Ar	SAE Aerospace		SAE, AS1946	REV. B			
		STANDARD	lssued 1990-07 Revised 2003-04 Reaffirmed 2007-07				
			Superseding AS1946A				
	Hose Assembly, Up to 1500	Polytetrafluoroethylene, Metallic psi and 450 °F, Hydraulic and Pn	Reinforced, eumatic				
		RATIONALE	5.	2			
This	s document has been reaffirmed to c	omply with the SAE 5-Year Review	policy.				
1.	SCOPE:						
1.1	Application:						
This SAE Aerospace Standard (AS) defines the requirements for polytetrafluoroethylene (PTFE) lined, metallic reinforced, hose assemblies suitable for use in aerospace hydraulic, fuel and lubricating oil systems at temperatures between -67 °F and 450 °F for Class I assemblies, -67 °F and 275 °F for Class II assemblies, and at nominal pressures up to 1500 psi. 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,							
	covered specifically by this standard procuring activity.	d, for example oxygen, shall be subj	ch the application is not ject to the approval of the	•			
1.2	Classification:						
1.2.1	1 Hose assemblies furnished under	this document shall be of the follow	ving classes:				
	a. Class I: All corrosion resistan	t steel, or nickel alloy or titanium cor	mbination fittings, 450 °F				
	b. Class II: Combination aluminu and larger	um alloy and corrosion resistant stee	el fittings, 275 °F, size -08	\$			
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- 1.2.2 Hose assemblies furnished under this document may be of the following types. If no type is defined then Type A shall prevail.
 - a. Type A: Permanently attached fittings
 - b. Type B: Field attachable (re-usable) fittings, size -04 and larger

2. REFERENCES:

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2.1 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.

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

AMS 2486	Conversion Coating of Titanium Alloys, Fluoride-Phosphate Type
AMS 4069	Aluminum Alloy, Drawn, Round Seamless Tubing Close Tolerance, 2.5Mg 0.25Cr (5052-0) Annealed
AMS 4082	Aluminum Alloy, Seamless Drawn Tubing, 1.0Mg 0.60Si 0.28Cu 0.20Cr (6061-T6) Solution and Precipitation Heat Treated
AMS 4117	Aluminum Alloy, Rolled or Cold Finished Bars, Rods, and Wire and Flash Welded Rings, 1.0Mg 0.60Si 0.28Cu 0.20Cr (6061; -T6, -T651) Solution and Precipitation Heat Treated
AMS 4121	Aluminum Alloy, Bars, Rods, and Wire Rolled or Cold Finished, 4.5Cu 0.85Si 0.80Mn 0.50Mg (2024-T6) Solution and Precipitation Heat Treated
AMS 4127	Aluminum Alloy, Forgings and Rolled or Forged Rings, 1.0Mg 0.60Si 0.28Cu 0.20Cr (6061-T6) Solution and Precipitation Heat Treated
AMS 4339	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
AMS 4928	Titanium Alloy, Bars, Wire, Forgings, and Rings, 6AI 4V, Annealed
AMS 4944	Titanium Alloy, Seamless, Hydraulic Tubing, 3.0Al 2.5V Cold Worked, Stress Relieved
AMS 4945	Titanium Alloy, Tubing, Seamless, Hydraulic, 3AI 2.5V, Texture Controlled, 105 ksi Yield Strength Cold Worked, Stress Relieved
AMS 4965	Titanium Alloy, Bars, Wire, Forgings, and Rings, 6.0Al 4.0V Solution Heat Treated and Aged
AMS 5556	Steel, Corrosion and Heat Resistant, Seamless or Welded Tubing, 18Cr 11Ni 0.70Cb (SAE 30347), Hydraulic, Solution Heat Treated
AMS 5557	Steel, Corrosion and Heat Resistant, Seamless or Welded Hydraulic Tubing 18.5Cr 10.5Ni 0.40Ti (SAE 30321), Solution Heat Treated
AMS 5561	Steel, Corrosion and Heat Resistant, Welded and Drawn Tubing 9.0Mn 20Cr 6.5Ni 0.28N High Pressure Hydraulic

2.1.1 (Continued):

Steel Corrosion Resistant, Seamless or Welded Tubing, 19Cr 10Ni (SAE
Steel, Corrosion and Heat Resistant, Seamless Tubing, 17Cr 12.5Ni 2.5Mo (SAE 30316), Solution Heat Troated
Nickel Alloy, Corrosion and Heat Resistant, Seamless or Welded Tubing 62Ni 21.5Cr 9.0Mo 3.7(Cb+Ta) Appealed
Steel, Corrosion Resistant, Bars, Wire, Forgings, Tubing and Rings, 19Cr 10Ni (SAE 30304), Solution Heat Treated
Steel, Corrosion Resistant, Bars, Wire, Forgings, Tubing and Rings, 16Cr 4.0Ni 0.30(Cb+Ta) 4.0Cu (SAE 17-4PH), Solution Heat Treated, Precipitation Hardenable
Steel Bars and Forgings, Corrosion Resistant, 17Cr 7 ONI 1 OAL (SAF 17 ADL)
Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Tubing and Rings, 18Cr 10Ni 0.40Ti (SAE 30321), Solution Heat Treated
Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Tubing and Rings, 18Cr 11Ni 0.60Cb (SAE 30347), Solution Heat Treated
Steel, Corrosion Resistant, Bars, Wire, Forgings, Tubing and Rings, 19Cr 9.5Ni (SAE 304L), Solution Heat Treated
Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Tubing and Rings, 17Cr 12Ni 2.5Mo (SAE 30316), Solution Heat Treated
Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Tubing and Rings, 17Cr 12Ni 2.5Mo (SAE 30316L), Solution Heat Treated
Steel, Corrosion Resistant, Bars, Wire, Forgings, Extrusions, and Rings 9.0Mn 20Cr 6.5Ni 0.27N Solution Heat Treated
Steel, Corrosion Resistant, Bars, Wire, Forgings, Rings, and Extrusions 15Cr 4.5Ni 0.30Cb 3.5Cu, Consumable Electrode Melted, Solution Heat Treated, Precipitation Hardenable
Nickel Alloy, Corrosion and Heat Resistant, Bars, Forgings, Extrusions, and Rings 62Ni 21.5Cr 9.0Mo 3.65(Cb+Ta) Annealed
Steel, Corrosion and Heat Resistant, Wire 18Cr 10.5Ni 0.40Ti (SAE 30321), Solution Heat Treated
Steel, Corrosion and Heat Resistant, Wire 17Cr 12Ni 2.5Mo (SAE 30316), Solution Heat Treated
Steel, Corrosion Resistant, Wire 19Cr 9.5Ni (SAE 30304), Solution Heat Treated
Steel, Corrosion and Heat Resistant, Bars and Forgings 15.5Cr 4.5Ni 2.9Mo 0.10N (SAE AM-355), Solution Heat Treated, Sub-Zero Cooled, Equalized, and Over-Tempered
Passivation Treatments for Corrosion Resistant Steel
Hose Assembly, Type Classifications of, Basic Performance and Fire Resistance
Hose Assembly and Tubing, Polytetrafluoroethylene, Cleaning Methods for Hose Fitting - Installation and Qualification Test Torque Requirements

