AEROSPACE STANDARD

AS4897	
Issued 1994-07 Reaffirmed 2015-07	

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

RATIONALE

AS4897 has been reaffirmed to comply with the SAE five-year review policy.

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 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.

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http://www.sae.org/technical/standards/AS4897

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 in	Effuss. 1/2 h cc/ft Max	Effuss. After Stress Degrad[2] cc/in/min Max	Neg. Press. in Hg	Vol. Expan.[2] cc/in Max
03	.008	1000	2000	4000	3200	.75	2.0	2.0	28	.028
04	.010	1000	2000	4000	3200	1.00	2.0	2.0	28	.042
05	.012	800	1600	3200	2500	1.25	2.0	2.0	28	.042
06	.014	750	1500	3000	2400	2.00	2.0	2.0	28	.075
08	.017	750	1500	3000	2250	2.00	2.0	2.0	28	--
10	.022	700	1400	2800	2100	3.00	2.0	2.0	28	--
12	.027	600	1200	2400	1800	4.50	2.0	2.0	20	--

[1] Hose weight shall be determined on a minimum length of 12 in.
[2] Verified per 3.10.3.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The applicable issue of other documents shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 4928 Titanium Alloy Bars and Forgings, 6Al4V, Annealed, 120,000 psi (827 MPa) Yield
AMS 4945 Titanium Alloy Tubing, Seamless, Hydraulic, 3Al-2.5V, Texture Controlled, 105,000 psi (724 MPa) Yield Strength
AMS 4965 Bars, Forgings and Rings 6Al4V, Solution and Precipitation Heat Treated
AMS 5637 Bars, 18Cr 9Ni, Solution Heat Treated and Cold Drawn - 125,000 psi
AMS 5639 Steel Bars, Forgings, Tubing, and Rings, Corrosion-Resistant 19 Cr - 10 Ni (SAE 30304)
AMS 5643 Steel Bars, Forgings, Tubing, and Rings, Corrosion Resistant 16.5 Cr - 4.0 Ni - 4.0 Cu
AMS 5644 Steel, Bars, and Forgings, Corrosion and Heat Resistant 17 Cr - 7 Ni - 1 Al
AMS 5645 Steel Bars, Forgings, Tubing, and Rings, Corrosion and Heat Resistant 18 Cr - 10 Ni - 0.40 Ti (SAE 30321)
AMS 5646 Steel Bars, Forgings, Tubing, and Rings, Corrosion and Heat Resistant 18 Cr - 11 Ni - 0.60 (Cb + Ta) (SAE 30347)
AMS 5647 Bars, Forgings, Tubing and Rings 19 Cr 9.5 Ni, Solution Heat Treated
AMS 5659 Bars, Wire, Forgings, Rings and Extrusions, 15 Cr 4.5 Ni 0.30 (Cb + Ta) 3.5 Cu, Consumable Electrode Melted, Solution Heat Treated, Precipitation Hardenable
AMS 5685 Wire, Safety, 18 Cr 11.5 Ni, Solution Heat Treated, Cold Finished (SAE30305)

2.1 (Continued):

AMS 5689	Wire, Corrosion and Heat Resistant 18 Cr - 9.5 Ni - Ti (SAE 30321) Solution Heat Treated
AMS 5690	Wire, Corrosion and Heat-Resistant 17 Cr - 12 Ni - 2.5 Mo (SAE 30316)
AMS 5697	Wire, Corrosion Resistant 19 Cr - 9.5 Ni (SAE 30304)
AMS 5743	Bars and Forgings 15.5 Cr - 4.5 Ni - 2.9 Mo - 0.10 N, Solution Heat-treated, Sub-Zero Cooled, Equalized, and Over Tempered
AS150	Hose Assembly, Type Classifications of, Basic Performance and Fire Resistance
ARP603	Impulse Testing of Hydraulic Hose Assemblies, Tubing and Fittings
AS611	Tetrafluoroethylene Hose Assembly Cleaning Methods
ARP908	Hose Fittings Installation and Qualification Test, Torque Requirements
AS1055	Fire Testing of Flexible Hose, Tube Assemblies, Coils, Fittings and Similar System Components
ARP1153	Methods for Determining Relative Specific Gravity
AS1708	Fitting End, Flared, Female, Standard Dimensions for
ARP1835	Preparation for Delivery, General Requirements for Hose Assemblies
AS1946	Hose Assembly, Polytetrafluoroethylene (PTFE), Up to 450 °F (232 °C) and 1500 psi (10 500 kPa), Procurement Specification
AS2078	Aerospace - Fluid Systems - Test Methods for Polytetrafluoroethylene (PTFE) Hose Assemblies
AS4375	Fitting End, External Thread, Flareless, Design Standard
AS4395	Fitting End - Flared Tube Connection, Design Standard

