BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

AIR FORCE MATERIEL COMMAND
INSTRUCTION 21-131

4 DECEMBER 2025

Maintenance

DEMILITARIZATION/DISPOSITION REQUIREMENTS RELATING TO THE DESIGN OF NEW OR MODIFICATION OF AMMUNITION ITEMS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements Department of the Air Force Policy Directive (DAFPD) 21-2, *Munitions,* and DAFMAN 21-201, *Munitions Management*, and establishes demilitarization and disposition policies, responsibilities, and procedures relating to requirements governing the concept, research, development, engineering, and release for production for all new or modified ammunition items. This instruction applies to Air Force Life Cycle Management Center (AFLCMC) munitions activities. This instruction applies to AFMC organizations in the United States Air Force (USAF) and United States Space Force (USSF) involved in developing or modifying ammunition items. This publication does not apply to the ANG and the AFRC and their units. This instruction requires to the maximum extent possible; ammunition be designed for demilitarization and also requires the development of a formal demilitarization plan to accomplish safe and environmentally acceptable demilitarization/disposition of the ammunition. There are no wing/unit level compliance requirements in this publication, therefore compliance statements are "non-tiered" IAW DAFI 90-160, *Publications and Forms Management* and DAFMAN 90-161, *Publishing Processes and Procedures*. All waiver requests will be submitted through the chain of command to the publication OPR for review and recommendation and the AFMC A4 for approval of non-tiered compliance items. Refer recommended changes and questions about this publication to the OPR using the DAF Form 847, *Recommendation for Change of Product*; route DAF Forms 847 from the field through the appropriate functional chain of command. Supplements to this instruction are prohibited. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with AFI 33-322, *Records Management and Information*

Governance Program, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System.

SUMMARY OF CHANGES

This document has been substantially revised and needs to be completely reviewed. The revision incorporates Joint Conventional Ammunition Policies and Procedures (JCAPP) Number 7, *Demilitarization and Disposal* requirements relating to the design of new or modified ammunition items. Finally, this revision makes appropriate administrative changes.

Chapter 1

BACKGROUND

1.1. Background. This instruction expands and implements the joint agreement on demilitarization/ disposition requirements relating to the design of new or modified ammunition items in accordance with the JCAPP number 7, *Demilitarization and Disposal* viewed at website: **https://www.us.army.mil**..

Chapter 2

SCOPE

2.1. Scope. This instruction applies to AFLCMC organizations and activities above the subordinate wing/unit level to include product centers, Product Support Managers (PSM), and Program Offices (PO) having responsibilities for disposition requirements relating to the design of new or modification of ammunition items. Organizations at the subordinate Wing/unit level do not develop demilitarization/disposition plans for new or modified ammunitions items. The use of the name or mark of any specific manufacturer, commercial product, commodity, service in this publication does not imply endorsement by the Air Force.

Chapter 3

OBJECTIVES

3.1. Objectives. The objectives of this instruction are to:

3.1.1. Influence the design of new or modified munitions items to facilitate the eventual demilitarization and disposition of the item by cost effective, safe, and environmentally acceptable means.

3.1.2. Assure that the design allows demilitarization and disposition IAW the requirements of DoDI 5000.02, *Operation of the Defense Acquisition System*. This instruction is a helpful reference to understand the acquisition process and includes life-cycle planning, milestone decisions, and acquisition strategies.

3.1.3. Identify the processes, procedures and equipment necessary to affect the safe and environmentally acceptable demilitarization and disposition of a munitions item.

3.1.4. Assure that demilitarization or disposition and disposal considerations are an integral part of the life-cycle planning and decision-making processes for all new or modified ammunition items from conception to final acceptance of the end item.

3.1.5. Provide for review and approval of demilitarization or disposition and disposal considerations and plans IAW program management procedures and processes prior to Operational Test and Evaluation (OT&E).

3.1.6. Assure that safety and environmental quality are primary considerations in the demilitarization or disposition and disposal procedures developed.

3.1.7. Assure that maximum attainable recycling and recovery are achieved IAW the Resource Conservation and Recovery Act (RCRA).

