INCH-POUND

MIL-DTL-83797B
18 September 2000
SUPERSEDING
MIL-H-83797A
2 June 1993

DETAIL SPECIFICATION

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

This specification is approved 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 with operating limits of -65 to 250 °F and 200 to 1000 psi suitable for aircraft fuel and oil systems within the limits specified herein.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are 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).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center, Columbus, DSCC-VAI, 3990 East Broad Street, Columbus, OH 43216-5000,by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 4720

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-PRF-5624	-	Turbine fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
MIL-PRF-7808	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-DTL-83133	-	
MIL-PRF-83282	-	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft NATO Code Number H-537
MIL-DTL-83796	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, General Specification for
MIL-DTL-83796/1	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flare
MIL-DTL-83796/2	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flare, with Lockwire Hole
MIL-DTL-83796/3	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flareless
MIL-DTL-83796/4	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flareless, with Lockwire Hole
MIL-DTL-83796/5	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flange
MIL-DTL-83796/6	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flange, with Lockwire Hole
MIL-DTL-83796/7	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flange
MIL-DTL-83796/8	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flange, with Lockwire Hole
MIL-DTL-83796/9	-	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flange to Flange
MIL-DTL-83798	-	Fitting, Rubber Hose, Lightweight, Medium Pressure, General Specification For

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-130	-	Identification Marking of U.S. Military Property
MS20756	-	Flange, Swivel, Retaining

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 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).

AMERICAN STANDARDS INSTITUTE (ANSI)

ANSI/NCSL Z540-1 - Calibration Laboratories and Measuring and Test Equipment, General Requirements.

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway New York 10018-3308.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE AS1933 - Age Controls for Hose Containing Age-Sensitive Elastomeric Material (DoD Adopted)

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15086.)

2.4 Order of precedence. In the event of a conflict between this document and the references cited herein, (except for related 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. Hoses furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.4 and 6.3).

3.2 Materials. Materials shall be of a quality that will allow compliance with the performance requirements of this specification.

3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.2.2 Hazardous substances. The use of hazardous substances, toxic chemicals, or Ozone Depleting Chemicals (ODCs) shall be avoided, whenever feasible.

3.3 Design and construction. The design and construction of the hose, including braid details, shall conform to figure 1.

3.3.1 Hose. The hose shall consist of seamless compounded inner tube of oil resistant synthetic rubber or copolymer and of uniform gage, reinforced with 18-8 corrosion-resistant steel wire in a manner to meet the requirements of this specification and retain end fittings, in accordance with MIL-DTL-83798, without leakage or other malfunction when tested as specified herein.

3.3.1.1 Lengths. Unless otherwise specified, hose shall be furnished in minimum lengths of 20 feet; however, 10 percent of such orders may be furnished in random lengths over 10 feet, and an additional 10 percent in random lengths over 3 feet. When hose is ordered in specified lengths, a tolerance of ±1 percent of the lengths shall be allowed.

3.4 Performance.

3.4.1 Examination of product. The hose shall conform to the requirements of 3.6, 3.8, and Figure 1 when visually examined as specified in 4.7.1.

3.4.1.1 Cleanliness check. The hose shall be free of all foreign material, both internally and externally, which could adversely affect performance and reliability when examined as specified in 4.7.1.1.

3.4.1.2 Dimensions. The hose internal and external diameters shall conform to the dimensions specified herein and on the applicable drawing when examined as specified in 4.7.1.2.

3.4.2 Reduction in diameter. The hose inside diameter shall not decrease to less than 90 percent of the minimum ID specified on figure 1 for all sizes except size 03, which shall not decrease to less than 75 percent of the ID specified on figure 1, when tested as specified in 4.7.2.

3.4.3 Field attachability. The hose assembly fittings shall not separate from the hose or show any evidence of leakage around the fitting, when tested as specified in 4.7.3.

3.4.4 Inner tube bulge, straight coupling. The gage shall fall through the bulge at the end of the coupling nippleof its own weight, when tested as specified in 4.7.4.

3.4.5 Proof pressure. The hose shall show no evidence of leakage or deformation, when tested as specified in 4.7.5.

3.4.6 Elongation or contraction. The hose shall not increase in length more than 2 percent or decrease more than 4 percent, when tested as specified in 4.7.6.

3.4.7 Bending and vacuum. A steel ball of the applicable diameter shall roll freely throughout the entire length of the hose and there shall be no evidence of ply separation, blistering, collapse, or other deformation, when tested as specified in 4.7.7.

3.4.8 Fuel immersion. The hose shall show no evidence of disintegration, solubility of component parts, porosity, blistering or collapse, when tested as specified in 4.7.8.

3.4.9 Oil immersion. The hose shall show no evidence of disintegration, solubility of component parts, porosity, blistering or collapse, when tested as specified in 4.7.9.

3.4.10 Cold temperature deflection. The hose assembly shall show no evidence of leakage or deterioration, when tested as specified in 4.7.10.

3.4.11 Oil circulation. The hose assembly shall show no evidence of leakage or other malfunction, when tested as specified in 4.7.11.

3.4.12 Leakage. The hose assembly shall show no evidence of leakage from the fitting, seepage through the hose or other malfunction, when tested as specified in 4.7.12.

3.4.13 Corrosion. The hose assembly shall show no evidence of leakage, burst, or a fitting blow-off below the minimum burst pressure specified in table IV, when tested as specified in 4.7.13.

3.4.14 Burst pressure. The hose assembly shall show no leakage, burst, or a fitting blow-off below the minimum burst pressure specified in table V, when tested as specified in 4.7.14.

