

INCH-POUND

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 SUPERSEDING
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MILITARY SPECIFICATION
HOSES AND HOSE ASSEMBLIES, NONMETALLIC:
ELASTOMERIC, LIQUID FUEL

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

1. SCOPE

1.1 Scope. This specification covers elastomeric, liquid fuel transfer hose and hose assemblies.

1.2 Classification. The hose and hose assemblies shall be of the following types, sizes, classes and fitting styles (see 6.2 and 6.4).

Type I	-	Non-Wire Reinforced.	
Type II	-	Wire Reinforced, Noncollapsible.	
Size 1	-	1/2-inch.	(0.50-inch)
Size 2	-	3/4-inch	(0.75-inch)
Size 3	-	1-inch	(1.00-inch)
Size 4	-	1-1/4-inch	(1.25-inch)
Size 5	-	1-1/2-inch	(1.50-inch)
Size 6	-	2-inch	(2.00-inch)
Size 7	-	2-1/2-inch	(2.50-inch)
Size 8	-	3-inch	(3.00-inch)
Size 9	-	4-inch	(4.00-inch)
Size 10	-	6-inch	(6.00-inch)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US ARMY BELVOIR RDE CTR, ATTN SATBE TSE, 10101 GRIDLEY RD STE 104, FT BELVOIR VA 22060-5818 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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FSC 4720

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- Class 0 - Bulk Hose (Without Fittings).
- Class 1 - Male Fitting On One End and Female Fitting On Other End.
- Class 2 - Male Fitting Both Ends.
- Class 3 - Female Fittings Both Ends.

- Style 0 - Bulk Hose (Without Fittings).
- Style A - Banded Shank (Reattachable).
- Style B - Compression (Reattachable-Threaded).
- Style D - Internal Expanded (One Time Threaded).

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 shall be 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

- WW-C-440 - Clamps, Hose, (Low-Pressure).

MILITARY

- MIL-H-775 - Hose and Hose Assemblies; Rubber, Plastic, Fabric, or Metal (Including Tubing); and Fittings, Nozzles, and Strainers, Packaging of.
- MIL-C-27487 - Coupling Halves, Quick-Disconnect, Cam-Locking Type.

STANDARDS

FEDERAL

- FED-STD-H28 - Screw-Thread Standards for Federal Services.
- FED-STD-H28/10 - Screw-Thread Standards for Federal Services (Section 10 American National Hose Coupling and Fire Hose Coupling Threads.)
- FED-STD-595 - Colors Used in Government Procurements.

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

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(Unless otherwise indicated, copies of federal and military specifications and standards are available from: STDZN DCMNT ORDER DESK, BLDG 4D, 700 ROBBINS AVE, PHILADELPHIA PA 19111-5094.)

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).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- B 26 - Aluminum-Alloy Sand Casting.
- D 380 - Rubber Hose.
- D 381 - Existent Gum in Fuels by Jet Evaporation.
- D 412 - Rubber Properties in Tension.
- D 413 - Rubber Property - Adhesion to Flexible Substrate.
- D 471 - Rubber Property - Effect of Liquids.
- D 518 - Rubber Deterioration.
- D 1053 - Rubber Property - Stiffening at Low Temperature: Surface Cracking Flexible Polymers and Coated Fabrics.
- D 1149 - Rubber Deterioration - Surface Ozone Cracking in a Chamber (Flat Specimen).
- D 3951 - Standard Practice for Commercial Packaging.

(Application for copies should be addressed to: AMERCN SCTY & MTRLS, 1916 RACE STRET, PHILADELPHIA PA 19103.)

(Non-Government standards are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

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 Description. The hose and hose assemblies shall consist of a tube, one or more plies of reinforcement, and a cover, for use with liquid hydrocarbon fuels as specified herein.

3.2 First article. Unless otherwise specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

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3.3.1 Material deterioration prevention and control. The hose and hose assemblies shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration that may be encountered in any of the applicable operation and storage environment to which the hose and hose assemblies may be exposed.

3.3.2 Recovered materials. For the purpose of this requirement, recovered materials are those materials which have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials. The components, pieces and parts incorporated in the hose and hose assemblies may be newly fabricated from recovered materials to the maximum extent practicable, provided the hose and hose assemblies produced meets all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the hose and hose assemblies.

3.3.3 Elastomer.

3.3.3.1 Tube. The basic material for the tube shall be a synthetic compound utilizing a copolymer product of butadiene and acrylonitrile or other synthetic fuel resistant elastomer that shall comply with all requirements specified herein.

3.3.3.2 Cover. The cover shall be elastomer compounded for fuel, oil, hydrolytic and ultraviolet stability and ozone resistance that complies with all requirements specified herein.