Chapter 4

GUIDANCE

4.1. Guidance. It is mandatory that the design concept for all new or modified ammunition items include demilitarization and disposition by acceptable means. All demilitarization and disposition plans will have an environmentally accepted process or Resource Recovery and Recycling (R3) process as the preferable method for demilitarization/disposition. Open Burn and Open Detonation (OB/OD) may be an acceptable secondary alternative.

4.2. Demilitarization. Demilitarization and disposition considerations and procedures will be incorporated into the design and development of new or modified ammunition items to achieve compliance with applicable environmental requirements. Documentation will include detailed chemical, physical, and quantitative characteristics of any radioactive material, Resource Conservation Recovery Act (RCRA) list hazardous substance, Propellant, Explosive, and Pyrotechnics (PEP), or Toxic Release Inventory (TRI) chemical contained in the munitions items to be demilitarized.

4.3. Disassembly. Disassembly, recovery, and salvage of ammunition components for re-use or conversion to other applications will be given full consideration in all ammunition design and modification activities.

4.4. New Materials. Development of new or modified PEP materials qualified for military use shall have an approved demilitarization/disposition plan IAW this instruction.

Chapter 5

RESPONSIBILITIES

5.1. Responsibilities. AFMC organizations and activities above the subordinate wing/unit level to include product centers, PSM, and PO responsible for ammunition development or modification will:

5.1.1. Ensure demilitarization and disposition considerations are incorporated as an integral part of planning and decision-making processes for all new or modified ammunition items.

5.1.2. Document design constraints for demilitarization in the product support strategy during the life-cycle sustainment planning.

5.1.3. Ensure, to the maximum extent possible, ammunition is designed for demilitarization. This is to be implemented by inclusion on each new ammunition team of a demilitarization expert and further implemented through the Acquisition Milestone sign-off responsibility.

5.1.4. Prepare ammunition demilitarization and disposition plans in the format that is provided in **Attachment 2.**

5.1.5. Review a draft demilitarization and disposition plan prior to Milestone C. A draft final demilitarization and disposition plan shall be provided through existing command channels to the applicable Demilitarization Program Office prior to OT&E. The applicable Demilitarization Program Office will accomplish final review and approval.

5.1.6. Provide for review and approval of demilitarization/disposition plans that require rewrite/revision after OT&E of the munitions item.

5.2. Air Force Demilitarization Program Office will:

5.2.1. Review and approve all demilitarization/disposition plans.

5.2.2. Maintain copies of demilitarization/disposition plans and distribute them to the Single Manager for Conventional Ammunition (SMCA).

5.2.3. Submit for review at least one new or revised demilitarization/disposition plan per year to the Joint Ordnance Commanders Group (JOCG).

5.2.4. Issue appropriate instructions or procedures to implement the requirements of this instruction.

5.2.5. Interface with and advise the JOCG Munitions Demilitarization/Disposal Subgroup in their role to make recommendations to the Joint Logistics Commanders.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 33-322, *Records Management and Information Governance Program,* 23 March 2020

DAFI 90-160, *Publications and Forms Management,* 14 April 2022

DAFMAN 21-201, *Munitions Management,* 24 October 2024

DAFMAN 90-161, *Publishing Processes and Procedures*, 18 October 2023

DAFPD 21-2, *Munitions,* 15 January 2025

DODI 5000.02, *Operation of the Defense Acquisition System,* 7 January 2015

DODM 4160.21, Volumes 1 - 4, *Defense Materiel Disposition Manuals,* 22 October 2015