3.5 Identification of product. The hose shall be identified in accordance with MIL-STD-130. In addition, the hose shall have a band attached near the ends of each hose length and for hose lengths more than 10 feet long, an additional band attached near the center. For hose lengths that are 30 feet or more, an additional band every 10 feet. Each band shall contain the following information:

a. Specification number and hose size

b. Date of manufacture in quarter and year

c. The rated working pressure in psi

d. Manufacturer's name or trademark

e. Manufacturer's part number

f. Hose manufacturer's cage code number.

3.6 Cleanliness.

3.6.1 Clean. All hose lengths shall be free of contaminants both internally and externally.

3.6.2 Closures. Unless otherwise specified, the hose shall be sealed on both ends to prevent foreign matter or moisture from entering during shipping and storage. Closures shall be constructed to withstand the normal strains, jars, vibrations and other conditions incident to shipping, storage and handling.

3.7 Age control. Bulk hose shall not exceed age limits established in SAE AS1933. Chlorinated Polyethylene (CPE) base hose may exceed the SAE AS1933 limits and is acceptable to 12 years (48 quarters).

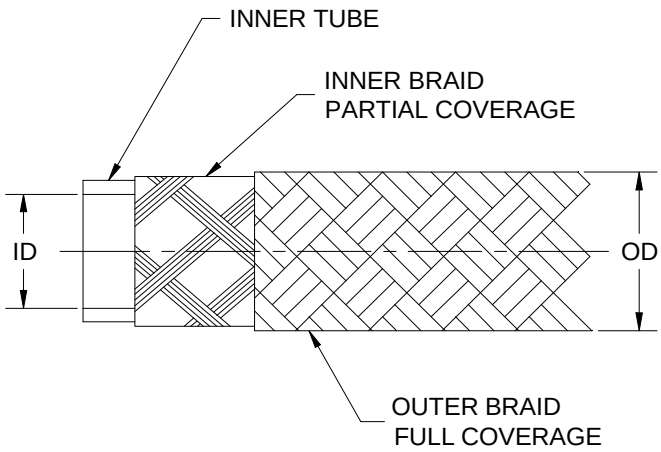
3.8 Workmanship. Workmanship shall be of the quality necessary to produce hose and hose assemblies free from all defects which affect proper functioning in service.

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment (I.e. Industry Standard, Military Standard, etc.) shall be in accordance with ANSI/NCSL Z540-1 or equivalent.

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

a. Qualification inspection (see 4.4).



Hose Dimensions					Braid Detail		
					Inner Braid	Outer Braid	
Hose Size	Equiv. OD Tube	ID Inner Tube	OD Over Braid	Conc. OD To ID Fim	Wire OD	Wire OD	Wt. Max lbs./in.
-03	0.188	0.156 ± .015	0.376 ± .022	0.020	0.008	0.008	0.008
-04	0.250	0.219 ± .015	0.440 ± .022	0.020	0.008	0.008	0.010
-05	0.313	0.281 ± .015	0.486 ± .022	0.020	0.008	0.008	0.012
-06	0.375	0.344 ± .015	0.549 ± .022	0.020	0.008	0.008	0.013
-08	0.500	0.438 ± .023	0.651 ± .022	0.020	0.008	0.008	0.017
-10	0.625	0.562 ± .023	0.797 ± .023	0.020	0.008	0.008	0.022
-12	0.750	0.688 ± .023	0.938 ± .023	0.030	0.008	0.008	0.026
-16	1.000	0.875 ± .031	1.156 ± .031	0.030	0.010	0.008	0.037
-20	1.250	1.125 ± .031	1.437 ± .031	0.030	0.010	0.010	0.051
-24	1.500	1.375 ± .031	1.703 ± .031	0.030	0.016	0.010	0.069
-32	2.000	1.773 ± .023	2.101 ± .039	0.030	0.016	0.012	0.085

NOTES:

1. Identification: See paragraphs 3.5 and 6.4.

2. Dimensions in inches. Unless otherwise specified, tolerances: decimals, ± .010 except for wire braid which will be in accordance with current industry standards.

Figure 1. Hose construction.

b. Quality conformance inspection (see 4.5).

1. Individual tests.

2. Sampling tests.

3. Periodic control tests.

4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in 4.6.

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the qualifying activity on sample units produced with equipment and procedures used in production.

4.4.1 Samples for qualification. Samples for qualification shall be representative of the products proposed to be furnished to the Government. Samples, consisting of 12 hose assemblies of each size and two lengths of hose of the lengths specified in table II and III, as applicable, shall be subjected to qualification testing (see 6.3). Each hose assembly test sample shall consist of a hose as specified herein, coupled with fittings in accordance with MIL-DTL-83798. Unless otherwise specified, fittings for the test samples may be straight, 45 degrees, 90 degrees, flared, flareless, or flanges.

TABLE I. Inspection requirements.

Inspection or test	Requirement	Test Method	Qualification	Quality conformance inspection		
				Individual tests	Sampling tests	Periodic control tests
Examination of hose	3.4.1	4.7.1	X	X		
Cleanliness	3.4.1.1	4.7.1.1	X	X		
Dimensions	3.4.1.2	4.7.1.2	X		X	
Reduction in diameter	3.4.2	4.7.2	X			
Field attachability	3.4.3	4.7.3	X			
Inner tube bulge, straight coupling 1/	3.4.4	4.7.4	X			X
Proof pressure	3.4.5	4.7.5	X	X		
Elongation or contraction	3.4.6	4.7.6	X		X	
Bending and vacuum	3.4.7	4.7.7	X			X
Fuel immersion	3.4.8	4.7.8	X			
Oil immersion	3.4.9	4.7.9	X			
Cold temperature deflection test	3.4.10	4.7.10	X			
Oil circulation test	3.4.11	4.7.11	X			X
Leakage 1/	3.4.12	4.7.12	X		X	
Corrosion	3.4.13	4.7.13	X			
Burst pressure 1/	3.4.14	4.7.14	X		X	

1/ These are destructive tests.