2.1.1	(Continued):	
	AS1055	Fire Testing of Flexible Hose, Tube Assemblies, Coils, Fittings and Similar System Components
	AS1072	Sleeve, Hose Assembly, Fire Protection
	AS1708	Fitting End, Internal Flared, Design Standard
	ARP1835	Preparation for Delivery, General Requirements for Hose Assemblies
	AS2078	Test Methods, Hose Assemblies, Polytetrafluoroethylene (PTFF)
	AS4207	Fitting End, External Thread, Beam Seal, Design Standard
	AS4209	Fitting End Assembly, Internal Thread, Retained Nut, Beam Seal, Design Standard
	AS4375	Fitting End, External Thread, Flareless Design Standard
	AS4395	End Fitting - Flared Tubing Connections, Design Standard
	AS7003	National Aerospace and Defense Contractors Accreditation Program (NADCAP)
	AS7112	National Aerospace and Defense Contractors Accreditation Program Requirements for Fluid System Components
	AS8879	Screw Threads - UNJ Profile, Inch
	AS33514	Fitting End, Standard Dimensions for Flareless Tube Connection and Gasket Seal
	AS85421	Fittings, Tube, Fluid Systems, Separable, Beam Seal, 3000/4000 psi, General Specification for
2.1.2	ASTM Publications 19428-2959.	: Available from ASTM, 100 Barr Harbor, West Conshohocken, PA
	ASTM A 262	Standard Recommended Practices for Detecting Susceptibility to Intergranular
	ASTM A 313	Standard Specification for Stainless Steel Spring Wire
	ASTM D 471	Standard Test Method for Rubber Property - Effect of Liquids
	ASTM A 580	Specification for Stainless and Heat Resisting Steel Wire
2.1.3	NAS Standards: Av Washington, DC 20	ailable from Aerospace Industries Association, 1250 Eye Street NW, 005.
	NAS 847 NAS 1760	Caps and Plugs, Protective, Dust and Moisture Seal Fitting End, Flareless Acorn, Standard Dimensions for

2.1.4 U.S. Government Publications: Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

P-D-680 MIL-H-5606 MIL-HDBK-831 MIL-PRF-7808 MIL-A-8625 MIL-PRF-83282 MIL-F-85421/1 MIL-PRF-87257	Dry Cleaning Solvent Hydraulic Fluid, Petroleum Base; Aircraft; Missile and Ordnance Preparation of Test Reports Lubricating Oil, Aircraft Turbine Engine, Synthetic Base Anodic Coatings for Aluminum and Aluminum Alloys Hydraulic Fluid, Fire Resistant Synthetic Hydrocarbon Base, Aircraft Fitting End, Standard Dimensions for Dynamic Beam Seal, Male Hydraulic Fluid, Fire Resistant; Low Temperature, Synthetic Hydrocarbon Base, Aircraft and Missile
MIL-STD-100	Engineering Drawings
MIL-STD-130	Identification Marking of U.S. Military Property

2.1.5 ASME Publications: Available from ASME, 345 East 47th Street, New York, NY 10017-2330.

ASME B46.1 Surface Texture

2.1.6 PRI Publications: Available from Performance Review Institute, 161 Thornhill Road, Warrendale, PA 15086-7527.

PD2001	Qualified Product Management Council Procedures for Qualified Products Group
PD2101	Aerospace Quality Assurance, Product Standard, Qualification Procedures, Fluid Systems

- 2.1.7 Order of Precedence: In the event of a conflict between the text of this specification and the reference cited herein, the text of this specification shall take precedence.
- 2.2 Hose Assembly Procurement Specifications:

Refer to AS1946SUP1 for a listing of applicable hose assembly part standards applicable to this document.

