

# MIL-F-6001A (ASG)

## 15 JULY 1958

Superseding  
MIL-F-6001  
14 March 1950

### MILITARY SPECIFICATION

#### FITTINGS; AIRCRAFT, SOLDER TYPE, TUBE

This specification has been approved by the Department of the Air Force and by the Navy Bureau of Aeronautics.

#### 1. SCOPE

1.1 This specification covers one type of tube fitting known as the solder type.

#### 2. APPLICABLE DOCUMENTS

2.1 The following specifications and standards of the issue in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

#### SPECIFICATIONS

##### Federal

QQ-B-626	Brass, Leaded and Non-Leaded; Rods, Shapes, Forgings and Flat Products with Finished Edges (Bars, Flat Wire and Strips)
QQ-N-281	Nickel-Copper-Alloy (Monel and R-Monel) Bars, Plates, Rods, Sheets, Strips, Wire, Forgings, and Structural and Special Shaped Sections
QQ-P-416	Plating, Cadmium (Electrodeposited)
PPP-B-566	Boxes, Folding, Paperboard
PPP-B-585	Boxes; Wood, Wirebound
PPP-B-591	Boxes, Fiberboard, Wood-Cleated
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-621	Boxes, Wood, Nailed and Lock-Corner
PPP-B-636	Boxes, Fiber
PPP-B-676	Boxes, Set-Up, Paperboard
PPP-T-60	Tape; Pressure Sensitive Adhesive, Waterproof - for Packaging and Sealing

FSC 4730

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Military

JAN-P-100	Packaging and Packing for Overseas Shipment - General Specification
MIL-P-116	Preservation, Methods of
MIL-B-138	Boxes, Wood, Fiberboard-Lined for Overseas Shipment (for Weight of Contents not Exceeding 500 Pounds)
MIL-B-4229	Boxes; Paperboard, Metal-Stayed
MIL-S-7720	Steel, Corrosion-Resistant (18-8) Bars, and Forging Stock (for Aircraft Applications)
MIL-B-10377	Box, Wood, Cleated, Veneer, Paper Overlaid
MIL-L-10547	Liners, Case, Waterproof

STANDARDSMilitary

MIL-STD-129	Marking for Shipment and Storage
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Air Force-Navy Aeronautical

AN780	Nipple, Union
AN785	Coupling, Union, Brazing
AN790	Elbow, Union
AN791	Elbow, Union 45°
AN795	Tee, Union
AN800	Cone - Union
AN805	Nut, Union

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

## 3. REQUIREMENTS

3.1 Design and dimensions.- The design and dimensions shall be in accordance with the applicable AN or MS standard, as specified in 2.1.

3.2 Shape and form restrictions.- Abrupt reductions of section shall be avoided. Small external sections adjoining relatively heavy body sections shall be shaded into the heavier sections by means of ample fillets. Sharp corners or inadequate fillets, excessive undercuts or grooves, at the junction of such small sections with large sections of fittings shall be considered cause for rejection. Unless otherwise specified, drawing tolerances shall apply to fillet and corner radii.

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### 3.3 Passages.-

3.3.1 Drill offset.- On straight fittings where the fluid passage is drilled from each end, the offset between the drilled holes at the meeting point of the drills shall not exceed 0.015 inch. It shall be possible to pass through the fluid passage a ball whose minimum diameter is 0.020 less than the minimum diameter specified for the passage. This does not mean that the drilled passage may be smaller than that required by the detail drawings.

3.3.2 On angle fittings, the cross-sectional area at the junction of the fluid passages shall be not smaller than the cross-sectional area of the smaller passage.

3.4 Wall thickness.- Except as otherwise specified on the applicable AN or MS standard, the wall thickness at any point on the fitting shall be not less than the thickness established by the dimensions and tolerances for the inside and outside diameters and eccentricities specified in the AN or MS standard.

3.5 Material.- Fittings shall be fabricated of materials listed in Table I as specified on the applicable AN or MS standard.

TABLE I  
Materials

Materials		Specification Number
Brass	Bars, Rods Shapes, and Forging	QQ-B-626 Composition 21 or 22
Corrosion-Resistant Steel (18Cr-8Ni)	Bars and Rods	MIL-S-7720
Nickel-Copper-Alloy	Forging, Plates, Rods, Shapes, Sheets, Strips, and Wire	QQ-N-281

3.6 Finish.- Cadmium plating, when required, shall be in accordance with Specification QQ-P-416. All corrosion-resistant steel fittings shall be passivated.

3.7 Internal strain of copper base alloys.- Fittings made of copper base alloys (Specification QQ-B-626) shall have no internal strains as revealed by the test specified in 4.3.2.

3.8 Identification of product.- All fittings shall be marked with the applicable AN or MS number and the manufacturer's name or trademark. 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.

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3.9 Workmanship.- Fittings shall be free from burrs, and longitudinal and spiral tool marks. All sealing surfaces shall be smooth, except that annular tool marks up to 100 microinches rms maximum will be acceptable. Workmanship shall conform to the best commercial practice to produce fittings free from all defects which will affect proper functioning in service.

## 4. QUALITY ASSURANCE PROVISIONS

4.1 General.- All the tests required herein for the testing of fittings are classified as Acceptance Tests, for which necessary sampling techniques and methods of testing are specified in this section.

4.2 Sampling.- A maximum of 1 percent but not less than 10 of the fittings from each lot on a contract shall be selected at random for the Acceptance Tests specified herein. When the sample fittings are damaged by the Acceptance Tests, as in tests for internal strain, they shall not be included in the contract or order.

4.2.1 Lot.- A lot shall consist of all fittings of a given part number, made from the same alloy and submitted for inspection at the same time.