4.4.2 Qualification inspection schedule. The sample(s) shall be subjected to the qualifications inspections specified in table I and in the sequence specified in table II.

4.4.3 Acceptance of qualification data. For identical requirements and test procedures, using an identical fitting, qualification test data from the manufacturer of MIL-DTL-83797 hose may be accepted as qualification test data for MIL-DTL-83798 and first article data for MIL-DTL-83796 providing that documented approval has been obtained from the qualifying or acquiring activity, as applicable. Unless otherwise approved by the qualifying or acquiring activity, qualification or first article test data from one manufacturer shall not be accepted for another.

4.4.4 Failures. One or more failures shall be cause for refusal to grant qualification approval.

4.4.5 Retention of qualification. To retain qualification, the contractor shall forward a report at 12-month intervals to the qualifying activity. The qualifying activity shall establish the initial report date. Each report shall contain a summary of the results obtained from both the sampling tests and the periodic control tests performed during the 12-month interval. The number of lots and quantities of hose that have passed and failed shall be included. All reworked sampling lots shall be accounted for and identified. If the summary of test results indicates nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

4.4.5.1 Periodic qualification report. Failure to submit a report within 30 days after the end of each 12-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 12-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification. In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit his qualified products to testing in accordance with the qualification inspection requirements.

4.5 Quality conformance inspection.

4.5.1 Individual tests. Inspection of the product for delivery shall consist of subjecting each hose length to the individual tests specified in table I. Any item failing to meet the requirements of the individual tests shall be immediately removed from the lot.

4.5.2 Sampling tests. Hose lengths, randomly selected from a production lot (see 4.5.2.1) to form an inspection sample (see 4.5.2.2), shall be subjected to the sampling tests specified in table I.

4.5.2.1 Production lot. A production lot shall consist of all hose of one size manufactured on the same production line(s) by means of the same production techniques, materials, controls and design during the same continuous production run.

TABLE II. Qualification inspection schedule.

Inspection Requirements	Sample Number and Sample Length						
	Hose	Hose Assembly					
	1, 2 3 in.	3, 4 18 in.	5, 6 18 in.	7, 8 18 in.	9, 10 see table III	11, 12 see table III	13, 14 18 in.
Visual examination	X	X	X	X	X	X	X
Cleanliness	X	X	X	X	X	X	X
Dimensions	X	X	X	X	X	X	X
Reduction in diameter	X						
Field attachability		X	X	X	X	X	X
Inner tube bulge		X	X				
Proof pressure		X	X	X	X	X	X
Elongation or contraction				X			
Bending and vacuum					X		
Fuel immersion		X					
Oil immersion			X				
Cold temperature deflection						X	
Oil circulation							X
Leakage				X			
Corrosion				X			
Burst pressure				X			

TABLE III. Hose assembly lengths for samples 9-12.

Dash No.	-3	-4	-5	-6	-8	-10	-12	-16	-20	-24	-32
Hose assy. Length (in.)	10	10	12	12	15	18	20	24	28	30	43

4.5.2.2 Inspection sample. An inspection sample shall consist of hose lengths randomly selected from the production lot without regard to quality. For each full or partial increment of 750 feet of bulk hose produced in the continuous run, 1 sample shall be subjected to the sampling tests up to a maximum of ten samples.

4.5.2.3 Nonconformance of sampling tests. If one or more defects are found in the inspection sample, both the qualifying and inspection activities shall be immediately notified and the production lot shall be rejected and not be supplied to this specification. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity, has been taken. The corrective measures shall be performed on the materials or processes, or both, as warranted, and on all products considered subjected to the same failure. Once the corrective action has been completed, either the specific sampling test in which the original sample failed or all sampling tests may be required to be repeated on additional samples, at the option of the qualifying activity. However, final acceptance shall be withheld until testing have shown that the corrective action was successful. In the event of a failure after re-inspection, information concerning the failure and the corrective action taken shall be furnished to both the qualifying and inspection activities.

4.5.3 Periodic control tests. For each size manufactured under essentially the same conditions, periodic control testing shall be performed on either 4 samples from every 20,000 feet of bulk hose produced or 1 sample from every 5,000 feet. If there has been some production but the total number of footage produced has not reached 5,000 feet for a specific size within three years, the manufacturer shall perform periodic control test on 1 sample of that size unless documented approval has been obtained from the qualifying activity.

4.5.3.1 Periodic control test plan. Testing shall be in accordance with table I.

4.5.3.2 Nonconformance of periodic control tests. If a sample fails a periodic control test, both the qualifying and inspection activities shall be immediately notified of such failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity, has been taken. The corrective measures shall be performed on the materials or processes, or both, as warranted, and on all products considered subjected to the same failure. Once the corrective action has been completed, either the specific periodic control test in which the original sample failed or all periodic control tests may be required to be repeated on additional samples, at the option of the qualifying activity. Futhermore, the sampling tests may be reinstituted in addition to the periodic control tests if deemed applicable by the qualifying activity. However, final acceptance shall be withheld until testing have shown that the corrective action was successful. In the event of a failure after re-inspection, information concerning the failure and the corrective action taken shall be furnished to both the qualifying and inspection activities.

4.5.4 Disposition of test specimens. Samples that have been subjected to any sampling or periodic control tests are considered damaged and shall not be delivered as part of a contract or purchase order.

4.5.5 Discontinuation and resumption of production. If there has been no production of a specific size for a period of three years or more, 10 samples shall be randomly selected from the first lot produced when production of that size has been resumed. Four of the samples shall be subjected to the sampling tests and the remaining 6 shall be subjected to the periodic control tests (see table 1)..

