

**BY ORDER OF THE COMMANDER  
KADENA AIR BASE (PACAF)**

**KADENA AIR BASE INSTRUCTION 21-101**



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Maintenance**

**WELDING ON AIRCRAFT**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction implements Air Force Policy Directive (AFPD) 21-1, *Air and Space Maintenance*. It establishes procedures for on aircraft welding. This publication applies to all 18th Wing military, civilian, contract personnel and units assigned or attached to Kadena Air Base unless limited by waiver granted under host-tenant agreement. 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 filed through the appropriate functional's chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/>.

**SUMMARY OF CHANGES**

This document has been substantially revised and must be completely reviewed. Sortie Generation Flight (SGF) has been changed to Aircraft Maintenance Unit (AMU) throughout this publication and on all attachments. 18th Maintenance Squadron (18 AMXS) has been changed to 18th Equipment Maintenance Squadron (18 EMS). Paragraph **3.1** has been completely rewritten.

**1. References.**

1.1. Air Force Occupational Safety and Health Standard (AFOSHSTD) 91-5, *Welding, Cutting, and Brazing* and T.O. 1C-135-2-4-1, *Power Plant Ground Operation and Maintenance*.

## 2. Responsibilities.

2.1. Maintenance Operations Center (MOC) will:

2.1.1. Notify the appropriate AMU of the welding requirements.

2.2. AMUs will:

2.2.1. Provide fireguard, tug operator, tow team, door operators and sufficient personnel to position the aircraft for welding.

2.2.2. Prepare the aircraft for welding by completing their portion of the Aircraft Welding Fire Safety Checklist, AF Form 2519, *All Purpose Checklist* (**Attachment 2**). Once complete the AMU will ensure the checklist is given to the 18 EMS Fabrication Flight Metals Technology Section to complete their portion of the checklist and contact the Fire Department.

2.2.3. Notify MOC when personnel and aircraft are ready for Metals Technology (welders).

2.2.4. If welding in Hangar 3560 (North Isochronal Inspection [ISO]), notify MOC to have the doors for building 73332 and 73334 (hush house) closed to prevent the fire detection systems from activating.

2.3. Fire Department will:

2.3.1. Provide standby fire truck at welding site.

2.3.2. Complete required fire safety checklists.

2.3.3. Issue the AF Form 592, *USAF Welding, Cutting, and Brazing Permit*, to Metals Technology.

2.3.4. Review the completed Aircraft Welding Fire Safety Checklist prior to start of welding.

2.4. 18 EMS Fabrication Flight Metals Technology Section will:

2.4.1. Dispatch two welding shop personnel with required equipment to the welding site when notified by MOC that the aircraft is ready for welding.

2.4.2. Complete the 18 EMS portion of the Aircraft Welding Fire Safety Checklist.

2.4.3. Ensure all checklist items are complete and welding area is properly prepared. The Metals Technology section will initiate all coordination with 18 CES Fire Department to ensure standby fire truck is available, review the area for fire safety and have the Fire Department issue the AF Form 592 to Metals Technology.

## 3. Procedures.

3.1. In accordance with AFOSHSTD 91-5, paragraph 3.10.1., welding on aircraft should be done outside of hangars if possible. Aircraft may be parked in suitable hangars (Buildings 3560 and 3660) with Fire Department authorization; as fire suppression systems will have to

be disabled to weld inside of any hangar. If hangar space cannot be made available, aircraft can be welded while parked in three-sided revetments provided the ground wind speed is 5 knots or less and the ground is dry with no rain anticipated.

3.2. C-130 aircraft may be welded on the hardstands provided wind velocity does not exceed 5 knots. Alternate areas/hangars can be utilized if coordinated on a case-by-case basis with the Fire Department.

3.3. Aircraft requiring silver (hard) soldering will be soldered at any location not in the immediate vicinity of other aircraft or within 100 feet of flammable materials to include in ground fuel storage tanks.

