SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE STANDARD

SAE MA2126

Issued 1990-06
Reaffirmed 2001-12

Hose Assembly, Polytetrafluoroethylene (PTFE), up to 232°C and 10 500 kPa Procurement Specification, Metric (ISO/DIS 10502)

This standard is word-for-word equivalent to ISO/DIS 10502 except that U.S. backup specifications are used.

1. SCOPE:

1.1 Application:

This Metric Aerospace Standard (MA) covers the requirements for polytetrafluoroethylene (PTFE) hose assemblies for use in aerospace hydraulic, fuel, and lubricating oil systems at temperatures between -55°C and 232°C for Class I assemblies, -55°C and 135°C for Class II assemblies, and at nominal pressures up to 10 500 kPa (105 bar). 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 standard, for example oxygen, shall be subject to the approval of the purchaser.

1.2 Classification:

The hose assemblies shall be of the following classes:

Class I - All corrosion resistant steel or titanium combination fittings, (232°C)
Class II - Combination aluminum alloy and corrosion resistant steel fittings, (135°C), size DN12 and larger

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2. APPLICABLE DOCUMENTS:

The following documents of the issue in effect on date of invitation for bids or requests for proposals, form a part of this specification to the extent specified herein:

2.1 Specifications:

2.1.1 Federal Specifications:

P-D-680	Dry Cleaning Solvent
QQ-S-763	Steel Bars, Wire Shapes, and Forgings, Corrosion-Resisting

2.1.2 Military:

MIL-C-5501	Caps and Plugs, Protective, Dust and Moisture Seal, General Specification for
DOD-D-1000	Drawings, Engineering and Associated Lists
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-105 (ISO 2859)	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-831	Test Reports: Preparation of
MIL-T-8504	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)

2.1.3 Industry Publications:

SAE Material Specifications:

AMS-4069	Tubing, Seamless, Drawn, Close Tolerance, 2.5 Mg 0.25 Cr
AMS-4079	Tubing, Seamless, Drawn, Round Close Tolerance, 1.0 Mg 0.60 Si 0.28 Cu 0.20 Cr
AMS-4082	Tubing, Seamless, Drawn, 1.0 Mg 0.60 Si 0.28 Cu 0.20 Cr, Solution and Precipitation Heat Treated
AMS-4112	Bars, Rods, and Wire, Rolled, Drawn or Cold Finished -4.4 Cu 1.5 Mg 0.60 Mn
AMS-4117	Bars and Flash Welded Rings, 1.0 Mg 0.60 Si 0.28 Cu 0.20 Cr, Solution and Precipitation Heat Treated
AMS-4121	Bars, Rods, and Wire, Rolled, Drawn or Cold Finished -4.5 Cu 0.85 Si 0.80 Mn 0.50 Mg
AMS-4127	Forgings - 1.0 Mg 0.60 Si 0.28 Cu 0.20 Cr, Solution and Precipitation Heat Treated
AMS-4928	Titanium Alloy Bars and Forgings, 6A14V, Annealed, 120,000 psi (827 MPa) Yield
AMS-4945	Titanium Alloy Tubing, Seamless, Hydraulic, 3A1 - 2.5V, Texture Controlled, 105,000 psi (724 MPa) Yield Strength
AMS-4965	Bars, Forgings and Rings 6A14V, Solution and Precipitation Heat Treated

2.1.3 (Continued):

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-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, Subzero Cooled, Equalized, and Over-Tempered

SAE Aerospace Recommended Practices:

ARP1153	Methods for Determining Relative Specific Gravity (ISO 7258)
ARP1835	Preparation for Delivery, General Requirements for Hose Assemblies
AS611	Tetrafluoroethylene Hose Assembly Cleaning Methods

American Society for Testing and Materials:

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

SAE Aerospace Standards:

AS1055	Aircraft - Environmental Conditions and Test Procedures for Airborne Equipment - Resistance to Fire in Designated Fire Zones (ISO/TR2685)
AS1072	Sleeve, Hose Assembly, Fire Protection
AS1370	Screw Threads, Controlled Root Radius (J-Threads) - Metric Series (ISO 5855/3)
MA2002	Impulse Testing of Hydraulic Hose, Tubing and Fitting Assemblies (ISO 6772)
MA2005	Aerospace Construction - Separable Tube Fittings for Fluid Systems - General Specification (ISO 7169)
MA2078	Aerospace - Fluid Systems - Test Methods for Polytetrafluoroethylene (PTFE) Hose Assemblies (ISO 8829)
MA2095	Aerospace Fluid Systems - 24° Cone Fittings, Geometrical Definition of Ends (ISO 7321)

Copies may be obtained from the SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.3 (Continued):

AIA National Aerospace Standards:

NAS1760 Fitting End, Flareless Acorn, Standard Dimensions for

Copies may be obtained from the National Standards Association, Inc., 5161 River Road, 1200 Quince Orchard Road, Gaithersburg, MD 20878.

2.1.4 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.

3. REQUIREMENTS:

3.1 Qualification:

Hose assemblies supplied in accordance with this metric 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 in the applicable qualified products 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 metric 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 corrosion-resistant steel, titanium, or aluminum alloy 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 or 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:

Corrosion-resistant steel, austenitic, annealed or as rolled

304 AMS-5639

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

304 AMS-5647
321 AMS-5645
347 AMS-5646

3.2.1 (Continued):

Precipitation-hardening corrosion-resistant steel - resolution heat treated and artificially aged condition

15-5 PH	AMS-5743
17-4 PH	AMS-5643
17-7 PH	AMS-5644

Titanium

6A1-4V	AMS-4928

Aluminum

Aluminum Alloy, 2014-T6	AMS-4121
Aluminum Alloy, 2024-T6	AMS-4112
Aluminum Alloy, 6061-T6/T651	AMS-4117
Aluminum Alloy, 6061-T6	QQ-A-367

b. Tubing:

Aluminum Alloy, 5052	AMS-4069
Aluminum Alloy, 6061	AMS-4082

Corrosion-resistant steel, austenitic, seamless or welded, annealed

304	MIL-T-8504

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

321	MIL-T-8808
347	MIL-T-8808

Titanium

3A1-2.5V	AMS-4945

c. Wire:

Corrosion-resistant steel, austenitic, cold drawn

321	AMS-5689
316	AMS-5690
304	AMS-5697

3.3 Construction:

The hose assembly shall consist of a seamless PTFE inner tube, corrosion-resistant steel-wire reinforcement, and aluminum, 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: 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. Broken or missing reinforcing wires or buckled wires more than 1.5 mm 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 fittings may be of a permanent or of a reusable design. Forgings are permitted. Unless specified otherwise by the user, the hose assembly end fittings shall have 24° cone fittings in accordance with MA2095 (ISO 7321).

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 or lap-weld design, or braze joints using lap-bronze design, and fabricated from annealed corrosion-resistant steel, titanium, or aluminum alloy tubing. Welded and redrawn tubing may be used for corrosion-resistant steel.

3.3.3.2 Fitting Finish:

3.3.3.2.1 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.

3.3.3.2.2 Corrosion-Resistant Steel Parts: Unless otherwise specified, corrosion-resistant steel parts shall be passivated by immersion in a solution of 2% sodium dichromate in nitric acid of a concentration of 15 to 25% by volume for 15 or 30 min at a temperature of 120°F + 5. Parts shall then be thoroughly rinsed in water and dried.

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

3.4 Inner Tube Requirements:

3.4.1 Density and Relative Density: The relative density of the hose inner tube shall not exceed 2.155 when tested in accordance with MA2078 (ISO 7258 Method A or B). The density shall not exceed a value of 2.204 g/cm^3 when tested as specified in MA2078 (ISO 7258, Method C).

