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MIL-F-83798B
15 November 1991
SUPERSEDING
MIL-F-83798A
12 Jan 1977

MILITARY SPECIFICATION

FITTING, RUBBER HOSE, LIGHTWEIGHT, MEDIUM PRESSURE, GENERAL SPECIFICATION FOR

This specification is approved for use within the Department of the Air Force and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE.

1.1 Scope. This specification covers the general requirements for lightweight medium pressure, rubber hose fittings.

2. APPLICABLE DOCUMENTS

2.1 Government documents:

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

QQ-P-416	Plating, Cadmium (Electrodeposited)
PPP-B-566	Box, Folding, Paperboard
PPP-B-601	Box, Wood, Cleated Plywood
PPP-B-636	Boxes, Shipping, Fiberboard
PPP-B-676	Box, Setup

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to the Resources and Logistics Services Division, SA-ALC/TIRDM, Kelly AFB, TX 78241-5000, by using the self-addressed Standardization Document Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 4730

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MILITARY

MIL-P-116	Preservation Methods of
MIL-F-5509	Fittings, Flared Tube, Fluid Connection
MIL-H-5606	Hydraulic Fluid, Petroleum Base, Aircraft Missile, and Ordnance
MIL-T-5624	Turbine Fuel, Aviation Grades JP-4 and JP-5
MIL-H-6083	Hydraulic Fluid, Petroleum Base, for Preservation & Operation
MIL-L-7808	Lubrication Oil, Aircraft Turbine Engine, Synthetic Base, Nato Code Number 0-148
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-S-8879	Screw Threads, Controlled Radius Root with Increased Minor Diameter; General Specification for
MIL-H-19457	Hydraulic Fluid, Fire Resistant, Non Neurotoxic
MIL-H-46170	Hydraulic Fluid, Rust Inhibited, Fire-resistant, Synthetic Hydrocarbon Base
MIL-H-83796/1	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flare
MIL-H-83796/2	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flare, with Lockwire Hole
MIL-H-83796/3	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flareless
MIL-H-83796/4	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flareless, with Lockwire Hole
MIL-H-83796/5	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flange
MIL-H-83796/6	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flange, with Lockwire Hole
MIL-H-83796/7	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flange
MIL-H-83796/8	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flange, with Lockwire Hole
MIL-H-83796/9	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flange to Flange
MIL-H-83797	Hose, Rubber, Lightweight, Medium Pressure, General Specification for
MIL-F-83798/1	Fittings, Rubber Hose, Lightweight, Medium Pressure, Flared, Swivel Nut, Straight
MIL-F-83798/2	Fittings, Rubber Hose, Lightweight, Medium Pressure, Flared, Swivel Nut, 45 Degrees
MIL-F-83798/3	Fittings, Rubber Hose, Lightweight, Medium Pressure, Flared, Swivel Nut, 90 Degrees
MIL-F-83798/4	Fittings, Rubber Hose, Lightweight, Medium Pressure, Flareless, Swivel Nut, Straight
MIL-F-83798/5	Fittings, Rubber Hose, Lightweight, Medium Pressure, Flareless, Swivel Nut, 45 Degrees
MIL-F-83798/6	Fittings, Rubber Hose, Lightweight, Medium Pressure, Flareless, Swivel Nut, 90 Degrees
MIL-F-83798/7	Fittings, Rubber Hose, Lightweight, Medium Pressure, Swivel Flange, Straight

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MIL-F-83798/8	Fittings, Rubber Hose, Lightweight, Medium Pressure, Swivel Flange, 45 Degrees
MIL-F-83798/9	Fittings, Rubber Hose, Lightweight, Medium Pressure, Swivel Flange, 90 Degrees

STANDARDS

MILITARY

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-970	Standards and Specifications, Order of Preference for the Selection of
MIL-STD-1190	Minimum Guidelines for Level C Preservation, Packing & Marking
MIL-STD-2073	Packaging Requirement Codes
MS20756	Flange, Swivel, Retaining
MS33514	Fitting End, Standard Dimensions for Flareless Tube Connection and Gasket Seal
MS33656	Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal
MS33786	Fitting Installation, Flared Tube and Hose, Swivel

(Unless otherwise indicated, copies of federal and military specification and standards are available from the Standardization Documents Order Desk, BLDG. 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government publications. The following publication forms a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

FEDERAL AVIATION AGENCY TECHNICAL STANDARD ORDER

TSO-C53	Fuel and Engine Oil System Hose Assemblies

(Application for copies should be addressed to Library Services Division HQ-620, Federal Aviation Administration, Washington, DC. 20533.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

SOCIETY OF AUTOMOTIVE ENGINEERS SPECIFICATIONS

ARP 908	Torque Requirements, Installation and Qualification Test, Hose and Tube Fitting
AS 611	Tetrafluoroethylene Hose Assembly Cleaning Methods
AS 1055	Fire Testing of Flexible Hose, Tube Assemblies, Coils, Fittings and Similar System Components

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

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NATIONAL AEROSPACE STANDARDS COMMITTEE

NAS 1760 Fitting End, Flareless Acorn, Standard, Dimensions for

(Application for copies should be addressed to National Aerospace Standards Committee, 1725 De Sales Street N.W. Washington DC 20036.)