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia PA 19111-5094.

P-D-680	Dry Cleaning and Degreasing Solvent
QQ-S-763	Steel Bars, Wire Shapes, and Forgings, Corrosion-Resisting
QQ-P-35	Passivation Treatments for Corrosion Resistant Steel
MIL-T-31000	Drawings, Engineering and Associated Lists
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-831	Test Reports: Preparation of
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-S-8879	Screw Threads, Controlled Radius Root, With Increased Minor Diameter, General Specification for
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)
MS33514	Fitting End, Standard Dimensions for Flareless Tube Connection and Gasket Seal (See AS4375)
MS33656	Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal (Cancelled - See AS4395)

2.3 ASTM Publications:

Available from ASTM, 1916 Race St., Philadelphia, PA 19103-1187.

ASTM A 262 Standard Recommended Practices for Detecting Susceptibility to Intergranular Attack in Stainless Steel
ASTM A 580 Specification for Stainless and Heat Resisting Steel Wire
ASTM D 792 Tests for Specific Gravity and Density of Plastics by Displacement

2.4 AIA National Aerospace Standards:

Available from Aerospace Industries Association, 1250 Eye Street NW, Washington, DC 20005.

NAS 1760 Fitting End, Flareless Acorn, Standard Dimensions for

2.5 ASME Publications:

Available from ASME, 345 E. 47th St., New York, NY 10017.

ANSI/ASME B46.1 Surface Texture

3. REQUIREMENTS:

3.1 Qualification:

Hose assemblies supplied in accordance with this standard shall be representative of products which have been subjected to and which have successfully passed the material and qualification tests specified in this standard. They shall be listed on or approved for listing on an applicable qualified products list. Users/purchasers are encouraged to establish a qualified product/manufacturers list.

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 A 262, 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 AMS 5639

(2) Solution heat treated, corrosion resistant steel, austenitic, annealed or as rolled

(a) 321 AMS 5645
(b) 347 AMS 5646

(3) Precipitation hardenable, corrosion resistant steel, solution heat treated and artificially aged condition

(a) 15-5 PH AMS 5659
(b) 17-4 PH AMS 5643
(c) 17-7 PH AMS 5644
(d) AM-355 AMS 5743

(4) Titanium

(a) 6Al-4V AMS 4928
(b) 6Al-4V AMS 4965

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 AMS 4945

3.2.1 (Continued):

c. Wire:

(1) Corrosion resistant steel, austenitic, cold drawn

(a) 302 AMS 5637 or ASTM A 580
(b) 304 AMS 5697 or ASTM A 580
(c) 305 AMS 5685 or ASTM A 580
(d) 321 AMS 5689
(e) 316 AMS 5690

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 gage. 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 .06 in 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° cone fittings in accordance with NAS 1760 to mate with MS33514/AS4375, or flared fittings (AS1708 configurations is 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.

3.3.3.2 Fitting Finish:

3.3.3.2.1 Corrosion-Resistant Steel Parts: Unless otherwise specified, corrosion-resistant steel parts shall be passivated in accordance with QQ-P-35.

3.3.3.2.2 Titanium Alloy Parts: Titanium alloy fittings and nuts shall be fluoride phosphate coated per AMS 2486.

3.4 Inner Tube Requirements:

3.4.1 Apparent and Relative Specific Gravity: The apparent specific gravity of the hose inner tube shall not exceed 2.155 when tested in accordance with ARP1153. The relative specific gravity shall not exceed a value of 2.210 g/cm^3 when tested as specified in ARP1153.