3.4.2 Tensile Strength: When tested in accordance with MA2078 (ISO 8829), paragraph 4.2, the longitudinal tensile strength for all sizes of tubes shall be 15.1 MPa minimum. The transverse tensile strength for sizes DN16 and larger shall be 12.4 MPa minimum. For sizes under DN16, the transverse strength need not be tested.

3.4.3 Elongation: When tested in accordance with MA2078 (ISO 8829), paragraph 4.2, 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 MA2078 (ISO 8829), paragraph 4.3.1.

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 MA2078 (ISO 8829), paragraph 4.3.2.

3.4.6 Electrical Conductivity: When tested in accordance with MA2078 (ISO 8829), paragraph 4.4, the electrical current shall be equal to or greater than 10 μA for sizes DN05 through DN12, and equal to or greater than 20 μA for sizes DN16 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.

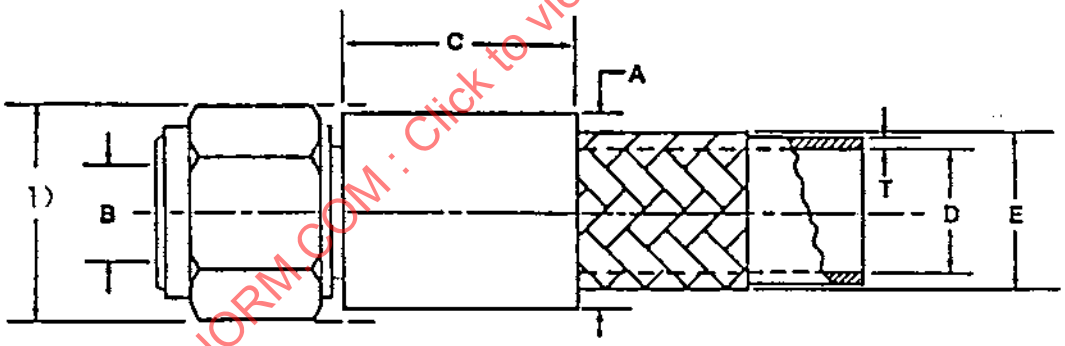

FIGURE 1 - Hose and Fitting Dimensions (Table 1)

1) The dimensions across the corners of nut and socket dimensions may exceed "A" dimensions.

TABLE 1 - Hose and Fitting Dimensions as Shown in Figure 1 (mm)[1)]

Hose Size (DN)	Fitting O.D. A[2)] Max	Fitting I.D. B[3)] Min	Attachment Length C Max	Hose I.D. Braided D Min	Hose O.D. Braided E Min	Hose O.D. Braided E Max	Wall Thickness, Inner Tube T Min	Wall Thickness, Inner Tube T Max	Number of Braids
05	12.7	2.0	31.8	2.3	5.8	6.8	0.89	1.19	1
06	14.2	3.4	31.0	4.4	7.7	9.5	0.89	1.19	1
08	16.0	4.9	34.3	5.8	9.3	10.6	0.89	1.19	1
10	18.0	6.5	37.0	7.6	10.9	12.7	0.89	1.19	1
12	21.4	8.5	44.0	9.9	13.9	15.6	0.97	1.27	1
16	26.0	11.0	49.0	12.3	16.3	20.3	1.07	1.37	1
20	30.0	13.8	55.1	15.6	19.5	23.0	1.07	1.37	1
25	38.6	19.7	64.8	21.6	27.4	29.0	1.07	1.37	2
32	50.8	25.4	61.7	28.0	33.7	35.3	1.14	1.45	2
40	58.0	31.8	68.1	34.1	41.6	43.3	1.65	1.96	2

1)Dimensions listed in this table are for reference only, refer to applicable 'MA' standards.
2)The dimensions across the corners of nut and socket hexagon may exceed "A" dimension.
3)Minimum I.D. through the elbow area may be 0.8 mm less than the values shown.

