

MIL-F-5509A
AMENDMENT-6
28 JULY 1954

Superseding
 Amendment -5
 8 July 1953

MILITARY SPECIFICATION

FITTINGS; FLUID CONNECTION

This amendment forms a part of Military Specification MIL-F-5509A, dated 13 March 1951, and has been approved by the Department of Defense for use of the Departments of the Army, the Navy, and the Air Force.

Paragraph 2.1.1 Specifications:

(a) Under "Federal" add the following specifications:

QQ-A-266	Aluminum-Alloy Rolled or Drawn - Bars, Rods, Shapes and Wire, 14S
QQ-A-351	Aluminum-Alloy (AL-17) (Aluminum-Copper-Magnesium-Manganese); Bars, Rods, Shapes, and Wire
QQ-S-763	Steel, Corrosion-Resisting; Bars and Forgings (Except for Reforging)

(b) Under "Military" add the following specifications:

MIL-B-4229	Boxes; Paperboard, Metal Edge
MIL-P-116	Preservation, Methods of
MIL-S-5626	Steel; Chrome-Molybdenum (4140) Bars, Rods, and Forging Stock (For Aircraft Applications)"

(c) Add the following:

"U. S. Air Force
 14128 Compound; Steam Cleaning"

Paragraph 3.4 Identification of Product: Delete entire paragraph and substitute the following:

"3.4 Identification of Product.- All AN or MS tube fittings shall be marked in accordance with the following instructions. The marking shall be applied in a location not detrimental to the fitting and shall not be detrimental to the corrosion protection of the fitting.

"3.4.1 AN or MS Symbols and Trade-Marks.- Unless otherwise specified, all fittings shall be marked with the letters "AN" or "MS" and the manufacturer's name or trade-mark. Sleeves, AN819 and ferrules, MS21918 shall be trade-marked at the option of the manufacturer. The marking shall be permanent, preferably embossed letters or impression stamping. However, ink stamping may be used. The letters AN or MS shall be separated and distinct from the manufacturer's name or trade-mark.

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"3.4.2 Identifying Number or Letter.- Each AN fitting made from corrosion-resisting steel, except AN819 sleeves, shall be permanently marked with the letter "S" if fabricated from either type 304L or 316 steel and with the letter "C" if fabricated from either type 302, 303, 304, 316, or 321. Wherever practicable each fitting shall also be identified by the complete drawing number as shown by the detail drawing. The size is not to be included with the drawing number. The identifying number shall be added to the part by embossing; impression stamping, ink stamping, or printed on a paper collar supplied with the fitting. The preferable marking shall be in the order mentioned. The identifying number shall not be placed on AN818, 819, 924, 6289, MS21914 and MS21918. Also the fittings in sizes -6 and under need not be individually marked but will be packaged in units with the package carrying the identifying number.

"3.4.3 Color Identification.- In addition to the marking under paragraphs 3.4.1 and 3.4.2, the AN and MS fittings shall be identified by the following colors:

AN Fittings (Flared and Straight Thread)

Aluminum Alloy	- Blue
Steel	- Black
Aluminum Bronze	- Natural Cadmium Plate
Copper Base Alloys	- Natural Cadmium Plate
Corrosion Resisting Steel	- None

MS Fittings (Flareless)

Aluminum Alloy	- Green
Steel	- Natural Cadmium Plate
21900 - 21901 Aluminum Alloy	- Brown
21900 - 21901 Steel	- Natural Cadmium Plate
Ferrules 21918	- Natural Cadmium Plate

Where application of color is necessary it shall be applied by dyeing, or other process, to provide a color which will not rub off or be smeared by contact incident to handling and service and which will not injure the material, clog the threads, or interfere in any way with the functioning of the fittings in service. If the coloring material used is soluble or would affect in any way the liquids used for fuel, lubricant, coolant, hydraulic, anti-icing or oxygen systems of airplanes, those areas of the fittings coming in contact with such fluids shall not be colored. The dye shall be capable of withstanding immersion in a cleaning solution containing 5 to 6 ounces of a cleaner conforming to Specification 14128 per gallon of solution, at a temperature of 160° to 170°F for 5 minutes."

Paragraph 3.6 Workmanship: Add the following sentence at the end of the first sentence:

"The finished fittings shall be clean, dry, and free of oils, greases, and all other materials which might adversely affect the safe use of the fittings in oxygen systems."

Paragraph 4.4.4.2 Assembly and Test of Flared Tube End Fitting: In the first sentence delete "an approved fitting" and substitute "approved tubing."