3. TECHNICAL REQUIREMENTS:

3.1 Qualification:

Hose assemblies supplied in accordance with this document shall be representative of products which have been subjected to and which have successfully passed the 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 PD2101, AS7003 and AS7112, and shall be listed in a Performance Review Institute (PRI) 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 PD2001 and PD2101 for listing in a PRI Qualified Products List (QPL).
- 3.2 Material:

The hose assemblies shall be uniform in quality and free from defects in material as is consistent with good manufacturing practice, and shall conform to the applicable specifications and requirements specified in this standard. 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 aluminum alloy, corrosion-resistant steel, titanium, or nickel alloy suitably treated to resist corrosion when in storage or during normal service use. Metals used in the hose and fittings shall be as listed below:
 - a. Bars and Forgings:

Corrosion resistant steel, austenitic, annealed or as rolled

(1)	AMS 5639	304
101		

(2) AMS 5647 304L

Heat stabilized corrosion resistant steel, austenitic, annealed or as rolled

(3)	AMS 5645	321
(4)	AMS 5646	347

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(5)	AMS 5648	316

- (6) AMS 5653 316L
- (7) AMS 5656 21-6-9

			SAE	AS1946	Revision B
3.2.1	(Cor	ntinued):			
	F	Precipitation harden condition	ing corrosion r	esistant ste	eel - resolution heat treated and artificially aged
	(8 (9 (1) (1)	8) AMS 5659 9) AMS 5643 10) AMS 5644 11) AMS 5743	15-5PH 17-4PH 17-7PH AM-355		
	Т	itanium			
	(1 (1	12) AMS 4928 13) AMS 4965	6AI-4V Anr 6AI-4V Sol	nealed ution Heat	Treated and Aged
	Ν	ickel Alloy			
	(1	4) AMS 5666	Type 625		
	A	luminum Alloy			
	(1 (1 (1 (1	 5) AMS 4121 6) AMS 4339 7) AMS 4117 8) AMS 4127 	2014-T6 2024-T851 6061-T6, -T 6061-T6	651	
	b. Tu	ubing:			
	Al	uminum Alloy			
	(1) (2)) AMS 4069) AMS 4082	Seamless, s Seamless, 6	5052-0 6061-T6	
	Co	prrosion resistant st	eel, austenitic,	seamless	or welded, annealed
	(3)) AMS 5567	Type 1 or Ty	/pe 2, 304	
	He	eat stabilized corros	ion resistant st	teel, auster	nitic, seamless or welded
	(4) (5) (6) (7)	AMS 5557 AMS 5556 AMS 5561 AMS 5573	Type 1 or Ty Type 1 or Ty 21-6-9 Seamless, 3	/pe 2, 321 /pe 2, 347 316	
	Tita	anium			
	(8) (9)	AMS 4944 AMS 4945	3AI-2.5V 3AI-2.5V Tex	dure Contr	olled
	Nic	kel Alloy			
	(10)) AMS 5581	Type 625		

3.2.1 (Continued):

c. Wire:

Corrosion resistant steel, austenitic, cold drawn

- (1) ASTM A 580/A 313 Comp. 304 (AMS 5697)
- (2) ASTM A 580/A 313 Comp. 316 (AMS 5690)
- (3) ASTM A 580/A 313 Comp. 321 (AMS 5689)

3.3 Design and Construction:

The hose assembly shall consist of a seamless PTFE inner tube, corrosion-resistant steel-wire reinforcement, and aluminum, corrosion-resistant steel, titanium, or nickel alloy end fittings as required to meet the construction and performance requirements of this document, 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: 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 to the requirements specified herein. Broken reinforcing wires or buckled wires more than 0.06 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.
- 3.3.3 Fittings: All fittings shall be proven to meet the requirements herein. The hose attachment fitting shall be of a permanent or of a reusable design, as applicable. Forgings are permitted. Standard hose assemblies shall have flared fittings according to AS1708 (single flared permitted) to mate with AS4395; flareless fittings according to NAS 1760 to mate with AS4375 or AS33514; or beam seal fittings according to AS4209 to mate with AS4207 or MIL-F-85421/1. Fitting hex portions shall fit standard wrench openings.
- 3.3.3.1 Insert Fittings: Insert fittings shall be of one piece construction whenever possible. Those made of other than one piece construction shall have either welded joints using butt-welded or lap-weld design, or braze joints using lap-braze design, and fabricated from annealed corrosion-resistant steel, titanium, nickel alloy, or aluminum alloy tubing. Welded and redrawn tubing may be used for corrosion-resistant steel.
- 3.3.3.2 End Fitting Collars (Sockets): All end fitting collars (sockets) 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 or swaging operation. Sockets fabricated from stabilized austenitic steel (304L, 321, or 347) are acceptable without being subjected to the embrittlement test. Titanium sockets are not recommended.

- 3.3.3.3 Fitting Finish:
- 3.3.3.3.1 Aluminum Parts: Unless otherwise specified, aluminum parts shall be finished in accordance with MIL-A-8625, Type II, and dyed yellow on flareless parts and blue on flared parts. The color fastness requirement of MIL-A-8625 does not apply.
- 3.3.3.3.2 Corrosion-Resistant Steel Parts: Unless otherwise specified, corrosion-resistant steel parts shall be passivated in accordance with AMS-QQ-P-35.
- 3.3.3.3.3 Titanium Alloy Parts: Unless otherwise specified, titanium alloy fittings and nuts shall be fluoride phosphate coated per AMS 2486.
- 3.4 Inner Tube Requirements:
- 3.4.1 Specific Gravity: The specific gravity values of the hose inner tube shall not exceed 2.155 apparent and 2.210 relative when tested in accordance with AS2078.
- 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 proof pressure tested as specified in AS2078.
- 3.4.6 Electrical Conductivity: When tested in accordance with AS2078, the electrical current of the inner tube shall be equal to or greater than 10 μ A for sizes -03 through -08, and equal to or greater than 20 μ A 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 1.
- 3.5.2 Physical Requirements: Hose assemblies shall meet the physical and weight requirements specified in Table 2.





