.5. Department of Defense Hazardous Materials Packaging, LOGO140 Packaging of Hazardous Material, DAU Computer Based Training (CBT), request a DAU account ( [Enrollment Procedures | www.dau.edu](https://www.dau.edu) ) to receive checks on learning and tests from this web site, <https://www.dau.edu/courses/log-0140>.

A25.2.2. Packers. Packers, who do not certify, work closely with the preparer (certifier) and may not close (seal) the container until the preparer (certifier) has validated the packaging.

Trainers ensure that packers are knowledgeable in all aspects of handler's requirements with additional emphasis in hazardous materials packaging requirements.

A25.2.2.1. Department of Defense Performance Oriented Packaging (POP) Application Training, Ms. Ronda Urey, Division Chief, Distribution and Materiel Logistics Training Division, (717) 770-8878, DSN 771-8878 [Ronda.urey@dla.mil](mailto:Ronda.urey@dla.mil).

A25.2.3. Inspectors. In addition to handlers' requirements, trainers ensure that inspectors are knowledgeable in the use of commercial and military hazardous materials documents, and shipping papers. Ensure inspectors are familiar with appropriate packaging specifications.

A25.2.3.1. Hazardous Materials Airlift Inspector Course (LCAZP2T251 00AC, Initial (Resident) or L6AZW2T251 00BA, Initial (Distance Learning)). 345 TRS HAZMAT classrooms located at building 1540, 201 Clarke Avenue, Fort Gregg-Adams VA 23801-1529. Telephone DSN 539-1559/1560/1586/1561 or commercial (804) 765-1559/1560/1586/1561. Training Manager email: [345TRS.TRR.TrainingManager@us.af.mil](mailto:345TRS.TRR.TrainingManager@us.af.mil) / Telephone DSN 539-1801/1817 or commercial (804) 765-1801/1817. Course information can be obtained on Education Training Course Announcements (ETCA) at <https://usaf.dps.mil/teams/app10-etca/SitePages/Home.aspx>.

A25.2.3.2. Hazardous Material Inspector Course (4J5AAO2T251-003, Initial (Resident) or 4J6AAO2T251-003, Initial (Mobile/Virtual)). 622 TRS/TPC Transportation Proficiency Center located 1519 Refueling Road, Dobbins ARB, GA 30069. Telephone, DSN 625-4167/5709/3217/5797 or commercial 678-655-4167/5709/3217/5797. Course information and schedule can be found at the SharePoint <https://usaf.dps.mil/sites/622CEG/622TRS/TPC>

**A25.3. Training for Certifying Officials.** Preparers (certifying officials), as defined in paragraph 1.2.10., are authorized to accomplish the Shipper's Declaration for Dangerous Goods certification according to paragraph 1.2.6.2. Supervisors consult DOD Catalog 5010.16-c *Defense Management Education and Training* to select the most appropriate course for the individual based on course prerequisites. Train preparers based on one of the following function specific requirements:

A25.3.1. Preparers. Personnel whose primary duty is preparing and certifying all types of hazardous materials shipments on a daily basis. The courses identified below are authorized only if developed and administered according to the most recent Interservice Training Review Organization Task Group on Hazardous Materials Training Memorandum of Understanding (MOU). The MOU is developed jointly with each school and Service/DLA policy focal point to ensure standard and adequate Preparer level training for DOD personnel. Any deviation from the MOU invalidates the course and is not authorized as acceptable training under this manual. These individuals are qualified by satisfactorily completing one of the qualifying courses:

A25.3.1.1. Initial Training Courses. Personnel identified in A25.3.1. are qualified by satisfactorily completing one of the initial training courses identified below as a prerequisite to certifying the Shipper's Declaration for Dangerous Goods for airlift of hazardous cargo.

A25.3.1.1.1. Hazardous Material Preparer Course (L8AZP2T051 00AA, Initial (Resident) or L6AZW2T051 00AA, Initial (Distance Learning)). 345 TRS HAZMAT classrooms



- located at building 1540, 201 Clarke Avenue, Fort Gregg-Adams VA 23801-1529. Telephone DSN 539-1559/1560/1586/1561 or commercial (804) 765-1559/1560/1586/1561. Training Manager email: [345TRS.TRR.TrainingManager@us.af.mil](mailto:345TRS.TRR.TrainingManager@us.af.mil) / Telephone DSN 539-1801/1817 or commercial (804) 765-1801/1817. Course information can be obtained on Education Training Course Announcements (ETCA) at <https://usaf.dps.mil/teams/app10-etca/SitePages/Home.aspx>.
- A25.3.1.1.2. Technical Transportation of Hazardous Materials (9E-F58/322-F37), U.S. Army Defense Ammunition Center and School, McAlester OK 76544. Telephone DSN 956-8398 or commercial (918) 420-8398.
- A25.3.1.1.3. Transportation of Hazardous Material-Basic (A-822-0012), Navy Supply Corps School, 1378 Porter Ave., Naval Station Newport, Newport, RI 02841. Telephone DSN: 841-4852, Commercial: (401) 841-4852, Web address: <https://www.public.navy.mil/netc/centers/css/nscs/Home.aspx>, E-mail: [NSCS\\_NWPT\\_CourseInformation@navy.mil](mailto:NSCS_NWPT_CourseInformation@navy.mil).
- A25.3.1.2. Refresher Training Courses. Personnel, who have previously completed one of the courses specified in A25.3.1.1., satisfy the 24-month refresher training requirement of A25.5. by completing one of the following courses:
- A25.3.1.2.1. Hazardous Material Preparer Course (L6ARW2T051 00AB, Refresher (Distance Learning)). 345 TRS, 201 Clarke Avenue, Fort Gregg-Adams VA 23801-1529. Telephone DSN 539-1559/1560/1586/1561 or commercial (804) 765-1559/1560/1586/1561. E-mail: [345TRS.TTTH.preparercourse@us.af.mil](mailto:345TRS.TTTH.preparercourse@us.af.mil), for refresher training only. Training Manager email: [345TRS.TRR.TrainingManager@us.af.mil](mailto:345TRS.TRR.TrainingManager@us.af.mil) / Telephone DSN 539-1801/1817 or commercial (804) 765-1801/1817. Course information can be obtained on Education Training Course Announcements (ETCA) at <https://usaf.dps.mil/teams/app10-etca/SitePages/Home.aspx>.
- A25.3.1.2.2. General Transportation of Hazardous Materials (9E-F66/920-F34), U.S. Army Defense Ammunition Center, McAlester OK 76544. Telephone DSN 956-8398 or commercial (918) 420-8398.
- A25.3.1.2.3. Transportation of Hazardous Material-Recertification (A-822-0011), Navy Supply Corps School, 1378 Porter Ave., Naval Station Newport, Newport, RI 02841. Telephone DSN: 841-4852, Commercial: (401) 841-4852, Web address: <https://www.public.navy.mil/netc/centers/css/nscs/Home.aspx>, E-mail: [NSCS\\_NWPT\\_CourseInformation@navy.mil](mailto:NSCS_NWPT_CourseInformation@navy.mil).
- A25.3.1.2.4. Hazardous Materials Airlift Inspector Course (L6ARW2T251 00AB, Refresher (Distance Learning)). 345 TRS, 201 Clarke Avenue, Fort Gregg-Adams VA 23801-1529. Telephone DSN 539-1559/1560/1586/1561 or commercial (804) 765-1559/1560/1586/1561. E-mail: [345TRS.TTTH.inspectorcourse@us.af.mil](mailto:345TRS.TTTH.inspectorcourse@us.af.mil), for refresher training only. Training Manager email: [345TRS.TRR.TrainingManager@us.af.mil](mailto:345TRS.TRR.TrainingManager@us.af.mil) / Telephone DSN 539-1801/1817 or commercial (804) 765-1801/1817. Course information can be obtained on Education Training Course Announcements (ETCA) at <https://usaf.dps.mil/teams/app10-etca/SitePages/Home.aspx>.

A25.3.1.3. The following training is available for medical personnel (e.g., anyone involved with the transportation of pathogens or etiologic agents, except when mixed with explosives or substances in other hazard classes) who manage, package, certify, or prepare laboratory samples and specimens and regulated medical waste only, for transport by any mode.

A25.3.1.3.1.. Transport of Biomedical Material Course (Initial or Refresher) is offered by: Defense Health Agency Defense Centers for Public Health – Aberdeen 8078 Wise Road, Bldg. E1675, Aberdeen Proving Ground, MD 21010-5403, DSN: 584-5228/3651, Commercial: (410) 436-5228/3651, Web Address: Initial Course – <https://eph.health.mil/CREG/Course/Details/16> Refresher Course – <https://eph.health.mil/CREG/Course/Details/17> ,Select training conferences for specific course dates and locations. On-site training is available through the Web address.

A25.3.1.3.2. Medical Waste Transport Course (Initial or Refresher) are offered by: Defense Health Agency, Defense Centers for Public Health – Aberdeen 8078 Wise Road, Bldg. E1675 Aberdeen Proving Ground, MD 21010-5403, DSN: 584-5228/3651, Commercial: (410) 436-5228/3651, Web Address: (Initial and Refresher Course): <https://eph.health.mil/CREG/Course/Details/15>

A25.3.1.4. DOT Transportation Safety Institute (TSI) training. TSI is authorized to conduct DOD Hazmat certification training on an overflow basis when the recognized DOD Schools (Defense Travel Regulation (DTR) 4500.9-R, Part II, Chapter 204; or identified above) cannot provide training within the required timeframe. In this case, the requesting Service or Agency Training Manager/Coordinator prepares the request to the DOD school and maintain a record of the request and reason for refusal.

A25.3.1.4.1. DOD Preparation of Hazardous Material for Transportation (Initial) (HM00204), Transportation Safety Institute, 6500 South MacArthur Blvd, Oklahoma City, OK 73169-6900. Telephone (405) 954-4500; [hazmattraining@dot.gov](mailto:hazmattraining@dot.gov) .

A25.3.1.4.2. DOD Preparation of Hazardous Material for Transportation (Refresher) (HM00205), Transportation Safety Institute, 6500 South MacArthur Blvd, Oklahoma City, OK 73169-6900. Telephone (405) 954-4500; [hazmattraining@dot.gov](mailto:hazmattraining@dot.gov) .

A25.3.2. Technical Specialist. Technical Specialists may only sign the Shipper's Declaration for Dangerous Goods form as a certifying official on items they are technically qualified to maintain and prepare for shipment. A Technical Specialists are:

A25.3.2.1. Designated in writing by the Commander to certify the unit or activity's hazardous materials upon completion of training that includes:

A25.3.2.1.1. Trained for packaging and preparation. Training may be obtained by formal training/job skills or from an individual qualified by formal training/job skills to package/prepare hazardous materials specific to the unit or activity.

A25.3.2.1.2. Trained for certification, marking, labeling, and all other aspects of this manual and/or other Hazardous Material Regulations (HMR) (i.e. IATA, 49 CFR). relevant to the hazardous materials specific to the unit or activity. Training is conducted by an individual qualified as a Preparer according to A25.3.1.

A25.3.2.2. Trained to provide necessary documentation required by A17.1.1.2 to transportation offices for non-mobility movement. This authorization applies to mobility operations conducted according to DTR 4500.9-R, Part III.

A25.3.2.3. Air Force activities use the "Hazardous Material Technical Specialist Instructional Guidance" training material to develop and administer a local technical specialist training program. Contact MAJCOM transportation office for guidance, and AFMC/A4RT on the AF HAZMAT SharePoint ( <https://usaf.dps.mil/teams/AFMC-A4R/SitePages/Hazardous-Materials-Transportation.aspx?web=1> ) to obtain a copy of the material.

**A25.4. Security Training.** Ensure each employee associated with the packaging and transportation of hazardous materials receives security training in accordance with 49 CFR Section 172.704.

**A25.5. Training Frequency.** Ensure all hazardous material personnel receive initial training and subsequent refresher training at 24-month intervals. Refresher (or an Initial course) training must be completed (to include test completion) prior to their 24 month expiration date through any of the courses listed in paragraph A25.3.. A hazmat employee must receive requalification training with in 24 months of their last passing test date. This applies to all levels (e.g., Handlers, Packers, Inspectors, Technical Specialists, and Preparers) of required training. Train individuals based on functional group requirements.

A25.5.1. Unit Commanders may grant (except Army and DLA) an extension to this qualification expiration date for a period not to exceed 60 calendar days during which eligible personnel may receive requalification training. This extension allows certification to AFMAN 24-604 only. Successive 60-day extensions to a person's qualification expiration date is not allowed. Extensions for medical personnel attending biomedical material training may be granted by the Defense Health Agency (DHA) Defense Centers for Public Health – Aberdeen (DCPH-A) training proponent focal point for those who are unable to take the course due to extenuating circumstances. Extensions are permitted only for special circumstances and may not exceed 60 calendar days. Extensions do not apply to commercial air shipments (IATA Certification).

A25.5.2. Each Service focal point or MAJCOM (e.g., MAJCOM, AFIMSC, ACOM) focal point may grant successive 60-day extensions to a person's qualification expiration date for long-term tactical or contingency operations. In this instance, personnel extended past their initial 60-day extension may only certify hazardous materials moved according to the tactical or contingency operation. Once personnel return to normal duty, train each person as specified in this attachment. Extensions do not apply to commercial air shipments (IATA Certification).

A25.5.3. Each Service focal point or MAJCOM (e.g., MAJCOM, AFIMSC, ACOM) focal point is responsible for management of the extension authority and may establish more stringent training frequencies to enhance training requirements.

**A25.6. Training Records.** Test all hazardous material personnel and maintain a record of the training provided. Maintain and dispose of records according to an approved Records Disposition Schedule. As a minimum, maintain the record for as long as the person works for the DOD as a hazardous material employee and for 90 calendar days after separation from the DOD. This record must indicate the following:

A25.6.1. Name of person who received the training.

A25.6.2. Date training took place.

A25.6.3. A description, copy, or location of training materials used to train the person.

A25.6.4. The name and address of the person who provided the training.

A25.6.5. Certification statement of completion of training and testing. **(T-0)**.

**A25.7. Certification Under Combat Conditions.** An aircraft commander (or representative designated by the commander) may accept a hazardous materials shipment under a combat situation without regard to the above training.