3.5.2 Physical Requirements: Hose assemblies shall meet the physical and weight requirements per Table 2.

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

Hose Size (DN)	Hose Weight[1)] Max kg/m	Operating Pressure kPa	Proof Pressure kPa	Burst Pressure Room Temp. Min kPa	Burst Pressure High Temp. Min kPa	Bend Radius at Inside of Bend Min mm	Volumetric Expansion Max mL/m	Effusion (per 1/2 hour) mL/m	Effusion After Stress Degred. (per minute) mL/m Min	Negative Pressure kPa
05	0.089	10500	21000	83000	48000	50	1.1	13	394	95
06	0.129	10500	21000	83000	48000	50	1.1	13	315	95
08	0.147	10500	21000	69000	45000	50	1.6	16	315	95
10	0.183	10500	21000	62000	45000	100		16	315	95
12	0.235	10500	21000	56000	41000	120		16	158	95
16	0.305	10500	21000	48000	38000	140		16	79	95
20	0.486	7000	14000	34000	24000	165		20	79	70
25	0.863	8750	17500	34000	24000	190		26	79	50
32	1.110	7000	14000	27500	21000	280		26	79	35
40	1.500	7000	14000	27500	21000	355		26	79	30

1)Hose weight shall be determined on a minimum length of 300 mm.

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 90% of the appropriate minimum inside diameter "B" of the end fittings as specified in Table 1. For elbow fittings see note 3 of Table 1.

3.6 Screw Threads:

Unless otherwise specified (see 3.3.3), fitting threads shall be in accordance with AS1370 (ISO 5855/3). NOTE: Fitting nut thread tolerance increase of 10% following proof testing shall not be cause for rejection of the hose assembly.

3.7 Part Numbering of Interchangeable Parts:

Parts comply with this metric 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 DOD-D-1000 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 Fitting: The manufacturer's name or trademark shall be permanently marked on one element of all end fittings.

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 25 mm 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. Complete hose assembly part number, and hose liner source Federal Supply Code for Manufacturer's (FSCM) number
c. Nominal pressure "10 500 kPa", or as applicable per Table 2
d. Operating temperature "230°C" or 135°C (as applicable) if required
e. Pressure test symbol "PT"
f. Date of hose assembly manufacture expressed in terms of month and year, or batch number

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 tools marks up to 100 μin R_A per ANSI 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 all 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 O of ARP611 and shall meet the following requirements when properly cleaned.

3.9.2.1 Internal Cleanliness Test:

3.9.2.1.1 Visually 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 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.

3.10 Hose Assembly, Test and Performance Requirements:

3.10.1 Proof Pressure: When tested in accordance with MA2078 (ISO 8829), paragraph 5.8, each hose assembly shall withstand the proof pressure listed in Table 2 without malfunction or leakage.

3.10.2 Elongation and Contraction: When tested in accordance with MA2078 (ISO 8829), paragraph 5.5, there shall be no change in length by more than 2% in 250 mm gauge length. Two sample hoses shall be subjected to this test.

3.10.3 Volumetric Expansion: When tested in accordance with MA2078 (ISO 8829), paragraph 5.6, the volumetric expansion shall not exceed the limits specified in Table 2. Two sample hose assemblies shall be subjected to this test.

3.10.4 Pneumatic Effusion: When tested in accordance with MA2078 (ISO 8829), paragraph 5.2, the hose assemblies shall not exceed a total effusion rate as shown in Table 2. Two sample hose assemblies shall be used for this test.

3.10.5 Pneumatic Surge: When tested in accordance with MA2078 (ISO 8829), paragraph 5.16, 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 MA2078 (ISO 8829), paragraph 5.12, 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:

3.10.71 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 2 for a minimum of 5 min.