TABLE 1 - HOSE and Filling Dimensions as Shown in Figure 1 (in)	ABLE 1 - Hose and Fitting Dimensions as Shown in Fig	ure 1 (in)
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Hose Size	Rigid Tube OD (Ref)	Fitting OD A Max	Fitting ID B ²⁾ Min	Socket Length C Max	Hose ID D Min	Hose OD E Min	Hose OD E Max	Unbraided Inner Tube Wall T Min	Unbraided Inner Tube Wall T Max	Number of Braide	Spherical Ball Size for Determining Min Hose Assy ID ²⁾ in Straight Eittigge	Spherical Ball Size for Determining Min Hose Assy ID ²⁾ in
03	.188	.49	.080	1.25	.110	.234	285	035	047	1	072	
04	.250	.55	.132	1.25	173	304	374	035	047	4	110	.008
05	.312	.63	.193	1.35	235	367	417	035	047	-	174	164
					1200		.417	.000	.047		.1/4	.104
06	.375	.70	.256	1.45	.298	.430	.500	035	047	1	230	218
08	.500	.83	.340	1.72	.391	.546	614	038	050	1	306	280
10	.625	.97	.430	1.93	.485	641	799	042	054	1	397	.205
							.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.042	.054		.307	.300
12	.750	1.17	.548	2.16	.615	766	906	042	054	1	403	166
16	1.000	1.52	.778	2.50	851	1.078	1 140	042	054	2	700	.400
20	1.250	2.00	1 000	2.55	1 101	1 328	1 300	045	057	2	.700	.001
				2.00	1.101	1.020	1.550	.040	.057	2	.900	.850
24	1.500	2.28	1.250	2.68	1.344	1.637	1.707	.065	.077	2	1.125	1.063

1 2

Cross corners of nut and socket hex may exceed "A" dimension. Minimum specified inside diameter shall be verified by passing a spherical ball through the hose assembly.

TABLE 2 - Physical Requirements of Hose Assemblies and Weight of Hose

				_		Bend				
				Burst	Burst	Radius			Effusion	
				Pressure	Pressure	at		Effusion	After	
	Hose	_		Room	High	Inside	Volumetric	(per 30	Stress	
	Weight'	Operating	Proof	Temp	Temp	of	Expansion	min)	Degrad	Negative
Hose	Max	Pressure	Pressure	Min	Min	Bend	Max	Max	Max	Pressure
Size	lb/in	psig	psig	psig	psig	in	cm ³ /in	cm³/ft	cm ³ /in/min	in Hg
03	.005	1500	3000	12000	7000	2.00	.028	4.0	8.0	28
04	.007	1500	3000	12000	7000	2.00	.028	4.0	8.0	28
05	.008	1500	3000	10000	6500	2.00	.040	5.0	8.0	28
06	.010	1500	3000	9000	6500	4.00	N/A	5.0	8.0	28
08	.013	1500	3000	8000	6000	4.63	N/A	5.0	4.0	28
10	.017	1500	3000	7000	5500	5.50	N/A	5.0	2.0	28
12	.027	1000	2000	5000	3500	6.50	N/A	6.0	2.0	20
16	.048	1250	2500	5000	3500	7.38	N/A	8.0	2.0	14
20	.062	1000	2000	4000	3000	11.00	N/A	8.0	2.0	10
24	.084	1000	2000	4000	3000	14.00	N/A	8.0	2.0	8

- 3.5.3 Bore Check: When bent to the appropriate minimum bend radius as specified in Table 2, the hose assembly shall permit the free passage of a solid rigid sphere throughout its length. The diameter of the sphere shall be as specified in Table 1 for the applicable end fitting type.
- 3.6 Screw Threads:

Coupling nut threads shall be in accordance with AS8879. Thread tolerance increase of 10% during assembly or testing shall not be cause for rejection of the hose assembly.

3.7 Length:

Tolerances on hose assembly lengths shall be as follows:

- a. ±0.125 in for lengths under 18 in
- b. ±0.250 in for lengths from 18 to 36 in exclusive
- c. ±0.500 in for lengths from 36 to 50 in exclusive
- d. ±1% for lengths of 50 in and over
- 3.8 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 requirement of MIL-STD-100 shall govern the manufacturer's part numbers and changes thereto.

3.9 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:

3.9.1 Fittings: The manufacturer's name or trademark shall be permanently marked on one element of all end fittings.

3.9.2 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. The band shall be no wider than 1 in and shall not impair the flexibility or the performance of the hose. 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. CAGE code and complete hose assembly part number
- c. Operating pressure "1500 psi", or as applicable per Table 2
- d. Operating temperature "450 °F" or 275 °F (as applicable)
- e. Pressure test symbol "PT"
- f. Date of hose assembly manufacture expressed in terms of month and year, or batch number
- g. Hose manufacturer's CAGE code number (required only when hose manufacturer is different than hose assembly manufacturer)
- h. Fire resistance type per AS1055, Type and Class, or AS150 and Type (when applicable)
- 3.10 Workmanship:

The hose assembly, including all parts, shall be constructed and finished to 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 maximum per ASME B46.1 will be acceptable.

- 3.10.1 Dimensions and Tolerances: All pertinent dimensions and tolerances, where interchangeability, operation, or performance of the hose assembly may be affected, shall be specified on all drawings.
- 3.10.2 Cleaning: All hose assemblies shall be free from oil, grease, dirt, moisture, cleaning solvents and other foreign materials, both internally and externally. Unless otherwise specified, hose assemblies shall be cleaned per Class 0 of AS611 using approved alkaline cleaners only. Do not use chlorinated solvents.
- 3.11 Hose Assembly, Test and Performance Requirements:

The hose, complete with reinforcing wires and assembled with end fittings, shall meet the following performance requirements:

- 3.11.1 Proof Pressure: All hose assemblies shall be subjected to the proof pressure test in accordance with AS2078. The hose assembly shall withstand the proof pressure listed in Table 2 without malfunction or leakage.
- 3.11.2 Elongation and Contraction: Two sample hose assemblies of each size shall be subjected to the elongation and contraction test in accordance with AS2078. The hose assembly shall not change in length by more than +2% or -3% in 10 inches of hose length.
- 3.11.3 Volumetric Expansion: Two sample hose assemblies each of sizes -03, -04, and, -05 only shall be subjected to the volumetric expansion test in accordance with AS2078. The volumetric expansion of the hose assemblies shall not exceed the limits specified in Table 2.
- 3.11.4 Pneumatic Effusion: Two sample hose assemblies of each size shall be subjected to the pneumatic effusion test in accordance with AS2078. The hose assemblies shall not exceed the effusion rate as specified in Table 2.
- 3.11.5 Pneumatic Surge: Two sample hose assemblies of each size shall be subjected to the pneumatic surge test in accordance with AS2078. The inner tube of the hose assembly shall not collapse nor show evidence of degradation.
- 3.11.6 Fuel Resistance: Two sample hose assemblies of each size shall be subjected to the fuel resistance test in accordance with AS2078. The hose assemblies shall not leak or show evidence of degradation.
- 3.11.7 Impulse:
- 3.11.7.1 Preconditioning: Six 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 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.
- 3.11.7.2 Preparation: Two hose 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 2 for a minimum of 5 min.