AMERICAN NATIONAL STANDARDS INSTITUTE STANDARD

ANSI/ASME B46.1 Surface Texture - Surface Roughness, Waviness and Lay

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B633 Zinc On Iron & Steel, Electrodeposited Coatings Of

(Applications for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa 19103.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detail specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. The hose fittings furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.5 and 6.3).

3.2 Materials. Materials shall be limited to those specified in MIL-F-83798/1 through MIL-F-83798/9, as applicable.

3.3 Design and construction. The design and construction of the fittings shall conform to MIL-F-83798/1 through MIL-F-83798/9, as applicable. The fittings shall be designed for use with hose in accordance with MIL-H-83797.

3.3.1 Mating. The fittings shall mate with adapter ends designed in accordance with MS33514, MS33656 or NAS 1760 end fittings, or with MS33786 connection, as applicable.

3.3.2 Finish. Aluminum parts shall be anodized in accordance with MIL-A-8625. Carbon steel parts shall be cadmium plated in accordance with QQ-P-416, type and class optional or in accordance with ASTM B633 Type II Fe/Zn. Aluminum swivel nuts shall be dyed blue on flared and yellow on flareless. Swivel flanges shall be dyed blue.

3.3.3 Surface roughness. Surface roughness of machined parts shall not exceed 125 microinches arithmetical average (AA), except for the sealing surfaces of fittings which shall not have annular tool marks in excess of 100 AA. AA values shall be interpreted in accordance with ANSI/ASME B46.1.

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3.3.4 Heat treatment. Aluminum parts shall be heat treated in accordance with MIL-F-5509.

3.3.5 Dimensions. Dimensions and tolerances shall be as shown on the applicable specification sheet specified in 3.3.

3.3.6 Screw threads. Threads for the swivel nut shall be in accordance with MIL-S-8879, gaging method B. Reduction of Class 3B thread tolerance to Class 2B tolerance on coupling nut during assembly (or testing) shall not be cause for rejection of the fitting or hose assembly.

3.3.7 Field attachability. The fittings shall be capable of being attached to the hose with common standard tools such as vise and wrench. The method of determining proper tightening of the socket shall be by measurement of the gap between the socket and the nipple/elbow with a feeler gage. The maximum allowable gap shall be 0.041 inch (in) (1.041 millimeters (mm)) for sizes -3, -4, and -5; 0.031 in (0.787 mm) for size -6 and larger.

3.3.8 Hose insertion gage. The socket of the fitting shall contain a groove no wider than 0.035 in (0.889 mm) around its circumference on the edges of the hexagon. The distance from the center of the groove to the unthreaded end of socket shall be equal to the recommended depth of insertion of the hose into the socket at the time of assembly.

3.4 Selection of specifications and standards. Specifications and standards for parts, materials, procedures, and processes not specified herein shall be selected in accordance with MIL-STD-970.

3.5 Performance of product. The product shall meet the appropriate requirements listed below and in Table I when subjected to the applicable tests in Section 4:

		Paragraph
a.	Examination product	4.4.2.1
b.	Field attachability	4.4.2.2
c.	Torque	4.4.2.3
d.	Coupling	4.4.2.4
e.	Proof pressure	4.4.2.5
f.	Fuel immersion	4.4.2.6
g.	Oil immersion	4.4.2.7
h.	Cold temperature deflection	4.4.2.8
i.	Oil circulation	4.4.2.9
j.	Leakage	4.4.2.10
k.	Corrosion	4.4.2.11
l.	Burst pressure	4.4.2.12
m.	Fire resistance when required	4.4.2.13

3.6 Identification of product. Products shall be identified in accordance with MIL-STD-130. In addition, the fittings shall be permanently marked with:

a. Manufacturer's identification or trademark.

b. Part number of the fitting, including dash size (see MIL-F-83798/1 through MIL-F-83798/9).

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3.7 Cleaning. All fittings shall be free from oil, grease, dirt or other foreign materials both internally and externally. Cleaning shall be in accordance with Class 9 of AS 611.

3.8 Workmanship. Workmanship shall be of the quality necessary to produce fittings free from all defects which affect proper functioning in service.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manfacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification (see 4.4)

b. Quality conformance (see 4.5)

4.3 Test conditions.

Lubricating oils listed below have been identified as containing tricresyl phosphate. A warning, such as the one provided below, shall be placed in the text, where applicable, prior to the first occurrence of use. (MIL-L-7808; MIL-H-5606; MIL-H-6083; MIL-H-19457; MIL-H-46170; Type IV commercial fluids (Skydrol, Hyje , etc.).