**A25.8. Non-DOD Personnel Certifying Hazardous Material Shipments.** Non-DOD personnel preparing hazardous materials for transportation by military air must do so according to this manual. **(T-0)**. DOD does not require non-DOD personnel to complete the training courses specified in this attachment. Non-DoD personnel may meet the requirements of the 49 CFR Part 172 Subpart H *Training*, and/or International Air Transport Association (IATA), Dangerous Goods Regulations or International Civil Aviation Organization (ICAO), Technical Instructions provided individuals/employees maintain the responsibility for properly preparing hazardous materials for shipment. **(T-0)**. Training must include general awareness, function specific, safety, and security responsibilities related to military air transportation. Non-DoD personnel who desire the training outlined in this attachment must contact their contract administration office. **(T-0)**.

## Attachment 26

TABLE OF EQUIVALENTS AND NET QUANTITY OF GAS CONVERSION  
FORMULA

**A26.1. Metrics.** Figure A26.1. provides a list of metric prefixes.

**Figure A26.1. Metric Prefixes.**

Deci	0.1	Deca	10
Centi	0.01	Hecto	100
Milli	0.001	Kilo	1,000
Micro	0.000001	Mega	1,000,000
Nano	0.000000001	Giga	1,000,000,000
Pico	0.000000000001	Tera	1,000,000,000,000

**A26.2. Miscellaneous Conversions.** Figure A26.2. provides a list of general miscellaneous conversions for use with this manual.

**Figure A26.2. Miscellaneous Conversions.**

VOLUME		WEIGHT	
1 liter	0.264 gallon, 1.057 quarts, 61.025 cubic inches, 33.815 fluid ounces	1 gram	0.03527 ounces, 0.0022 pounds avoirdupois
1 cubic foot	28.32 liters, 7.481 gallons, 1728 cubic inches	1 kilogram	2.205 pounds, 35.274 ounces
1 cubic meter	1000 liters, 35.31 cubic feet, 264.2 gallons	1 pound	0.4536 kg
1 milliliter	0.0338 oz	1 ounce	28.35 grams
1 gallon	3.785l	<u>PRESSURE:</u>	
1 oz	29.57 ml	1 pound per square inch	6.895 kilopascal
		1 kilopascal	0.145 psi
LENGTH		RADIOACTIVE	ACTIVITY
1 centimeter	0.3937 inches	1 TBq	27 Ci
1 meter	3.28 feet, 39.37 inches	1 Sv/hr	100 rem/hr
1 inch	2.54 cm, 25.4 mm	1 rem/hr	0.01 Sv/hr
1 foot	0.3048 m		
1 millimeter	0.03937 in		
VOLUME			
1 newton	101.97 gram force		

**A26.3. Temperature Conversion.** Use Figure A26.3. to convert temperatures between Celsius and Fahrenheit.

**Figure A26.3. Temperature Conversion Formula.**

$C = (F - 32) \text{ times } 5/9$
$F = (C \text{ times } 9/5) + 32$
$K = C + 273.15$
C = degrees Celsius
F = degrees Fahrenheit,
K = degrees Kelvin (absolute)

**A26.4. Tank Volume.** Use Figure A26.4 to determine tank volume.

**Figure A26.4. Tank Volume Formula.**

<i>Formula</i>	$V = p r^2 h$
where:	V= Tank Volume
	p= 3.142
	$r^2$ = radius of tank
	h= height of tank

**A26.5. Net Quantity of Gas Conversion Formula.** Use Figure A26.5. to determine the net hazard of a compressed gas by converting PSI of a cylinder into pounds. Use Figure A26.6. to determine the molecular weight or specific gravity required to complete the formula.

**Figure A26.5. Net Quantity of Gas Conversion Formula.**

<i>Formula (1)</i>	$P = 0.00512 \times A \times B \times C$
	or
<i>Formula (2)</i>	$P = .0001744 \times A \times B \times M$
Where:	P=weight of gas in pounds
	A=pressure in pounds per square inch
	B=volume of cylinder in cubic feet
	C=specific gravity of the gas
	M=molecular weight of the gas molecule
<b>Note:</b> Use Formula (1) for calculation using the specific gravity value. Use Formula (2) for calculation using the molecular weight value.	

A26.5.1. Example for Determining Net Quantity of Gas. The following information is known or determined by examination of the cylinder. Measure the cylinder's height from the external base to the valve seat. Measure the external diameter (width). Assume the cylinder does not cone at the top.

A26.5.1.1. Example 1. Tank measurements:

Height: 50 inches

Diameter: 9 inches

Radius: 4.5 inches

Tank contents: CO<sub>2</sub>

Internal Pressure: 900 psi

Tank Volume = 1.841 Ft<sup>3</sup>

$P \text{ (pounds of gas)} = 0.00512 \times A \times B \times C = \{0.00512 \text{ in}^2/\text{Ft}^3\} \times \{900 \text{ psi}\} \times \{1.841 \text{ Ft}^3\} \times \{1.516\}$

Answer:  $P = 12.9 \text{ pounds}$

A26.5.1.2. Example 2. Tank measurements:

Height: 40 inches

Diameter: 12 inches

Radius = 6 inches

Tank contents: C<sub>2</sub>H<sub>2</sub>

Internal Pressure: 500 psi

Tank Volume = 2.618 Ft<sup>3</sup>

$P \text{ (pounds of gas)} = 0.00512 \times A \times B \times C = \{0.00512 \text{ in}^2/\text{Ft}^3\} \times \{500 \text{ psi}\} \times \{2.618 \text{ Ft}^3\} \times \{0.897\}$

Answer:  $P = 6.01 \text{ pounds}$

A26.5.1.3. Example 3. Tank measurements:

Height: 50 inches

Diameter: 9 inches

Radius = 4.5 inches

Tank contents: CO<sub>2</sub>

Internal Pressure: 900 psi

Tank Volume = 1.841 Ft<sup>3</sup>

$P = 0.0001744 \times A \times B \times M = 0.0001744 \times (900 \text{ psi}) \times (1.841 \text{ Ft}^3) \times (44.00)$

Answer:  $P = 12.7 \text{ pounds}$

A26.5.1.4. Example 4. Tank measurements:

Height: 40 inches

Diameter: 12 inches

Radius = 6 inches

Tank contents: C<sub>2</sub>H<sub>2</sub>

Internal Pressure: 500 psi

Tank Volume = 2.618 Ft<sup>3</sup>

$P = 0.0001744 \times A \times B \times C = 0.0001744 \times (500 \text{ psi}) \times (2.618 \text{ Ft}^3) \times (26.00)$

Answer:  $P = 5.94 \text{ pounds}$

A26.5.2. Examples for Determining Radioactive Shipments.  $A_1/A_2$  values represent the maximum activity that can be shipped in a Type A package.  $A_1$  is for Special form material and  $A_2$  values is for Normal or Other form material. In dealing with mixtures of radionuclides if the sum of the ratios is  $\leq 1$ , then use a Type A package. If the sum of the ratios is  $> 1$ , then use a Type B package.

A26.5.2.1. Example 1. Determine the most appropriate packaging when shipping a mixture of 0.46 TBq of Bromine-77 (Br-77) & 0.25 TBq of Cerium-143 (Ce-143).

Activity measured / Activity allowed = sum of the ratio

$0.46 \text{ TBq} / 3 \text{ TBq} = 0.15$  ( $A_2$  for Br-77)

$0.25 \text{ TBq} / 0.6 \text{ TBq} = 0.42$  ( $A_2$  for Ce-143)

$0.15 + 0.42 = 0.57$  Total sum of the ratios  $0.57 \leq 1$ , so a Type A package is required

A26.5.2.2. Example 2. Determine if the item can be shipped as a RQ of a hazardous substance.

Shipping a mixture of 2.02 TBq of Silver-112 (Ag-112), 0.16 TBq of Tin-113 (Sn-113) & 0.21 TBq of Tungsten-185 (W-185).

Activity measured / Reportable Quantity = RQ

$2.02 \text{ TBq} / 3.7 \text{ TBq} = 0.546$  (RQ for Ag-112)

$0.16 \text{ TBq} / 0.37 \text{ TBq} = 0.432$  (RQ for Sn-113)

$0.21 \text{ TBq} / 0.37 \text{ TBq} = 0.568$  (RQ for W-185)

Total RQ of  $1.576 > 1$  Therefore, mixture would be regulated as a hazardous substance.

A26.5.2.3. Example 3. Determine the most appropriate packaging when shipping the following:

1.45 TBq of Terbium-160 (Tb-160)

$A_2$  value for Tb-160 is 0.6 TBq.

$1.45 \text{ TBq} > 0.6 \text{ TBq}$  Since the amount shipped is greater than the  $A_2$  value; a Type B package is required.

A26.5.2.4. Example 4. Determine the most appropriate packaging when shipping the following:

0.45 GBq of solid Niobium (Nb-95) internationally

0.45 GBq converted is 0.00045 TBq

$A_2$  value for Nb-95 = 1 TBq

$10^{-3} A_2 = 0.001 \text{ TBq} > 0.00045 \text{ TBq}$

A26.5.2.4.1. Since the maximum activity allowed is greater than amount being shipped, the item can be shipped in an Excepted package.



**A26.6. Properties of Common Gases.** Figure A26.6. is a list of the molecular weight and specific gravity of common gases.

**Figure A26.6. Properties of Common Gases.**

GAS	SYMBOL	MOLECULAR WEIGHT	SPECIFIC GRAVITY
Helium	He	4.00	0.138
Argon	A	40.00	1.377
Air	-	29.00	1.000
Oxygen	O <sub>2</sub>	32.00	1.103
Nitrogen	N <sub>2</sub>	28.00	0.966
Hydrogen	H <sub>2</sub>	2.00	0.0695
Nitric Oxide	NO	30.00	1.034
Carbon Monoxide	CO	28.00	0.965
Hydrochloric Acid	HCl	36.50	1.256
Steam	H <sub>2</sub> O	18.00	0.623
Carbon Dioxide	CO <sub>2</sub>	44.00	1.516
Nitrous Oxide	N <sub>2</sub> O	44.00	1.518
Sulfur Dioxide	SO <sub>2</sub>	64.00	2.208
Ammonia	NH <sub>3</sub>	17.00	0.587
Acetylene	C <sub>2</sub> H <sub>2</sub>	26.00	0.897
Methyl Chloride	CH <sub>2</sub> Cl	50.50	1.738
Methane	CH <sub>4</sub>	16.00	0.553
Ethylene	C <sub>2</sub> H <sub>4</sub>	28.00	0.967

**A26.7. Lithium Content.** Rechargeable lithium batteries are manufactured without lithium metals. There are two methods to determine equivalent lithium content.

A26.7.1. The rated capacity, in ampere-hours, of each cell times 0.3 expressed in grams (g).  
Example: A battery with 9 cells each having a rated capacity of 2.2 ampere-hours contains 5.94 grams of equivalent lithium content ( $2.2 \times 0.3 \times 9 = 5.94\text{g}$ )

A26.7.2. Dividing the stated volts (V) on a battery pack by 3.7 (rounded to nearest whole number), multiplying the results by the stated ampere-hours (Ah) times 0.3. Example: Battery marked with 14.8 (V) and 4.8 (Ah) contains 5.76 grams of equivalent lithium content ( $14.8 \text{ divided by } 3.7 = 4, 4 \times 4.8 = 19.2, 19.2 \times 0.3 = 5.76 \text{ grams}$ )

**A26.8. Lithium batteries.** The watt-hour (Wh) rating is a measure by which lithium ion batteries are regulated. Lithium Ion batteries manufactured after 31 December 2011 are required to be marked with their watt-hour rating.

A26.8.1. To arrive at the number of watt-hours the battery provides multiply the battery's nominal voltage (V) by the capacity in ampere-hours (Ah):  $\text{Ah} \times \text{V} = \text{Wh}$ . A battery of 14.8 V with a capacity of 2 Ah is 29.6 Wh normally rounded to 30 Wh

**Attachment 27****PREPARING EXPLOSIVES PACKAGED PRIOR TO 1 JANUARY 1990**

**A27.1. General Requirements.** Use this attachment to verify existing packaging which is exempt from UN specification packaging requirements according to paragraph A3.3.1.10. The methods of packaging described in this attachment were authorized by 49 CFR and in effect on 31 December 1989.

A27.1.1. See Attachment 17 for certification requirements.

A27.1.2. Use Proper Shipping Names identified in Table A4.1. in place of DOT names described in this attachment.

A27.1.3. See Attachment 5 for special and general handling instructions.

A27.1.4. Comply with Attachment 24 for ammunition or explosives which are packed in freon for safety during movement or which contain toxic substances previously described as a "Class A Poison."

A27.1.5. Unstable, condemned, or deteriorated explosives may not be shipped by military air. Unserviceable explosives may be shipped if otherwise safe for transportation.

A27.1.6. See Attachment 14 and Attachment 15 for marking and labeling requirements.

A27.1.7. Annotate Shipping Papers (e.g., manifest) and Shipper's Declaration For Dangerous Goods (Key 19), "Government owned goods packaged prior to 1 January 1990."

A27.1.8. Damaged or unserviceable packaging may not be shipped by military air. Repackage explosives according to current guidance in Attachment 5.

A27.1.9. See table A27.1. for an explosive or ammunition cross reference. In this table, column 1 contains a list of explosive/ammunition with column 2 giving the paragraph from AFR 71-4 and column 3 identifying the paragraph for that item in this manual.

A27.1.10. Use DOT/Military specification containers specified in this attachment, when applicable. Use UN Specification packaging specified in Attachment 5 when repackaging is required. See Table A27.2. for DOT/Military specification container cross reference.

