



AEROSPACE STANDARD

AS4875™**REV. B**

Issued 1995-05
Reaffirmed 2015-07
Revised 2021-03

Superseding AS4875A

Fittings, Straight Threaded Boss or Flanged, Fluid Connection, Procurement Specification

RATIONALE

Revise AS4875 by including individual tables showing recommended operating pressure ratings for fittings when used on CRES and Al Alloy tubing. Document title revised. Note 2.1 updated to include specifications mentioned herein. Note 3.1.1 revised. Note 3.1.2 added. Notes /5/, /6/, /7/, and /8/ and optional material added to Table 1. Note 2.1 and Table 1, AMS4134 replaced by AMS4133 (AMS4134 was inadvertently listed as 2014-T6. Appropriate T6 spec should be AMS4133). Upper range of hardness requirement in note 3.3.3 revised. Note 3.6.4 (d) revised. Note 6.2 revised. Historical information added to Note 6.2. Tables 5A and 5B added. Note 6.2.2 revised and supersession Table 6 added. Lessons learned Note 6.2.4 added. General updates included. Note 4.5.1.2 revised to remove the statement that destructive testing is required to retain QML status. This requirement is regulated by AC7112.

1. SCOPE

This SAE Aerospace Standard (AS) establishes the requirements for straight threaded boss or flanged fluid connection fittings (see Section 6) for use in all types of fluid systems.

1.1 Classification

Fittings shall be furnished in the types and styles designated by the applicable AN, AS, MS, NAS, or other engineering standard drawings. This specification is similar to MIL-F-5509 as applicable to straight threaded boss or flanged fittings including updated materials and process specifications and industry coordinated general improvements. It is intended to serve as a procurement specification for the fittings described herein and in Section 6.

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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Full document details: SAE AS4875B

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Documents

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2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2472	Anodic Treatment of Aluminum Alloys Sulfuric Acid Process, Dyed Coatings
AMS2486	Conversion Coating of Titanium Alloys, Fluoride-Phosphate Type
AMS2488	Anodic Treatment - Titanium and Titanium Alloys, Solution pH 13 or Higher
AMS2658	Hardness and Conductivity Inspection of Wrought Aluminum Alloy Parts
AMS2700	Passivation of Corrosion Resistant Steels
AMS2759	Heat Treatment of Steel Parts General Requirements
AMS2770	Heat Treatment of Wrought Aluminum Alloy Parts
AMS2772	Heat Treatment of Aluminum Alloy Raw Materials
AMS4124	Aluminum Alloy, Rolled or Cold Finished Bars, Rods, and Wire 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-T73, T7351) Solution Heat Treated, Stress Relieved by Stretching, and Overaged - UNS A97075
AMS4133	Aluminum Alloy Forgings and Rolled Rings 4.4Cu - 0.85Si - 0.80Mn - 0.50Mg (2014-T6) Solution and Precipitation Heat Treated - UNS A92014
AMS4141	Aluminum Alloy Die Forgings 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-T73) Solution and Precipitation Heat Treated - UNS A97075
AMS4339	Aluminum Alloy, Rolled or Cold Finished Bars and Rods 4.4Cu - 1.5Mg - 0.60Mn (2024-T851) Solution Heat Treated, Cold Worked, and Artificially Aged - UNS A92024
AMS4928	Titanium Alloy Bars, Wire, Forgings, Rings, and Drawn Shapes 6Al - 4V Annealed - UNS R56400
AMS5639	Steel, Corrosion-Resistant, Bars, Wire, Forgings, Mechanical Tubing, and Rings 19Cr - 10Ni Solution Heat Treated - UNS S30400
AMS5645	Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Tubing, and Rings 18Cr - 10Ni - 0.40Ti (321) Solution Heat Treated - UNS S32100
AMS5646	Steel, Corrosion and Heat-Resistant, Bars, Wire, Forgings, Tubing, and Rings 18Cr - 11Ni - 0.60Cb(Nb) (347) Solution Heat Treated - UNS S34700
AMS5648	Steel, Corrosion and Heat-Resistant, Bars, Wire, Forgings, Tubing, and Rings, 17Cr - 12Ni - 2.5Mo (316) Solution Heat Treated - UNS S31600
AMS6349	Steel Bars 0.95Cr - 0.20Mo (0.38 to 0.43C) (SAE 4140) Normalized
AMS6370	Steel, Bars, Forgings, and Rings, 0.95Cr - 0.20Mo (0.28-0.33C) (SAE 4130) - UNS G41300
AMS6382	Steel, Bars, Forgings, and Rings, 0.95Cr - 0.20Mo (0.38-0.43C) (SAE 4140) Annealed - UNS G41400
AMS-H-6875	Heat Treatment of Steel Raw Materials
AMS-QQ-A-225/6	Aluminum Alloy, 2024, Bar, Rod, and Wire; Rolled, Drawn, or Cold Finished
AMS-QQ-A-225/9	Aluminum Alloy 7075, Bar, Rod, Wire, and Special Shaped; Rolled, Drawn, or Cold Finished