WARNING

SOME OF THE PETROLEUM AND SYNTHETIC TYPE HYDRAULIC OILS/FLUIDS OFTEN CONTAIN TRICRESYL PHOSPHATE (TCP) AS ADDITIVES, WHICH IS READILY ABSORBED BY THE SKIN AND IS TOXIC. ANY PORTION OF THE BODY THAT COMES IN CONTACT WITH THESE OILS/FLUIDS SHOULD BE CLEANED AS SOON AS POSSIBLE. IF SKIN OR EYE CONTACT CAN BE ANTICIPATED, APPROPRIATE PROTECTIVE EQUIPMENT WILL BE WORN.

4.3.1 Oil aging. When a test specifies an oil-aged sample, it shall be produced by immersing in oil conforming to MIL-L-7808 at 250 Fahrenheit (F), plus or minus 2°F (121° Celsius(C)±1°C) for 168 hours. All air shall be excluded from the bore of the hose during this aging. For qualification tests, a new batch of

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oil shall be used for each group of test samples. For quality conformance tests, a new batch of oil shall be used for each 10 or fewer tests.

4.4 Qualification tests. Qualification tests shall be in accordance with the following (See 6.3):

4.4.1 Samples. The length of test samples, the minimum quantity of test samples, and the schedule for conducting the tests shall be as shown in Table I.

4.4.1.1 Fittings. Each size of fitting shall meet the tests in Table 1. The tests shall be performed on MIL-F-83798/1 straight type swivel end fittings, except samples No. 9 and 10 shall have a MIL-F-83798/3 90-degree elbow-swivel nut on one end. Satisfactory test results on these fitting ends shall constitute approval of fittings MIL-F-83798/1 through MIL-F-83798/3 and MIL-F-83798/7 through MIL-F-83798/9 in the sizes tested. Two additional assemblies having MIL-83798/4 flareless style fitting ends of the sizes to be tested shall be examined as specified in 4.4.2.1 and tested as specified in 4.4.2.5, 4.4.2.10, and 4.4.2.12. Satisfactory test results on these fittings shall constitute approval of fittings MIL-F-83798/4 through MIL-F-83798/6 in the sizes inspected. All other fittings that use an identical attachment method as the standard fittings MIL-F-83798/1 through MIL-F-83798/9 but having special end configurations shall be submitted to the procuring activity for approval. The hose for the test samples shall be obtained from all of the hose manufacturers listed or approved for listing in the applicable Qualified Products List (QPL). When there are two qualified hose manufacturers, the hose of each manufacturer shall be on 50 percent of the samples in Table I. When there are more than two qualified hose manufacturers, the total quantity of samples in Table I shall be increased so that all makes of hose are used on a quantity of samples equal to 50 percent of the quantity shown in Table I.

4.4.2 Test methods. The qualification tests required by 3.1 shall consist of all the tests in Table I and as specified below. At the option of the preparing activity, the qualification tests may be supplemented by tests under actual service conditions (see 6.2b).

4.4.2.1 Examination of product. All fittings shall be examined to determine conformance with this specification regarding the following, as applicable:

a. Size
b. Materials (3.2)
c. Finish (3.3.2)
d. Dimensions (3.3.5)
e. Identification (3.6)
f. Cleaning (3.7)
g. Workmanship (3.8)

4.4.2.2 Field attachability. The hose lengths shall be cut, using the groove on the socket to establish the cut-off factor. The hose shall be inserted into the socket to the depth of the groove on the socket. The fitting shall be attached to the hose with standard common tools. The nipple shall be tightened to meet the gap specified in 3.3.7. The hose assembly length shall then meet the tolerance specified in MIL-H-83796/1 through MIL-H-83796/9. If assemblies fabricated as specified herein fail in any of the tests required by Table I, then the assembly shall be considered to have also failed this field attachability test.

4.4.2.3 Torque. The flared and flareless type fittings shall be installed on mating adapter ends (MS33656, MS33514 or NAS 1760 as applicable) in accordance with ARP 908. They shall be tested and meet the requirements of ARP 908.

TABLE I. Fittings test schedule - qualification and quality conformance.