**Table A27.1. Explosive/Ammunition Cross Reference.**

<b>Name of Explosive or Ammunition</b>	<b>AFR 71-4 Paragraph</b>	<b>AFMAN 24-604 Paragraph</b>
Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve	5-32	A27.16.
Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives	5-10	A27.2.
Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles	5-11	A27.3.
Black Powder and Low Explosives	5-13	A27.4.
Blasting Agent N.O.S.	5-63	A27.31.
Cartridge, Practice Ammunition	5-62	A27.30.
Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges	5-23	A27.9.
Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad	5-25	A27.10.
Detonating, Fuzes, Class C Explosives	5-27	A27.11.
Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive	5-17	A27.6.
Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives	5-28	A27.12.
Detonators, Class A Explosives and Detonators, Class C Explosives	5-14	A27.5.
Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive	5-29	A27.13.
Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive	5-30	A27.14.
Explosive Power Device, Class B	5-56	A27.28.
Explosive Rivets	5-31	A27.15.
Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer	5-22	A27.8.
Grenade, Tear Gas Irritating Material	10-37	A27.34.
High Explosives	5-34	A27.18.
High Explosives, Liquids	5-35	A27.18.1.

<b>Name of Explosive or Ammunition</b>	<b>AFR 71-4 Paragraph</b>	<b>AFMAN 24-604 Paragraph</b>
High Explosives With Liquid Explosive Ingredients	5-36	A27.18.2.
High Explosives With No Liquid Explosive Ingredient and Propellant Explosives, Class A	5-37	A27.18.3.
High Explosives With No Liquid Explosive Ingredient Nor Any Chlorate	5-38	A27.18.4. – A27.18.12.
Igniter Cord	5-39	A27.19.
Initiating Explosive (Diazodinitrophenol or Lead Monoitroresorcinate)	5-40	A27.20.1.
Initiating Explosive (Guanyl Nitrosomino Guanylidene Hydrazine)	5-41	A27.20.2.
Initiating Explosive (Lead Azide Dextrinated Type Only)	5-42	A27.20.3.
Initiating Explosive (Lead Styphnate (Lead Trinitrosorcinate) or Barium Styphnate, Monohydrate)	5-43	A27.20.4.
Initiating Explosive (Nitro Mannite)	5-44	A27.20.5.
Initiating Explosive (Nitrosoguanadine)	5-45	A27.20.6.
Initiating Explosive (Pentaerythrite Tetranitrate)	5-46	A27.20.7.
Initiating Explosive (Tetrazene)	5-47	A27.20.8.
Initiating Explosive (Fulminate of Mercury)	5-48	A27.20.9.
Oil Well Cartridges	5-64	A27.32.
Propellant Explosives, Solid or Liquid (Class A or B Explosives)	5-51	A27.24.
Railway Torpedoes	5-33.a.(6)	A27.23.
Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles)	5-52	A27.25.
Rocket Engine (Liquid), Class B Explosives	5-61	A27.29.
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine	5-50	A27.22.
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives)	5-49	A27.21.
Small Arms Ammunition and Small arms Ammunition, Tear Gas Cartridges	5-53	A27.26.
Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed	5-18	A27.7.
Special Fireworks	5-33	A27.17.
Toy Caps	5-54	A27.27.

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-604 Paragraph
Delay Electric Igniter; Electric Squib; Empty Cartridge Bag with Black Powder Igniter; Fuse Igniter; Fuse Lighter; Igniter Fuse, Metal Clad; Igniter; Safety Squib	5-19	A27.33.

**A27.2. Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives.** Package in strong wooden or metal containers, or plastic containers approved by military specifications or drawings.

**A27.3. Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles.** Package in strong wooden or metal containers approved by military specifications or drawings not to exceed 175 pounds gross weight.

**A27.4. Black Powder and Low Explosives.**

A27.4.1. Metal kegs, DOT 1, not less than 7 inches long. Net weight not less than 6 ¼ pounds and no more than 150 pounds.

A27.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside fiber or metal containers, not over 1 ¾ pound capacity each, or cotton bags at least 4-ounce cotton duck not over 25-pounds capacity each. The maximum gross weight is 140 pounds for DOT 14 and 200 pounds for DOT 15A, 16A, or 19B wooden boxes.

A27.4.3. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cylindrical fiber cartridge not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface, with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Completely line boxes with strong paraffined paper, or other suitable waterproofed material, without joints or other openings at the bottom or sides. Authorized maximum gross weight is 75 pounds.

A27.4.4. Fiberboard boxes, DOT 12H, 23F, or 23H, with inside cylindrical fiber cartridges not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Authorized maximum gross weight is 65 pounds.

A27.4.5. Black Powder (not low explosive), in addition to containers specified above, may be shipped in the following specification containers:

A27.4.5.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cloth or paper bags not over 25 pounds net weight. Ensure the completed shipping package is capable of withstanding a drop of 4 feet without rupture of inner or outer containers. The completed package may not contain more than 50 pounds net weight of black powder.

A27.4.5.2. Fiberboard boxes, DOT 12H, 23F, or 23H with inside cloth, paper, or securely closed polyethylene bags constructed of material not less than 0.004 inch thick. The

maximum net weight may not exceed 25 pounds for cloth or paper bags and 50 pounds for polyethylene bags. Inside fiber or metal containers not over 1 pound net capacity each may be used, provided the completed shipping package is capable of withstanding a drop of 4 feet without rupture of the inner or outer containers. The tubes of the box may be eliminated and a single tube as specified in DOT 23F may be substituted. The completed package may not contain more than 50 pounds net weight of black powder.

A27.4.6. Black pellet powder, primed with the electric squib, secured inside the coaxial hole of the pellet powder (with loose ends of the wire of the squib effectively short-circuited) may be shipped in wooden boxes, DOT 14, 15A, 16A, or 19B with inside strong paraffined paper cartridges not over 12 inches long, and authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Line boxes as prescribed for cylindrical fiber cartridges. Gross weight may not be over 65 pounds.

A27.4.7. Low explosives (not black powder), in addition to the containers specified, may be shipped in the following specification containers:

A27.4.7.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with strong paper bags not over 25 pounds capacity. Gross weight of DOT 15A or 16A boxes may not be over 200 pounds. Gross weight of DOT 14 box may not be over 140 pounds.

A27.4.7.2. Fiberboard boxes. DOT 12H, 23F, 23H, with inside strong paper bags not over 25 pounds capacity. Gross weight may not be over 65 pounds.

A27.4.7.3. Wooden boxes, DOT 15A or 19B, lined with paper, DOT 2L. Authorized for rods or cylinders not less than five-eighths of an inch in diameter.

**A27.5. Detonators, Class A Explosives and Detonators, Class C Explosives.** Fit detonators snugly in strong inside packaging and snugly overpack in outer packagings as specified in A27.5.7. and A27.5.8. below.

A27.5.1. For devices containing no more than 10 grams of explosives (excluding ignition and delay charges):

A27.5.1.1. No more than 50 devices may be packed in one inside packaging and no more than 500 devices may be packed in one outer packaging.

A27.5.1.2. The gross weight of the completed package may not be over 150 pounds or the gross weight permitted by the specification for the outer packaging used, whichever is less.

A27.5.2. For detonators that are blasting caps (including percussion activated) or delay connectors in metal tubes, the packaging requires is as specified below. Also:

A27.5.3. Cover open ends of any device with appropriate cushioning material.

A27.5.3.1. Fit inside packaging snugly in intermediate packagings consisting of cartons or wrappings made of paper, plastic, or pasteboard.

A27.5.3.2. Separate intermediate packagings from the outer packaging by at least 1 inch of cushioning material.

A27.5.4. For devices containing no more than 3 grams of explosives (excluding ignition and delay charges):

A27.5.4.1. No more than 110 devices may be packed in one inside packaging; and,

A27.5.4.2. No more than 5,000 devices may be packed in one outer packaging.

A27.5.5. Pack detonators that are electric blasting caps, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing containing no more than 3 grams of explosives (excluding ignition and delay charges) with no more than 100 devices in one inside receptacle and no more than 1,000 devices in one outer container.

A27.5.6. Detonators that are blasting caps with safety fuse, blasting caps with metal clad mild detonating cord, blasting caps with detonating cord, or blasting caps with shock tubes are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube, and inside packagings are not required if the packagings configuration restricts freedom of movement of the caps and protects them from impact forces. Quantity limitations do not apply to Detonators, Class C Explosives. Container weight limitations do apply.

A27.5.7. Wooden boxes DOT 14, 15A, 16A, or 19B.

A27.5.8. Fiberboard boxes DOT 12H, 23F, or 23H.

**A27.6. Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive.** Package in well secured strong tight wooden or metal boxes approved by military specifications or drawings.

A27.6.1. The gross weight of an outer package containing detonating fuzes, Class A, may not exceed 190 pounds.

A27.6.2. Boosters, bursters, and supplementary charges, without detonators, when shipped separately, may not exceed 300 pounds gross weight.

A27.6.3. Ensure a fuze with any radioactive component also meets requirements of Attachment 11.

**A27.7. Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed.**

A27.7.1. Package primers (cannon, combination, and small arms), percussion caps, and empty grenades, primed, in strong, tight outside wooden boxes with special provisions for securing the individual packages against movement within the exterior containers.

A27.7.2. Package empty cartridge cases, primed, in strong, tight outside wooden or fiberboard boxes or in DOT21C fiber drums. Construct each drum to the specification requirements for a drum containing at least 250 pounds net weight. Insert a protective corrugated paperboard pad between the contents and the metal for each drum having a metal top or bottom.

A27.7.3. Pack small arms primers containing anvils in:

A27.7.3.1. Cellular Inside Packages. Packages with partitions separating the layers and columns of the primers so that the explosion of a portion of the primers in the completed shipping packages do not cause the explosion of all primers. Then pack in outer packagings as stated in A27.7.1. or in fiberboard boxes, DOT 12B, equipped with a corrugated fiberboard liner. Ensure the bursting test of the liner is equal to or over that of the box. **Exception:** a liner is not required for a full telescopic style box that may be closed

with pressure sensitive tape as specified for DOT 12B. Not more than 5,000 primers may be packed in one outside fiberboard box.

A27.7.3.2. Fiberboard boxes, DOT 23H. Each box is full depth telescopic style, with top section having extended end flaps and bottom section having extended side flaps, set up without glued or stapled joints. Ensure the full height inside perimeter liner, top and bottom pads is made of doublewall corrugated fiberboard. Hand-holes not more than 4 inches by 1 inch, horizontal with top score line are authorized in the ends of boxes. Package primers in cellular inside packages with partitions separating the layers and columns to form a tight fitting pack in the outer packagings. Do not pack more than 50,000 primers in one outside box.

A27.7.4. Small arms primers and percussion caps may be packed with nonexplosive and nonflammable articles, or with small arms ammunition as provided in A27.27. Small arms primers may be included with propellant explosive (solid), class B, in the same outer packagings as provided in A27.24.2. The weight of the small arms primers or percussion caps may not exceed 5 pounds per shipping container. Package percussion caps in metal or other inside boxes. Do not pack more than 500 caps in inside boxes. The construction of the cap or packaging, and the kind and quantity of explosives in each, is such that the explosion of a part of the caps in the completed package does not cause the explosion of all the caps. Package percussion caps in fiberboard boxes, DOT 12B, also:

A27.7.4.1. Do not pack more than 100 caps each in inside metal cans. Not more than 10 metal cans each may then be overpacked in a chipboard box. Pack no more than five chipboard boxes in the 12B fiberboard box. Ensure the completed package is such that an explosion of a part of the caps can not cause the explosion of all the caps.

A27.7.4.2. Pack no more than 100 caps each in inside plastic cans. Then pack the plastic cans in a chipboard box with not more than eight such chipboard boxes tightly packed in the DOT 12B fiberboard box. Ensure the completed package is such that an explosion of part of the caps can not cause the explosion of all of the caps. The gross weight of one outside package may not be more than 150 pounds.

**A27.8. Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer.** Package in strong, tight, outside wooden boxes, triple-wall fiberboard boxes, or DOT 23F fiberboard boxes. Make special provisions for securing individual packages of fuzes or tracers against movement in the box. The gross weight of each wooden or fiberboard box may not be more than 150 pounds. The gross weight of each DOT 23F fiberboard box may not be over 65 pounds.

**A27.9. Package Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges** as follows:

A27.9.1. Wooden boxes, DOT 15A, 16A, 19A, or 19B. The gross weight may not be over 100 pounds, however, a gross weight of 500 pounds is authorized for wooden boxes with very signal cartridges only.

A27.9.2. Fiberboard boxes, DOT 12B. The gross weight of fiberboard boxes may not be over 65 pounds.

A27.9.3. Watertight, aluminum drums, 8 inches in diameter, having a rubber gasket and a positive closure. These are authorized only for smoke pots.



A27.9.4. Smoke signals may be packed two each in a Navy-designated preformed polystyrene container banded with pressure-sensitive tape. Pallet loads having a 2-foot high, 1/4-inch plywood border around the lower portion of the load. Each polystyrene case may be overwrapped in a heat-sealed polystyrene bag. The minimum thickness of the bag is 0.006 inch. Eighteen such containers may be consolidated in a MIL-B-43096, type II, class 2, wirebound wooden box. Line each face of the box with PPP-F-320, type W6C or equal fiberboard.

A27.9.5. Ensure fireworks, such as sparklers, with match tip or head, or similar igniting point or surface, have each individual tip, head, or similar ignition point or surface entirely covered and securely protected against accidental contact or friction. Except as otherwise specified above, the gross weight of one outside package containing common fireworks may not be over 100 pounds.

**A27.10. Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad.** Package in wooden or fiberboard boxes or shipping containers approved by military specification or drawings.

**A27.11. Detonating, Fuzes, Class C Explosives.** Packaging requirements:

A27.11.1. Package in fiberboard boxes, DOT 12H, with or without liners, with well-secured inside paperboard cartons. Use suitable filler or lining materials to prevent movement in the box.

A27.11.2. In well-secured, strong, tight outside wooden or metal boxes approved by military specification or drawing. The gross weight of the outside wooden or metal box may not be over 190 pounds.

**A27.12. Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives.** Packaging requirements:

A27.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B, or fiberboard boxes DOT 12H, 23F, or 23H.

A27.12.2. Shipping containers approved by military specification or drawing.

**A27.13. Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive.** Packaging requirements:

A27.13.1. Pack and secure explosive bombs, mines, projectiles, torpedoes, or grenades in strong wooden or metal boxes, except as provided in (2) below.

A27.13.2. Explosive bombs, mines, projectiles, torpedoes, over 90 pounds in weight, and explosive projectiles of not less than 4 3/4 inches in diameter, may be shipped unboxed if securely fastened to pallets or securely blocked and braced.