4.3 Tests.- The Acceptance Tests of fittings shall consist of the tests described herein as Examination of product and Internal strain of copper base alloys. In addition, fittings shall be subject to other tests which the Inspector considers necessary to determine conformance with the requirements of this specification.

4.3.1 Examination of product.- All fittings shall be carefully examined to determine conformance with the requirements for workmanship, finish, design, dimensions, marking, and surface defects.

4.3.2 Internal strain of copper base alloys.- Fittings made of copper base alloys, as specified herein, shall be immersed in an aqueous solution containing 100 g of mercurous nitrate and 13 ml nitric acid (sp gr 1.43) per liter. After 15 minutes, the specimens shall be removed and examined for cracks. Any evidence of cracks indicates internal strain and shall be cause for rejection.

4.4 Rejection and retest.- If 10 percent of the sample fittings fail to conform to any of the requirements of this specification, the whole lot shall be tested to those requirements in which the 10 percent of sample fittings failed, except that if 10 percent or more of the fittings subjected to test for Internal strain of copper base alloys fail in such test, the entire lot shall be rejected. Those fittings subjected to other individual tests and failing to meet the requirements shall be rejected. Fittings which have been rejected may be reworked to correct the defects and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the defects shall be furnished the Inspector. Units rejected after retest shall not be resubmitted without the specific approval of the procuring activity.

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## 5. PREPARATION FOR DELIVERY

### 5.1 Preservation and packaging.

5.1.1 Level A.- Fittings shall be preserved in accordance with Specification MIL-P-116, Method IC and packed in containers conforming to Specification MIL-B-4229, PPP-B-566, PPP-B-676, or PPP-B-636. Unit quantities shall be as specified by the procuring activity.

5.1.1.1 Intermediate packaging.- Only identical items shall be included in an intermediate package. For items preserved and packaged as specified in 5.1.2, the requirements for intermediate packaging shall be at the option of the contractor. Fittings preserved and packages as specified in 5.1.1 shall be packaged in containers conforming to Specification PPP-B-566, PPP-B-636, PPP-B-676, or MIL-B-4229. Unless otherwise specified by the procuring activity, the quantity of unit packages to be included in each intermediate package shall be at the option of the contractor and as governed by the limitations of the container being used.

5.1.2 Level C.- Fittings shall be preserved and packaged in accordance with manufacturer's commercial practice.

### 5.2 Packing.

5.2.1 Level A.- Fittings preserved and packaged as specified in 5.1.1 and 5.1.1.1 shall be packed in exterior-type shipping containers conforming to Specification PPP-B-591, PPP-B-636, Type I, Class 3 or Type II, Class 3, MIL-B-138, PPP-B-585, PPP-B-621, PPP-B-601, or MIL-B-10377. As far as practicable, exterior shipping containers shall be of uniform shape and size, be of minimum cube and tare consistent with the protection required, and contain identical quantities. The gross weight of each pack shall be limited to approximately 200 pounds. Containers shall be closed and strapped in accordance with the applicable container specification or appendix thereto. Containers shall be provided with a case liner conforming to Specification MIL-L-10547, and shall be sealed in accordance with the appendix thereto. The case liner will not be required when the unit, intermediate, or exterior shipping container conforms to Specification PPP-B-636, Type I, Class 3 or Type II, Class 3, and is sealed at all joints and seams, including manufacturer's joint, with tape conforming to Specification PPP-T-60.

5.2.2 Level B.- Fittings preserved and packaged as specified in 5.1.1 and 5.1.1.1 shall be packed in domestic-type exterior shipping containers conforming to Specification PPP-B-591, PPP-B-601, PPP-B-585, PPP-B-621, PPP-B-636, or MIL-B-10377. Exterior shipping containers shall be of minimum cube and tare consistent with the protection required. As far as practicable, exterior shipping containers shall be of uniform shape and size and contain identical quantities. The gross weight of each pack shall be limited to approximately 500 pounds. Containers shall be closed and strapped in accordance with the applicable container specification or appendix thereto. When fiberboard containers are used, the fiberboard shall conform to Table I, titled "Requirements for types I and II, class 1, domestic service fiberboard" of Specification PPP-B-636.

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5.2.3 Level C.- Packages which require overpacking for acceptance by the carrier shall be packed in exterior-type shipping containers in a manner that will insure safe transportation at the lowest rate to the point of delivery. Containers shall meet Consolidated Freight Classification Rules or regulations of other common carriers as applicable to the mode of transportation.

5.3 Physical protection.- Cushioning, blocking, bracing and bolting as required shall be in accordance with Specification JAN-P-100 except that for domestic shipments, waterproofing requirements for cushioning materials and containers shall be waived. Drop tests of Specification JAN-P-100 shall be waived when preservation, packaging, and packing of the item is for immediate use or when tests of Specification MIL-P-116 are applicable.

5.4 Marking.- Interior and exterior containers shall be marked in accordance with Standard MIL-STD-129.

## 6. NOTES

6.1 Intended use.- Fittings covered by this specification are intended for general aircraft use.

6.2 Ordering data.- Procurement documents should specify the following:

- (a) AN or MS part number of fitting desired.
- (b) Selection of applicable levels of preservation and packaging and packing (see 5.1 and 5.2).

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodians:

Navy - Bureau of Aeronautics  
Air Force

Preparing activity:

Navy - Bureau of Aeronautics

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004	
<b>INSTRUCTIONS</b>			
This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).			
SPECIFICATION			
ORGANIZATION (of submitter)		CITY AND STATE	
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT	
		\$	
MATERIAL PROCURED UNDER A			
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT			
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?			
A. GIVE PARAGRAPH NUMBER AND WORDING.			
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.			
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID			
3. IS THE SPECIFICATION RESTRICTIVE?			
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?			
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)			
SUBMITTED BY (Printed or typed name and activity)		DATE	

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