QUALIFICATION								
Hose assembly sample number		1/ 1,2,3,4	5, 6	7, 8	9, 10 2/	11, 12	13, 14	15, 16 3/
Length of hose assembly		Fittings only	18 in(457 mm)	18 in(457 mm)	18 in(457 mm)	*See column 1	18 in(457 mm)	18 in(457 mm)
*		Exam 4.4.2.1	Exam 4.4.2.1	→	→	→	→	→
		Torque 4.4.2.3	Field atch 4.4.2.2	→	→	→	→	→
size	length							
-3	10 in(254 mm)		Proof 4.4.2.5	→	→	→	→	→
-4	10 in(254 mm)							
-5	12 in(305 mm)		Coupling 4.4.2.4	→	Leakage 4.4.2.10	Cold def 4.4.2.8	Oil crclt 4.4.2.9	Leakage 4.4.2.10
-6	12 in(305 mm)							
-8	15 in(381 mm)		Fuel imrs 4.4.2.6	Oil imrs 4.4.2.7	Corrosion 4.4.2.11			Burst 4.4.2.12
-10	18 in(457 mm)							
-12	20 in(508 mm)				Burst 4.4.2.12			
-16	24 in(610 mm)							
-20	28 in(711 mm)							
-24	30 in(762 mm)							
-32	43 in(1092 mm)							

1/ Two samples - flared type fittings; two samples - flareless type fittings.
2/ These samples shall have a 90-degree elbow fitting on one end of the assembly.
3/ These samples are flareless fittings.

QUALITY CONFORMANCE							
Sampling (lot size 2,000 or less) (See 4.5.2)							
				As above except omit Corrosion			
Periodic control (lot size 10,000 or less) (See 4.5.2)							
	As above						

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4.4.2.4 Coupling. The measurement of the bulging of hose inner tubes caused by attachment of the fitting shall be made with a ball-end type gage. The diameter of the ball shall be within 0.001 in (0.025 mm) of the minimum bulge diameter specified in Table III and Figure 1. The weight of each gage in ounces shall be equal to the dash number of the fitting being tested. In taking the measurement, the gage shall be placed inside the end of the assembly without lubrication, and without pushing through. The gage shall fall through the bulge under its own weight. This test shall be made only on straight fittings.

4.4.2.5 Proof pressure. The hose assemblies shall be subjected to the proof pressure of Table II for not less than 30 seconds and not more than 5 minutes, using oil conforming to MIL-L-7808, hydraulic fluid conforming to MIL-H-5606, or water. There shall be no evidence of leakage.

4.4.2.6 Fuel immersion. The uncapped hose assemblies shall be immersed in fuel conforming to type JP-4 of MIL-T-5624 for 48 hours at a temperature of 250°F (121°C). After immersion, the assemblies shall be removed and, at room temperature, shall pass the proof pressure test of 4.4.2.5 for 5 minutes, with oil conforming to MIL-L-7808. The assemblies shall then pass the coupling test of 4.4.2.4. The hose shall then be dissected longitudinally, and any indication of disintegration, solubility of component parts, porosity, blistering, or collapse shall be considered failure to meet the test.

4.4.2.7 Oil immersion. The uncapped hose assemblies shall be immersed in oil conforming to MIL-L-7808 at a temperature of 250°F (121°C) for a period of 168 hours. After 24 hours, 96 hours, and 158 hours, the assemblies shall be removed, cooled to room temperature, and shall pass the proof pressure test of 4.4.2.5 for 5 minutes, using MIL-L-7808 oil. The assemblies shall then pass the coupling test of 4.4.2.4. The hose shall then be dissected longitudinally, and any indication of disintegration, solubility of component parts, porosity, blistering, or collapse shall be considered failure to meet the test.

4.4.2.8 Cold temperature deflection. One of two hose assembly samples, (see Table I) shall be oil-aged in accordance with 4.3.1, and the other not aged. The hose assemblies shall then be installed in the apparatus shown in Figure 2 and subjected to the cold temperature deflection test. One assembly shall be filled with MIL-L-7808 oil, and one assembly with type JP-4 (MIL-T-5624) fuel. These assemblies shall be placed in a cold type JP-4 (MIL-T-5624) fuel. These assemblies shall be placed in a cold chamber, the temperature of which shall be controlled at -67°F±2°F (-55°C±1°C), and maintained at this temperature for 2 hours. After this time, and while at the specified temperature, the assemblies shall be subjected to the operating pressure specified in Table II. The hose assemblies shall also be subjected to a deflection of plus or minus 0.5 in (12.7 mm) at a rate of 15 cycles per minute for a 15 minute period. Then the hose assemblies shall be raised to room temperature, and shall pass the proof pressure test of 4.4.2.5.

4.4.2.9 Oil circulation. The hose assemblies shall be installed in a test set-up similar to that shown in Figure 3. The test fluid shall be oil conforming to MIL-L-7808. The sequence of the test procedure, as shown in Figure 4, follows:

a. Soak the assemblies with no pressure in a cold chamber, the temperature of which shall be controlled at -65°F±2°F (-54°C±1°C) and maintained at this temperature for 1 hour.

b. Pressure-test the assemblies to the operating pressure specified in Table II for 30 seconds. There shall be no evidence of leakage.

TABLE II. Physical requirements of fittings and hose assemblies.