A27.13.3. Pack and secure bombs, grenades, or projectiles containing gas, smoke, or incendiary charges and bursting charges in strong wooden or metal boxes.

A27.13.3.1. The gross weight of a box containing more than one grenade or mine may not be over 250 pounds.

A27.13.3.2. The gross weight of a shipping container with more than one explosive bomb, warhead, or projectile may not be over 1,400 pounds.

A27.13.4. Package XM47, XM42, XM42E1, and SX54 mine-dispensing subsystem and XM2, XM12, XM12E1, XM12E2/E3, and XM17 canisters in wooden or metal containers. The following special shipping procedures apply:

A27.13.4.1. Do not stack wooden containers more than three high with a minimum of 3 feet of space above the top containers. Position containers in aircraft to allow a minimum of 2 feet of space in front of the container inspection door. Tiedown containers in such a manner that allows access to inspection door (nets are not considered an obstruction); and

A27.13.4.2. Gross weight of wooden container may not be over 675 pounds.

A27.13.5. BLU 50/B bomblets are packaged in specially designed fiberboard lined plywood boxes. Inside containers consist of ten each bomblets in snug fitting, preformed polyurethane cushioning in a heat-sealed barrier bag.

A27.13.6. Explosive mines may be packaged in metal drums, PA 16, with 14 inside can assemblies with perforated tops, a preformed packing and two base assemblies. Fill drums with liquid freon. Ensure two liquid level sight gauges are located in the top half of the drum for visual monitoring of the liquid level.

A27.13.7. Explosive mines may be packaged in metal drums, PA 17, with inside preformed packing designed to hold mines below liquid freon level. Fill drums with liquid freon. Ensure two liquid level sight gauges are located in the top half of the drums for visual monitoring of the liquid level.

A27.13.8. Package CDU-4/B (SM41E1), CDE-5/B (XM40ES), CDU-10 (XM40ES/SM44) and CDU-14/B (XM64) in wooden boxes approved by military specification or drawing. Fill CDUs with liquid freon and electrically monitor level.

A27.13.9. Explosive bomb, further described as 7.2 inch projector charge, may be shipped assembled to a 40-by 48 inch steel pallet having a gross weight of approximately 2,000 pounds.

A27.13.10. Package explosive bombs, CBU-55/B, containing explosive components and fuel (ethylene oxide) in a CNU-120/E container.

A27.13.11. Package explosive bombs, CBU-55/B, without fuel, in a CNU-120/E container.

A27.13.12. Explosive bombs, CBU-33/A, may be packed in plastic containers CNU-104/E conforming to MIL-P-22748A, class A, grade 6. Loaded containers may not be over 1,200 pounds gross weight.

**A27.14. Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive. Packaging Requirements:**

A27.14.1. Fiberboard boxes, DOT 12H, 23F, or 23H. The maximum gross weight may not be over 65 pounds.

A27.14.2. Wooden or metal boxes approved by military specification or drawings. Starter cartridges, jet engine, having igniter wires short-circuited when packed for shipment.

**A27.15. Explosive Rivets.** Package explosive rivets, containing not more than 375 milligrams of explosive composition each, in unit containers or paperboard. Pack the unit containers or

paperboard in strong wooden, fiberboard or metal containers approved by military specification or drawings.

**A27.16. Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve .** Package in strong wooden or fiberboard boxes.

**A27.17. Special Fireworks.** Packaging Requirements:

A27.17.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. The maximum gross weight may not be over 500 pounds.

A27.17.2. Fiberboard boxes, DOT 12B. The maximum gross weight may not be over 65 pounds. Illuminating projectiles and airplane flares are not permitted in DOT 12B boxes.

A27.17.3. Package flash or spreader cartridges with not more than 72 grains of flash powder in inside fiberboard cartons or tin cans containing not over six cartridges. Pack no more than 150 inside containers in outside DOT 15A, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes.

A27.17.4. Package assembled flash cartridge consisting of a paper cartridge shell, small arms primer, and flash composition in inside cartons. The flash composition in the one-piece assembled and ready for firing flash cartridge may not be over 180 grains. Do not pack more than 12 cartridges each in the inside cartons. A maximum of 12 inside cartons may be packed in DOT 15A, 15B, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes. Flash cartridges, in quantities not over 5 pounds, packaged in small interior wooden boxes, may be packed with nonexplosive, nonflammable, and noncorrosive items.

A27.17.5. Unit pack no more than six flash sheets in an inside container. Intermediate pack no more than 12 unit packages in a pasteboard box or carton and packed in a DOT 15A, 16A, 19A, or 19B wooden box or DOT 12B fiberboard box. The gross weight of wooden boxes may not be over 150 pounds. The gross weight of fiberboard boxes may not be over 65 pounds.

A27.17.6. Package photographic flash powder in specification containers as specified in A27.17.3., except ensure the inside container is strong enough to hold up to 2 ounces each of contents. If bottles are used, pack each bottle in a securely closed fiber mailing tube with metal ends. Not more than forty eight 2-ounce bottles may be packed in an exterior wooden box. When packed in units not over 1-ounce each without bottles in similar fiber mailing tubes and exterior wooden boxes, the gross weight of each exterior box may not be over 150 pounds. The gross weight of exterior fiberboard boxes may not be over 65 pounds.

A27.17.7. Package toy torpedoes in wooden boxes, DOT 15A, 15B, 16A, 19A, 19B, or fiberboard boxes DOT 12B containers. Not more than 20 one-quarter gross cartons totaling not more than five gross of toy torpedoes are authorized per fiberboard box. The gross weight of a fiberboard box may not be over 35 pounds. The gross weight of a wooden box may not be over 65 pounds.

A27.17.7.1. Do not pack toy torpedoes of any kind with other fireworks.

A27.17.7.2. Pack toy torpedoes containing a cap in sawdust in inside paper or cardboard cartons. The size of the carton may not be less than 4 cubic inches for each grain of explosive.

A27.17.7.3. Pack toy torpedoes containing a mixture of potassium chlorate, black antimony, and sulfur, in an inner container containing not more than 36 torpedoes. Ensure the capacity of this inner container is at least 105 cubic inches, and divided into 12 equal compartments. Fill all vacant space inside the container with sawdust or fine shavings.

A27.17.8. Ship distress signals may be packed in outside DOT 12 fiberboard boxes provided:

A27.17.8.1. They are packed in inside metal containers. Make these containers from at least 24 gauge sheet iron or other metal of equal strength.

A27.17.8.2. The inner container is closed by positive means (not friction).

A27.17.8.3. Inside containers completely fill the outer packaging.

A27.17.8.4. The gross weight is not over 95 pounds.

A27.17.9. Marine location markers (eight each) and aircraft flares (two each) may be packed two each in a Navy-designed, preformed polystyrene container banded with pressure-sensitive tape. Ensure pallet loads have a 2-foot high, 1/4-inch plywood border around the lower portion of the load. Polystyrene case may be overwrapped in heat sealed polyethylene bag .006 inch thickness minimum. Consolidate 18 such containers in a wirebound wood box MIL-B-43096, type II, class 2, lined top, bottom and sides with fiberboard, PPP-F-320, grade W6c or equal.

A27.17.10. Illuminating projectiles, incendiary projectiles, and smoke projectiles over 90 pounds in weight each, or of not less than 4 3/4 inches in diameter, may be palletized. Securely block and brace the palletized load according to methods prescribed by the responsible military department. A shipment container is not required.

A27.17.11. Illuminating projectiles, incendiary projectiles, and smoke projectiles less than 4 3/4 inches in diameter may be shipped without being boxed, when palletized and securely blocked and braced with methods prescribed by the responsible military department.

A27.17.12. MK27 Mod O guided missile flares or MK28-3 target flares may be packed in MK2 Mod O metal boxes.

A27.17.13. Practice or exercise warheads containing polytechnics may be shipped two each in a metal box (MK34, Mod O) with a gross weight over 65 pounds.

A27.17.14. Flares may be packed in flame-retardant polystyrene cases. Ship the polystyrene cases palletized and covered with plywood or wirebound sheathing secured with steel strapping.

#### **A27.18. High Explosives.**

A27.18.1. High explosives, consisting of a liquid mixed with an absorbent material, require the absorbent (wood pulp or similar material) in sufficient quantity and be of satisfactory quality, and properly dried at the time of mixing. Ensure the nitrate of soda is dried at the time of mixing to less than 1 percent of moisture; and the ingredients are uniformly mixed so that the liquid remains thoroughly absorbed under the most unfavorable atmospheric conditions incident to transportation.

A27.18.2. Mix high explosives containing nitroglycerin or other liquid explosive ingredients uniformly with an absorbent material and a satisfactory antacid. Ensure the antacid is in

sufficient quantity to have the neutralizing power of an amount of magnesium carbonate equal to 1 percent of the nitroglycerin or other liquid explosive ingredient.

A27.18.3. High explosive cartridges consist of a column of explosives completely enclosed in a shell made of strong paper or polyethylene or a combination of paper and polyethylene, treated so that it does not absorb the liquid ingredient of the explosive.

A27.18.4. High explosive packaged bags made of strong paper of equally efficient material so treated or of such nature that it does not absorb the liquid ingredient of the explosive.

A27.18.5. Line high explosives packed in boxes with strong, paraffined paper or other suitable material. Ensure the lining is without joints or other openings or with cemented joints at the bottom, ends, or sides of the boxes. For explosives with liquid ingredients, ensure the lining is impervious to such ingredients and also to water. Protect box covers from contact with explosives by lining paper or other suitable material.

A27.18.6. Pack gelatine explosives in cartridges or bags with dry fine wood pulp or sawdust at least ¼ of an inch in depth spread over the bottom of the box or the bottom of the box may have a full area pad formed of an absorptive cellulose sheet which has a nitroglycerin absorptive value equivalent to sawdust as specified. Similar materials are required in boxes for packing all non-gelatinous types of explosives containing 30 percent or more of liquid explosive ingredient.

A27.18.7. Except for high explosive (gelatin dynamite) in cartridges, place all cartridges of high explosives exceeding 4 inches in length and containing more than 10 percent of a liquid explosive ingredient horizontally in boxes. Pack bags with their filling holes up.

A27.18.8. Prevent movement of high explosives contained in cartridges and bags within the boxes by sufficiently tight packing.

A27.18.9. High explosive (dynamite), except gelatin dynamite, packed in bags or in cartridges over 2 inches in diameter and containing not more than 30 percent liquid explosive ingredients may be packed in outer packagings without sawdust and without lining paper, provided each inside or outer packaging is siftproof and is treated to prevent penetration by the commodity with which the container is filled for shipping.

A27.18.10. Pack liquid high explosives in DOT 15L wooden boxes and DOT 15M wooden boxes. The inside metal containers in the DOT 15M containers cannot contain more than 10 quarts of liquid explosives each.

A27.18.11. High Explosives with Liquid Explosive Ingredients.

A27.18.11.1. Package high explosives (dynamite) containing no more than 30 percent liquid explosive ingredients in the following specification containers.

A27.18.11.1.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the boxes may not be over 65 pounds.

A27.18.11.1.2. Wooden boxes, DOT 14, 15A, 16A, 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside containers, which are cartridges or bags. Inside cartridges may not be more than 12 inches in diameter by 36 inches in length or 50 pounds gross weight. Securely close inside bags not over 50 pounds each to prevent leakage of

contents. The gross weight of wooden boxes may not be over 75 pounds and the gross weight of fiberboard boxes may not be more than 65 pounds.

A27.18.11.1.3. Fiberboard boxes, DOT 23F or 23H, having one inside 26-gauge metal container, measuring not over 8 inches in diameter and 31 inches in length, containing high explosives (ammonium dynamite core) surrounded by a blasting agent. Gross weight may not be more than 65 pounds.

A27.18.11.2. High explosives (dynamite) containing 10 percent or less of a liquid ingredient are prepared for shipment as follows:

A27.18.11.2.1. Packed in DOT 14, 15A, 16A, or 19B wooden boxes or in DOT 12H, 23F, or 23H fiberboard boxes. The gross weight may not be more than 140 pounds.

A27.18.11.2.2. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the box may not exceed 65 pounds.

A27.18.11.3. Pack high explosives (dynamite) containing more than 30 percent liquid explosive ingredients in specification containers as follows:

A27.18.11.3.1. Wooden boxes (maximum gross weight 75 pounds), DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H, with inside containers that consist of:

A27.18.11.3.1.1. Cartridges not over 4 inches in diameter and not over 8 inches in length.

A27.18.11.3.1.2. Redip cartridges having a diameter of 4 to 5 inches and between 8 and 10 inches in length in melted paraffin or equivalent material.

A27.18.11.3.1.3. Enclose two or more cartridges, redipped because of their size, in another strong paper shell to form a completed cartridge not more than 30 inches in length. Dip the resulting cartridge in melted paraffin or equivalent.

A27.18.11.3.1.4. The gross weight of wooden boxes may not be more than 75 pounds and the gross weight of fiberboard boxes may not be more than 65 pounds.

A27.18.11.3.2. In wooden or fiberboard specification boxes as prescribed inside containers may be paper or polyethylene bags meeting the following conditions:

A27.18.11.3.2.1. Paper bags:

A27.18.11.3.2.1.1. Paraffined two-ply paper not over 12  $\frac{3}{4}$  pounds capacity, securely closed by folding the tops and securing the fold by tape.

A27.18.11.3.2.1.2. Insert no more than two such bags into another two-ply paper bag that are securely closed and dipped in paraffin after closing.

A27.18.11.3.2.2. Polyethylene bags

A27.18.11.3.2.2.1. May not be less than 0.0004 inches in thickness and no more than 12  $\frac{3}{4}$  pounds capacity each.

A27.18.11.3.2.2.2. May not be more than two such securely closed bags packed in an intermediate polyethylene or paper bag. Securely close the polyethylene or paper bag and pack in polyethylene lined outside fiberboard boxes.

A27.18.11.3.2.3. The gross weight of wooden boxes may not be over 75 pounds, and the gross weight of fiberboard boxes may not be over 65 pounds.

A27.18.11.4. High explosives (gelatin dynamite and blasting gelatin) packed in specification containers as follows:

A27.18.11.4.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. Gross weight of boxes may not be over 65 pounds.