3.3.4 Reinforcement.

3.3.4.1 Type I.

3.3.4.1.1 Hose up to and including 1-1/2 inches (1.50 inch) in diameter. The reinforcement shall be one or more plies of braided, woven or spiralled synthetic fiber cord, evenly and firmly fabricated, and thoroughly impregnated with elastomeric compound, causing the plies to adhere firmly to each other and to the tube and cover and be of sufficient strength to assure conformance to the applicable requirements of this specification.

3.3.4.1.2 Hose, 2-inch diameter and larger. The reinforcement may be one or more plies of braided, woven or spiralled synthetic fiber cord evenly and firmly fabricated and shall be thoroughly impregnated with elastomeric compound, causing plies to adhere firmly to each other and to the tube and cover, and be of sufficient strength to conform to the applicable requirements of this specification. As an alternative, the reinforcement may be an even number of layers of parallel synthetic woven fiber fabric embedded in elastomeric compound, wound in contra-direction, so that there is an elastomeric bond throughout, providing a continuous elastomer bond from the inner tube through the reinforcement to the outer cover.

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3.3.4.1.3 Static bond. Static electric bonding shall be provided. The bond shall not break when the hose is coiled or subjected to internal or external pressure.

3.3.4.2 Type II. The type II hose reinforcement shall be in accordance with 3.3.3.1, and shall have a helix or helixes of round, steel wire between the fiber reinforcement; or, hose reinforcement may consist of a carcass of synthetic filament warp yarns interwoven with a helix or helixes of round, steel wire and fillers of cotton or synthetic filament yarns, alternately spaced. The reinforcing wire shall have the physical and dimensional characteristics required to enable the hose to conform to 3.5.8.

3.3.5 Fittings (couplings). The fittings (couplings) shall be cast or forged aluminum. The fittings shall be protected with flexible dust plug(s) or cap(s) as appropriate.

3.3.5.1 Aluminum. Aluminum shall conform to ASTM B 26 alloy 356.0 temper T-6 or alloy 712.0, temper T-5.

3.3.5.2 Style A, banded shank. Unless otherwise specified (see 6.2), style A fittings shall be cam-locking, quick-disconnect fittings conforming to MIL-C-27487, type II or type VI, class 1.

3.3.5.2.1 Clamps. Hose clamps shall conform to WW-C-440, type H, and shall be austenitic stainless steel. Hose clamps shall be non-reflective. Two clamps shall be used for each fitting, except for 6-inch hose, which shall have three clamps for each fitting. The widths of clamps shall be minimum 1/2 inch (0.50 inch) for hose size up to and including 2-1/2 inches (2.50 inch) inside diameter (I.D.) and 3/4 inch (0.75 inch) for hose 3 inches (3.00 inch), I.D. and up.

3.3.5.3 Style B. Reattachable compression fittings shall be two-piece construction. No cement, sealers, or adhesives shall be used in their installation other than to seal the cut ends of the hose. The body of the coupling shall be cast or forged with a smooth bore and shall include central hexagon or octagon wrench surfaces and a tailpiece consisting of two concentric walls with an intermediate hose chamber. The outer wall of the tailpiece shall have male threads to engage the sleeve and a tapered end to compress the grip. The inner wall shall be constructed so as to maintain grip on the hose and shall have a rounded outer edge to prevent cutting of the hose during installation or upon sharp bending. The grip shall be reusable, left-hand wound into a coil of approximately 3 loops and may be round, or flat with rounded edges. The ends shall be ground square. The sleeve shall be threaded and tapered in order to facilitate assembly and provide maximum compression of the hose. The edge of the sleeve in contact with the hose

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shall be rounded to prevent cutting of the hose upon bending and shall extend beyond the end of the coupling tailpiece. Body, sleeve, and grip shall be free from porosity and other imperfections.

3.3.5.4 Style D. The one-time-use internal expanded fittings shall have an internal expanding serrated tailpiece, suitably gripping and compressing the wall of the hose against an external ferrule. When expanded, these fittings shall have an inside diameter conforming to the normal inside diameter of the hose.

3.3.6 Threads. Unless otherwise specified (see 6.2), styles B and D fittings shall have tapered male or NPSH female threads. The threads shall conform to FED-STD-H28/10.

3.4 Construction.

3.4.1 Hose. The hose shall be constructed of an elastomeric inner tube, a synthetic fiber reinforcement with two helically wound static bonds (type I) or reinforcing wires (type II), and a compounded rubber cover.

3.4.1.1 Tubing. The tubing shall be fabricated from the material specified in 3.3.3.1. The inside wall of the tube shall be smooth and free from pits. The tube shall be of uniform thickness not less than 5/64-inch (0.078125-inch).