Hose Size	Operating Pressure (max.)		Proof 1/ Pressure		Burst Pressure (min.)		Bend Radius (min.)		Operating Temperature (fluid or ambient)	
	psi	kg/sq cm	psi	kg/sq cm	psi	kg/sq cm	in	mm	°F	°C
-3	1,000	70.300	3,000	210.900	6,000	421.800	1.75	44.45	-65 to +250	-54 to +121
-4	1,000	70.300	3,000	210.900	6,000	421.800	2.00	50.80	-65 to +250	-54 to +121
-5	1,000	70.300	3,000	210.900	6,000	421.800	2.25	57.15	-65 to +250	-54 to +121
-6	1,000	70.300	3,000	210.900	6,000	421.800	2.50	63.50	-65 to +250	-54 to +121
-8	1,000	70.300	2,500	175.750	5,000	351.500	3.50	88.90	-65 to +250	-54 to +121
-10	1,000	70.300	2,500	175.750	5,000	351.500	4.00	101.60	-65 to +250	-54 to +121
-12	1,000	70.300	2,000	140.600	4,750	333.925	4.50	114.30	-65 to +250	-54 to +121
-16	750	52.725	1,500	105.450	3,000	210.900	5.50	139.70	-65 to +250	-54 to +121
-20	500	35.150	1,300	91.390	2,000	140.600	8.00	203.20	-65 to +250	-54 to +121
-24	250	17.575	800	56.240	1,750	123.025	9.00	228.60	-65 to +250	-54 to +121
-32	200	14.060	600	42.180	1,200	84.360	12.50	317.50	-65 to +250	-54 to +121

1/ Assemblies having aluminum flange fittings shall be pressure tested at the rated proof pressure or 1,500 psi (105.450 kg/sq cm) whichever is less (see MS20756).

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TABLE III. Coupling bulge. (See Figure 1)

Fitting Size	Minimum Bulge Diameter	
	Inches	Millimeters
-3	0.094	2.388
-4	0.141	3.581
-5	0.203	5.156
-6	0.266	6.756
-8	0.344	8.738
-10	0.469	11.913
-12	0.563	14.300
-16	0.750	19.050
-20	1.000	25.400
-24	1.250	31.750
-32	1.625	41.275

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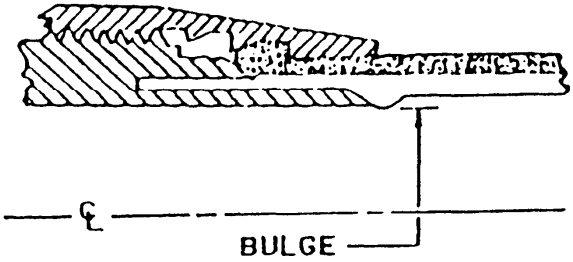

FIGURE 1. Coupling bulge. (See TABLE III)

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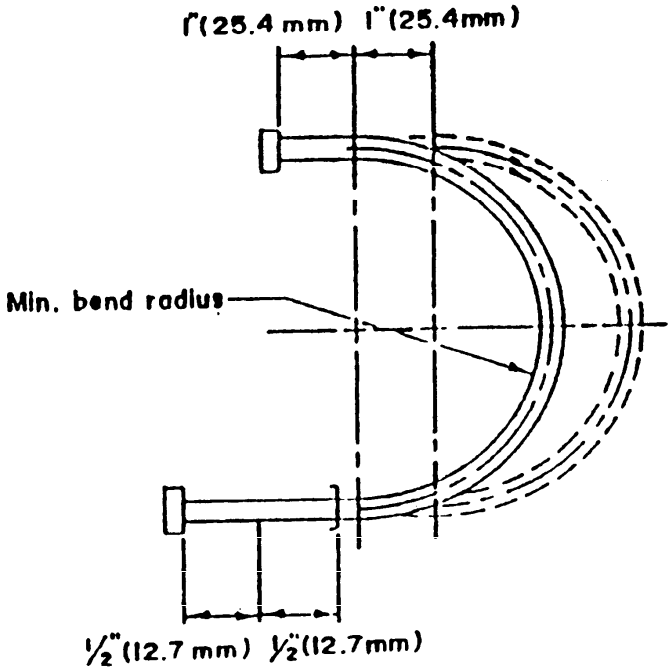

FIGURE 2. Cold temperature deflection test diagram.