AMS-QQ-A-367	Aluminum Alloy Forgings
AMS-QQ-P-416	Plating, Cadmium (Electrodeposited)
AMS-QQ-S-763	Steel, Corrosion Resistant, Bars, Wire, Shapes, and Forgings
AMS-S-6758	Steel, Chrome-Molybdenum (4130), Bars and Reforging Stock (Aircraft Quality)AMS-STD-595Colors Used in Government Procurement
ARP4784	Definitions and Limits, Metal Material Defects and Surface and Edge Features, Fluid Couplings, Fittings and Hose Ends
ARP9013	Statistical Product Acceptance Requirements
AS478	Identification Marking Methods
AS930	Fitting End, Straight Thread, Port Connection, Design Standard
AS1376	Alternate Dimensions, Center Body Section, Shape Fluid Fitting, Design Standard
AS4395	Fitting End, Flared, Tube Connection, Design Standard
AS4396	Fitting End, Bulkhead, Flared, Tube Connection, Design Standard
AS5202	Port or Fitting End, Internal Straight Thread, Design Standard
AS8879	Screw Threads - UNJ Profile, Inch Controlled Radius Root with Increased Minor Diameter

2.2 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

A-A-59133	Cleaning Compound, High Pressure (Steam) Cleaner
MIL-PRF-6083	Hydraulic Fluid, Petroleum Base, For Preservation and Operation
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-PRF-83282	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, NATO Code Number H-537
MIL-DTL-83488	Coating, Aluminum, High Purity
MS21947	Fitting End, Bolt Cluster Fitting Single Port Through, Flare

2.3 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ASME B46.1	Surface Texture (Surface Roughness, Waviness, and Lay)
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2.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A108	Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products



Documents

Document Sharing Hub

2.5 PRI Publications

Available from Performance Review Institute, 161 Thorn Hill Road, Warrendale, PA 15086-7527, Tel: 724-772-1616, www.pri-network.org.

AC7112 Nadcap Audit Criteria for Fluid Systems Component Manufacturers

AC7112/2 Nadcap Audit Criteria for Fittings and other Machined Components

PD1100 Nadcap Program Requirements

3. TECHNICAL REQUIREMENTS

3.1 Qualification

3.1.1 Manufacturer Qualification

A manufacturer producing a product in conformance to this procurement specification shall be accredited in accordance with the requirements of AC7112 and PD1100 and shall be listed in the NADCAP Qualified Manufacturers' List (QML). The QML is available at www.eAuditNet.com.

3.1.2 Accreditation of Special Processes

Manufacturers of threaded items are to be accredited to PRI NADCAP AC7112/2 (see 3.5.3).

3.2 Material

Fittings shall be fabricated of materials listed in Table 1 and in compliance with requirements in this specification, or as specified on the applicable part standard drawing.

Table 1 - Materials

Material	Type of Part	Form /1/	Specification	Alloy and Temper	Material Code
Aluminum Alloy /5/	Straight fittings, bolts	Bars, rods	AMS-QQ-A-225/6	2024-T6 or T851 /6/	D /8/
			AMS4339	2024-T851 /6/	D /8/
			AMS-QQ-A-225/9	7075-T73	W
			AMS4124	7075-T7351	W
	Shape fittings	Forgings	AMS-QQ-A-367	2014-T6 /6/	D /8/
			AMS4133	2014-T6 /6/	D /8/
			AMS-QQ-A-367	7075-T73	W
			AMS4141	7075-T73	W
	Shape fittings	Bars	AMS-QQ-A-225/6	2024-T6 or T851 /6/	D /8/
			AMS4339	2024-T851 /6/	D /8/
			AMS-QQ-A-225/9	7075-T73	W
			AMS4124	7075-T7351	W
Carbon and Low Alloy Steel /2/	Fittings, bolts	Bars, rods	ASTM A108 /3/	1137 /7/	None
			AMS-S-6758	4130	F or None
			AMS6370	4130	F or None
			AMS6349	4140	F or None
	Shape fittings	Forgings	ASTM A108 /3/	1137 /7/	None
			AMS6370	4130 Cold Finished	F or None
			AMS-S-6758	4130 Cold Finished	F or None
			AMS6382	4140 Cold Finished	F or None
Corrosion-Resistant Steel	Fittings, bolts	Bars	AMS5639	Class 304, Cond A	J
			AMS-QQ-S-763	Class 304, Cond A	J
			AMS5648	Class 316, Cond A	K
			AMS-QQ-S-763	Class 316, Cond A	K
			AMS5645	Class 321, Cond A	R
			AMS-QQ-S-763	Class 321, Cond A	R
			AMS5646 /4/	Class 347, Cond A	S
			AMS-QQ-S-763 /4/	Class 347, Cond A	S
	Shape fittings	Forgings	AMS5639	Class 304, Cond A	J
			AMS-QQ-S-763	Class 304, Cond	J
			AMS5648	Class 316, Cond A	K
			AMS-QQ-S-763	Class 316, Cond A	K
			AMS5645	Class 321, Cond A	R
			AMS-QQ-S-763	Class 321, Cond A	R
			AMS5646 /4/	Class 347, Cond A	S
			AMS-QQ-S-763 /4/	Class 347, Cond A	S
Titanium alloy	Fittings, bolts	Bars	AMS4928	6Al-4V annealed	T
	Shape fittings	Forgings	AMS4928	6Al-4V annealed	T

