



AEROSPACE STANDARD

AS4897™**REV. B**

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Reaffirmed 2015-07
Revised 2024-09

Superseding AS4897A

Hose Assembly, Polytetrafluoroethylene (PTFE), Low Pressure,
450 °F and Fireproof, Procurement Specification for

RATIONALE

Change minimum ID of fitting to the elbow dimension only; add hose assembly parts standards; change PRI publications to match current; and increase individual proof test tolerance.

1. SCOPE

1.1 Application

This SAE Aerospace Standard (AS) covers the requirements for polytetrafluoroethylene (PTFE) hose assemblies for use in aerospace fuel and lubricating oil systems at temperatures between -67 °F and 450 °F and at operating pressures per Table 1. The hose assemblies are also suitable for use within the same temperature and pressure limitations in aerospace pneumatic systems, where some gaseous diffusion through the wall of the PTFE liner can be tolerated.

The use of these hose assemblies in pneumatic storage systems is not recommended. In addition, installations in which the limits specified herein are exceeded, or in which the application is not covered specifically by this document, for example oxygen, shall be subject to the approval of the purchaser.

Table 1 - Physical requirements of hose assemblies

Hose Size	Hose Weight ⁽¹⁾ Max lb/in	Oper. Press. psig	Proof Press. psig	Burst Press. Room Temp Min psig	Burst Press. 450 °F Min psig	Bend Radius at Inside of Bend Min Inches	Effuss. 1/2 hour cc/ft Max	Effuss. After Stress Degrad' cc/in/min Max	Neg. Press. in Hg	Vol. Expan. ⁽²⁾ cc/in Max
03	0.008	1000	2000	4000	3200	0.75	2.0	2.0	28	0.028
04	0.010	1000	2000	4000	3200	1.00	2.0	2.0	28	0.042
05	0.012	800	1600	3200	2500	1.25	2.0	2.0	28	0.042
06	0.014	750	1500	3000	2400	2.00	2.0	2.0	28	0.075
08	0.017	750	1500	3000	2250	2.00	2.0	2.0	28	--
10	0.022	700	1400	2800	2100	3.00	2.0	2.0	28	--
12	0.027	600	1200	2400	1800	4.50	2.0	2.0	20	--

⁽¹⁾ Hose weight shall be determined on a minimum length of 12 inches.

⁽²⁾ Verified per 3.10.3.

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Documents

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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.

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.

AMS-QQ-S-763 Steel, Corrosion Resistant, Bars, Wire, Shapes, and Forgings

AMS2700	Passivation of Corrosion Resistant Steels
AMS4928	Titanium Alloy Bars, Wire, Forgings, Rings, and Drawn Shapes, 6Al - 4V Annealed
AMS4945	Titanium Alloy Tubing, Seamless, Hydraulic, 3Al - 2.5V, Controlled Contractile Strain Ratio, Cold Worked, Stress Relieved
AMS4965	Titanium Alloy, Bars, Wire, Forgings, and Rings, 6.0Al - 4.0V, Solution Heat Treated and Aged
AMS5637	Steel, Corrosion-Resistant, Bars and Wire, 18Cr - 9.0Ni (302), Solution Heat Treated, Cold Drawn and Stress Relieved, 125 ksi (862 MPa) Tensile Strength
AMS5639	Steel, Corrosion-Resistant, Bars, Wire, Forgings, Mechanical Tubing, Rings, and Forging and Ring Stock, 19Cr - 10Ni, Solution Heat Treated
AMS5643	Steel, Corrosion-Resistant, Bars, Wire, Forgings, Mechanical Tubing, and Rings, 16Cr - 4.0Ni - 0.30Cb (Nb) - 4.0Cu, Solution Heat Treated, Precipitation Hardenable
AMS5644	Steel, Bars and Forgings, Corrosion Resistant, 17Cr - 7Ni - 1Al
AMS5645	Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Mechanical Tubing, Rings and Forging Stock, 18Cr - 10Ni - 0.40Ti (321), Solution Heat Treated
AMS5646	Steel, Corrosion and Heat-Resistant, Bars, Wire, Forgings, Mechanical Tubing, Rings and Forging Stock, 18Cr - 11Ni - 0.60Cb(Nb) (347), Solution Heat Treated
AMS5647	Steel, Corrosion-Resistant, Bars, Wire, Forgings, Mechanical Tubing, Rings, and Forging Stock, 19Cr - 9.5Ni, Solution Heat Treated
AMS5659	Steel, Corrosion Resistant, Bars, Wire, Forgings, Rings, and Extrusions, 15Cr - 4.5Ni - 0.30Cb (Nb) - 3.5Cu, Consumable Electrode Remelted, Solution Heat Treated, Precipitation Hardenable
AMS5685	Steel, Corrosion Resistant, Safety Wire, 18Cr - 11.5Ni (SAE 30305), Solution Heat Treated, Cold Finished
AMS5689	Steel, Corrosion- and Heat-Resistant, Wire, 18Cr - 10.5Ni - 0.40Ti (321), Solution Heat Treated
AMS5690	Steel, Corrosion and Heat Resistant, Wire, 17Cr - 12Ni - 2.5Mo (316), Solution Heat Treated
AMS5697	Steel, Corrosion-Resistant, Wire, 19Cr - 9.5Ni (304), Solution Heat Treated