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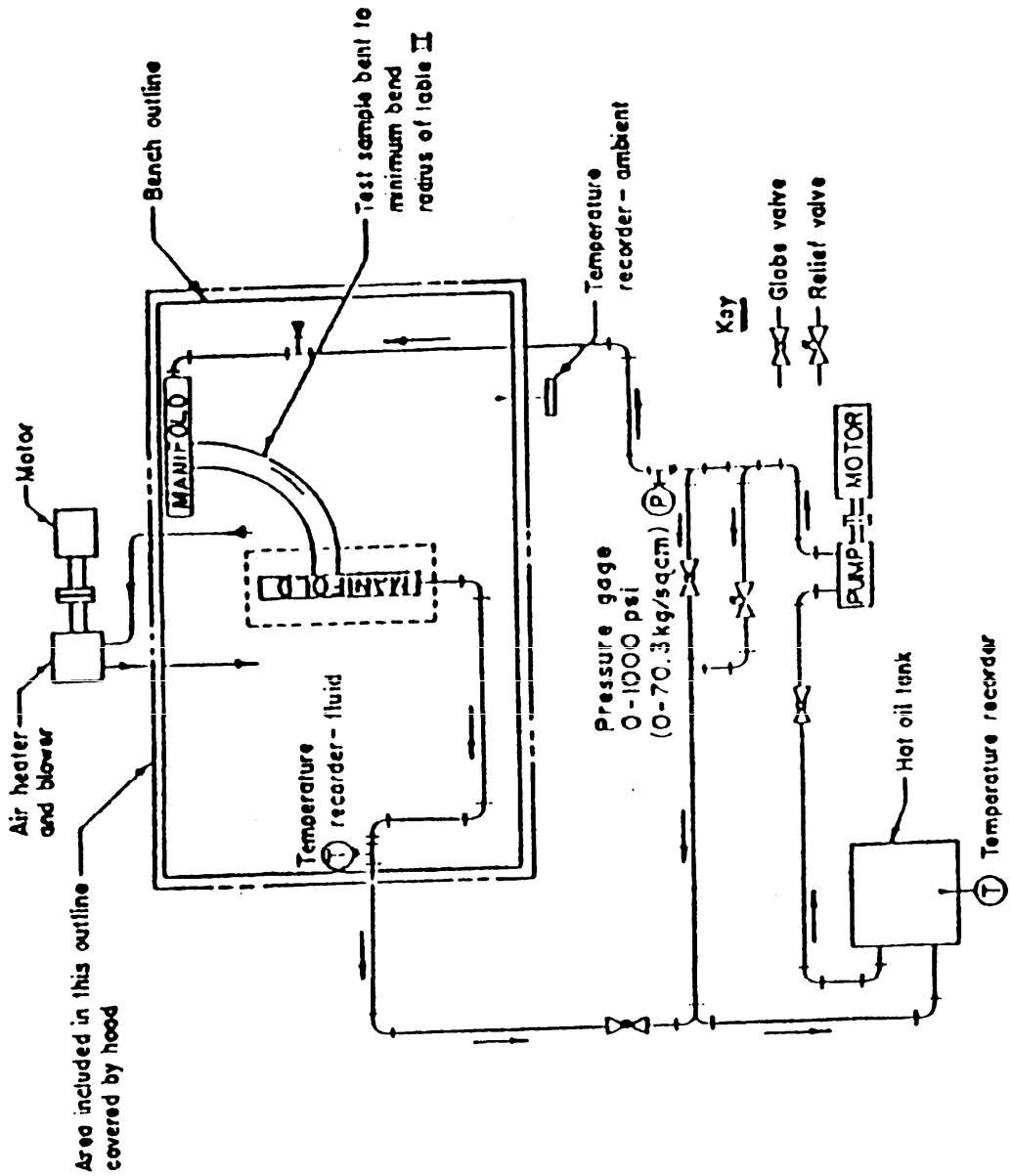

FIGURE 3. Oil circulation test schematic.