4.5.6 Acceptance of conformance inspection data. For identical requirements and test procedures, using an identical fitting, conformance inspection data from MIL-DTL-83796 or MIL-DTL-83798 may be accepted as conformance inspection data for MIL-DTL-83797, providing that documented approval has been obtained from the qualifying activity. When conformance inspection data from MIL-DTL-83796 or MIL-DTL-83798 is to be accepted as conformance inspection data for MIL-DTL-83797, one hose assembly shall be considered to be the equivalent to two feet of bulk hose.

4.6 Test conditions.

4.6.1 Temperature and pressure. Unless otherwise specified, tests shall be conducted at local ambient temperature and barometric pressure.

4.6.2 Test fluids. Unless otherwise specified in the test, the test fluid shall be oil conforming to MIL-PRF-7808, hydraulic fluid conforming to MIL-PRF-5606 or MIL-PRF-83282, water, or fuel conforming to MIL-DTL-5624 or MIL-DTL-83133, as applicable.

4.6.3 Oil aging. An oil aged sample shall be produced by immersing in oil, conforming to MIL-PRF-7808, at 250 ± 2 °F for 168 hours. During immersion, exclude all air from the bore of the hose to assure all hose surfaces are in contact with the oil when immersed.

4.6.4 Hose assemblies. Unless otherwise specified, hoses to be tested shall have a fitting in accordance with MIL-DTL-83798 attached to each end. The hose assembly shall be as specified in MIL-DTL-83796 and MIL-DTL-83796/1 through MIL-DTL-83796/9. 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 tools. The maximum allowable gap between, the socket and the nipple/elbow is 0.041 inch for fitting sizes -3, -4, and -5 and 0.031 inch for -6 and larger.

4.7 Methods of inspection.

4.7.1 Examination of products. The hose shall be examined for identification markings and workmanship. With documented approval from the qualifying activity, statistical quality control may be used for marking and workmanship examination. Conformance shall be as specified in 3.4.1.

4.7.1.1 Cleanliness. The hose shall be visually examined internally and externally for conformance to the requirements specified in 3.4.1.1.

4.6.1.2 Dimensions. The internal and external diameters of the free ends of the hose shall be checked dimensionally to determine conformance to the dimensions specified herein and on the applicable drawing. Conformance shall be as specified in 3.4.1.2.

4.7.2 Reduction in diameter. The inside diameter of 2 three inch lengths of hose shall be measured and recorded. The hose samples shall then be oil-aged in accordance with 4.6.2. Immediately after the oil-aging, the inside diameter of the hose shall be measured a minimum of 0.5 inch from the end. Conformance shall be as specified in 3.4.2.

4.7.3 Field attachability. The field attachability of the fitting to the hose shall be a requirement of the tests of this specification where test procedure requires a hose assembly. A fitting shall be attached to each end of lengths of bulk hose as specified in 4.6.4. The hose assembly length shall be specified in tables II and III. These hose assemblies shall be used for performing the tests of this specification. Conformance shall be as specified in 3.4.3.

4.7.4 Inner tube bulge, straight 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 .001 inch of the minimum bulge diameter specified on figure 2. 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. Conformance shall be as specified in 3.4.4.

4.7.5 Proof pressure. The hose assemblies, consisting of lengths of hose with attached fittings shall be subjected to the proof pressure of table V using MIL-PRF-7808 oil, MIL-PRF-5606 or MIL-PRF-83282 hydraulic fluid or water for not less than 30 seconds and not more than 5 minutes. Conformance shall be specified in 3.4.5.

4.7.6 Elongation or contraction. The hose assemblies shall be placed in a straight unpressurized position and a standard 10-inch length marked off on the hose. The hose assemblies shall then be pressurized to the applicable operating pressure specified in table V using MIL-PRF-7808 oil, MIL-PRF-5606 or MIL-PRF-83282 hydraulic fluid, or water. While still pressurized, the standard length shall be remeasured and the change in length computed as a percent of the original length. Conformance shall be as specified in 3.4.6.

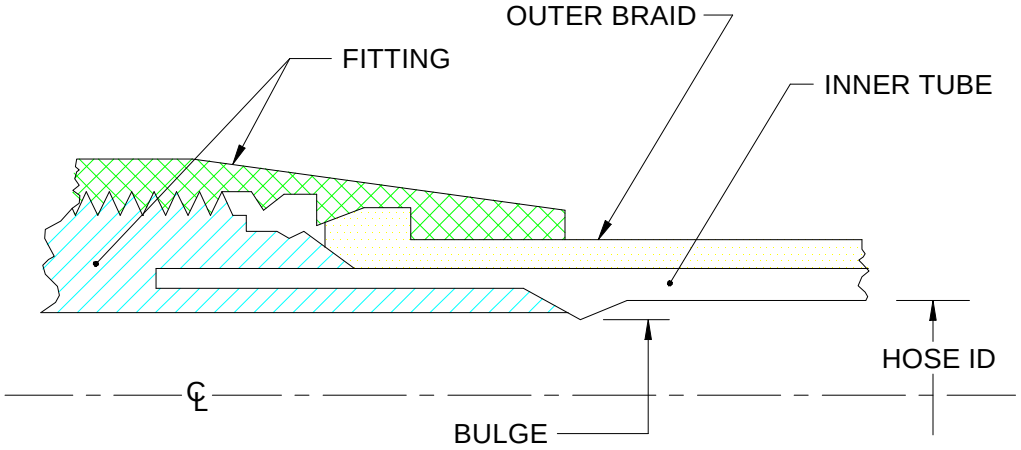
4.7.7 Bending and vacuum. The bending and vacuum test shall be performed at room temperature. A steel ball of the applicable diameter, as specified in table VI, shall be installed within the hose assemblies. The assemblies shall then be bent over to form the applicable minimum bend radius specified in table V. All size assemblies shall not flatten or otherwise deform at any section more than 10 percent of the outside diameter (OD). While bent in this radius, a vacuum of 27 inches Hg shall be applied to size -03 through -12, and 22 inches Hg to sizes -16 through -32, and held for 5 minutes. Application of vacuum shall not flatten or otherwise deform the hose an additional 10 percent of the OD for sizes -03 through -24, and an additional 25 percent of the OD for size -32. With the vacuum still applied, the assemblies shall be straightened and held in a horizontal position, then gradually tilted 30 degrees in each direction allowing the ball to roll through the hose assembly. After release of the vacuum, one assembly shall be dissected longitudinally and visually examined. Conformance shall be as specified in 3.4.7.