JCAPP 7, *Joint Conventional Ammunition Policies and Procedures*, 12 July 2017

Prescribed Forms

None

Adopted Forms

DAF Form 847, *Recommendation for Change of Product*

Abbreviations and Acronyms

AFLCMC—Air Force Life Cycle Management Center

AFMC—Air Force Materiel Command

CAD—Cartridge Activated Devices

DMWR—Navy Instructions, Depot Maintenance Work Requirements

DoD—Department of Defense

DODIC—Department of Defense Identification Code

ICP—Inventory Control Point

JATO—Jet Assisted Take Off

JCAPP—Joint Conventional Ammunition Policies and Procedures

JOCG—Joint Ordnance Command Group

MIDAS—Munitions Items Disposition Action System

NEW—net explosive weight

OB/OD—Open Burn and Open Detonation

OT&E—Operational Test and Evaluation

PEP—Propellant, Explosive, and Pyrotechnics

PO—Program Office

RCRA—Resource Conservation and Recovery Act

SDS—Safety Data Sheet

SMCA—Single Manager for Conventional Ammunition

SOP—Standard Operating Procedures

TRI—Toxic Release Inventory

Terms

Ammunition—The term ammunition as applied in this instruction includes all non-surety ordnance components and explosives prepared to form a charge, complete round, or cartridge for small arms, rifle, gun, cannon or any other weapon or explosive-actuated device, impulse device, torpedo warhead, mine, bomb, grenades, depth charge, fuze, detonator, projectile, rocket or guided missile. Ammunition also includes all solid propellants, explosives, hypergolic liquid propellant systems, and other hazardous materials applied to ordnance uses and requiring surveillance for reasons of explosive safety and all Jet Assisted Take Off (JATO) rockets, boosters, sustainers, military pyrotechnics, tactical missiles and non-surety chemical materials.

Demilitarization/Disposition Plan—A written document that describes the item and identifies processes, procedures and equipment necessary to effect the safe and environmentally acceptable demilitarization or disposition, and disposal of the new or modified ammunition item. Instructions and an example of a Demilitarization/Disposition Plan are contained in **Attachment 2.**

Demilitarization—The act of destroying the military offensive or defensive advantage inherent in ammunition. This process may be applied to serviceable, unserviceable, used or unused items, which are excess, obsolete, or uneconomically repairable, as well as, items determined to be hazardous for continued storage. Examples of ammunition demilitarization methods are disassembly, washout, melt-out, incineration, deactivation, mutilation, chemical neutralization, open burning, open detonation, or static firing. The environmentally and safety-approved methods will render the item inert and no longer usable for military applications.

Developers—Manufacturers, vendors, contractors, activities, commands, laboratories, centers, and program offices involved in developing munitions items.

Disposal—End of life Tasks and/or Actions for residual materials resulting from demilitarization or disposition operations.

Disposition—The process of redistributing, transferring, donating, selling, demilitarizing, treating, destroying or other end of life cycle guidance for Department of Defense (DoD) personal property. Disposition is the final stage of an asset's life cycle prior to exiting the DoD system. The item must pass through a specific system or set of guidance and controls to ensure that re-utilization, transfer, or sale options are exhausted by the appropriate Inventory Control Point (ICP). Examples of authorized means are reuse, recycling, conversion, or sale to an authorized buyer. In some instances, the act of demilitarization accomplishes disposal, as well. Disposal methods such as ocean dumping or land burial of items containing energetic materials are not typically authorized.

Resource Recovery and Recycling (R3)—A term used to describe a family of processes/technologies for demilitarization of ammunition using processes other than open burning and open detonation which results in all or part of the ammunition's components being recovered for recycle and reuse.

Attachment 2

DEMILITARIZATION/DISPOSITION PLAN

A2.1. Guidelines. Basic guidelines and standard format information is provided below to assist in the development of demilitarization/disposition plans.

A2.1.1. Demilitarization/disposition plans are not developed for emergency demilitarization.

A2.1.2. All plans should be based on disassembly to the lowest level necessary to gain access to or remove energetic hazardous materials or components for demilitarization or disposition.

A2.1.3. OB/OD are not considered the primary demilitarization or disposition option.

A2.1.4. Plans for items containing subassemblies should be developed in tiers or appendices with a plan for the end item and individual plans for each subassembly. This is especially true for subassemblies that may be stocked as individual items in the supply system. An example; e.g. 3"/50 cartridge consisting of a cartridge case, primer, propellant, projectile and fuze. Plans should be developed for the cartridge, primer and fuze separately. Disposition guidance for "after use" components such as cans, clips, cartridge cases and wooden boxes should also be developed.

A2.1.5. The use of reference documents (e.g., Technical Manuals (TM), Technical Orders (TO), Navy Instructions, Depot Maintenance Work Requirements (DMWR), Standard Operating Procedures (SOP), or approved Demilitarization/Disposition Plans) to satisfy portions of plan requirements is encouraged. However, reference documents (or applicable portions) used in this manner must accompany the plan.