3.4.2 Tensile Strength: When tested in accordance with AS2078 the longitudinal tensile strength for all sizes of tubes shall be 3000 psi minimum. The transverse tensile strength for sizes -10 and larger shall be 2500 psi minimum. For sizes under -10 the transverse strength need not be tested.

3.4.3 Elongation: When tested in accordance with AS2078, the elongation shall be a minimum of 200%.

3.4.4 Tube Roll: The tube shall not leak, split, burst, or show any evidence of malfunction, when tested through the sequence as specified in AS2078.

3.4.5 Tube Proof Pressure: Following tube roll test per 3.4.4, the tube, without reinforcing wires, shall not leak, burst, or show any evidence of malfunction when tested as specified in AS2078 to tube proof pressure of Table 2.

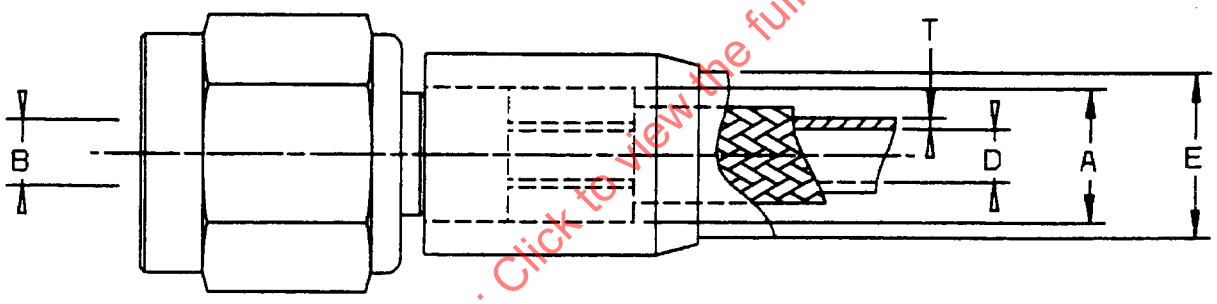

FIGURE 1 - Hose and Fitting Dimensions (Table 2)

TABLE 2 - Hose and Fitting Dimensions as Shown in Figure 1 (inch)

Hose Size (Ref)	Ftg. OD A[1] Max	Str. Ftg. ID B[2] Min	Hose ID Braided D Min	Hose OD[3] E Min	Hose OD[3] E Max	Wall Thickness Inner Tube T Min	Tube[4] Proof Pressure psig
03	.49	.080	.110	.385	.425	.025	250
04	.55	.132	.173	.460	.500	.025	250
05	.63	.193	.235	.510	.550	.025	250
06	.70	.256	.298	.575	.615	.025	200
08	.83	.340	.391	.665	.705	.030	160
10	.97	.430	.485	.780	.820	.030	160
12	1.17	.548	.615	.925	.965	.030	140

[1] The dimensions across the corners of nut and socket hexagon and protective silicone cuff may exceed "A" dimension. Socket hex is optional.
[2] Minimum ID through the elbow area may be less than the values shown.
[3] Over integral silicone cover (firesleeve).
[4] Unreinforced tube.

3.4.6 Electrical Conductivity: When tested in accordance with AS2078 the electrical current shall be equal to or greater than 10 µA for sizes -03 through -08, and equal to or greater than 20 µA for sizes -10 and over.

3.5 Hose, Dimensional and Physical Requirements:

3.5.1 Dimensions: The hose assembly dimensions, except for length, shall be as specified in Figure 1 and Table 2.

3.5.2 Physical Requirements: Hose assemblies shall meet the physical and weight requirements per Table 1.

3.5.3 Bore Check: When bent to the appropriate minimum bend radius as specified in Table 1, the hose assembly shall permit the free passage of a solid rigid sphere through its length. The diameter of the sphere shall be 90% of the appropriate minimum inside diameter “B” of the end fittings as specified in Table 2. For elbow fittings see Note 2 of Table 2 and 3.9.2.1.2.

3.6 Screw Threads:

Unless otherwise specified, fitting threads shall be in accordance with MIL-S-8879, “other threads”.

NOTE: Fitting nut thread pitch diameter tolerance increase of 10% following connection for proof testing shall not be cause for rejection of the hose assembly.