ARP603	Impulse Testing of Hydraulic Hose, Tubing, and Fitting Assemblies
ARP908	Torque Requirements, Installation and Qualification Test, Hose and Tube Fitting
ARP1153	Method for Determining Relative Specific Gravity Polytetrafluoroethylene Tubing
ARP1835	Preparation for Delivery, General Requirements for Hose Assemblies
AS150	Hose Assembly, Type Classifications of, Basic Performance and Fire Resistance
AS611	Hose Assembly and Tubing, Polytetrafluoroethylene, Cleaning Methods for
AS1055	Fire Testing of Flexible Hose, Tube Assemblies, Coils, Fittings, and Similar System Components
AS1708	Fitting End, Internal Flare, Design Standard
AS1946	Hose Assembly, Polytetrafluoroethylene, Metallic Reinforced, Up to 1500 psi and 450 °F, Hydraulic and Pneumatic
AS2078	Test Methods, Hose Assemblies, Polytetrafluoroethylene (PTFE)
AS4375	Fitting End, Flareless, Design Standard
AS4395	Fitting End, Flared, Tube Connection, Design Standard
AS7051	Hose Assembly, Polytetrafluoroethylene (PTFE), Metal Braid, Low Pressure, Flared, Straight to Straight
AS7052	Hose Assembly, Polytetrafluoroethylene (PTFE), Metal Braid, Low Pressure, Flared, Straight to 45°
AS7053	Hose Assembly, Polytetrafluoroethylene (PTFE), Metal Braid, Low Pressure, Flared, Straight to 90°
AS7054	Hose Assembly, Polytetrafluoroethylene (PTFE), Metal Braid, Low Pressure, Flared, 45° to 45°
AS7055	Hose Assembly, Polytetrafluoroethylene (PTFE), Metal Braid, Low Pressure, Flared, 45° to 90°
AS7056	Hose Assembly, Polytetrafluoroethylene (PTFE), Metal Braid, Low Pressure, Flared, 90° to 90°
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>.

MIL-C-5501	Caps and Plugs, Protective, Dust and Moisture Seal, General Specification for
MIL-H-25579	Hose Assembly, Tetrafluoroethylene, High Temperature, Medium Pressure
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-831	Test Reports: Preparation of
MIL-T-8504	Tubing Steel, Corrosion-Resisting (304) Aerospace Vehicle Hydraulic Systems, Annealed, Seamless and Welded
MIL-T-8808	Tubing, Steel, Corrosion-Resistant (18-8 Stabilized), Aircraft Hydraulic Quality (Composition 321 and 347)
MIL-T-31000	Drawings, Engineering and Associated Lists

- MS33514 Fitting End, Standard Dimensions for Flareless Tube Connection and Gasket Seal (*Refer to AS4375*)
- MS33656 Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal (*Cancelled - Refer to AS4395*)
- P-D-680 Dry Cleaning and Degreasing Solvent

2.3 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 A262 Standard Recommended Practices for Detecting Susceptibility to Intergranular Attack in Stainless Steel
- ASTM A580 Specification for Stainless and Heat Resisting Steel Wire
- ASTM D792 Tests for Specific Gravity and Density of Plastics by Displacement

2.4 AIA Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

- NAS1760 Fitting End, Flareless Acorn, Standard Dimensions for

2.5 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.

- ANSI/ASME B46.1 Surface Texture

2.6 PRI Publications

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

- AC7112 Nadcap AUDIT CRITERIA FOR FLUID SYSTEMS COMPONENT MANUFACTURERS
- OP2007 Appendix G3 QPL PROGRAM OPERATING PROCEDURE: APPENDIX G3
- PD1100 Nadcap PROGRAM REQUIREMENTS
- PD2000 PRI-QPL PROGRAM REQUIREMENTS

3. REQUIREMENTS

3.1 Qualification

Hose assemblies supplied in accordance with this standard shall be representative of products that have been subjected to and that have successfully passed the material and qualification tests specified in this standard.