A2.1.6. Information on existing and emerging demilitarization and disposition alternatives for families of munitions are maintained by the JOCG at the Munitions Items Disposition Action System (MIDAS) web site: **https://midas.army.mil**.

A2.1.7. Demilitarization of both energetic and inert components to prevent reuses IAW the requirements of the latest publication of DODM 4160.21, Volumes 1 – 4, Defense Materiel Disposition Manuals shall be addressed in the plan.

A2.2. Demilitarization and Disposition Plan Format.

A2.2.1. **COVER PAGE.** Include ammunition item name, Department of Defense Identification Code (DODIC), preparer, distribution statement, revision/change and date (demilitarization/disposition plan identification number is optional).

A2.2.2. **TABLE OF CONTENTS.** Self-explanatory.

A2.2.3. **LIST OF TABLES.** Self-explanatory.

A2.2.4. **LIST OF FIGURES.** Self-explanatory.

A2.2.5. **Purpose:**

A2.2.5.1. Objective: This plan identifies requirements necessary to accomplish safe and environmentally acceptable demilitarization/disposition of the item.

A2.2.5.2. Scope: Provide a brief overview of the preferred process(es) being used.

A2.2.5.3. Limitations: Identify areas not covered by the plan, e.g.; transportation, incinerator operations, washout operations, etc. Also, demilitarization/disposition of subassemblies covered in other plans.

A2.2.6. **Item Description:**

A2.2.6.1. Physical description: Provide a detailed description of the item configuration with attached illustration(s).

A2.2.6.2. Functional description: Describe how the item functions when used as intended.

A2.2.6.3. Product Baseline Table: Develop a table similar to the example shown in **Table A2.1**. As a minimum, the table should contain fields/columns for assembly level, description/nomenclature, unit weight, net explosive weight (NEW), quantity, drawing/specification numbers, safety data sheet (SDS) reference numbers, and compositions. Provide as much information as possible on this table to avoid delays in the demilitarization/disposition plan approval process. This table should essentially be the complete drawing package for the ammunition item excluding schematic drawings. Proprietary information should be included and as a minimum should identify basic constituents, if not the exact formula. Energetic and hazardous materials should be listed by name only (HNS, PBXN-5, Lithium, etc.) and an Energetic and Hazardous Materials table as described below (under safety summary) should be referenced for specific compositions.

A2.2.6.4. Classification: Identify the source of classification for all classified items/components and provide minimum declassification requirements for each.

A2.2.6.5. Provide Hazard Classification information for the end item (either Final or Interim).

A2.2.7. **Safety Summary.** This section will summarize hazards that are unique to the item and precautions/procedures that must be employed during demilitarization/disposition operations.

A2.2.7.1. General. Provide an overview of the safety requirements for storage and handling of the item.

A2.2.7.2. Specific. Identify the safety requirements directly related to the demilitarization process being used.

A2.2.7.3. Energetic and Hazardous Materials Table. Refer to **Table A2.2** to develop a table listing all of the energetic and hazardous materials in the munitions item including the chemical composition of each material and the resultant products of combustion. Information will be made available on existing PEP materials. Provide as much information as possible on this table to avoid delays in the demilitarization/disposition plan approval process.

A2.2.7.4. Propellant Composition Table. Refer to **Table A2.3** to develop a table listing all of the propellants in the munitions item including the chemical composition, specification, and net explosive weight (NEW). Provide as much information as possible on this table to avoid delays in the demilitarization/disposition plan approval process.

A2.2.8. **Environmental Significance.** This section will include an analysis describing the environmental significance of each demilitarization/disposition process.

A2.2.8.1. General: Provide a brief overview of the regulations applicable to the preferred demilitarization/ disposition process.

A2.2.8.2. Specific: Identify the specific impact of all identified demilitarization/disposition processes. Identify the output products of all neutralization processes. Identify the method used to determine the products (e.g. computer models, bang box data, other empirical techniques, etc.)

A2.2.8.2.1. Recyclable Materials: List all of the recyclable materials generated by the preferred demilitarization/disposition process.

A2.2.8.2.2. Waste Streams. Identify the hazardous and solid waste streams produced by the preferred demilitarization/disposition process. This will include the combustion products from the energetic and hazardous materials table.