3.7 Part Numbering of Interchangeable Parts:

All parts complying with this standard and having the same manufacturer’s or standard part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of MIL-T-31000 shall govern the manufacturer’s part numbers and changes thereto.

3.8 Identification of Product:

The assembly and its component parts shall be permanently marked for identification in accordance with MIL-STD-130. The following special marking shall be added:

3.8.1 Fittings: The manufacturer's name or trademark may be permanently marked on one element of all end fittings see 3.8.2.

3.8.2 Assembly: A permanent marking shall be applied on a fitting or on a permanent band or bands securely attached on the hose. Marking bands shall be so designed as to remain tight on the hose to prevent relative movement and resultant chafing. Bands shall be no wider than 1 in and shall not impair the flexibility or the performance of the hose. Band location over the fitting is recommended and should be covered with PTFE/FEP shrink sleeve. Unless otherwise specified, the marking on the fitting or band shall include the following information:

a. Assembly manufacturer's name or trademark, and specification number
b. Complete hose assembly part number, and hose liner source Contractor And Government Entity (CAGE) number if different ownership than assembly manufacturer
c. Nominal pressure "1000 psi", or as applicable per Table 1
d. Operating temperature "450 °F"
e. Pressure test symbol "PT"
f. Date of hose assembly manufacture expressed in terms of month and year, or batch number
g. Fire resistance type per AS1055 (see 3.10.18) or AS3150 (see 3.11)

3.9 Workmanship:

The hose assembly, including all parts, shall be constructed and finished to a good quality. All surfaces shall be free from burrs and sharp edges. All sealing surfaces shall be smooth, except that annular tool marks up to 100 μin Ra per ANSI/ASME B46.1 maximum will be acceptable.

3.9.1 Dimensions and Tolerances: All pertinent dimensions and tolerances, where interchangeability, operation, or performance of the hose assembly may be affected, shall be specified on applicable drawings.

3.9.2 Cleaning: All hose assemblies shall be free from oil, grease, dirt, moisture, cleaning solvents and other foreign materials both internally and externally. Hose assemblies shall be cleaned per Class 0 of AS611 and shall meet the following requirements when properly cleaned.

3.9.2.1 Internal Cleanliness Test: 3.9.2.1.1Visually inspect hose assembly ends for installation of plug or cap at fitting. Both ends should be firmly capped. An uncovered fitting nipple end shall be cause for rejection.

3.9.2.1.2 Remove caps or plugs, place a light source at one end of the hose assembly with straight fittings and visually examine the hose assembly, without magnification, from the opposite end. Oil, grease, dirt, moisture or other foreign materials shall be cause for rejection. An assembly with elbow or bent tube fittings shall be checked per 3.5.3 without need to bend the hose assembly and with an 85% ID ball.

3.10 Hose Assembly, Test and Performance Requirements:

3.10.1 Proof Pressure: When tested in accordance with AS2078 each hose assembly shall withstand the proof pressure listed in Table 1 without malfunction or leakage.

3.10.2 Elongation and Contraction: When tested in accordance with AS2078 there shall be no change in length by more than 2% in a 10 in gauge length. Two sample hoses shall be subjected to this test.

3.10.3 Volumetric Expansion: When tested in accordance with AS2078 the volumetric expansion shall not exceed the limits specified in Table 1. Two sample hose assemblies shall be subjected to this test.

3.10.4 Pneumatic Effusion: When tested in accordance with AS2078 the hose assemblies shall not exceed a total effusion rate as shown in Table 1. Two sample hose assemblies shall be used for this test. Apparent failure [all collection at end(s)] shall require retest without the silicone cover. Satisfactory test of uncovered hose shall be qualification.

3.10.5 Pneumatic Surge: When tested in accordance with AS2078 the inner tube of the hose assembly shall not collapse nor show evidence of degradation. Two sample hose assemblies shall be used for this test.

3.10.6 Fuel resistance: When tested in accordance with AS2078 the hose assemblies shall not leak or show evidence of degradation. Two sample hose assemblies shall be used for this test.

3.10.7 Impulse:

3.10.7.1 Preconditioning: Six sample hose assemblies having a 90° elbow fitting on one end and a straight fitting on the other end shall be used for this test. If approval is being sought for both the bent-tube and the forged-elbow configuration, then one-half of the samples as shown in Table 3 shall use the bent elbows, while the other half of the samples shall have the forged elbows.