4.7.8 Fuel immersion. The uncapped hose assemblies shall be immersed in fuel conforming to type JP-8, MIL-DTL-83133 (JP-5, MIL-PRF-5624, may be used as an alternate) for 48 hours at a temperature of 250 ± 2 °F. After immersion, the assemblies shall be removed and, at room temperature, shall pass the proof pressure test for three minutes, with oil conforming to MIL-PRF-7808. The assemblies shall then pass the inner tube bulge, straight coupling test. The hose shall then be dissected longitudinally, and visually inspected. Conformance shall be as specified in 3.4.8.

"**CAUTION**: Use safety precautions, fuel and oil under pressure and at high temperature may self ignite or explode."

4.7.9 Oil immersion. The uncapped hose assemblies shall be immersed in oil conforming to MIL-PRF-7808 at a temperature of 250 ±2 °F for a period of 168 hours. After 24 hours, 96 hours, and 168 hours, the assemblies shall be removed, cooled to room temperature, and shall pass the proof pressure test for three minutes, using MIL-PRF-7808 oil. The assemblies shall then pass the inner tube bulge, straight coupling test. The hose shall then be dissected longitudinally and visually inspected. Conformance shall be as specified in 3.4.9:

"**CAUTION**: Use safety precautions, fuel and oil under pressure and at high temperature may self ignite or explode."



Hose Size	Minimum Bulge Diameter (in.)
-03	0.094
-04	0.141
-05	0.203
-06	0.266
-08	0.344

Hose Size	Minimum Bulge Diameter (in.)
-10	0.469
-12	0.563
-16	0.750
-20	1.000
-24	1.250
-32	1.625

Figure 2. Inner tube.

TABLE V. Physical requirements of hose, fittings, and hose assemblies.

Hose Size	Operating Pressure psi (Max)	Proof Pressure 1/ psi	Burst Pressure psi (min)	Bend Radius Inches (min)	Operating Temperature (fluid or ambient)
-03	1,000	3,000	6,000	1.75	-65 °F to +250 °F
-04	1,000	3,000	6,000	2.00	-65 °F to +250 °F
-05	1,000	3,000	6,000	2.25	-65 °F to +250 °F
-06	1,000	3,000	6,000	2.50	-65 °F to +250 °F
-08	1,000	2,500	5,000	3.50	-65 °F to +250 °F
-10	1,000	2,500	5,000	4.00	-65 °F to +250 °F
-12	1,000	2,000	4,000	4.50	-65 °F to +250 °F
-16	750	1,500	3,000	5.50	-65 °F to +250 °F
-20	500	1,300	2,000	8.00	-65 °F to +250 °F
-24	250	800	1,750	9.00	-65 °F to +250 °F
-32	200	600	1,200	12.50	-65 °F to +250 °F

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

TABLE VI. Ball size for bending and vacum test.

Dash no.	Dia. plus .001-inch	Dash no.	Dia. plus .001-inch
-03	0.070	-10	0.406
-04	0.125	-12	0.500
-05	0.188	-16	0.656
-06	0.250	-20	0.875
-08	0.313	-24	1.125
		-32	1.594

4.7.10 Cold temperature deflection test. One of two hose assembly samples (see table II) shall be oil-aged in accordance with 4.6.3, and the other hose assembly not conditioned. The hose assemblies shall then be installed in the apparatus shown on figure 3 and subjected to the cold temperature deflection test. The oil-aged assembly shall be filled with MIL-PRF-7808 oil, and the non-aged assembly with type JP-8, MIL-DTL-83133 fuel (JP-5 may be used as an alternate). These assemblies shall be placed in a cold chamber, the temperature of which shall be controlled at -65 ± 2 °F, 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 V. The hose assemblies shall also be subjected to a deflection of plus or minus 0.5 inch at a rate of 15 cycles a minute for a 15 minute period. Then the hose assemblies shall be allowed to return to room temperature, and shall be subjected to the proof pressure test. Conformance shall be as specified in 3.4.10.

4.7.11 Oil circulation test. The hose assemblies shall be installed in a test set-up similar to that shown on figure 4. The test fluid shall be oil conforming to MIL-L-7808. The following test sequence procedure, see figure 5, shall be performed.

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

b. Pressure-test the assemblies to the operating pressure specified in table V for 30 seconds.

c. Circulate the test fluid at a pressure of 70 pounds per square inch (psi) and at a flow rate not to exceed 15 feet a second. While circulating the fluid, increase the temperature of the test fluid to 250 ± 10 °F, and increase the ambient temperature of 200 ± 10 °F.

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

CAUTION: Use safety precautions, fuel and oil under pressure and at high temperature may self ignite or explode.

e. Upon completion of above procedures, reduce the fluid and ambient temperature to room temperature, and test the assembly to the applicable operating pressure a minimum of 30 seconds.

f. The test sequence procedures (a) through (e) above constitute one cycle. Complete 10 cycles. Upon completion of the 10 cycles, pressure-test the hose assemblies at the applicable operating pressure for a minimum of three minutes. Conformance shall be as specified in 3.4.11.