3.10.7.3 Requirement: The hose assemblies shall then be tested in accordance with MA2078 (ISO 8829), paragraph 5.10, except that sizes DN25, DN32, and DN40 shall be tested straight, without bending. The specimens shall pass 100 000 cycles of impulse testing without any evidence of leakage (see also 6.h).

NOTE: The high temperature portion of the impulse test shall be conducted at 204°C.

3.10.8 Stress Degradation: When tested in accordance with MA2078 (ISO 8829), paragraph 5.1.2, the hose assembly shall not exceed an average effusion rate as shown in Table 2. Two sample hose assemblies shall be used for this test.

3.10.9 Low Temperature Flexing: When tested in accordance with MA2078 (ISO 8829), paragraph 5.13, 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 MA2078 (ISO 8829), paragraph 5.7, 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 for Table 2, and immersed in a 2.5% ± 0.1 NaCl solution for a period of 5 min then hot air dried at 60°C 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: End fittings on hose assemblies 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 manifold union. Fitting nuts shall be tightened to the torques specified in MA908, 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.

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

	Inner Tube 0/1	Hose Assemblies																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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					
Hydr. 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	0											
3.10.16 Pneumatic leakage													0	0									
3.10.17 Electr. conductivity																					0		
3.10.18 Fire (when required)																						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

3.10.13 Room Temperature Burst Pressure: When tested in accordance with MA2078 (ISO 8829), paragraph 5.9 and 5.9.1, the hose assembly shall not leak or burst at any pressure below the room temperature burst value specified in Table 2. Two hose assemblies shall be tested.

3.10.14 High Temperature Burst Pressure: When tested in accordance with MA2078 (ISO 8829), paragraph 5.9 and 5.9.2 the hose assembly shall not leak or burst at any pressure below the high temperature burst value specified in Table 2. Two hose assemblies shall be tested.

3.10.15 Vacuum: When tested in accordance with MA2078 (ISO 8829), paragraph 5.15, the hose shall not collapse or buckle. After completion of the test a spherical ball of a diameter as shown in Table 4 shall be rolled freely through the length of the hose assembly. Three sample assemblies shall be used for this test.

TABLE 4 - Spherical Ball Size for Verifying Hose I.D. After Vacuum Test

Hose Size (D/N)	05	06	08	10	12	16	20	25	32	40
Ball Dia. (mm)	1.9	3.2	4.7	6.3	7.9	10.3	13.5	19.5	24.5	31.7

3.10.16 Pneumatic Leakage: When tested in accordance with MA2078 (ISO 8829), paragraph 5.14, 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. Two assemblies shall be tested.

3.10.17 Electrical Conductivity: When tested in accordance with MA2078 (ISO 8829), paragraph 5.3, hose assemblies of sizes DN06 through DN12 shall be capable of conducting a direct current equal to or greater than 6 μA and sizes DN16 and over a current equal to or greater the 12 μA. One sample shall be used for this test.

3.10.18 Resistance to Fire:

a. When the hose assemblies are required to withstand a specified resistance to fire, two sample hose assemblies, which may be fitted with fire sleeves per AS1072 or an extrusion silicone fire sleeve, shall be tested in accordance with AS1055 (ISO/TR 2685).

NOTE: On occasion a test may not be valid because of failure to hold the flame temperature at the specified value. For this reason it is advised to prepare three hose assemblies for this test.

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

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 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.

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.

TABLE 5 - Lengths of Hose Assemblies for Test (mm)

Hose Size (DN)	Six Assemblies for Impulse Test (3.10.7)	Two Assemblies for Fire Test (3.10.18)	Thirteen Assemblies for Other Tests[1)]
05	360	600	460
06	360	600	460
08	410	600	460
10	460	600	460
12	550	600	460
16	600	600	460
20	700	600	460
25	460	600	460
32	460	600	460
40	460	600	460

1) One additional sample of each size in lengths as shown in MA2078 (ISO 8829), paragraph 5.12, shall be used for electrical conductivity tests (3.10.17).