A27.18.11.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside cartridges or bags. The cartridges may not be more than 12 inches in diameter by 36 inches in length or 50 pounds in weight. Ensure bags not completely sealed against leakage are packed with filling holes up. The gross weight for wooden boxes may not be over 75 pounds, and the gross weight of fiberboard boxes may not be over 65 pounds.

A27.18.11.4.3. High explosives (straight gelatin dynamite of 80 percent strength and over and blasting gelatin) are packed in cartridges, or in bulk in outside boxes. When packed in bulk, double line boxes throughout with paper and pack in wooden boxes, DOT 14, 15A, 16A, or 19B or 23 H. Pack DOT 23G fiberboard boxes in an outer container consisting of at least seven-ply heavy kraft paper. Two 3-mil polyethylene bags, one within the other, may be used in place of the double-lining paper when a DOT 12H is the outer packaging. Not more than one such double bag may be packed in DOT 12H fiberboard box. The gross weight of wooden boxes may not be more than 75 pounds and the gross weight of fiberboard boxes may not be over 65 pounds.

A27.18.12. High explosives with no liquid explosive ingredient and propellant explosives, class A. Packaging requirements:

A27.18.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B. The gross weight may not be more than 140 pounds.

A27.18.12.2. Fiberboard boxes, DOT 12H, 23F, or 23H. The gross weight may not be more than 65 pounds.

A27.18.12.3. Boxes require an inside polyethylene bag having a minimum thickness of 6 mils, or lined with strong paraffined paper or other authorized material, DOT 2L. When such explosives contain over 5 percent moisture, boxes with handholes are not authorized.

A27.18.12.4. Outside boxes. When such explosives are in combination cartridges, consisting of a column of explosive with core of dynamite, they may be shipped when packed in outside boxes. The gross weight may not be over 65 pounds. Completely enclose the column of explosives in waterproofed cloth or waterproofed paper, which are not more than 6 inches in diameter, 2 inches in length, or 25 pounds gross weight.

A27.18.12.5. Fiberboard boxes, DOT 23G. Gross weight of the box may not be over 65 pounds. The high explosives sensitiveness to percussion may not be greater than that measured by the blow delivered by an 8 pound weight dropping from a distance of 7 inches on a compressed pellet of the explosive 0.03 inch thick and 0.2 inch diameter. The compressed pellet is confined rigidly between hard steel surfaces as in standard Impact Testing Apparatus of the Bureau of Explosives during the test. Pack the high explosives in cartridges when their sensitiveness is greater than the limit prescribed herein. Such

explosives, when dry, may be packed in strong siftproof cloth or paper bags of capacity not be over 25 pounds.

A27.18.13. High explosives with no liquid explosive ingredient nor any chlorate. Pack in one of the following outer containers:

A27.18.13.1. When high explosives contain over 5 percent moisture, ensure the box has an inside securely closed polyethylene bag having a minimum thickness of 6 mil; or the box has a DOT 2L lining. Polyethylene is authorized only for materials that do not react with or cause decomposition of the plastic.

A27.18.13.2. When high explosives are in combination cartridges, consisting of a column of explosives with a core of dynamite, they may be packed in exterior containers with 65 pounds as the maximum gross weight. Completely enclose the column of explosives in waterproofed cloth or strong waterproofed paper, not more than 6 inches in diameter, 20 inches in length, or a gross weight of 25 pounds.

A27.18.13.3. Sensitiveness to percussion is not greater than that measured by the blow delivered by an 8-pound weight, dropping from a distance of 7 inches, or compressed pellet of the explosive 0.03-inch thick and 0.20-inch diameter, confined rigidly between hard steel surfaces as in the Standard Impact Testing Apparatus of the Bureau of Explosives. The requirement of packaging in cartridges, bags, or metal containers does not apply to plastic-bonded explosives. Pack and cushion to prevent movement of individual pieces within the outside shipping container. Pack in cartridges when their sensitiveness is greater than the limit prescribed in this section. Such explosives, when dry may be packed in strong siftproof bags, securely closed to prevent leakage, or in metal containers of capacity not over 60 pounds.

A27.18.13.4. Wooden boxes, DOT 14, 15A, 16A, or 19B. Gross weight may not be over 140 pounds. Wooden boxes, having inside metal containers that are tightly and securely closed, may be equipped with handholes in each end that may not be more than 1- by 4-inches and centered laterally not nearer than 1 5/8 inches from top edge of box.

A27.18.13.5. Fiberboard boxes, DOT 12H, 23F, 23G, or 23H. Gross weight may not be over 65 pounds.

A27.18.13.6. Metal drums (single-trip) DOT 17H or 37A having a minimum 0.003-inch thick polyethylene liner. Authorized only for Ammonium Perchlorate with particle size of 5 to 15 micrometers. Maximum capacity is 30 gallons.

A27.18.14. Amatol consisting of 80 percent ammonium nitrate and 20 percent Trinitrotoluene, Ammonium Picrate, Nitroguanidine, Nitrourea, Urea Nitrate, Picric Acid, Tetryl, Trinitroresorcinal, Trinitrotoluene, Pentolite, Cyclotrimethyltrinitramine (desensitized), and Soda Amatol, in dry condition, may be shipped in containers with the following specifications:

A27.18.14.1. Those described in A27.18.13.

A27.18.14.2. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong paper or cloth bags of capacity not over 50 pounds, packed with filling holes up.

A27.18.14.3. Fiber drums, DOT 21C. Net weight not over 200 pounds.



A27.18.15. Trinitrotoluene and Pentolite in dry condition.

A27.18.15.1. Packed in containers described in A27.18.13.

A27.18.15.2. Packed in containers described in A27.18.14.

A27.18.15.3. Wooden boxes, DOT 14, 15A, 16A, 19B, or with strong paper or cloth bags of capacity not over 100 pounds, packed with filling holes up.

A27.18.15.4. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong siftproof liners, DOT 2L.

A27.18.15.5. Fiber drums, DOT 21C. Net weight may not be over 200 pounds.

A27.18.15.6. The following materials may be shipped dry, in quantity not more than 4 ounces in one outside package for medical purposes or as reagents, as drugs, medicines, or chemicals without other restriction, when in securely closed bottles or jars properly cushioned to prevent breakage:

A27.18.15.6.1. Ammonium picrate

A27.18.15.6.2. Dipicrylamine

A27.18.15.6.3. Dipicryl sulfide

A27.18.15.6.4. Dinitrophenylhydrazine

A27.18.15.6.5. Nitroguanidine

A27.18.15.6.6. Picramide

A27.18.15.6.7. Picric acid

A27.18.15.6.8. Picryl chloride

A27.18.15.6.9. Trinitroanisole

A27.18.15.6.10. Trinitrobenzene

A27.18.15.6.11. Trinitrobenzoic acid

A27.18.15.6.12. Trinitro-m-cresol

A27.18.15.6.13. Trinitronaphthalene

A27.18.15.6.14. Trinitroresorcinol

A27.18.15.6.15. Trinitrotoluene

A27.18.15.6.16. Urea nitrate

A27.18.15.6.17. Triaminotrinitrobenzene

A27.18.15.6.18. Trichlorotrinitrobenzene

A27.18.15.6.19. Hexanitrostilbene

A27.18.16. Ship Ammonium Picrate, Picric Acid, Urea Nitrate, Trinitrobenzene, Trinitroresorcinol, Trinitrotoluene, Cyclotrimethylenetrinitramine, Cyclotetramethylenetetranitramine, Pentaerythrite Tetranitrate (desensitized), or Trinitrobenzoic Acid

when wet with not less than 10 pounds of water to each 90 pounds of dry material in containers complying with the following specifications:

- A27.18.16.1. Metal barrels or drums, DOT 5B, or fiber drums, DOT 2C. Authorized only for Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine, wet with not less than 10 pounds of water to each 90 pounds of dry material in inside containers which are bags made of at least 10-ounce cotton duck rubber or rubberized cloth, and securely closed. The dry weight of Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine in one metal barrel or drum may not be more than 300 pounds and not more than 225 pounds in fiber drums. Then place each bag containing the Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material that is securely closed and then placed in the drum. If shipment of cyclotrimethylenetrinitramine is to take place at a time freezing weather is anticipated, wet with a mixture of denatured ethyl alcohol or other suitable antifreeze and water of such proportions that freezing does not occur in transit.
- A27.18.16.2. Fiber drum, DOT 21C, with inside polyethylene bag having 0.004 inch minimum thickness and liquid tight closure. Net weight may not be over 200 pounds. Authorized only for wet desensitized Pentaerythrite Tetranitrate.
- A27.18.17. Amatol when cast or compressed in a solid block or column, in addition to containers prescribed in A27.18.5. may be shipped in metal drums, DOT 13A, not over 90 pounds gross weight.
- A27.18.18. Pack nitrocellulose in wooden boxes complying with DOT 14, 15A, 16A, or 19B, with inside packages as follows:
- A27.18.18.1. Wrap in strong paraffined paper or suitable sparkproof material, when containing not more than 1 pound each of dry, uncompressed nitrocellulose. Completed outside package may not contain more than 10 pounds of dry nitrocellulose.
- A27.18.18.2. Wrapped in strong paraffined paper when containing compressed sticks or blocks of dry nitrocellulose. Gross weight may not be over 75 pounds.
- A27.18.19. Shaped charges, commercial, having exposed lined conical cavities that are covered are be paired together with the cavities facing each other and with one or more pairs in a fiber tube, or so arranged that the conical cavities of the shaped charges at the ends of the column face toward the center of the tube. Fit the shaped charges in the fiber tubes snugly with no excess space in the outer packaging. Pack shaped charges, commercial, in specification containers as follows:
- A27.18.19.1. Wooden boxes, DOT 14, 15A, 16A, or 19B; gross weight may not be over 140 pounds.
- A27.18.19.2. Fiberboard boxes, DOT 12H, 23F, or 23H; gross weight may not be over 65 pounds.
- A27.18.19.3. Fiberboard boxes, DOT 12B; at least 275 pounds test double-wall corrugated fiberboard, with double-faced corrugated lining board having minimum test of 200 pounds. Pack individual charges of explosives in inside securely closed, waterproof plastic containers, or in securely closed waterproof container having metal ends. Separate

inside individual containers by means of double-faced corrugated fiberboard partitions of material not less than 175 pounds (Mullen or Cady). Gross weight may not be over 65 pounds.

A27.18.19.4. Specially designed Navy steel cylindrical containers possessing a shock mitigation system. One each charge, to a container: four containers properly strapped or banded to a pallet.

A27.18.20. Cyclotrimethylenetrinitramine (RDX) (desensitized) in pellet form, dry may also be packed in specification containers as follows:

A27.18.20.1. Wooden box, DOT 15A or 19B, for pellets  $\frac{1}{4}$  of an inch or less in diameter. Pack pellets in a slide-type fiber container with perforated fillers. Securely close all openings of the container with pressure-sensitive tape. Cushion inside containers with at least 2 inches of sawdust between inner and outer containers. No inside container may contain more than  $\frac{3}{4}$  pound net weight of explosive composition, and not more than 10 pounds of net weight explosive composition may be packed in one outside box.

A27.18.20.2. Wooden box, DOT 15A or 19B, for pellets exceeding  $\frac{1}{4}$  inch in diameter. Pack pellets in a fiber tube with positive closures at both ends, and then pack in a fiber container having not more than  $\frac{3}{4}$  pound net weight of explosive composition. Cushion inside containers with at least 2 inches of sawdust between inner and outer containers. Not more than 10 pounds of net weight of explosive composition may be packed in one outer packaging.

A27.18.21. Pack conversion kits, containing Comp. A-3 pellets, eight each to a fiberboard lined, metal ammunition components box, MK2. Securely nest kit components and separately packaged pellets within fiberboard separators in inside fiberboard boxes.

**A27.19. Igniter Cord.** Pack in strong, tight, outside fiberboard boxes or drums, wooden boxes, or metal containers.

**A27.20. Initiating Explosive.**

A27.20.1. Diazodinitrophenol or Lead Mononitroresorcinate. Packaged wet with not less than 40 percent by weight of water in:

A27.20.1.1. Metal barrels or drums, DOT 5 or 5B, with inside securely closed bags made of at least 10-ounce cotton duck, rubber, or rubberized cloth. The dry weight of Diazodinitrophenol in one container may not be more than 220 pounds, and the dry weight of lead mononitroresorcinate in one container may not be over 100 pounds. Place the bags containing Diazodinitrophenol in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material, and then place in the barrel or drum. Fill any empty space in the outside bag with water, and securely close this bag. Allow sufficient outage in the outer packaging to prevent rupturing of the container in freezing weather, or a mixture of denatured alcohol and water may be used to prevent freezing in transit.

A27.20.1.2. Fiber drums, DOT 21C, not over 30-gallon capacity of at least 9-ply construction having in addition, a sheet of steel having a minimum base box of 75 pounds, not less than .008-inch thick, wound between the fifth and sixth plies. Laminate the inside ply of kraft paper on each side with polyethylene to form a waterproof lining. Ensure the

bottom head is fiber, metal covered on the outside, and attached to the body to form a watertight joint.

A27.20.1.2.1. Lead Mononitroresorcinate may only be packed wet, with not less than 40 percent by weight of water, and contained in at least two tightly sealed polyethylene bags of at least 0.004-inch thickness; this unit is then be placed in a tightly closed polyethylene bag of at least 0.004-inch thickness, and this assembly is placed within a 0.006-inch thickness polyethylene (or other suitable plastic bag) completely filled with water and tightly closed. The 0.006-inch plastic bag is of such a size as to completely fill the outside shipping container. The dry weight of lead Mononitroresorcinate only in one outer packaging may not be more than 100 pounds.

A27.20.2. Guanyl Nitrosomino Guanylidene Hydrazine. Packed wet with not less than 30 percent by weight of water in metal barrels or drums, DOT 5 or 5B, with 4-ounce duck bag inside containers. Inside the bag, and over the Guanyl Nitrosamino Guanylidene Hydrazine, place a cap of the same fabric, of the same diameter as the bag. Securely tie the bag and place in a strong grain bag and securely tie. The dry weight of Guanyl Nitrosamino Guanylidene Hydrazine in one container may not be over 75 pounds. Pack the bag and contents in the center of the wooden barrel or keg, metal barrel or drum, and entirely surround with not less than 3 inches of well packed sawdust saturated with water. Line the wooden barrel or keg, or metal barrel or drum, with a heavy close-fitting jute bag, closed by secure sewing to prevent escape of sawdust. Inspect the barrel, keg, or drum carefully and stop all leaks. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing does not occur during transit.