The hose assemblies shall then be pressurized to operating pressure and while maintaining this pressure at room temperature, the hose assemblies shall be immersed in a 3.5% + 0.1% U.S.P. Grade NaCl solution by weight for 8 to 10 min, then allowed to air dry for the remainder of 1 h. This sequence of immersion and air drying shall be repeated no less than 50 times.

NOTE: The U.S.P. Grade sodium chloride (NaCl) solution shall contain on a dry basis not more than 0.1% sodium iodine and not more than 0.5% total impurities

TABLE 3 - Qualification Test Sequence and Number of Test Specimens in Sample

														Samp	ole H	ose A	Asser	nblie	s							
	Relevant inspection/test		Hose											Te	est S	becin	nen N	lo.								
	,			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	General Examination ¹⁾	x x	x																	196			2 2 1 2			
3.4.1	Density and Relative De	nsity ¹⁾ X X							T				1 22					1228								
3.4.2	Tensile Strength ¹⁾	хx								1								3.5			1.5					1.1
3.4.3	Elongation ¹⁾	хx		11.3		1				-		1					1			1.1.1				100		
3.4.4	Tube Roll ¹⁾	x x	x																				1	1.12-2		100
3.4.5	Proof Pressure ¹⁾	x x	x			1.7.7									1				12,185	1.00			23,55			130
3.4.6	Electrical Conductivity ¹⁾	x x		10.00															allage in	and the second	392.5 61 s (1000		* 19.45		-1 (1997)
3.12	Braid Flare		x	2.0.1 285		1993						1													1.2	
3.5 to 3.10	General Examination			×	x	x	×	x	x	x	×	x	x	×	×	×	x	x	x	x	x	x	x	x	x	x
3.11.1	Proof Pressure	4 - N - 1		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x
3.11.2	Elongation and Contraction	on					x							x		-			-	~	-	~		^	^	Ĥ
3.11.3	Volumetric Expansion						x					\vdash	\vdash	x				-		-					-	-
3.11.4	Pneumatic Effusion	1.2.3								x	x	\vdash	\vdash											-		\neg
3.11.5	Pneumatic Surge									x	x	\vdash	\vdash	1				-		-				-	-	\neg
3.11.6	Fuel Resistance					х	x						\vdash	1						-	-		-	-	-	\neg
	Unage	ed								-		\vdash					x	x	-	-	-	-	-	+	-	\neg
3.11.7	Impulse Air-age	ed											-				~	~	x	x		-+	-	-	-	-
	Oil-age	ed																-	~		v	$\overline{\mathbf{v}}$	-	-+		-
3.11.8	Stress Degradation		1.017	1	+	1						x	x				-	-	-+	-+	Â	Â	+	-	-	\neg
3.11.9	Low-Temperature Flexing			1	1	x		+					x	x		-	-+	-	-	+	-	+	-	+	-+	-
3.11.10	Leakage	14.1.1		+	+			+		х	х					\neg	+	-+	-+	+	+	+	+	+	+	\neg
3.11.11	Corrosion		2	1	+	+		x	x		-					+	+		+	+	+	+	+	+	+	\neg
3.11.12	Repeated Installation	V 4-4		x	x	+	1	+			-		_		-	-	-	+	+	+	+	+	+	+	+	-
3.11.13	Burst Pressure at Room Temperature			1	1	1	1	x		x							\uparrow	+	+	+	+			+		\neg
3.11.14	Burst Pressure at High Temperature			1		1	1		x		x							+	\uparrow	╡	+	╉	+	+	+	-
3.11.15	Vacuum			+	1,	x T	+	+	+	+	+	+	x	x	-	+	+	+	+	+	+	+	+	+	+	-
3.11.16	Pneumatic Leakage			1	+	+	+	+	+	+	+	+			x	x	+	+	+	+	+	+	+	+	+	\neg
3.11.17	Electrical Conductivity			+	+	+	+	+	+	+	+	+		-+	-	+	+	+	+	+	+	-+,	$\frac{1}{2}$	+	+	\neg
3.11.18	Fire Resistance (when requ	uired)		+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	ť	<u>,</u>			Н
Key: X me	ans one inspection/test	internet of the second s																						<u>`</u>	` L'	H
1)Product	ion lot records may be used	to verify conforman	ce to the	ese	tests	s if t	he F	TFF	= tut	ne o	r ho	se a	550	nhlyl	heino	1190	d is a	n est	ablic	hod	orod	uctio	n itor	~		\neg

3.11.7.3 Requirement: The hose assemblies shall then be impulse tested in accordance with AS2078, except that sizes -16 and larger shall be tested straight, without bending. The hose assemblies shall show no evidence of leakage from hose or fitting prior to completion of 100,000 pressure impulse cycles.