4.7.12 Leakage. The hose assemblies shall be subjected to 70 percent of the minimum burst pressure specified in Table V for five minutes, using oil conforming to MIL-PRF-7808. The pressure shall then be released to 0 psi and then reapplied to 70 percent of minimum burst pressure and held for an additional five minutes. Conformance shall be as specified in 3.4.12.

4.7.13 Corrosion. The hose assemblies shall be immersed, in a vertical position with the ends capped, into a 2.5 percent solution of sodium chloride for a minimum of five minutes. The samples shall then be air dried for 25 minutes at a temperature of 140 ± 5 °F. This immersion and drying cycle shall be repeated for a total of 168 hours. Upon completion of this test the hose assemblies shall be subjected to the burst pressure test. Conformance shall be as specified in 3.4.13.

4.7.14 Burst pressure. Within 24 hours after assembly, the hose assemblies shall be pressurized until distruction occurs, using MIL-PRF-7808 oil, MIL-PRF-5606 or MIL-PRF-83282 hydraulic fluid, or water. The rate of pressure rise shall be 25,000 psi, +0 psi, -10,000 psi per minute. Conformance shall be as specified in 3.4.14. The type of failure and pressure at which failure occurred shall be recorded.

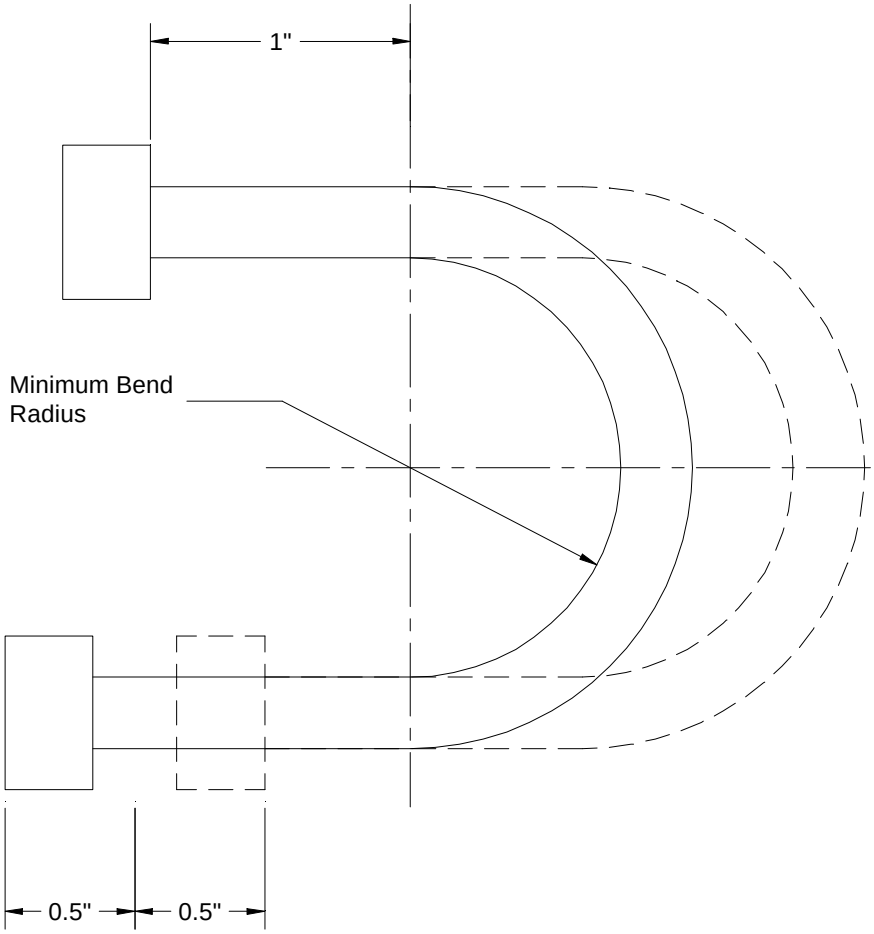


Figure 3. Cold temperature deflection test diagram.