/1/ The center body section of shape fittings machined from bar or oversized forgings shall conform to AS1376.

/2/ The hardness of finished carbon steel parts shall be per 3.3.3. If the materials are procured with this requirement as a supplement to the specification, the purchase order shall specify that any heat treatment applied shall be in accordance with AMS-H-6875 (see 3.3.2).

/3/ This document is for bar from which forgings shall be made and only the chemical composition applies.

/4/ Type 347 corrosion-resistant steel shall not be used for new manufacture but type code "S" parts may be used until existing stocks are depleted.

/5/ The electrical conductivity and hardness of aluminum alloy shall be per 3.3.2. This requirement shall be added to the applicable document when materials are procured, or the material is heat treated before or after fabrication in order to meet the requirement.

/6/ Aluminum Alloy, Type 2014 and 2024 are not recommended for new design.

/7/ Alloy steel, Type 1137 is not recommended for new design.

/8/ Material Code letter W, 7075 aluminum alloy, is a preferred replacement for material code letter D, 2014 and 2024 aluminum, because of superior corrosion and stress corrosion resistance.

3.3 Heat Treatment

3.3.1 Aluminum Alloy

Aluminum alloy fittings and bolts shall be supplied in the final temper as shown in Table 1. When fitting material is purchased in other than the final temper, the heat treatment of the raw material and of semi-finished or finished parts shall be in accordance with AMS2770 or AMS2772, as applicable.

3.3.1.1 Electrical Conductivity and Hardness

Aluminum alloy fittings and bolts shall meet the electrical conductivity and hardness requirements of AMS2658. The material may have to be heat treated before or after fabrication of parts in order to meet the requirement (see 4.7.2).

3.3.2 Steel

When additional processing is required to comply with hardness requirements of 3.3.3, heat treatment shall be in accordance with AMS-H-6875 or AMS2759, as applicable.

3.3.3 Additional Hardness Properties for Finished Carbon and Low Alloy Steel

Unless otherwise specified on the applicable drawings, the hardness of the finished carbon steel parts with plating removed shall be 92 HRB to 40 HRC. For carbon and low alloy steel parts below a hardness of 20 HRC, hardness tests shall be made using the Rockwell B scale, in which case the hardness shall be within the range of 92 to 99 HRB (see 4.7.3).

3.4 Finish

3.4.1 Aluminum Alloy

3.4.1.1 Anodic Coating

Aluminum alloy fittings and bolts shall be anodized in accordance with MIL-A-8625, Type II, Class 2, or AMS2472, dyed blue for material code D; or brown for material code W, as applicable (see 3.6.4), and shall be duplex sealed. Contact area from anodizing electrode may show discoloration and impressions. Such discoloration and impression due to anodizing electrode shall not be cause for rejection if they occur in internal passages. Burn marks are not permissible. Bare areas occurring on bearing or threaded surfaces shall be cause for rejection. Bare areas shall not exceed 30% of the remaining surface area.

3.4.1.2 High Purity Aluminum Coating

When specified, high purity aluminum coating shall be in accordance with MIL-DTL-83488, Class 3, Type II, with 0.0005 inch maximum thickness. Chromate treatment shall be applied after glass bead peening at a pressure of 25 psig maximum. Barrel processing is not permitted. Surface texture after glass bead peening and chromate treatment shall not exceed drawing tolerances. Coating thickness requirements for holes, recesses, and internal threads do not apply. Visual evidence of coating in holes and openings shall be to a minimum depth of two diameters or two times opening.

3.4.2 Carbon and Low Alloy Steel

Carbon and low alloy steel fittings and bolts shall be cadmium plated in accordance with AMS-QQ-P-416, Type II, Class 2, dyed black (see 3.6.4). All such carbon or low alloy steel fittings shall be dipped in oil conforming to MIL-PRF-6083 or MIL-PRF-83282. Fluid passage holes, other openings, and internal threads shall not be subject to a plating thickness requirement and may exhibit bare areas provided that they are protected with a light film of oil.