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

3.11.8 Stress Degradation (Air Leakage):

- a. Two hose assemblies of each size shall be subjected to this test. The hose assemblies shall be filled with high temperature test fluid conforming to MIL-PRF-7808 or MIL-PRF-83282.
- b. The hose assemblies shall then be placed in an oven which shall be maintained at a temperature of 450 °F ± 10 °F. Precautions shall be taken to assure that the hose assemblies do not come in contact with parts of the oven that are at a higher temperature. A pressure equal to the rated operating pressure specified in Table 2 shall be applied to the hose assemblies.
- c. After a minimum of 20 h at 450 °F, the pressure shall be gradually released and the assemblies shall be removed from the oven, drained and cooled to room temperature. The assemblies shall then be flushed with a quantity of new test fluid, equivalent in volume to a least twice the sample volume and drained.
- d. The hose assemblies shall then be filled with MIL-PRF-87257 fluid. A pressure equal to the rated operating pressure specified in Table 2 shall be applied and held for a minimum of 2 h at room temperature.
- e. The assemblies shall then be emptied and filled with oil or hydraulic fluid as specified in (a). The tests specified in paragraph (b), (c), and (d) shall be repeated.
- f. The hose assemblies shall then be filled with ASTM Reference Fluid B (isooctane, 70%; toluene, 30%) as defined in ASTM D 471 fluid and individually capped. While at room temperature, the assemblies shall be bent around a mandrel having a radius equal to the minimum bend radius as specified in Table 2. The assemblies shall be bent around the mandrel and straightened for 20 cycles. The assemblies shall be held by the fitting while the bending is being performed. The tests specified in (a), (b), (c) and (d) shall be conducted for the third time.
- g. Within 4 h after the final 2 h pressurization period with ASTM Reference Fluid B, the assemblies shall be drained and flushed with dry cleaning solvent per P-D-680 and placed in an oven for 1 h. The temperature of the oven shall be maintained at 160 °F ± 10 °F.
- h. Within 8 h after completion of the drying process, the hose assemblies shall be removed from the oven, cooled to room temperature, and then subjected to an air-under-water test. To conduct this test, the hose assemblies shall be installed in an apparatus similar to that shown in Figure 2.



3.11.8 (Continued):

- i. This test setup with the hose assembly installed shall be immersed in water containing no wetting agent. A pressure equivalent to the rated operating pressure specified in Table 2 shall be applied for a period of 15 min to allow any entrapped air in the hose to escape.
- j. The pressure shall be held for an additional 5 min period. During this time effused gas shall be collected from the test sample which includes the juncture of the hose to the fitting, but not including the fitting nut. If after the 5 min period of pressurization, the average rate of effusion through the hose assembly exceeds the values listed in Table 2, it shall be cause for rejection and considered failure to qualify.
- k. At the completion of the tests specified in (b) through (j), the hose assemblies shall be filled with oil and placed in a cold chamber for 8 h while maintained at -67 °F ± 2 °F. After the 8 h cold soak, the assemblies shall be subjected to a pressure equal to the operating pressure specified in Table 2. The pressure shall be held for a minimum of 5 min and then released. This shall be repeated for a total of 10 times with a minimum of 5 min between each pressure application and with the samples still in the -67 °F ± 2 °F cold chamber. At the end of this time oil at a temperature of 450 °F ± 10 °F shall be circulated through the hose assemblies. Within 15 sec after introduction of the hot oil, the pressure shall be increased to the rated proof pressure specified in Table 2 and held for a minimum of 2 min. There shall be no evidence of leakage from the hose assembly.

- 3.11.9 Low Temperature Flexibility: Three sample hose assemblies of each size shall be subjected to the low temperature flexing test in accordance with AS2078. The hose assembly shall show no damage after flexing.
- 3.11.10 Leakage: Two sample hose assemblies of each size shall be subjected to the leakage test in accordance with AS2078. The hose assembly shall not leak (no external wetting).
- 3.11.11 Corrosion: Two hose assemblies shall be tested in accordance with the following procedure. The hose assembly shall be pressurized to the operating pressure as specified in Table 2, 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 3.11.13 and one assembly high temperature burst tested per 3.11.14.
- 3.11.12 Repetitive Assembly Torque: Two hose assemblies of each size shall be subjected to the repetitive torque test procedure per ARP908 with torque values as defined in AS85421 for beam seal fitting design and ARP908 for the flared and flareless design. The fittings shall withstand the repetitive assembly torque values without failure or leakage. There shall be no leakage, galling, or other malfunction of the fitting nut and interface connection during the specified pressure test.
- 3.11.13 Room Temperature Burst Test: Two hose assemblies shall be subjected to the room temperature burst pressure test in accordance with AS2078. The hose assembly shall not leak nor burst at any pressure below the room temperature burst value specified in Table 2.
- 3.11.14 High Temperature Burst Test: Two hose assemblies shall be subjected to the high temperature burst pressure test in accordance with AS2078. The hose assembly shall not leak nor burst at any pressure below the high temperature burst value specified in Table 2.
- 3.11.15 Vacuum: Three sample assemblies shall be subjected to the vacuum test in accordance with AS2078. The hose assembly shall not collapse or buckle. After completion of the test a spherical ball of a minimum diameter as shown in Table 4 shall be rolled freely through the length of the hose assembly.

Hose Size	03	04	05	06	08	10	12	16	20	24
Ball Dia	.075	.125	.188	.250	.312	.406	.531	.750	1.00	1.25

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

3.11.16 Pneumatic Leakage: Two hose assemblies shall be subjected to the pneumatic leakage test in accordance with AS2078. Each assembly shall withstand the operating pressure listed in Table 2 without leakage. The test assemblies shall be prepared without the use of any oil during assembly.

3.11.17 Electrical Conductivity: One test specimen shall be subjected to the electrical conductivity test in accordance with AS2078 except that optional method of testing per Figure 3 is allowed. Hose assembly sizes -08 and smaller shall conduct a direct current equal to or greater than 6 μA and sizes -10 and above a direct current equal to or greater than 12 μA with a test potential of 1000 V DC.