3.10.7.2 Preparation: Two assemblies shall be oil aged, two shall be air aged, and two shall be unaged (see 4.5.2). The assemblies shall then be subjected at room temperature to the proof pressure specified in Table 1 for a minimum of 5 min. Salt solution conditioning is not required.

3.10.7.3 Requirement: The hose assemblies shall then be tested in accordance with AS2078 based on 125% of operating pressure(s) of Table 1. The specimens shall pass 100 000 cycles of impulse testing without any evidence of leakage.

NOTE: The high temperature portion of the impulse test shall be conducted at 400 °F.

3.10.8 Stress Degradation: When tested in accordance with AS2078 the hose assembly shall not exceed an average effusion rate as shown in Table 1. Two sample hose assemblies shall be used for this test. Apparent failure [all collection at end(s)] shall require retest without the silicone cover. Satisfactory test of uncovered hose shall be qualification.

3.10.9 Low Temperature Flexing: When tested in accordance with AS2078 the hose assembly shall not show damage after flexing. Three sample hose assemblies shall be used for this test.

3.10.10 Leakage: When tested in accordance with AS2078 there shall be no leakage. Two sample hose assemblies shall be subjected to this test.

3.10.11 Corrosion: Two assemblies shall be tested in accordance with the following procedure. Assembly shall be pressurized to the operating pressure of Table 1, and immersed in a 2.5% ± 0.1% NaCl solution for a period of 5 min then hot air dried at 140 °F for a period of 25 min. This cycle shall be repeated for a total of 172 h. Following completion, one assembly shall be room temperature burst tested per 3.10.13 and one assembly high temperature burst tested per 3.10.14.

3.10.12 Repeated Installation: When tested in accordance with the procedure outlined below, the assembly end fittings shall show no evidence of leakage, galling or other malfunction. Two sample hose assemblies shall be used for this test. The test procedure shall be as follows: hose assembly end fittings shall be screwed to appropriate union adapters eight times using system fluid or an equivalent lubricant. Each of the eight cycles shall include the complete removal of the hose fitting from the union. Fitting nuts shall be tightened to the torques specified in ARP908, one-half shall be tested to the minimum, one-half to the maximum tightening torques. Following the first, fourth, and eighth installation, proof tests shall be conducted in accordance with 3.10.1. Following the eighth installation the hose fittings shall be pressure tested with air or nitrogen for 5 min at the nominal operating pressure. There shall be no leakage from the interface connection.

3.10.13 Room Temperature Burst Pressure: When tested in accordance with AS2078 the hose assembly shall not leak or burst at any pressure below the room temperature burst value specified in Table 1. Two hose assemblies shall be tested.

3.10.14 High Temperature Burst Pressure: When tested in accordance with AS2078 the hose assembly shall not leak or burst at any pressure below the high temperature burst value specified in Table 1. Two hose assemblies shall be tested.

TABLE 3 - Qualification Test Sequence and Number of Samples[1]

	Inner Tube	Hose Assemblies																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
3.3 Examination[2]	0	0																						
3.4.1 Density, relat. dens.[2]	0	0																						
3.4.2 Tensile strength[2]	0	0																						
3.4.3 Elongation[2]	0	0																						
3.4.4 Flattening, rounding[2]	0	0																						
3.4.5 Proof pressure[2]	0	0																						
3.4.6 Electr. conductivity[2]	0	0																						
3.5-3.9 Examination[2]			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.10.1 Proof pressure			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
3.10.2 Elongation					0							0												
3.10.3 Volumetric expansion					0							0												
3.10.4 Pneumatic effusion								0	0															
3.10.5 Pneumatic surge								0	0															
3.10.6 Fuel				0	0																			
3.10.7 Impulse: Unaged															0	0								
Air aged																	0	0						
Oil aged																			0	0				
3.10.8 Stress degradation										0	0													
3.10.9 Flexing, Low Temp.					0						0	0												
3.10.10 Leakage								0	0															
3.10.11 Corrosion						0	0																	
3.10.12 Repeated use installation			0	0																				
3.10.13 Burst - room temp.						0		0																
3.10.14 Burst - high temp.							0		0															
3.10.15 Vacuum											0	0												
3.10.16 Pneumatic leakage													0	0										
3.10.17 Electr. conductivity																					0			
3.10.18 Fire (when required)																						0	0	0

[1] One circle "0" means one inspection.
[2] Production lot records may be used to verify conformance to these tests when the PTFE tube or hose assembly being used is an established production item.