A2.2.8.3. Residual Analysis: Provide an analysis of residual material remaining in/on retrievable hardware items such as cartridge cases, Cartridge Activated Devices (CAD) & Jet Assisted Take Off (JATO) rocket motor cases, after the item has functioned as intended.

A2.2.9. **Demilitarization/Disposition Alternatives.** This section will list alternative methods of demilitarization and disposition of the item(s) addressed by the plan identifying the preferred method. (Note: The Government shall provide information on available technology and equipment capability to the developer). The developer shall utilize this data in developing the demilitarization and disposition plan. Give a summary of the demilitarization options available for each item requiring demilitarization, e.g. incineration, mutilation of inert hardware by shredding or crushing, neutralization, hydrolysis, or plasma arc destruction. **Note:** Alternatives are not required if the demilitarization and disposition process is based on disassembly.

A2.2.10. **Demilitarization/Disposition Procedures.** This section will describe each alternative method in detail including step-by-step procedures including safety precautions, disassembly diagrams, declassification procedures, and components and piece part tables. Provide a block flow diagram showing movement of ammunition components through the demilitarization/disposition process. **Note:** Detailed operating procedures for equipment or processes covered by references are not required for the processes described here.

A2.2.10.1. Disassembly: Provide step-by-step procedures for disassembling the munitions item to the point necessary to gain access and/or remove the energetic and hazardous materials. Examples: fuze removal, pull apart, explosive washout/melt out, or water jet cutting.

A2.2.10.2. Demilitarization: This section will describe the processes used to remove or otherwise neutralize the military potential of munitions IAW DODM 4160.21, Volumes 1 – 4, Defense Materiel Disposition Manuals. Such neutralization is to be carried out in a safe, cost effective, practicable, and environmentally responsible manner. Demilitarization is a necessary step for military “items prior to their release” to a non-military setting.

A2.2.10.3. Disposition: List the available disposition options including treatment options for the demilitarized munitions items parts and residuals waste streams, e.g. “Incinerator

ash to hazardous waste landfill, inert hardware for sale or recycling, explosives for reuse/alternate use. List the available treatment options for the waste stream generated by processes, e.g. hydrolysis of wastewater from explosive washout or wet scrub of incinerator off gasses.

A2.2.11. **Demilitarization/Disposition Special Tools and Equipment.** This section will describe special tools and equipment required to accomplishing the procedures described.

A2.2.12. **Validation Test (When Required).** This section will address the validation test when required. The validation plan will identify the quantity of items to be demilitarized, the tools and equipment required, the proposed location for the test, and any other pertinent information required to validate the planned demilitarization disposition process. Satisfactory completion of the validation test shall be required prior to approval of the demilitarization/disposition plan.

A2.2.13. **Reference Documents.** List all technical references including any TMs, T.O.s, Depot Maintenance Work Requirement (DMWR), DoD and non-DoD regulations applicable to the preferred demilitarization process.

A2.2.14. **Terms and Definitions.** (As Required)

Table A2.1. Product Baseline Table.

Assembly Level	Description	U.W. (LBS)	N.E.W(LBS)	QTY	Drawing	Specification	SDS	Composition
1.0.	Cartridge, .50 Caliber, API MK 211	0.2521	0.0394	1	6086059	WS 25470	40939	
1.01	Case, Cartridge, .50 Cal	0.1243		1	5502646			Brass
1.02	Primer, Percussion	0.0026	0.0004	1	645339-1	MIL-P-46610	855	FED CTG K-75
1.02.01	Cup, Primer	0.0000		1				Brass
1.02.02	Mixture,	0.0004	0.0004	1		Federal		Table II
1.02.03	Disc	0.0000		1				
1.02.04	Anvil	0.0000		1				
1.03	Lacquer, Cellulose Nitrate, Green	AR		1		MIL-L-10287		