Paragraphs 4.4.4.2.1 and 4.4.4.3: Change "3,000 psi" and "6,000 psi" to "6,000 psi" and "12,000 psi," respectively.

Paragraph 4.4.4.2.2 Pull Up to Overtightened Torque: Delete entire paragraph and substitute the following:

"4.4.4.2.2 Pull Up to Overtightened Torque.- The test specified above for pull up to minimum torque shall be repeated again except that the fitting assemblies using aluminum-alloy tubing shall be tightened to 2-1/2 times the maximum wrench torque specified on Drawing AND10064, while the assemblies using steel tubing shall be tightened 1-1/3 times the maximum wrench torque specified on Drawing AND10064."

Paragraph 4.4.4.4 Impulse - At Room Temperature: Delete "1,500 psi" and substitute "3,000 psi."

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TABLE I Materials: Delete entire table and substitute the following:

"TABLE I
Materials

Material	Form	Specification		
Aluminum Alloy	Bars, Shapes, Sheet, Strip, and Plate	QQ-A-266 Temper T4 or T6 QQ-A-351 Condition T QQ-A-354 Condition T QQ-A-355 Condition T		
	Forgings	2/ QQ-A-367 Class 5 Temper T4 or T6		
	Steel	Bars, Rods, and Forgings	MIL-S-6758 MIL-S-5626 (4140) MIL-S-3050 MIL-S-6049 (8740) AN-S-9 (FSL141) (FSL117) (FSL118) (FSL137) QQ-S-633 QQ-S-624 (FSL335)	
			Tubing, Seamless	MIL-T-6732
Aluminum Bronze			Bar and Rod	MIL-B-6946
Copper-Base Alloys			Bars, Rods, Shapes, and Forgings	1/ QQ-B-721 Half Hard
			Bar and Rod	QQ-B-611 Composition B
			Forgings	QQ-B-611 Composition A
Corrosion- Resisting Steel	Bars, Shapes, or Forgings	Type 304L QQ-S-763 Class 8, Type A (Type 347)		
	Bars, Shapes, or Forgings	Type 302, 303, 304, 316, or 321		

1/ With bronze-forgings a soft temper will be permitted in the finished part.

2/ Forgings produced from bar stock conforming to Specification QQ-A-351 may also be used, provided the physical properties of the forging are as follows:

Ultimate Tensile Strength	55,000 psi (min)
Yield Strength (0.2 percent Offset)	30,000 psi (min)
Elongation in 2 inches	16 percent"

TABLE II Finish: Delete entire table and substitute the following:

"TABLE II
Finish

Fitting Material	Type of Finish	Finish Specification
Aluminum-Alloy	Anodic Treatment	AN-QQ-A-696
Steel	Cadmium Plate	QQ-P-416, Type II, Class C (Black Colored)
Aluminum Bronze	Cadmium Plate	QQ-P-416 Type I, Class C
Copper-Base Alloys	Cadmium Plate	QQ-P-416 Type I, Class C
Corrosion-Resisting Steel	Passivate	None"

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Paragraph 5.2 Preservation and Packaging: Delete entire paragraph and substitute the following:

"5.2 Preservation and Packaging.- Unless otherwise specified, fittings shall be protected from corrosion by packaging in accordance with method 1(c) of Specification MIL-P-116, without the use of a contact preservative. The quantity per unit and intermediate container shall be as specified below:

<u>Size (inches)</u>	<u>Number per Unit Container</u>	<u>Number per Intermediate</u>
1/8 through 3/8	5	20
1/2 through 1	5	10
1-1/4 through 1-1/2	5	0
1-3/4 up	1	0

"5.2.1 Unit Containers.- Fittings up to and including 1 inch shall be packaged in commercial-type paperboard or fiberboard cartons. Each such carton shall have interior separation capable of supporting and separating each individual fitting in such a manner as to prevent movement or contact of the fittings one with the other. Fittings over 1 inch shall be packaged in containers conforming to Specification JAN-P-120, JAN-P-133, or MIL-B-4229.

"5.2.2 Nuts and Sleeves.-

<u>Size (inches)</u>	<u>Number per Unit Container</u>
1/8 through 1/2	100
5/8 through 1-1/4	25
1-1/2 through 2	5

"5.2.3 Unit Containers.- Nuts and sleeves of one type and size shall be packaged in the following containers: Slip cover, friction top or hermetically sealed cans, or cartons conforming to Specification JAN-P-120, JAN-P-133, or MIL-B-4229."

Custodians:

Navy - Bureau of Aeronautics
Air Force