3.10.15 Vacuum: When tested in accordance with AS2078 the hose shall not collapse or buckle. After completion of the test a spherical ball of a diameter as shown in Table 4 shall roll freely through the length of the hose assembly. Two sample assemblies shall be used for this test.

TABLE 4 - Spherical Ball Size for Verifying Hose ID After Vacuum Test

Hose Size	03	04	05	06	08	10	12
Ball Dia (in)	0.078	0.125	0.188	0.250	0.312	0.406	0.531

3.10.16 Pneumatic Leakage: When tested in accordance with AS2078 each assembly shall withstand the operating pressure listed in Table 1 without leakage. The test assemblies shall be prepared without the use of any oil during assembly. Two assemblies shall be tested.

3.10.17 Electrical Conductivity: When tested in accordance with AS2078 hose assemblies of sizes 03 through 08 shall be capable of conducting a direct current equal to or greater than 6 μA and sizes 10 and over a current equal to or greater than 12 μA. One sample shall be used for this test.

3.10.18 Resistance to Fire: Three hose assemblies shall be tested in accordance with AS1055 Type IIa, Class B. They shall satisfactorily pass this criteria without added accessory(ies) such as AS1072 firesleeve. Silicone cuffs may cover the fitting sockets and must be representative of production configuration.

3.11 Performance:

Satisfactory qualification to this standard meets the requirements of AS150 Type I and Type IaB.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize their own facilities or any commercial laboratory acceptable to the procuring activity. The purchaser reserves the right to perform any of the inspections set forth in the specification, where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Classification of Inspections:

The examination and testing of hose assemblies shall be classified as:

a. Qualification inspections: 4.3
b. Quality conformance inspections: 4.4

4.3 Qualification Inspections:

4.3.1 Qualification Test Samples: Test samples shall consist of the number of samples specified in Table 3 and the specimen numbers and lengths specified in Table 5.

TABLE 5 - Lengths of Hose Assemblies for Test

Hose Size Dash	Six Assemblies for Impulse Test, Free Hose (3.10.7) in	Three Assemblies for Fire Test (3.10.18) in	Thirteen Assemblies for Other Tests[1] in
03	5	24	18
04	6	24	18
05	7.5	24	18
06	10	24	18
08	10.5	24	18
10	14.5	24	18
12	20	24	18

[1] One additional sample of each size in lengths as shown in AS2078, paragraph 4.3, shall be used for electrical conductivity tests (3.10.17).

4.3.1.1 If a supplier qualifies one type end fitting sealing design as defined herein and desires to qualify another sealing design, two hose assemblies of each size to be qualified shall be subjected to the test specified in 4.5.1.1.

4.3.1.2 The qualification of another sealing design (beam seal, etc.) may be satisfied by similarity in lieu of test. To qualify by similarity, the hose to fitting attachment (socket, nipple and installation) must be identical to that originally qualified and the connection design and material must have been qualified to a higher pressure similar standard; e.g. AS1946, AS604, AS1339, MIL-H-25579, etc.

4.3.2 Test Report, Test Samples, and Data for the Purchaser: When the tests are conducted at a location other than the laboratory of the purchaser, the following shall be made available if requested by the purchaser:

a. Test report in accordance with MIL-STD-831. Three copies of a test report which shall include a report of all tests and outline description of the tests and conditions.

b. Test samples: The samples that were tested, when requested for qualification approval by the purchaser. The samples remain the property of the manufacturer if test expenses are borne by the manufacturer.

c. List of sources of hose or hose components, including source's name and product indentification for inner tube, hose, and fitting if other than assembly supplier.

NOTE: Lot sheets, containing required test data, shall remain on file at the source test facility and are not to be sent to the qualifying activity unless specifically requested.