1.04	Lacquer, Cellulose Nitrate, Aluminum	AR		1		MIL-L-10287		
1.05	Propellant3 alternates)	0.0143	0.0143	1	6086059			Table III
1.06	Compound, Waterproofing	AR		1		MIL-C-13783		
1.07	Projectile .50 CAL API (Multi-purpose)	0.0959	0.0052	1	6086061		40936	
1.07.01	Core & Core Body Assembly	0.0550		1	6086065			Tungsten Carbide
1.07.01.01	Core Body (Phosphate Coated IAW MIL-C-49)	0.0240		1	6086067	AISI 12L14/12L13		Tungsten Carbide
1.07.01.02	Core	0.0310		1	6086066			Tungsten Carbide
1.07.02	Zirconium	0.0013	0.0013	1	6068064		40937	Zirconium /Hafnium
1.07.03	Composition	0.0020	0.0020	1		MIL-C-	311	Table II
1.07.04	Jacket, Projectile	0.0336		1	6086062	MIL-C-21768		Copper Alloy
1.07.05	Incendiary Mix #136	0.0019	0.0019	1	6086063	7548270	1772	Table II
1.07.06	Lead Seal	0.0022		1	6086068	MIL-L-	753	Lead
1.08	Unit Load, CTG, .50 CAL	4104.0000	453.8880	1		MIL-STD-1323-394		
1.08.01	Pallet, Steel MK 3 Mod 0	94.000		1	564200			Steel
1.08.02.01	Box, Wire	0.0000		1	7553347	PPP-B-		Wood
1.08.02.02.01	Box, Ammunition	0.0000		1	7553296			Steel
1.08.03	Strapping,	16.000		1				Steel

1.08.04	Base, Top & Bottom	29.0000		2				Plywood
1.08.05	Protector, Edge	0.0000		14				Steel

Table A2.2. Energetic and Hazardous Material.

Item	Composition	Drawing	Specification	N.E.W. (GRAINS)	SDS	Products of combustion
Projectile Load		6068064		36.2000		
	Zirconium			9.2000	40937	
Composition A-4	RDX/WAX		MIL-C-440	13.9000	311	
	RDX		MIL-R-398	13.4830	40425	
	Wax		MIL-W-20553	0.4170		
Incendiary mix	#136	6086063	7548270	13.1000	1772	
	Magnesium/Aluminum 50/50	7548270	JAN-M-454 TY A	6.4190	8/15	
	Potassium	7548270	MIL-P-217	6.4190	53	
	Calcium Resinate	7548270	MIL-C-20470	0.2620	10059	
Primer	K-75		FEDERAL CTG #215	2.7000		
	Lead Styphnate			1.0120	16	
	Tetracene			0.1350	18	
	Barium Nitrate			0.8100	4	
	Antimony Sulfide			0.3375	17	
	PETN			0.3375	11018	

Table A2.3. Propellant Compositions.

Item	Composition	Drawing	Specification	N.E.W. (GRAINS)	SDS
Propellant #1	WC860	10534811	MIL-P-3984	100.0000	10101
	Nitrocellulose		MIL-N-244	73.0000	31
	Dinitrotoluene		MIL-D-204	1.0000	439
	Graphite		MIL-G-155	0.4000	10161
	Potassium Nitrate		MIL-P-156	1.5000	38
	Sodium Sulfate		MIL-S-50004	0.5000	10067
	Calcium Carbonate		MIL-C-293	1.0000	10098
	Nitroglycerin		MIL-N-246	11.0000	30
	Diphenylamine		MIL-D-98	1.5000	408

	Dibutylphthalate		MIL-D-218	10.0000	482
	Tin Dioxide		MIL-S-50005	0.1000	
Propellant #2	RA-NC-167	6086060		100.0000	40938
	Nitrocellulose		MIL-N-244	94.8000	31
	Dibutylphthalate		MIL-D-218	1.5000	482
	Ethyl centralite		MIL-E-255	1.5000	37
	Diphenylamine		MIL-D-98	1.0000	408
	Potassium Sulfate		MIL-P-217	1.0000	53
	Graphite		MIL-G-155	0.2000	10161
Propellant #3	IMR5010	10534796	MIL-P-3984	100.0000	10040
	Nitrocellulose		MIL-N-244	83.7500	31
	Diphenylamine		MIL-D-98	1.2500	408
	Graphite		MIL-G-155	0.4000	10161
	Dinitrotoluene		MIL-D-204	10.0000	439
	Potassium Sulfate		MIL-P-193	1.0000	773