A27.20.3. Lead Azide (dextrinated type or otherwise prepared to effectively control grain size). Packed wet with not less than 20 percent by weight of water. Containers, packaging, and procedures are the same as prescribed in A27.20.2. except that the dry weight of Lead Azide in one container may not be over 150 pounds. The same freezing precautions apply.

A27.20.4. Lead Styphnate (Lead Trinitrosorcinate) or Barium Styphnate, Monohydrate. Packed wet with not less than 20 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with bags of rubber or rubberized cloth inside containers.

A27.20.4.1. Divide the Lead Styphnate or Barium Styphnate, Monohydrate within this bag into a number of smaller packages. Cap the bag with the same material of the same diameter as the bag over the Lead Sytphnate inside the bag.

A27.20.4.2. The dry weight of Lead Styphnate or Barium Styphnate, Monohydrate in one outer container may not be over 150 pounds. Pack the bag and contents in the center of the metal barrel or drum, and entirely surround by not less than 3 inches of well packed sawdust saturated with water.

A27.20.4.3. Line the metal barrel or drum with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. Inspect the barrel or drum carefully and stop all leaks.

A27.20.4.4. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing does not occur during transit.

A27.20.5. Nitromannite. Packed wet, with not less than 40 percent by weight or water container and packaging procedures are the same as A27.20.1. except that the dry weight of Nitro mannite in one container may not be over 100 pounds. The same freezing precautions apply.

A27.20.6. Nitrosoguanadine. Packed wet with not less than 10 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with inside strong cloth bag. The dry weight of Nitrosoguanidine in one container may not be over 75 pounds.

A27.20.7. Pentaerythrite Tetranitrate. Packed wet with not less than 40 percent by weight of water. Container and packaging procedures are outlined in A27.20.1. Except that the dry weight of Pentaerythrite Tetranitrate in one container may not be over 300 pounds. The same freezing precautions apply.

A27.20.8. Tetrazene. Packed wet with not less than 30 percent by weight of water. Container and packaging are the same as A27.20.2. The dry weight in one container may not be more than 75 pounds. The same freezing precautions apply.

A27.20.9. Fulminate of Mercury. Packed wet with not less than 25 percent by weight of water in DOT 5, 5B, or 17H metal drums or barrels with inside bag made of 4-ounce duck.

A27.20.9.1. Inside the bag and over the Fulminate, place a cap of the same fabric and of the same diameter as the bag. Securely tie the bag and place in a strong grain bag. Securely tie this grain bag.

A27.20.9.2. The dry weight of Fulminate in one container may not be over 150 pounds. Pack the bag and contents in the center of the wooden barrel, keg, or drum, entirely surrounded by not less than 3 inches of well-packed sawdust saturated with water.

A27.20.9.3. Line the barrel or drum with a heavy, close fitting jute bag closed by secure sewing to prevent escape of sawdust. Inspect the barrel or drum carefully, to stop all leaks.

A27.20.9.4. If shipment of Fulminate of Mercury is to take place at a time that freezing weather is to be anticipated, use a mixture of denatured ethyl alcohol and water of such proportions that freezing does not occur in transit.

**A27.21. Rocket motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives).** Package in:

A27.21.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.21.2. Metal Containers, MIL-D-6054 or other metal containers approved by the DOT.

A27.21.2.1. Igniters or igniter components may be shipped in the same outer packaging with the rocket motor or jet thrust unit if separately packed in unit package (metal can, fiberboard box, etc).

A27.21.2.2. Ship rocket motors in nonpropulsive state. When military air shipment of a rocket motor in a propulsive state is required, obtain written approval from hazard classification authority listed in TB 700-2/NAVSEAINST 8020.8B/T.O. 11A-1-47/DLAR 8220.1, DOD Explosive Hazard Classification Procedures.

**A27.22. Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine.** Package requirements:

- A27.22.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B. Packages containing igniters, ramjet engines may not be over 500 pounds gross weight.
- A27.22.2. Wooden boxes, DOT 15B, authorized only for igniters, jet thrust (jato) class B or igniters, rocket motor igniters, ramjet engine, class B explosive. Packages containing igniters, ramjet engine may not be over 500 pounds gross weight.
- A27.22.3. Service-designated and NAVAIR/NAVSEA-approved wood or metal containers identified by Ordnance Requirement (OR), MIL-STD, or other appropriate container document, and a letter container designated, such as MK and MOD or CNU numbers.
- A27.22.4. MIL-D-6054 drums (MS 63052) with specially designated interior blocking and bracing. Authorized for jet thrust units, class B explosives only.
- A27.22.5. LAU-10/A Launcher, using unit load adapter MK58, MOD 1 and palletized with WR-54/ 115C, which consists of 16 units per shipment of rocket motors, class B explosives.
- A27.22.6. MK4 metal container with properly designed interior mounting or blocking supports. Authorized for packed one each M77A1 rocket.
- A27.22.7. Fiberboard box, DOT 23F, authorized for Igniters, Jet Thrust (jato), Class B, Igniters, Rocket Motor, Class B, or Starter Cartridges, Jet Engine, Class B only packed in tightly closed inside fiberboard boxes, at least 200 pound test (Mullen or Cady), or metal containers. Ensure Starter Cartridges, Jet Engine, have igniter wires short-circuited when packed for shipment.
- A27.22.8. Wooden boxes, specification MIL-B-2427, Grade A, Style 4, Type II, containing eight igniters packed one each in inside hermetically sealed metal containers.
- A27.22.8.1. Igniters or igniter components may be shipped in the same container with jet thrust units. When approved by military specifications or drawings.
- A27.22.8.2. Ship rocket motors in a nonpropulsive state. When military air shipment of a rocket motor in a propulsive state is required, obtain written approval from hazard classification authority listed in TB 70-2/NAVSEAINST 8020.3/T.O. 11A-1-47/DLAR 8220.1, DOD Explosive Hazard Classification Procedures.

**A27.23. Railway Torpedoes. Packaging Requirements:**

- A27.23.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B are authorized; however, the net weight in wooden boxes may not be over 125 pounds.
- A27.23.2. Fiberboard boxes, DOT 12H, 23F, or 23H are authorized; however, the gross weight may not be over 65 pounds.
- A27.23.3. Fiberboard boxes, DOT 12B, with inside cartons are authorized. The inside cartons may not contain over 72 track torpedoes each. The gross weight of the exterior fiberboard box may not be over 65 pounds.
- A27.23.4. Fiberboard boxes, DOT 12B, without inside containers may be used for not more than 50 track torpedoes provided the smallest dimension of the box is at least 6 inches.

**A27.24. Propellant Explosives, Solid or Liquid (Class A or B Explosives). Package Requirements:**

- A27.24.1. Tight metal cases in tight wooden boxes free from loose knots and cracks, or tight metal containers. Gross weight may not be over 200 pounds.
- A27.24.2. Wooden boxes, DOT 14, 15A, or 19B metal lined DOT 2F. Gross weight may not be over 200 pounds.
- A27.24.3. Wooden boxes, DOT 14, 15A, 19B, or fiberboard boxes, DOT specifications 23F, or 23H, with inside cloth or paper bags of capacity may not be over 25 pounds net weight. Ensure each bag is capable of withstanding, when filled, at least 2 drops on end from a height of 4 feet without breaking or sifting of contents. Net weight of contents in outer packaging may not be over 50 pounds.
- A27.24.4. Wooden boxes, DOT 14, 15A, 15B, 15C, 19B, or fiberboard boxes, DOT 12B, or 23H, with inside DOT 13 metal kegs. Fiberboard boxes may contain not more than six metal kegs not over 5 pounds net weight each in one outer packaging. Gross weight of wooden boxes may not be over 200 pounds, and fiberboard boxes may not be more than 65 pounds.
- A27.24.5. Wooden boxes, DOT 14, 15A, 15B, 15C, or 19B fiberboard boxes, DOT 23F or 23H, with inside strong metal containers. A maximum of four inside containers may not be more than 25 pounds each. Gross weight of fiberboard boxes may not be more than 65 pounds.
- A27.24.6. Fiber drums, DOT 21C. Drums having wooden heads require a strong sift-proof liner. Authorized net weight not over 265 pounds.
- A27.24.7. Wooden boxes, DOT 14, 15A, 16A, or 19B not lined, authorized only for grains not less than 1 inch in diameter or 3 inches in length, provided such grains are tightly packed and are coated with a protective material. Gross weight may not be over 200 pounds.
- A27.24.8. Other wooden boxes and fiberboard boxes approved by the military services may be used instead of DOT specification containers.
- A27.24.9. Wooden boxes, DOT 14, 15A, 15B, 19B, or fiberboard boxes, DOT 12H, 23F, or 23H with inside fiber or metal containers of not more than a 1 ¾ pound capacity each. Gross

weight of wooden boxes may not be over 200 pounds, and fiberboard boxes may not weigh over 65 pounds.

A27.24.10. Conversion kits, containing Propellant Explosives, Class A, are packed eight each to a fiberboard lined, metal ammunition components box, MK2. Nest kit components and separately packaged pellets securely within fiberboard separators.

A27.24.11. Fiberboard boxes, DOT 12H, 23G, or 23H with inside securely closed polyethylene bags having a minimum wall thickness of 6 mils.

A27.24.11.1. Pack Propellant Explosives (Smokeless Powder for Cannon or Small Arms) in water, in containers to comply with the following specifications:

A27.24.11.2. Metal barrels or drums, DOT 5, 5A, 5B, 6B, or 6C.

A27.24.11.3. Wooden boxes, DOT 15A or 19B, metal lined DOT 2F.

A27.24.12. Pack Propellant Explosives (liquid) in specific containers as follows:

A27.24.12.1. Wooden boxes or wooden boxes fiberboard lined, DOT 15A, 15B, or 15E, with inside polyethylene bottles having taped screw cap closures, not over 1-gallon capacity each. Contain each bottle entirely within a polyethylene or other suitable plastic bag formed of material not less than 0.004-inch thickness, with ends securely closed. Enclose each bottle in the plastic bag in a tight metal container, and surround on all sides with at least 2 inches of incombustible cushioning material. Cushion cans in the outside box from each other and the sides, top, and bottom of the container.

A27.24.12.2. Metal barrels or drums, DOT 5B, 6B, 6C, 6D, or 17C, with inside polyethylene, DOT 2S, container packed inside a strong, tight metal drum and securely closed, or inside glass-lined aluminum carboy not over a 12-gallon capacity. Surround inside steel or glass-lined carboy on all sides with at least 2 inches of incombustible absorbent cushioning material uniformly distributed. Polyethylene containers are authorized only for liquids that do not react dangerously with plastic or result in container failure. Containers may not be entirely filled; leave sufficient interior space vacant to prevent leakage or distortion of containers due to expansion of the contents from increased temperatures during transit.

A27.24.13. Pack Propellant Explosives (solid) with small arms primers as follows:

A27.24.13.1. Tightly close inside containers in metal cans or fiber containers, not over 1-pound each or not containing more than one-grain of propellant (not exceeding 5 pounds each). Pack the inside container to prevent movement within the outer packaging.

A27.24.13.2. Not more than 1,000 small arms packed as prescribed in A27.7.3. may be included in one outside shipping container with solid propellant explosives. Pack the inside container to prevent movement within outer packaging.

A27.24.13.3. Wooden boxes, DOT 15A, 15B, 15C, or 19B.

A27.24.13.4. Fiberboard boxes, DOT 12B, 23F, or 23H. Not more than 10 pounds of propellant explosives may be shipped in one outer packaging.

A27.24.14. Package Document Destroyer with starter as follows:



A27.24.14.1. Metal or fiber drums with inside containers and items consisting of five 20-pound packages of sodium nitrate in kraft bags lined with polyethylene; 2 pounds of sodium nitrate, 0.2-0.4 percent Anti-caking Tricalcium Phosphate, and 2 pounds of sugar mixed with ¼ pound of charcoal in kraft bags lined with polyethylene; Two Igniter Incendiary M-25 consisting of the M-201A1 fuse adapted to the M-1 fire starter approximately 1 inch in diameter by 2 ¾ inches high cellulose acetate body filled with petroleum jelly; one 24-inch two mesh wire screen; safety matches. Net weight of contents may not be more than 120 pounds.

A27.24.14.2. Metal drums (Army drawing D-4 11-34) with inside fiber drums and items consisting of sodium nitrate, a 2-inch tube filled with charcoal, sodium nitrate, and sugar. The inside drum is positioned to form a 2-inch annulus which is filled with sodium nitrate.

**A27.25. Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles).** Pack in strong wooden or metal containers or aluminum containers approved by military specification or drawings.

**A27.26. Small Arms Ammunition and Small Arms Ammunition, Tear Gas Cartridges.** Pack in pasteboard or other inside boxes, or in partitions designed to fit snugly in the outer packaging, or pack in metal clips. Design the partitions and metal clips to protect the primers from accidental damage. Pack the inside boxes, partitions, and metal clips in securely closed strong outside wooden or fiberboard boxes or metal containers. Blank industrial power load cartridges may be packed in bulk in securely closed fiberboard boxes.

**A27.27. Toy Caps.** Toy caps may not contain more than an average of ¼ grain of explosive composition per cap, and be packed in inside packages constructed of paperboard not less than 0.013-inch thick, or metal not less than 0.008-inch thick, or noncombustible plastic not less than 0.015-inch thick. Ensure the material provides a complete enclosure, and the minimum dimensions of each side or end of such package may be not less than 1/8 of an inch in height. The number of caps in an inside package is limited so that not more than 10 grains of explosive composition is packed into 1 cubic inch of space, and not more than 17.5 grains of explosive composition of toy caps is packed in any inside container.

A27.27.1. Pack Toy Caps In:

A27.27.1.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight may not be over 150 pounds.

A27.27.1.2. Fiberboard boxes, DOT 12B. Gross weight may not be over 65 pounds.