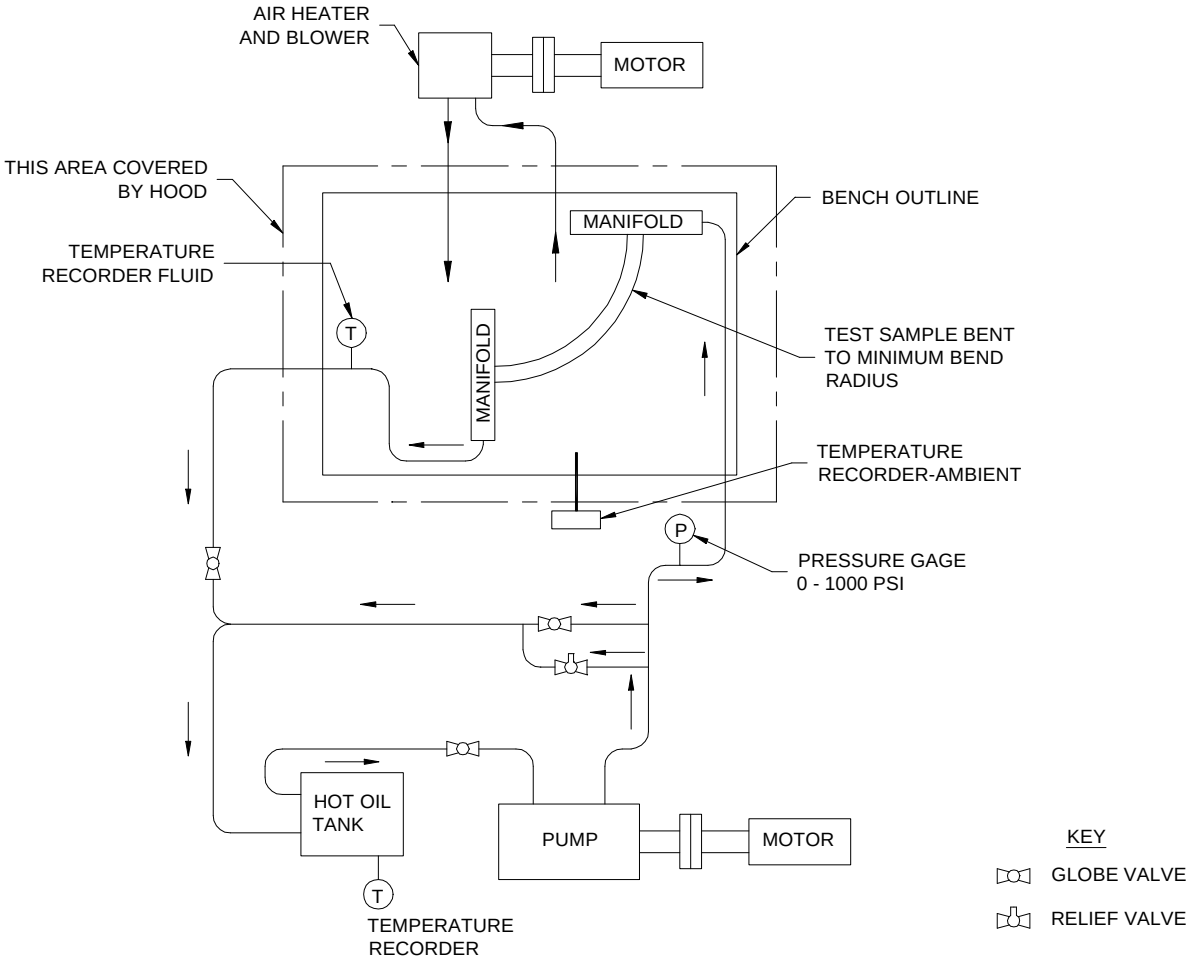


Figure 4. Oil circulation test schematic.