3.4. All items under Mobility of Aircraft in **Attachment 2** will not apply for welding/silver soldering operations conducted in open areas.

3.5. Items 5.1, 5.2, 5.5, 5.6, and 5.7 under Welding Equipment in **Attachment 2** will not apply when soldering operations are performed.

4. AF Form 592 will be signed by the Fire Department representative and welding technician and be kept at the welding site during the welding operation.

## **5. Prescribed and Adopted Forms.**

### **5.1. Prescribed Forms:**

No forms are prescribed by this publication.

### **5.2. Adopted Forms:**

AF Form 592, *USAF Welding, Cutting, and Brazing Permit*

AF Form 847, *Recommendation for Change of Publication*

AF Form 2519, *All Purpose Checklist*

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**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFOSHSTD 91-5, *Welding, Cutting, and Brazing*

AFPD 21-1, *Air and Space Maintenance*

T.O. 1C-135-2-4-1, *Power Plant Ground Operation and Maintenance*

***Abbreviation and Acronyms***

**AMU**— Aircraft Maintenance Unit

**MOC**— Maintenance Operations Center

**EMS**— Equipment Maintenance Squadron

Attachment 2

SAMPLE AIRCRAFT WELDING FIRE SAFETY CHECKLIST

Figure A2.1. Sample Aircraft Welding Fire Safety Checklist

ALL PURPOSE CHECKLIST		PAGE 1	OF 1	PAGES
TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA		OPR	DATE	
SAMPLE Aircraft Welding Fire Safety Checklist		18 EMS		
NO.	ITEM <i>(Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)</i>	C/W	DATE	Initials
	1. SAFEGUARDING FUEL SYSTEM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.1 Fuel system closed on aircraft being welded. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.1.1 Fuel tank access plated in place. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.1.2 Fuel tanks topped off and vent openings closed or covered. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.1.3 Fuel lines, valves and manifolds in place, secured and/or capped. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.2 Fuel systems on adjacent aircraft within 100 feet of welding point closed. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.3 Streamers attached to covered fuel vents. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.4 Pressure removed from fuel system. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2. HOUSEKEEPING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.1 Clean area where welding is to be accomplished. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.2 Combustible materials removed 35 ft. from welding area. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.3 Floor clear of any oil or fuel spills. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.4 Floor drains checked in area for oil or fuel contamination. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3. MOBILITY OF AIRCRAFT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.1 Aircraft parking brakes off and wheels chocked. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2 Tug and tow bar hooked to the aircraft. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.3 Clear path to permit towing aircraft outside (excluding doors). (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.4 Tail stand removed. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4. SAFEGUARDING OTHER WORK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1 Check area including hangar floor drains with combustible gas analyzer before welding and every 15 minutes during welding. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2 Welding area will be roped off. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3 Welding area will have placards reading "WELDING OPERATIONS IN PROGRESS" (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.4 Screens, when possible will be placed around the welding operation. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5 Covers for ultraviolet detector eyes will not be placed over the sensors until the fire department arrives on the scene and will be removed immediately after welding operations have ended. (AMU)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.6 Suspend all other work on aircraft (AMU and EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5. WELDING EQUIPMENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.1 Welding generator clear of aircraft engine and fuel tank vents. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.2 Static ground lead clamped to ground plug. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.3 Gas cylinders securely fastened to prevent tipping. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.4 Regulators and gauges working properly. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.5 A minimum of 3 minutes warm up for welding machine. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.6 all ground leads or cables positioned as close as possible to the area being welded. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.7 Electrical welding equipment components (other than flexible lead cables) kept at least 18 inches above the floor. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.8 All coiled welding cables spread out before use to prevent overheating. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6. FIRE PROTECTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6.1 Fire extinguisher (20-B rating minimum) immediately adjacent of welding operation. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6.2 fire extinguisher (80-B rating minimum) within 35 feet of welding operation. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6.3 Assigned fire guard on duty. (EMS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SIGNATURE _____				