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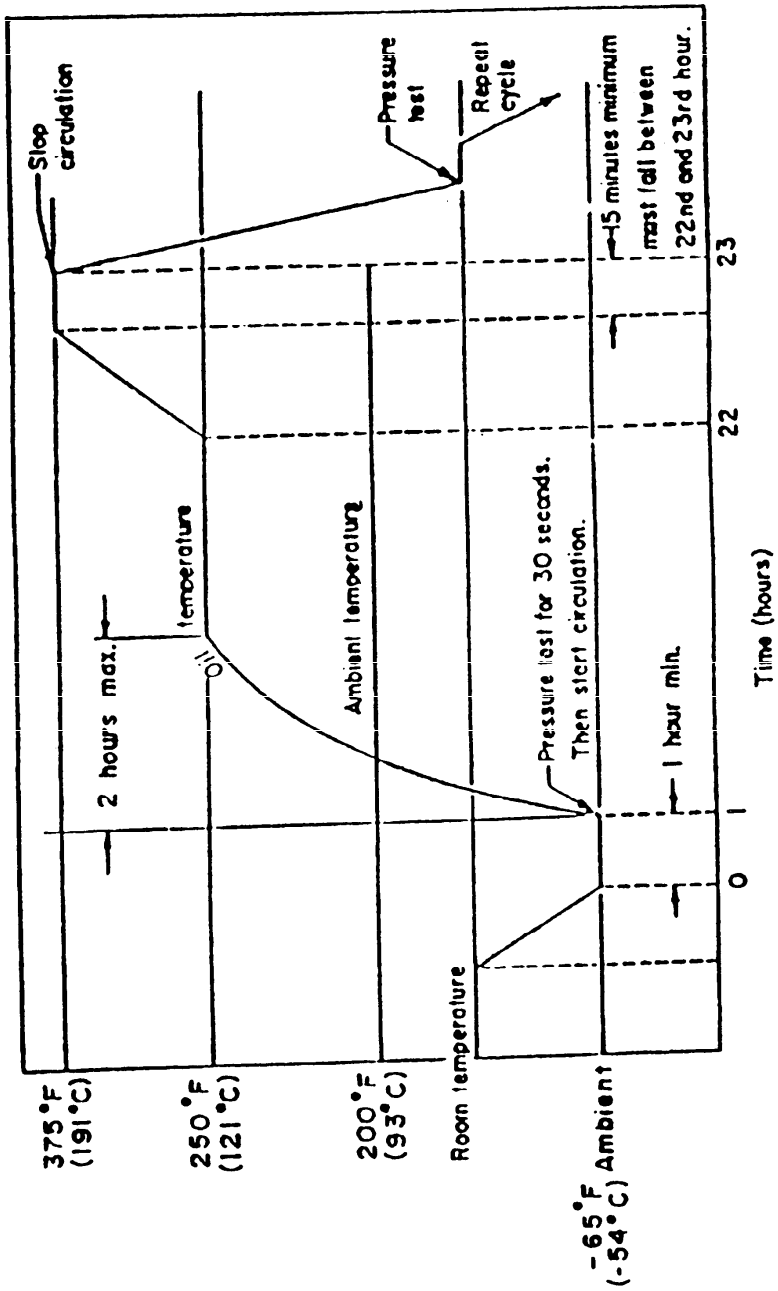

FIGURE 4. Oil circulation (time and temperature schedule).

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c. Circulate the test fluid at 70 pounds per square in (psi) (4.921 kilograms per square centimeter (kg/sq cm)) and at a flow rate not to exceed 15 feet per second. While circulating the fluid, increase the temperature of the test fluid to 250°F±10°F (121°C±6°C) and increase the ambient temperature to 200°F ±10°F (93°C±6°C).

d. Continue circulation for 20 hours. During the last hour of the 20-hour period, increase the test fluid temperature to 375°F±10°F (191°C±6°C). Maintain this fluid temperature for a minimum of 15 minutes.

e. Upon completion of above mentioned tests, reduce the fluid and ambient temperature to room temperature, and test the assembly to the applicable operating pressure for a minimum of 30 seconds. There shall be no evidence of leakage.

f. The tests described in subparagraphs a through e above constitute one cycle. Complete 10 such cycles. Upon completion of the 10 cycles, pressure test hose assemblies at the applicable operating pressure for a minimum of 5 minutes. There shall be no evidence of leakage or other malfunction.

4.4.2.10 Leakage. The hose assemblies shall be subjected to 70 percent of the minimum burst pressure specified in Table II for 5 minutes, using oil conforming to MIL-L-7808. The pressure shall then be released to 0 psi and then re-applied to 70 percent of minimum burst pressure and held for an additional 5 minutes. There shall be no leakage from the fitting, no seepage through the hose, or other malfunction.

4.4.2.11 Corrosion. The hose assemblies shall be immersed, in a vertical position with the ends capped, into 2.5 percent solution of sodium chloride for a 5-minute period. The samples shall then be air dried for 25 minutes at a temperature of 140°F (78°C). This immersion and drying cycle shall be repeated for a total of 168 hours showing no signs of visible corrosion. Upon completion of this test, the hose assemblies shall be subjected to and meet the burst requirements of 4.4.2.12.

4.4.2.12 Burst pressure. Within 24 hours after assembly, the hose assemblies shall be pressurized until failure, using MIL-L-7808 oil, MIL-H-5606 hydraulic fluid, or water. The rate of pressure rise shall be 25,000 psi, plus 0 psi, minus 10,000 psi (1,757.716 kg/sq cm, +0 kg/sq cm, -703.087 kg/sq cm) per minute. There shall be no leakage, burst, or fitting blow-off below minimum burst pressure specified in Table II.

4.4.2.13 Fire resistance. When fire resistance supplemental tests are required (see 6.2b), the hose assemblies shall be tested and shall meet the requirements of ARP 1055, Type 1, Class A. Hose assemblies approved to the fire test requirements of TSO-C53a prior to the effective date of this specification will be considered in compliance with this requirement. A protective sleeve over the hose or fitting may be required to facilitate compliance with this requirement.