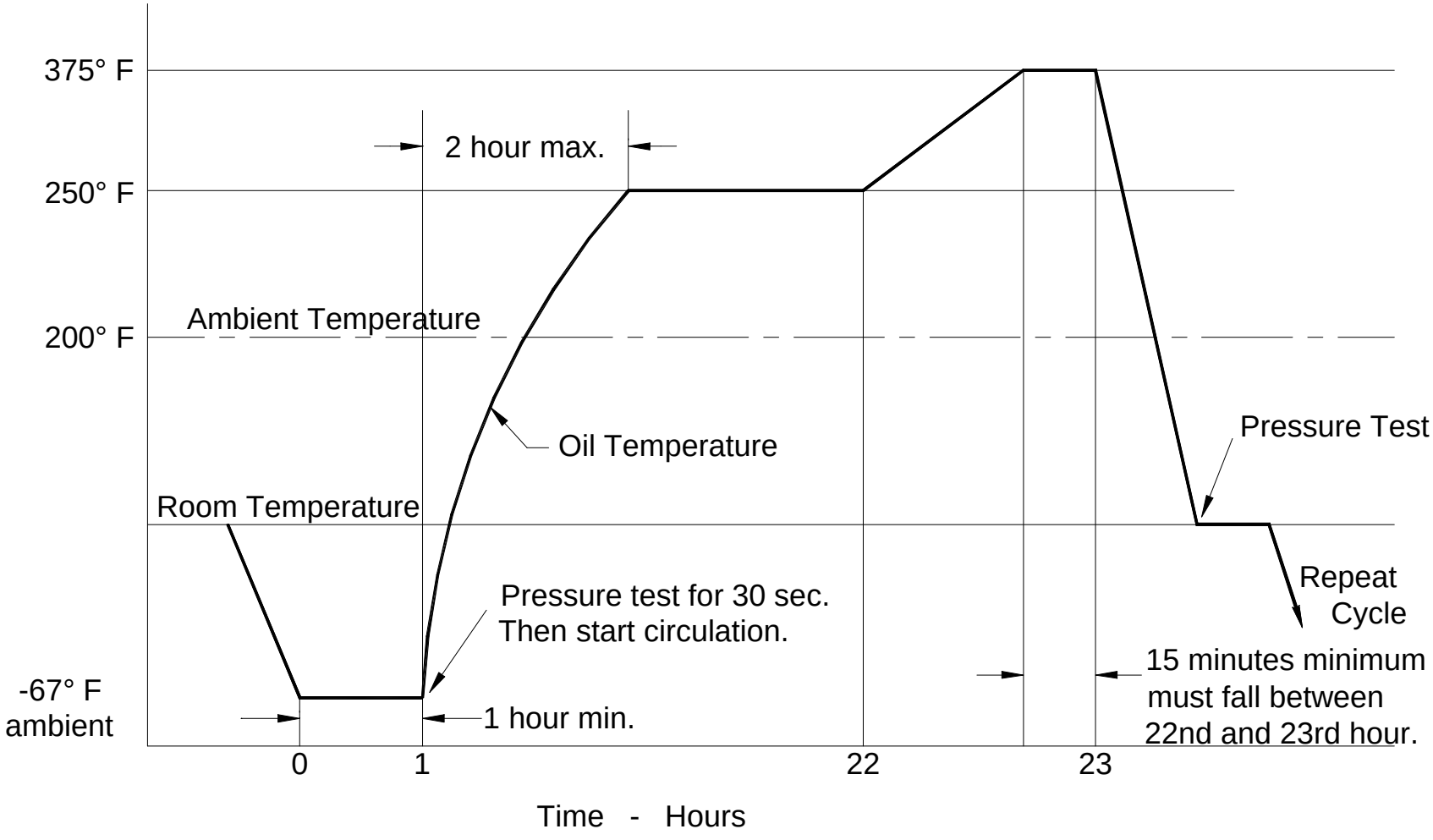


Figure 5. Oil circulation temperature cycle.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). when actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use.. The hose covered by this specification is military unique due to its ability to operate satisfactorily at pressures up to 1000 psi in a temperature range of -65 °F to 250 °F and meet the interoperability and compatibility requirements while encountering rapid ambient temperature fluctuations. The hose is intended for use in aircraft fuel and oil systems. This hose is not recommended for vacuum or hydraulic impulse applications.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification, including amendments.

b. Applicable part number (see 6.4).

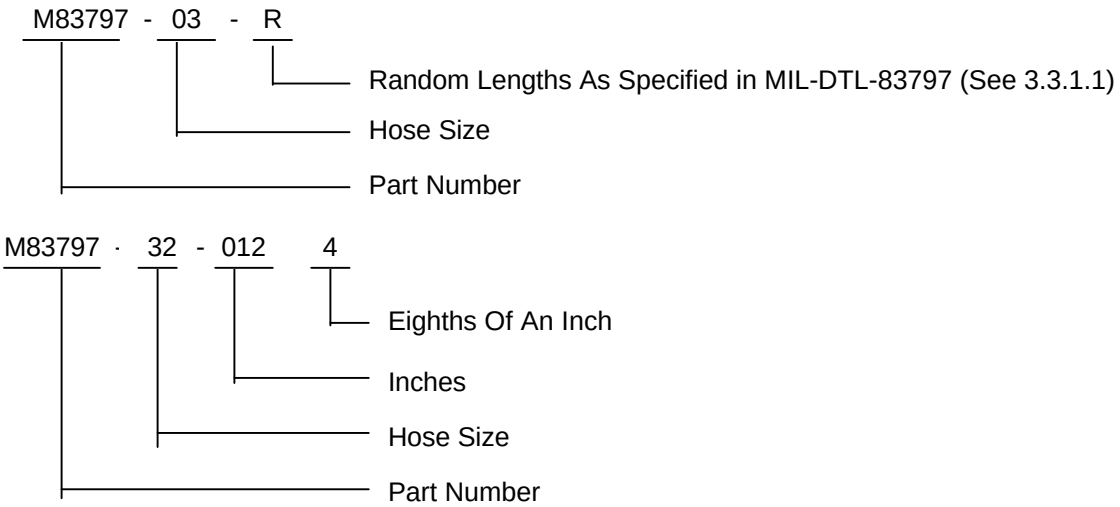
c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).

d. Packaging requirements (see 5.1).

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 Qualified Products List QPL 83797 whether or not such products have actually been so listed by that date. The attention of the contractors is called to this requirement, 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 orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Commander, Defense Supply Center, Columbus,
DSCC-VQP, 3990 East Broad Street, Columbus, OH 43216-5000.

6.3.1 Pre-qualification. An assessment of each manufacturer intending to qualify product to this specification shall be conducted by the qualifying activity prior to initial qualification and periodically thereafter to assure compliance with specification requirements. This assessment will review the manufacturer's quality system, including production and testing, to ensure that adequate controls are in place to provide compliant product on a recurring basis. This assessment may include a facility survey as determined necessary by the qualifying activity.

6.4 Part identifying Number (PIN). The PIN shall be constructed as follows:



6.5 Subject term (key word) listing.

Fuel systems
Oil resistant
Oil systems
Synthetic rubber
Wire reinforcement

6.6 International system of units (SI). The FED-STD-376, Preferred Metric Units For General Use by the Federal Government - A Guide to the Use of SI, the International System of Units, can be used for the conversion to the SI units in this document. The following conversion factors are applicable to this specification.

Pounds per square inch (psi) X 6.894	= Kilopascals (kPa)
Degrees Fahrenheit (°F)	= Degrees Celcius (°c) X 1.8 + 32
Inches X 25.4	= Millimetres (mm)

6.8 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:
Air Force - 99
Army - AV
Navy - AS
DLA - CC

Review activities:
Air Force - 11, 82
Army - AT
Navy- SA

Preparing activity:
DLA - CC

(Project 4720-0159)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.
NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-DTL-83797B	2. DOCUMENT DATE (*YYMMDD*) 00/09/18

3. DOCUMENT TITLE
Hose, Rubber, Lightweight, Medium Pressure, General Specification For

4. NATURE OF CHANGE (*Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.*)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (*Last, First, Middle Initial*)	b. ORGANIZATION	
c. ADDRESS (*Include Zip Code*) DD Form 1426, OCT 8 *Previous editions are obsolete* 198/290	d. TELEPHONE (*Include Area Code*) (1) Commercial: (2) DSN: (*If Applicable*)	7. DATE SUBMITTED (*YYMMDD*)

8. PREPARING ACTIVITY DLA-CC

a. NAME	b. TELEPHONE NUMBER (*Include Area Code*)
COMMANDER DEFENSE SUPPLY CENTER COLUMBUS	(1) Commercial (614) 692-0538 (2) DSN 850-0538 Fax: (614) 692-6939
c. ADDRESS (*Include Zip Code*) CODE DSCC-VAI 3990 EAST BROAD STREET COLUMBUS, OH 43216-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Standardization Program Office, Attn: DLSC-LM 8725 John J. Kingman Road, Suite 1655 Fort Belvoir, VA 22060-6221 Telephone (703) 767-6888 DSN 427-6888