3.4.1.2 Cover. The cover shall be fabricated from material as specified in 3.3.3.2, and shall be of uniform thickness not less than 5/64-inch (0.078125-inch). Unless otherwise specified (see 6.2) the cover color shall be tan 686, in accordance with FED-STD-595, color chip 33446.

3.4.1.3 Reinforcement and static bond.

3.4.1.3.1 Type I hose. When tested as specified in 4.5.2.1, the static bond (see 3.3.4.1.3) shall be continuous to effect an electric bond (see 6.5) between both ends of the hose.

3.4.1.3.2 Type II hose. When tested in accordance with 4.5.2.1, the reinforcing wire (see 3.3.4.2) shall be continuous to effect an electric bond (see 6.5) between both ends of the hose, and shall withstand the crush resistance requirements in table I, when tested in accordance with 4.5.2.9.

3.4.2 Hose assemblies. Hose assemblies shall be type I or type II hose with fittings attached as specified herein.

3.4.2.1 Fittings. Fittings shall be securely attached to the hose to form a permanent electric bond. The hose assembly shall not leak.

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3.4.3 Diameters and tolerances of hose. Hose diameters and tolerances shall be as follows:

Inside Diameter		Outside Diameter	
1/2	$\pm 1/32$ inch (0.50 ± 0.03125)	1-1/16	$\pm 1/32$ inch (1.0636 ± 0.03125)
3/4	$\pm 1/32$ inch (0.75 ± 0.03125)	1-3/8	$\pm 1/32$ inch (1.375 ± 0.375)
1	$\pm 1/16$ inch (1.00 ± 0.0625)	1-5/8	$\pm 1/16$ inch (1.625 ± 0.0625)
1-1/4	$\pm 1/16$ inch (1.25 ± 0.0625)	1-7/8	$\pm 1/16$ inch (1.875 ± 0.0625)
1-1/2	$\pm 1/16$ inch (1.50 ± 0.0625)	2-1/8	$\pm 1/16$ inch (2.125 ± 0.0625)
2	$\pm 1/16$ inch (2.00 ± 0.0625)	2-21/32	$\pm 1/16$ inch (2.65625 ± 0.0625)
2-1/2	$\pm 1/16$ inch (2.50 ± 0.0625)	3-3/16	$\pm 1/16$ inch (3.1875 ± 0.0625)
3	$\pm 1/16$ inch (3.00 ± 0.0625)	3-3/4	$\pm 1/16$ inch (3.75 ± 0.0625)
4	$\pm 1/16$ inch (4.00 ± 0.0625)	4-3/4	$\pm 1/16$ inch (4.75 ± 0.0625)
6	$\pm 1/16$ inch (6.00 ± 0.0625)	6-7/8	$\pm 1/8$ inch (6.875 ± 0.125)
		-1/16	inch (-0.0625)

3.5 Physical and chemical requirements.

3.5.1 Hydrostatic pressure.

3.5.1.1 Hose assembly. When tested as specified in 4.5.2.1 at the appropriate proof pressure (see table I), the hose or hose assemblies shall not leak nor show any imperfections in either the hose or the fittings, and there shall be no indication of slippage or pullout of the fitting from the hose. The length of the hose shall not change more than ± 7 percent. Type I hose shall not twist, either clockwise or counterclockwise, more than one-half turn (180 degrees) in 25 feet.

3.5.1.2 Minimum burst. When tested as specified in 4.5.2.2, each size hose or hose assembly shall have no failure of hose under the applicable minimum burst pressure shown in table I.

3.5.2 Tensile strength. When tested as specified in 4.5.2.3, the tensile strength of the tube and cover shall be not less than 1250 pounds per square inch (psi). When tested as specified in 4.5.2.4, the tensile strength of the tube and cover after immersion, shall be not less than 40 percent or less than 600 psi (whichever is greater) of the tensile strength obtained before immersion.

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TABLE I. Test loads and pressures.

Size of hose (inside diameter) (inches)	Proof test pressure (psi)	Burst test pressure (psi)	Working pressure (NTE) (psi)	Crush resistance (pounds)	Bend radius (inches)
1/2 (0.50)	150	500	125	200	2.75
3/4 (0.75)	150	500	125	200	3.50
1 (1.00)	150	500	125	200	4.00
1-1/4 (1.25)	150	500	125	200	5.00
1-1/2 (1.50)	150	500	125	225	6.00
2 (2.00)	125	400	100	250	8.00
2-1/2 (2.50)	125	375	94	325	10.00
3 (3.00)	100	300	75	325	12.00
4 (4.00)	100	300	75	325	16.00
6 (6.00)	100	300	75	325	24.00

3.5.3 Ultimate elongation. When tested as specified in 4.5.2.3, the ultimate elongation of the tube and cover shall be not less than 200 percent, and, when tested as specified in 4.5.2.4, the elongation after immersion shall be not less than 100 percent.