3.11.18 Resistance to Fire:

- a. When the hose assemblies are required to withstand a specified resistance to fire, three sample hose assemblies, which may be fitted with firesleeves per AS1072 or an extrusion silicone firesleeve, shall be tested in accordance with AS1055. Satisfactory qualification to this document and AS1055 meet the requirements of AS150 Type VII, as applicable.
- b. The hose assemblies shall withstand the effects of the flame without leakage for the following periods as appropriate:
 - 1. Fire resistant assemblies 5 min
 - 2. Fire proof assemblies 15 min

3.12 Braid Flare. TYPE B:

One hose sample of each size shall be sized by expanding the flared-out end over a plug having an expansion diameter as specified in Table 5. The plug shall be inserted into the flared-out end of the hose to a depth of 0.188 in and then removed. After this sizing operation, the sample shall be inserted through a ring that has an inside diameter as specified in Table 5 with the bottom of the flare extending 6 in above the top of the ring. From this position the sample shall pass by its own weight through the ring. The maximum braid flare shall not exceed the maximum flare diameter specified in Table 5.

		Plug	Maximum Flare
	Hose	Expansion	Diameter
	Size	Diameter	(Ring ID)
	04	.230	.500
	05	.300	.560
	06	.370	.625
	08	.475	.750
	10	.585	.875
	12	.720	1.000
	16Z	.995	1.400
	20Z	1.270	1.700
	24Z	1.545	1.950
_			

TABLE 5 - Braid Flare Dimensions (in)

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 his own facilities or any commercial laboratory acceptable to the procuring activity. The procuring activity 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 (see 4.3)
- b. Quality conformance inspections (see 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 number and lengths shall be as specified in Table 6.

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 tests specified in 4.5.1.1.

- 4.3.2 Test Report, Test Samples and Data for the Procuring Activity: When the tests are conducted at a location other than the laboratory of the procuring activity, the following shall be made available if requested by the procuring activity:
 - a. Test Report: The test report shall be in accordance with MIL-HDBK-831 which shall include a report of all tests and outline description of the tests and conditions.
 - b. Test Samples: Test samples when requested by the procuring activity. Samples subjected to qualification testing shall not be shipped as part of contract or order.
 - c. Drawings: Three sets of assembly and subassembly drawings. The assembly drawings shall have a cut-away section showing all details in their normal assembly position and shall define all details and subassemblies.
 - d. Sources: List of sources of hose or hose components, including source's name and product identification for inner tube, hose and fitting if other than assembly supplier.
 - NOTE: Log 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.

Hose	Six Assemblies	Thirteen	One Hose Sample
Assy	for Impulse Test	Assemblies for	for Braid Flare Test
Size	(3.11.7)	Other Tests ¹	(3.12)
03	14.0	18	12
04	14.0	18	12
05	16.0	18	12
06	18.0	18	12
08	21.0	18	12
10	23.5	18	12
12	27.5	18	12
16	18.0	18	12
20	18.0	18	12
24	18.0	18	12

One additional sample of each size in lengths as shown in Figure 3 shall be used for electrical conductivity tests (see 3.11.17).

- 4.3.3 Qualification Testing: Qualification testing shall consist of all the examinations and tests specified under 3.4 and 3.11. In addition, examinations and tests specified under 3.12 are applicable for Type B. The test sequence shall be as shown in Table 3.
- 4.4 Quality Conformance Inspections:

Quality conformance inspections shall consist of the following tests:

- a. Individual tests (100% inspection)
- b. Sampling tests
- c. Periodic control tests
- 4.4.1 Individual Tests: Each hose assembly shall be subjected to the following tests:
 - a. Examination of product (see 3.5 to 3.10)
 - b. Proof pressure test (see 3.11.1)
 - NOTE: Production samples that are proof pressure tested with water should be air dried prior to capping (see cleaning requirements, 3.10.2). When agreed upon between the manufacturer and procuring activity, the pneumatic leakage test may be substituted for the proof pressure test.

4.4.2 Sampling Tests: The following inspections and tests shall be performed in the order indicated on two samples, one consisting of eight hose assemblies with straight fittings at each end and the second consisting of 4 lengths of hose, selected at random from each inspection lot. The inspection lot shall consist of approximately, but not more than, 3000 hose assemblies, all of one size manufactured under essentially the same conditions, but not necessarily during one continuous run. One hose assembly tested from each lot of 375 hose assemblies is also permitted. The first sample (8 hose assemblies) shall be subjected to tests in the following sequence.

- a. Internal cleanliness (see 3.10.2)
- b. Leakage tests (see 3.11.10)
- c. Room temperature burst pressure test (see 3.11.13)

The second sample (4 hose lengths) shall be subjected to tests in the following sequence.

- d. Braid flare Type B only (see 3.12)
- e. Specific gravity tests (apparent and relative) (see 3.4.1)

- 4.4.3 Periodic Control Tests: The following inspections and tests shall be performed as indicated on eight hose assemblies manufactured from bulk hose lengths selected at random from each inspection lot. The inspection lot shall consist of not more than 20,000 ft of hose, all of one size, manufactured under essentially the same conditions but not necessarily during one continuous run. Two hose assemblies manufactured and tested from each lot of 5000 ft of hose is also permitted.
- 4.4.3.1 Assembly: Four hose assemblies, or one hose assembly from a lot of 5000 ft, shall be subjected to the following tests in the order indicated:
 - a. Elongation and contraction test (see 3.11.2)
 - b. Impulse test (see 3.11.7) (unaged samples only, and may have straight fittings on both ends)
- 4.4.3.2 Assembly and Inner Tube: Four hose assemblies, or one hose assembly from a lot of 5000 ft, shall be subjected to the following tests in the order indicated:
 - a. Stress degradation test (see 3.11.8; 3.11.8k may be omitted)
 - b. Electrical Conductivity test (see 3.11.17)

NOTE: Production lot records may be used to verify conformance to specific gravity tests if the PTFE tube being used is an established production item.