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 OP2007 Appendix G3, PD1100, and AC7112, and shall be listed in a Nadcap Qualified Manufacturers List (QML).

3.1.2 Product Qualification

All products shall conform to the requirements of this procurement specification and shall be approved in accordance with the requirements of PD2000 and OP2007 Appendix G3 for listing in a Performance Review Institute (PRI) Qualified Parts List (QPL).

3.2 Materials

The hose assemblies shall be uniform in quality and free from defects in material as is consistent with good manufacturing practice and shall conform with the applicable specifications and requirements specified in this document. All materials not specifically described herein shall be of the highest quality and suitable for the purposes intended.

3.2.1 Metals

Metals used in the hose shall be corrosion-resistant steel, and fittings shall be corrosion-resistant steel or titanium suitably treated to resist corrosion when in storage or during normal service use. All end fitting sockets (collars), crimped or swaged, fabricated from type 304 stainless steel, are required to be capable of passing an embrittlement test as specified in ASTM A262, practice E, prior to assembly to the nipple by a crimping/swaging operation. Sockets fabricated from stabilized austenitic steel are acceptable without being subjected to the embrittlement test. Metals used in the hose and fittings shall be as listed below:

a. Bars and Forgings

1. Corrosion-resistant steel, austenitic, annealed or as rolled
 - (a) 304 AMS5639
2. Solution heat treated, corrosion-resistant steel, austenitic, annealed or as rolled
 - (a) 321 AMS5645
 - (b) 347 AMS5646
3. Precipitation hardenable, corrosion-resistant steel, solution heat treated, and artificially aged condition
 - (a) 15-5 PH AMS5659
 - (b) 17-4 PH AMS5643
 - (c) 17-7 PH AMS5644
 - (d) AM-355 AMS5743
4. Titanium
 - (a) 6Al-4V AMS4928
 - (b) 6Al-4V AMS4965

b. Tubing

1. Corrosion-resistant steel, austenitic, seamless or welded, annealed
 - (a) 304 MIL-T-8504

2. Heat stabilized, corrosion-resistant steel, austenitic, seamless or welded

(a) 321 MIL-T-8808

(b) 347 MIL-T-8808

3. Titanium

(a) 3Al-2.5V AMS4945

c. Wire

1. Corrosion-resistant steel, austenitic, cold drawn

(a) 302 AMS5637 or ASTM A580

(b) 304 AMS5697 or ASTM A580

(c) 305 AMS5685 or ASTM A580

(d) 321 AMS5689

(e) 316 AMS5690

3.3 Construction

The hose assembly shall consist of a seamless PTFE inner tube, corrosion-resistant steel-wire reinforcement, an integral silicone cover, and corrosion-resistant steel or titanium end fittings as required to meet the construction and performance requirements of this specification, and as required for its intended use.

3.3.1 Inner Tube

The inner tube shall be of a seamless construction of virgin PTFE resin of uniform gauge. It shall have a smooth bore and shall be free from pitting or projections on the inner surface. Additives may be included in the compound from which the tube is extruded.

3.3.2 Reinforcement and Cover

The reinforcement shall consist of corrosion-resistant steel wires. The wires shall be so arranged over the inner tube as to provide sufficient strength to ensure conformance with the requirements specified herein. Multiple broken or missing reinforcing wires or buckled wires more than 0.06 inch above the outside diameter surface shall be cause for rejection. Crossed-over reinforcing wires shall not be cause for rejection of the hose assembly. There shall be an integral silicone cover; silicone cuffs may cover fittings to meet 3.10.18.

3.3.3 Fittings

All fittings shall be proven to meet the requirements herein. The hose attachment of fittings shall be a permanent design. Forgings are permitted. Unless specified otherwise by the user, the hose assembly end fittings shall have 24-degree cone fittings in accordance with NAS1760 to mate with MS33514/AS4375 or flared fittings (AS1708 configurations are acceptable) to mate with AS4395/MS33656, as applicable.

3.3.3.1 Insert Fittings

Insert fittings shall be of one-piece construction wherever possible. Those made of other than one-piece construction shall have either welded joints, using butt-welded design, or braze joints, using lap-braze design, and fabricated from annealed corrosion-resistant steel or titanium tubing. Welded and redrawn tubing may be used for corrosion-resistant steel.