A27.27.1.3. Wooden boxes in good condition, and weighing not more than 100 pounds gross.

**A27.28. Explosive Power Device, Class B.** Packing requirements:

A27.28.1. Wooden boxes or wooden boxes, fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.28.2. Containers authorized by military specification or drawings.

**A27.29. Rocket Engine (Liquid), Class B Explosives.** Pack in strong, airtight metal containers approved by military specification or drawings. Follow handling instructions and special requirements in A3.3.1.8.

**A27.30. Cartridge, Practice Ammunition.** Pack in inside boxes, partitions, or metal clips to protect primers from accidental firing, then place in:

A27.30.1. A strong wooden box closed by strapping.

A27.30.2. A fiberboard box closed by strapping or taping.

A27.30.3. A metal container.

**A27.31. Blasting Agent N.O.S..** Packaging Requirements:

A27.31.1. Ensure rigid packages (e.g., boxes and drums), prepared as for shipment, are capable of withstanding a 4-foot drop onto solid concrete so as to strike the most vulnerable point on the package without rupture of any loss of contents.

A27.31.2. Ensure nonrigid packages (e.g., tubes and bags), prepared as for shipment, are capable of withstanding three 4-foot drops onto solid concrete without rupture of any loss of content.

**A27.32. Oil Well Cartridges.** Pack so that explosive composition is not over 20 grains per cubic inch of space in the following shipping containers:

A27.32.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight may not exceed 150 pounds.

A27.32.2. Fiberboard box, DOT 15B. Gross weight may not exceed 65 pounds.

**A27.33. Moderate Ammunition Explosive Hazards.** Pack in strong fiberboard or wooden boxes. The ammunition may also be packed in wooden or metal barrels or drums.

**A27.34. Tear Gas Grenades.** Package requirements:

A27.34.1. Metal-strapped wooden boxes, DOT 15A, 15B, 15C or 19B. Ensure functioning elements not assembled in grenades or devices are in a separate compartment of these boxes either inside or separate outside boxes, DOT 15A, 15B, 15C or 19B. Pack and cushion the elements so they do not come in contact with each other or with walls of the boxes during transportation. Not more than 50 grenades and 50 functioning devices may be packed in one outside container. The gross weight of the package may not be over more than 75 pounds.

A27.34.2. Metal drum (single-trip) DOT 37A. Pack functioning elements in separate compartments. Not more than 24 grenades and 24 functioning devices may be packed in one outside container. The gross weight of the container may not be more than 75 pounds.

A27.34.3. Metal container, CNU-79/E, containing dispenser and 40 modules (32 bomblets containing orthochlorbenzalmalononitrile with a limited explosive train for expelling charge so designed and arranged and that neither propagation between modules nor accidental functioning can occur during transportation. Gross weight of container may not be over 1,200 pounds. Mark each outside container "TEAR GAS GRENADES".

A27.34.4. Grenades or other similar devices may be shipped completely assembled, provided the functioning elements are packed so that they do not accidentally function.

A27.34.5. Riot control canister cluster, E158 or E159 packed in a plywood box, PP-B-601. Mark each outside container "TEAR GAS GRENADE (DEVICE)".

Table A27.2. DOT/Military Specification Cross Reference.

DOT Specification	Military/Federal Specification	Description
1A	None	Boxed carboys
2C	PPP-B-636, Type CF-DW, 275	Inside containers, corrugated fiberboard carton
2F	PPP-C-96	Inside metal container and liner
2L	None	Lining for boxes
2S	MIL-D-40030, Styles A and B	Polyethylene containers
5	PPP-P-704, Type I, Class 7 and 10	Steel barrels or drums
5B	PPP-P-704, Type I, Class 4; Type III, Class 7 and 8; PPP-D-729, Type 1, Class A and B	Steel barrels or drums
6B	PPP-D-736, Type III and IV	Steel barrels or drums
6C	None	Steel barrels or drums
6D	PPP-C-1337, Type I, Class 3 and 4, Type II	Cylindrical steel overpack, straight sided for inside plastic container
12B	PPP-B-636, Type CF or SF, V3c	Fiberboard boxes
12H	PPP-B-636, Type CF, V3c, Style FTC	Fiberboard boxes
13	None	Metal kegs
13A	None	Metal drums
14	None	Wooden boxes, nailed
15A	PPP-B-621, Styles 1, 2, 2 ¾, 6, and 7, MIL-B-2427, Types I, II, III. MIL-B-48024, Type I and II.	Wooden boxes, nailed.
15B	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7. MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II	Wooden boxes, nailed
15C	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7. MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II.	Wooden boxes, nailed
15E	None	Wooden boxes, fiberboard lined
15L	None	Wooden boxes with inside containers for desensitized liquid explosives
15M	None	Wooden boxes, metal lined, with inside containers for desensitized liquid explosives
16A	PPP-B-585; MIL-B-46506	Plywood or wooden boxes, wirebound

<b>DOT Specification</b>	<b>Military/Federal Specification</b>	<b>Description</b>
17C	PPP-P-704, Type I, Class 4 and 9; Type II, Class 10 and 11. PPP-D-736, Type V and VI	Steel drums
17H	PPP-D-729, Type IV; PPP-D-705, Type V; PPP-P-704, Type II, Class 7	Steel barrels or drums
19A	PPP-B-601; MIL-B-48024	Wooden boxes, glued plywood, cleated
19B	None	Wooden boxes, glued plywood, nailed
21C	None	Fiber drum
23F	PPP-B-636, Type CF and SF	Fiberboard boxes
23G	None	Special cylindrical fiberboard box for high explosives.
23H	PPP-B-636, Type SF	Fiberboard boxes
37A	PPP-P-704, Type II, Class 1,3,5,8, and 9; Type III, Class 1,3, and 6; MIL-D-13901	Steel drums

## Attachment 28

## INSPECTION PROCEDURES

**A28.1. Inspection General Requirements.** Inspect hazardous materials before entering into the military airlift system. The inspection ensures hazardous materials are properly prepared and documented. Follow the guidelines in this attachment when inspecting hazardous materials, including opening an external container to inspect the internal packagings.

A28.1.1. Originating Shipping Activities. This activity prevents entry of improper shipments into the transportation system. Establish a quality control program that ensures packing, marking, labeling, and certifying of hazardous materials comply with this manual and safety of airlift criteria.

A28.1.1.1. Inspect each package to ensure the packaging is correct and in good condition.

A28.1.1.2. Open exterior containers if there is physical evidence to support suspected damage of the inner receptacles or if the external markings do not correspond to the type of container. Reseal opened containers according to the applicable test report or SPI.

A28.1.1.3. Provide graduated dip-stick with any vehicle or wheel engine-powered SE without an operational fuel gauge containing fuel-in-tank. Not required if the item is drained and purged or drained to 500 ml (17 ounces) or less of residual fuel.

A28.1.1.4. Check shipper's certification for overall accuracy including correct packaging paragraph.

A28.1.1.5. Immediately remove damaged or improperly prepared packages from the transportation system.

A28.1.1.6. Periodically inspect cylinders or spheres to ensure they have been retested and marked as required by 49 CFR Part 180, Subpart C and DLAI 4145.25/AR 700-68/NAVSUPINST 4440.128/MCO 10330.2B/ AFMAN 23-227\_IP, *Storage and Handling of Compressed Gases and Cylinders*. Do not offer for transportation any cylinder or sphere not meeting this requirement.

A28.1.2. Inspectors Other Than Originating Shipping Activity. Establish an inspection program at each Aerial Port of Embarkation to prevent improperly prepared hazardous material from entering the transportation system.

A28.1.2.1. As a minimum, visually inspect all exterior containers and equipment for damage or leakage. Reject packages showing evidence of leakage (moisture or staining) or other suspected damage until corrective action is taken to make sure the item is safe for air shipment (see paragraph 1.7.). Rigged airdrop loads do not have to be de-rigged. Inspect airdrop loads only as an outer package.

A28.1.2.2. Remove improperly prepared or damaged containers from the transportation system and advise the shipper to immediately coordinate corrective action. Properly store suspect packages containing explosive material pending repair or disposition.

A28.1.2.3. Use accurate fuel gauges, graduated dip-sticks or other positive means to determine the amount of fuel-in-tank for vehicles and equipment. If positive means is not available, drain and refill fuel tank to appropriate level in the presence of an inspector.

A28.1.2.4. Review all Shipper's Declarations for Dangerous Goods for accuracy. Make sure special instructions and warning labels are complete and being followed.

A28.1.2.5. Enter "Inspected by (followed by name of inspector, location, and date)" in key 6 of the Shipper's Declaration form. The "Inspector" cannot be the same individual who completes the Shipper's Declaration for Dangerous Goods and signs Key 22.

A28.1.2.6. Do not violate compatibility requirements (Attachment 18) in the consolidation or makeup of cargo loads.

A28.1.2.7. Report deficiencies in accordance with the procedures detailed in the DTR 4500.9-R, Part II, Chapter 210. Report supply discrepancies including item, packaging, and documentation discrepancies under official Supply Discrepancy Report (SDR) guidance contained in Defense Logistics Manual (DLM) 4000.25-M, Defense Logistics Management System (DLMS), Volume 2, Chapter 17, Supply Discrepancy Reporting (or equivalent reporting means as designated by the Service Focal Points and coordinated with HQ AMC) for any deficiencies discovered.

A28.1.2.8. The Contingency Response Group (CRG), Departure Airfield Control Group (DACG), or Contingency Response Element/Team (CRE/CRT) or Cargo Deployment Function (CDF) provides qualified joint inspectors for the mobility movement inspection function during tactical or contingency deployments, redeployments, and exercises (see paragraph 1.2.6.).

A28.1.2.9. Figure A28.1. is an example of inspection record format.

**A28.2. Inspection Packaging Procedures.** Design inspection procedures to validate safety of the shipment. Do not physically damage the package or perform any function that adversely affects the integrity or original performance capability of the packaging.

A28.2.1. Packaging Areas of Emphasis. As a minimum, inspection addresses the following areas:

A28.2.1.1. Single Packaging.

A28.2.1.1.1. Drum ullage.

A28.2.1.1.2. External visual condition and serviceability. Dents or corrosion at chime or seam, or dents causing paint chipping is considered damaged and requires removal from the transportation system.

A28.2.1.1.3. External package marking and labeling. Verify UN specification code (including package type and gross weight), for air eligibility, hazard and handling markings/labels.

A28.2.1.2. Combination Packaging.

A28.2.1.2.1. Inner receptacle orientation.

A28.2.1.2.2. Inner receptacle ullage.

A28.2.1.2.3. Inner receptacle secondary closure.

A28.2.1.2.4. Absorbent and cushioning material.

A28.2.1.2.5. Leak-proof liner (covering item or lining outer container).

A28.2.1.2.6. Air-eligible.

A28.2.1.2.7. External package markings including UN specification code, air-eligible, hazard and handling marking/labels, orientation markings for combination packagings and drums used as overpacks.

A28.2.1.3. Vehicles and Equipment.

A28.2.1.3.1. Fuel gauges operative or graduated dip-stick available.

A28.2.1.3.2. Fuel in tank quantity, including verifying presence of additional fuel tanks.

A28.2.1.3.3. Fuel leaks.

A28.2.1.3.4. Battery terminal posts protected against short circuit.

A28.2.1.3.5. Fire extinguishers secured in properly configured and approved holders.

A28.2.1.3.6. Spare fuel and secondary loads properly identified, packaged, stowed, and restrained.

A28.2.2. Packaging Opening and Closing. The following instructions provide acceptable procedures for opening external containers to inspect the internal packaging configuration. Comply with these procedures to maintain the performance capability of the package and the original shipper's certification. Noncompliance with any of these procedures constitutes repacking and requires a new certification.

A28.2.2.1. Fiberboard box opening.

A28.2.2.1.1. Cut original tape along seam using a shallow blade knife. Do not tear tape.

A28.2.2.1.2. If adhesive sealed on inside box flaps or the flaps are stitched/stapled (not closed by tape) opening may damage packaging components.

A28.2.2.2. Fiberboard box closure.

A28.2.2.2.1. Apply new tape over the existing tape using same method as original.

A28.2.2.2.2. Use only ASTM D 5486, Type I, Class 2 (film backed, pressure-sensitive adhesive, weather resistant) tape to reclose package.

A28.2.2.2.3. ensure the ends of sealing tape extends over the original tape a minimum of one-inch adhering to the fiberboard on the ends of the package.

A28.2.2.2.4. Use three-inch wide tape or two strips of two-inch wide tape.

A28.2.2.2.5. Ensure surface is clean and dry before applying tape and box flaps meet squarely.

A28.2.2.2.6. Do not cover markings or labels with tape.

A28.2.2.2.7. When reclosed using these procedures a new shipper's certification is not required. Based on DOD testing the packaging is considered returned to original condition and is not considered repacking.

A28.2.2.2.8. If adhesive sealed on inside box flaps or flaps are stitched/stapled (not closed by tape) then reclosure is considered repacking and requires a new shipper's certification.

A28.2.2.3. Wood box opening.

A28.2.2.3.1. Opening causes damage to packaging material.

A28.2.2.3.2. To reduce damage to wood material, use a nail puller to remove nails.

A28.2.2.3.3. Do not pry open wood box panels using crowbars, etc.

A28.2.2.4. Wood box closure.

A28.2.2.4.1. Do not close by nailing through existing holes.

A28.2.2.4.2. Replace damaged components. Use prescribed materials and specifications required by the applicable test report, special packaging instruction, or drawing.

A28.2.2.4.3. Replacing packaging material components is considered repacking and requires a new shipper's certification.

A28.2.2.5. Drum opening. Only open drums used as a combination package or overpack. Do not open drums used as a single package for liquid hazardous material.

A28.2.2.6. Drum closure.

A28.2.2.6.1. Replace old gaskets with new gaskets and seals. Old gaskets may "set" and not reseal properly.

A28.2.2.6.2. Use the torque and closing instructions required by the applicable test report.

A28.2.2.6.3. Reclosure of drum is considered repacking and requires new shipper's certification.

A28.2.2.7. Overpacks.

A28.2.2.7.1. Outer packaging used as an "Overpack" (for ease of handling) may be opened for inspection of contents. Follow inspection guidance for specific opening and closing of inside shipping containers according to A28.2.2.