4.5 Quality conformance tests. Quality conformance tests shall consist of the following:

a. Individual (see 4.5.1).

b. Sampling and periodic control (see 4.5.2).

4.5.1 Individual. Individual tests shall consist of the following:

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4.5.1.1 Examination of product (see 4.4.2.1). All fittings shall be examined to determine conformance with this specification regarding size and workmanship. The lot size for this inspection shall be as specified in 4.5.2.3.

4.5.1.2 Proof pressure (see 4.4.2.5). Proof-pressure tests shall be performed on each fitting.

4.5.2 Sampling and periodic control. The tests to be performed for sampling and periodic control are identified in Table I. The samples shall meet all of the tests.

4.5.2.1 Quantity. The quantity of samples for each test shall be the same as for qualification tests shown in Table I.

4.5.2.2 Schedule. The test schedules shall be the same as for qualification tests shown in Table I.

4.5.2.3 Lot size. Samples shall be selected at random from the lot size shown in Table I. A lot is defined as products of the same dash size, manufactured under essentially the same conditions, and at essentially the same time.

4.5.3 Rejection and retest. When an item selected from a production run fails to meet the specification, no items still on hand or later produced shall be accepted until the extent and cause of failure has been determined and corrected. The contractor shall explain to the Government representative the cause of failure and the action taken to preclude recurrence. After correction, all of the quality conformance tests shall be repeated.

4.5.3.1 Individual tests may continue. For production reasons, individual tests or other quality conformance tests may be continued pending the investigation of the test which failed. Final acceptance of items on hand or produced later shall not be made until it is determined that all items meet all the requirements of this specification.

4.5.4 Defects in items already accepted. If the investigation of quality conformance test failure indicates that defects may exist in items already accepted, the contractor shall fully advise the procuring activity of all defects liable to be found and the method of correcting them.

4.6 Packaging inspection. Preservation - packaging, packing, and container marking shall be examined to determine conformance with Section 5 of this specification.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or B in accordance with MIL-STD-2073-1A as specified(see 6.2c).

5.1.1 Fittings of dissimilar metals. Each fitting composed of aluminum and carbon steel shall be preserved Method IC-3 of MIL-P-116. No contact preservative shall be applied.

5.1.1.1 Level A. Ten each fittings shall be placed in snug-fitting unit containers conforming to PPP-B-636, class weather-resistant. The container shall not exceed one and one-half cubic feet.

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5.1.1.2 Level B. Fittings shall be packaged as for Level A, except that boxes conforming to PPP-B-566, PPP-B-676 or PPP-B-636, class domestic, may be used as snug-fitting unit containers.

5.1.2 Aluminum fittings. Each fitting composed entirely of aluminum shall be preserved Method III of MIL-P-116. No contact preservative shall be applied.

5.1.2.1 Level A. Ten each fittings shall be placed in snug-fitting unit containers conforming to PPP-B-636, class weather-resistant. Sufficient cushioning to prevent metal-to-metal contact shall be used.

5.1.2.2 Level B. Fittings shall be packaged as for Level A, except that boxes conforming to PPP-B-636, class domestic, may be used as unit containers.

5.2 Packing. Fittings, packaged per 5.1, shall be packed Level A or B, as specified (see 6.2c).

5.2.1 Level A. Packaged fittings shall be packed in snug-fitting, wood-cleated plywood boxes conforming to PPP-B-601, overseas type.

5.2.2 Level B. Packaged fittings shall be packed in snug-fitting, fiberboard boxes conforming to PPP-B-636, class weather-resistant.

5.3 Marking. In addition to any special requirements of the contract, all containers shall be marked in accordance with MIL-STD-129.

5.4 Level C. When specified in the contract, preservation packaging, packing, and container marking, as applicable, shall be acceptable if they meet the requirements of MIL-STD-1190.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The fittings covered by this specification are intended for use in aircraft fuel and oil systems at the pressures and temperatures specified in Table II herein. These fittings are not recommended for vacuum or hydraulic impulse applications.

6.2 Ordering Data. Procurement documents should specify the following:

a. Title, number, and date of this specification and applicable specification sheet.

b. Whether supplemental tests are required (see 4.4.2 and 4.4.2.13).

c. Levels of preservation - packaging and packing required (see 5.1 and 5.2).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in the Qualified Products List, QPL-83798, whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or

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purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is San Antonio Air Logistics Center, Support Division, ATTN: TIRDM, Kelly AFB, Texas 78241-5000, and information pertaining to qualification of products may be obtained from that activity.

6.4 Reclaimed materials. The use of reclaimed materials shall be encouraged to the maximum extent possible.

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:
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Army - AV

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DSA - CS
Navy - AS

User activities:
Air Force - 11
Army - AV
Navy - AS

Preparing activity:
Air Force - 82

Agent:
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5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

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7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional

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