4.4.4 Rejection and Retest: Where one or more items selected from a lot fails to meet the specification, all items in the lot shall be rejected.

4.4.4.1 Resubmitted Lots: Once a lot (or part of a lot) has been rejected by a procuring activity (Government or industry), it may be resubmitted for tests, after the manufacturer, in writing, has furnished full particulars concerning the cause of previous rejection and the action taken to correct the defects in the lot.

- 4.4.5 Inspection Procedure: All inspection plans shall be single sample plans with an accept number of zero.
- 4.4.6 Destructive Test Sample: Prior to testing, a letter "D" shall be permanently marked on each end fitting of those assemblies used for destructive tests (see 4.4.2 and 4.4.3).
- 4.5 Test Conditions:
- 4.5.1 Fitting Ends: Qualification tests shall be conducted on assemblies using straight type swivel ends with dimensions shown in Figure 1 and in Table 1, except for the impulse test samples requiring 90° elbow fitting at one end. Satisfactory completion of qualification tests on these hose assemblies shall also constitute qualification approval on hose assemblies using other fittings that have an identical attachment method and design.
- 4.5.1.1 Additional Fitting End Designs: If qualification approval is required for other type end fittings, mating design, two additional hose assemblies with the type fittings and of the size to be qualified shall be subjected to the following tests in the sequence indicated:
 - a. Examination of product (see 3.5 to 3.10)
 - b. Proof pressure test (see 3.11.1)
 - c. Leakage test (see 3.11.10)
 - d. Repetitive assembly torque test (see 3.11.12)
 - e. Room temperature burst pressure test (see 3.11.13)
- 4.5.2 Preparation of Sample:
- 4.5.2.1 Oil Aging: In all the tests using oil aged samples, the hose assemblies shall be filled with a high temperature test fluid and soaked in an air oven at a temperature of 400 °F or 275 °F, as applicable, for seven days. All air shall be excluded from the bore of the assembly during the test. No pressure shall be applied to the assembly during the aging period.
- 4.5.2.2 Air Aging: Air aged samples shall be kept in air at a temperature of 400 °F or 275 °F, as applicable, for seven days.
- 4.5.2.3 Unaged Samples: Unaged assemblies shall be as manufactured.

- 4.5.3 Test Fluids: Unless otherwise specified, test fluids shall be as specified in AS2078.
- 4.5.4 Temperature:
- 4.5.4.1 Qualification Test Temperature: Qualification test temperatures shall be defined in AS2078 except that Class II hose assemblies with aluminum fittings shall be limited to a maximum temperature limit of -65 to 275 °F for all test parameters.
- 4.5.4.2 Temperature Measurements: Unless otherwise specified, temperature measurements shall be taken within 6 in of the hose assemblies under test. Unless otherwise specified, all temperatures shall have a tolerance of +10 °F, -5 °F.
- 4.5.5 End Connections: Except as otherwise noted, each hose end shall be connected to a male fitting end in accordance with AS4395, AS4375, AS33514, AS4207 or MIL-F-85421/1, lubricated with either MIL-H-5606 fluid or the test fluid and utilizing the installation torque range specified in ARP908 for flared and flareless fittings and AS85421 for beam seal fittings.
- 4.5.6 Pressure Measurements: Unless otherwise specified, all pressures shall have a tolerance of +70 psi, -0 psi.
- 4.6 Inspection Methods:
- 4.6.1 Examination of Product:
- 4.6.1.1 Inner Tube (PTFE): Each length of tubing shall be examined to determine conformance to the requirements under 3.3.1 of this specification with respect to material, size, workmanship, and dimensions.
- 4.6.1.2 Hose Assembly: All hose assemblies shall be visually inspected to determine conformance to this document, and inspected for compliance with construction and reinforcement requirements (see 3.3). In addition, each hose assembly shall be checked to determine conformance with 3.6 through 3.10.
- 5. PREPARATION FOR DELIVERY:
- 5.1 Preservation and Packaging:

All openings shall be sealed with caps or plugs per NAS 847. An uncovered fitting end shall be cause for rejection. Preservation and packaging shall be in accordance with ARP1835 unless specified otherwise by the customer.

5.2 Marking:

Interior and exterior containers shall be marked in accordance with customer requirements.

6. NOTES:

6.1 Intended Use:

The hose assemblies are intended for use in aircraft and missile medium pressure up to 1500 psi hydraulic, fuel, lubricating oil and pneumatic systems operating in a temperature range of -67 to 450 °F for Class I, or -67 to 275 °F for Class II. High pressure pneumatic storage system applications are not recommended. Installations in which the limits specified herein are exceeded, or in which the application is not covered specifically by this standard shall be subject to the approval of the procuring activity. This standard is the functional equivalent of MIL-H/DTL-25579 permanently attached fitting hose assemblies; however, its use as a replacement shall be based on satisfactory qualification to the respective standard(s). AS1946 includes salt water conditioning prior to qualification impulse testing.

6.2 Ordering Data:

Procurement documents should specify:

- a. Title, number, and date of this document
- b. The details of parts required (part number), size, length, sleeving
- c. Type, size, or special features of end fittings desired (see 3.3.3)
- d. Data requirements (see 4.3.2)
- e. Applicable levels of preservation, packaging, and marking (see 5.1, 5.2)
- f. Samples subject to destructive testing are not to be considered or shipped as part of contract or order
- g. When fire resistance or fireproofing is required
- 6.3 The change bar (1) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document.
- 6.4 Key Words:

Aerospace, hose assembly, polytetrafluoroethylene, metallic reinforced, medium pressure, high temperature

PREPARED UNDER THE JURISDICTION OF SAE SUBCOMMITTEE G-3D, AEROSPACE HOSE OF COMMITTEE G-3, AEROSPACE COUPLINGS, FITTINGS, HOSE & TUBING ASSEMBLIES