A28.2.2.7.2. Close overpacks in a similar manner as received. A new shipper's declaration is not required.

A28.2.2.8. Non-Specification (strong outside) Packaging.

A28.2.2.8.1. Non-specification packaging may be opened for inspection.

A28.2.2.8.2. Close non-specification packaging in a similar manner as received. A new shipper's declaration is not required.

A28.2.2.9. UN Specification Jerricans.

A28.2.2.9.1. Caps may be removed for inspection.

A28.2.2.9.2. Re-secure cap (hand-tight) ensuring there is no "cross-threading. " A new shipper's declaration is not required.

A28.2.2.10. Shrink Wrap Packages. Do not cut, tear, or remove stretch or shrink wrap to verify packaging. Reject shipments if stretch or shrink wrap is cut, torn, or damaged so that it would prevent packages containing liquid hazardous materials from tipping or becoming loose in flight, or for any package that would be a hazard during handling operations.



A28.2.3. Inner package inspection.

A28.2.3.1. Perform visual inspection. Do not rearrange inner packaging contents or configuration.

A28.2.3.2. Do not cut wraps or barrier material.

A28.2.3.3. Any change to the inner configuration is considered repacking and requires a new shipper's certification.

A28.2.4. **Exceptions** to inspection. Some item packaging requires specialized training for opening, interior inspection, and closure. Only individuals trained and qualified in these specialized areas are authorized to open the following packagings:

A28.2.4.1. Radioactive material

A28.2.4.2. Class 1 (ammunition and explosives)

A28.2.4.3. Etiological Agents or Infectious Substances

A28.2.4.4. Pressurized metal shipping containers or drums

A28.2.4.5. Material identified as "inhalation hazard"

**A28.3. Inspection Checklist.** Inspection activities establish programs that standardize the local inspection process and ensure continuous level of quality. Figure A28.1. provides a suggested checklist to use during the inspection process. Use DD Form 2133, *Joint Airlift Inspection Record/Checklist*, for all cargo, vehicles, equipment prepared per DTR 4500.9-R, Part III, *Mobility*, as required by DTR 4500.9-R, Part III, Appendix O, *Preparation Inspection of Equipment and Supplies and Joint Inspection (JI) Procedures for Military Airlift*.

Figure A28.1. Hazmat Inspection Checklist.

HAZMAT INSPECTION AND ACCEPTANCE CHECKLIST				TCN
INSPECTION VALIDATION				
THIS SHIPMENT HAS BEEN INSPECTED AND		<input type="checkbox"/> COMPLIES WITH ALL REGULATORY REQUIREMENTS	<input type="checkbox"/> DOES NOT COMPLY WITH ALL REGULATORY REQUIREMENTS AS INDICATED	
DATE (YYYYMMDD)	INSPECTED BY (NAME)	DATE (YYYYMMDD)	CORRECTED BY (NAME)	
DATE (YYYYMMDD)	RE-INSPECTED BY (NAME)	<input type="checkbox"/> CORRECTIVE ACTIONS CHECKED. SHIPMENT COMPLIES WITH ALL REGULATORY REQUIREMENTS.		
ENTER "X" TO IDENTIFY NONCOMPLIANCE. USE COMMENTS BLOCK TO PROVIDE ADDITIONAL DETAILS. CIRCLE "X" WHEN CORRECTIVE ACTION IS COMPLETED. SIGN INSPECTION VALIDATION BLOCK AND ATTACH TO SHIPPER'S DECLARATION FILED WITH STATION MANIFEST. THOSE ITEMS THAT APPLY ONLY TO RADIOACTIVE MATERIAL ARE IDENTIFIED BY AN "R." ADDITIONAL CHECKPOINTS ON THE REVERSE.				
SHIPPER'S DECLARATION		CARGO IDENTIFICATION (IF APPLICABLE) (CONTINUED)		
<input type="checkbox"/> 1. THREE ORIGINAL DOCUMENTS FOR EACH PROPER SHIPPING NAME (PSN) UNDER A SINGLE TCN (ONLY TWO REQUIRED FOR CHAPTER 3)	<input type="checkbox"/> 33. CRYOGENICS VENTING REQUIREMENTS		<input type="checkbox"/> 34. SECONDARY HAZARD PSN, CLASS OR DIVISION AND NET QUANTITY	
<input type="checkbox"/> 2. SHIPPER'S ADDRESS AND PHONE NUMBER	<input type="checkbox"/> 35. HANDLING INSTRUCTIONS		<input type="checkbox"/> 36. OTHER	
<input type="checkbox"/> 3. CONSIGNEE DODACC OR ADDRESS (OR WORLDWIDE MOBILITY)	PACKAGING-OUTER			
<input type="checkbox"/> 4. TRANSPORTATION CONTROL NUMBER (TCN)	<input type="checkbox"/> 37. CONTAINER SERVICEABLE; DAMAGE, LEAKAGE OR LOSS CONTENTS		<input type="checkbox"/> 38. APPROVED OUTER CONTAINER (IF REQUIRED)	
<input type="checkbox"/> 5. AIRPORT OF DEPARTURE AND DESTINATION (OR WORLDWIDE MOBILITY)	<input type="checkbox"/> 39. PACKAGE PERMITTED BY PACKAGING REFERENCE		<input type="checkbox"/> 40. OTHER	
<input type="checkbox"/> 6. NAME AND TITLE OF PREPARER WITH SIGNATURE	IF APPLICABLE			
<input type="checkbox"/> 7. PLACE AND DATE MATERIAL CERTIFIED	<input type="checkbox"/> 41. ULLAGE		<input type="checkbox"/> 42. UN SPECIFICATION OR POP CONTAINER MATCHES CORRESPONDING PACKING GROUP	
<input type="checkbox"/> 8. PEN AND INK CHANGES SIGNED	<input type="checkbox"/> 43. GROSS WEIGHT OF PACKAGE IS EQUAL TO OR LESS THAN TESTED WEIGHT INDICATED AS PART OF POP MARKING		<input type="checkbox"/> 44. SINGLE PACKAGE (CONTAINING A LIQUID) TESTED PRESSURE (KPA) AGREES WITH CONTAINER REQUIREMENTS	
<input type="checkbox"/> 9. EMERGENCY RESPONSE NUMBER	<input type="checkbox"/> 45. OTHER		PACKAGING-INNER (IF INSPECTED AND APPLICABLE)	
<input type="checkbox"/> 10. OTHER	<input type="checkbox"/> 46. ABSORBENT MATERIAL		<input type="checkbox"/> 47. LEAK OR ACID PROOF LINER	
CARGO IDENTIFICATION (NATURE & QUANTITY OF HAZMAT)		<input type="checkbox"/> 48. INNER RECEPTACLE ORIENTATION		<input type="checkbox"/> 49. SECONDARY CLOSURE
<input type="checkbox"/> 11. IDENTIFIES WHETHER PACKED WITHIN PASSENGER OR CARGO AIRCRAFT ONLY	<input type="checkbox"/> 50. OTHER		MARKING	
<input type="checkbox"/> 12. IDENTIFIES RADIOACTIVE OR NONRADIOACTIVE SHIPMENT	<input type="checkbox"/> 51. PSN AND IDENTIFICATION NUMBER		IF APPLICABLE	
<input type="checkbox"/> 13. IDENTIFICATION NUMBER (UN, ID, NA)	<input type="checkbox"/> 52. UN OR POP SPECIFICATION MARKING		<input type="checkbox"/> 53. "RQ"	
<input type="checkbox"/> 14. PSN (WITH TECHNICAL NAME IF REQUIRED)	<input type="checkbox"/> 54. "WASTE"		<input type="checkbox"/> 55. "AIR ELIGIBLE" MARKING OR SYMBOL	
<input type="checkbox"/> 15. PRIMARY HAZARD CLASS OR DIVISION (COMPATIBILITY GROUP FOR EXPLOSIVES)	<input type="checkbox"/> 56. "OVERPACKS" IDENTIFIED		<input type="checkbox"/> 57. "ORIENTATION ARROWS"	
<input type="checkbox"/> 16. SUBSIDIARY RISK CLASS OR DIVISION, IF ASSIGNED	<input type="checkbox"/> 58. LIMITED QUANTITY IDENTIFIED		<input type="checkbox"/> 59. "ORM-D" OR "ORM-D-AIR" FOR DOMESTIC ONLY SHIPMENT	
<input type="checkbox"/> 17. PACKAGING GROUP	<input type="checkbox"/> 60. "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS"		<input type="checkbox"/> 61. DOT SPECIAL PERMIT (WHEN USED AS CERTIFICATION REFERENCE)	
<input type="checkbox"/> 18. NUMBER AND TYPE OF PACKAGES	<input type="checkbox"/> 62. COE NUMBER (WHEN USED AS CERTIFICATION REFERENCE)		<input type="checkbox"/> 63. CAA NUMBER (IF REQUIRED BY CAA)	
<input type="checkbox"/> 19. NET QUANTITY PER PACKAGE (METRIC UNLESS EXCEPTED)	<input type="checkbox"/> 64. FLASHPOINT (FOR FLAMMABLE LIQUIDS)		<input type="checkbox"/> 65. NSN (OR PART NUMBER) FOR EXPLOSIVES	
<input type="checkbox"/> 20. R-ACTIVITY PER PACKAGE GIVEN IN BECQUEREL SYSTEM	<input type="checkbox"/> 66. OTHER			
<input type="checkbox"/> 21. R-NAME AND SYMBOL OF MATERIAL				
<input type="checkbox"/> 22. R-MATERIAL PHYSICAL AND CHEMICAL FORM				
<input type="checkbox"/> 23. PACKAGING PARAGRAPH (FROM ATTACHMENTS 5-13)				
<input type="checkbox"/> A. "A3.1.7.3" USED WHEN POP TESTED PACKAGE IS OVERPACKED TO MEET AIR REQUIREMENTS				
<input type="checkbox"/> B. PACKAGING REFERENCE FROM ATTACHMENT 27 USED FOR EXPLOSIVES MEETING GRANDFATHER CLAUSE				
<input type="checkbox"/> C. UNPACKAGED EXPLOSIVES AUTHORIZED IAW "A5.2"				
<input type="checkbox"/> 24. DOT-E, COE, CAA OR OTHER APPROVED DOCUMENT USED AS CERTIFICATION REFERENCE (COPY ACCOMPANIES SHIPMENT)				
<input type="checkbox"/> 25. 49CFR, IATA OR ICAO REFERENCE USED AS CERTIFICATION REFERENCE (IF MEETING PASSENGER RESTRICTIONS)				
<input type="checkbox"/> 26. R-CATEGORY OF RADIOACTIVE PACKAGE				
<input type="checkbox"/> 27. R-TRANSPORT INDEX				
IF APPLICABLE				
<input type="checkbox"/> 28. "RQ" IDENTIFIES A PSN AS HAZARDOUS SUBSTANCE				
<input type="checkbox"/> 29. "WASTE" IF MARKED OR LABELED ON PACKAGE				
<input type="checkbox"/> 30. "INHALATION HAZARD (ZONE)" (IF MATERIAL MEETS THIS DEFINITION)				
<input type="checkbox"/> 31. IF OVERPACKED, THE WORDS "OVERPACK USED"				
<input type="checkbox"/> 32. "LIMITED QUANTITY" OR "LTD QTY"				

DAF FORM 7508, 20250131 PRESCRIBED BY DAFI24-605V2 REPLACES AMC FORM 1015, WHICH IS OBSOLETE

ENTER "X" TO IDENTIFY NONCOMPLIANCE. USE COMMENTS BLOCK TO PROVIDE ADDITIONAL DETAILS. CIRCLE "X" WHEN CORRECTIVE ACTION IS COMPLETED. SIGN INSPECTION VALIDATION BLOCK AND ATTACH TO SHIPPER'S DECLARATION FILED WITH STATION MANIFEST.

THOSE ITEMS THAT APPLY ONLY TO RADIOACTIVE MATERIAL ARE IDENTIFIED BY AN "R."

LABELING

<input type="checkbox"/>	69. PRIMARY RISK LABEL
<input type="checkbox"/>	70. R-RADIOACTIVE MATERIAL LABELS ON OPPOSITE SIDES OF PACKAGE
	IF APPLICABLE
<input type="checkbox"/>	71. SUBSIDIARY RISK LABELS
<input type="checkbox"/>	72. "CARGO AIRCRAFT ONLY" (NOT MANDATORY FOR MOBILITY OPERATIONS)
<input type="checkbox"/>	73. "MAGNETIZED MATERIAL"
<input type="checkbox"/>	74. "EMPTY"
<input type="checkbox"/>	75. OTHER

VEHICLES AND EQUIPMENT

USE DD FORM 2133 AS CHECKLIST FOR DEPLOYMENT OPERATIONS(DTR,PARTIII)

<input type="checkbox"/>	76. FUEL GAUGE OPERATIVE OR DIP STICK AVAILABLE
<input type="checkbox"/>	77. VEHICLES AND SELF-PROPELLED EQUIPMENT WITH FUEL QTY NOT EXCEEDING 1/2 TANK CAPACITY
<input type="checkbox"/>	78. SUPPORT EQUIPMENT DRAINED
<input type="checkbox"/>	79. NO EXISTING FUEL LEAKS
<input type="checkbox"/>	80. ALL ADDITIONAL HAZARDS IDENTIFIED (SEE BLOCK 36)
<input type="checkbox"/>	81. SECONDARY LOADS CERTIFIED, PACKAGED AND MARKED
<input type="checkbox"/>	82. BULK FLAMMABLE LIQUID FUEL TANKS DRAINED OR PURGED AS REQUIRED
<input type="checkbox"/>	83. SPARE FUEL IN AUTHORIZED CONTAINERS
<input type="checkbox"/>	84. BATTERY POSTS PROTECTED
<input type="checkbox"/>	85. FIRE EXTINGUISHERS IN APPROVED HOLDER
<input type="checkbox"/>	86. OTHER

87. COMMENTS/REASON(S) FOR FRUSTRATION

OPENED FOR INSPECTION: ☐ YES ☐ NO

OPTIONAL USE

87. PCS:

88. WT:

89. CUBE:

**Attachment 29**  
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