3.5.4 Adhesion.

3.5.4.1 Original. When tested as specified in 4.5.2.5, the original adhesion between tube and plies, between the plies, and between the cover and the plies shall be a minimum load of 10 pounds.

3.5.4.2 After fuel immersion. After fuel immersion, adhesion between the tube and plies, between the plies, and between the cover and the plies shall be a minimum load of 6 pounds after testing as specified in 4.5.2.6.

3.5.5 Volume increase. When tested as specified in 4.5.2.4, the volume increase of the tube specimen after immersion in test fluid shall not exceed 60 percent and the volume increase of the cover specimen shall not exceed 100 percent.

3.5.6 Low temperature flexibility.

3.5.6.1 Hose, all sizes. When tested as specified in 4.5.2.7.1, the cover and tube shall not exceed a Young's modulus of 10,000 psi.

3.5.7 Existent gum content. When tested as specified in 4.5.2.8, the existent gum residue extracted with heptane shall be not more than 20 milligrams per 100 milliliters of test fluid.

3.5.8 Crush resistance (type II only). During the crush resistance test specified in 4.5.2.9, the smallest outside diameter shall not be less than 85 percent of the original outside diameter. After release of the load, the smallest outside diameter shall be not less than 95 percent of the original outside diameter.

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3.5.9 Ozone resistance. Ozone resistance shall comply with ASTM D 1149. When tested in accordance with 4.5.2.10, at the end of the exposure time, there shall be no visible cracking in the cover when viewed under 7X magnification.

3.5.10 Bend radius. When tested as specified in 4.5.2.11, there shall be no loss of pressure.

3.6 Marking. Each length of the hose shall be marked with the contractor's name or trademark, the quarter and year of manufacture, "MIL-H-370", "type I" or "type II", as applicable, and the words "Liquid Fuel". When required (see 6.2), each length of hose shall be marked with the part or identifying number. The letters shall be a minimum of 0.18-inch high. Hoses shall be marked at 10-foot intervals or by continuous impression branding, provided that the pattern shall be repeated every 5 feet or less. Marking color shall contrast with the hose cover color. Each hose shall be marked with a longitudinal stripe of a contrasting color (see 6.2), not less than 0.125-inch and extending the full length of the hose. The label may be within the longitudinal stripe provided the stripe is not less than 0.20-inch greater than the height of the letters. The label may substitute for the longitudinal stripe, provided it is continuous and extends the full length of the hose. Labels shall be provided whenever it is necessary for personnel to identify, interpret, or follow procedures for deployment. Labeling and longitudinal stripe shall remain clear, distinct and legible for the life of the hose. Handling, bending, water, oil and environmental effects shall not adversely affect the label or stripe.

3.7 Workmanship. The hose and hose assemblies shall conform to the quality specified herein and be free from cuts, nicks, bruises, blisters, sharp edges, or lumps, and impurities.

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 and unless disapproved by the Government, the contractor's own or any other facilities suitable for the performance of the inspection requirements specified herein may be used. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must 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 manufacturing operations, is an acceptable practice to ascertain conformance

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to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Component and material inspection. The contractor is responsible for ensuring that components and materials are manufactured, examined, and tested in accordance with referenced specifications and standards, as applicable.

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

- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).
- c. Inspection of packaging (see 4.6).

4.3 First article inspection.

4.3.1 Examination. The first article shall be examined as specified in 4.5.1.

4.3.2 Tests. The first article shall be tested as specified in table II. Failure of any test shall be cause for rejection of the lot.

TABLE II. Test schedule.

First Article	Quality Conformance		Test	Requirement Paragraph	Test Paragraph
	Individual	Sample			
X	X		Hydrostatic.	3.5.1.1	4.5.2.1
X		X	Burst pressure.	3.5.1.2	4.5.2.2
X		X	Tensile strength.	3.5.2	4.5.2.3
X		X	Tensile strength after immersion.	3.5.2	4.5.2.4
X		X	Ultimate elongation.	3.5.3	4.5.2.3
X		X	Ultimate elongation after immersion.	3.5.3	4.5.2.4
X		X	Original adhesion.	3.5.4.1	4.5.2.5
X		X	Adhesion after immersion	3.5.4.2	4.5.2.6
X			Low temperature flexibility.	3.5.6	4.5.2.7
X		X	Existent gum.	3.5.7	4.5.2.8
X		X	Crush resistance.	3.5.8	4.5.2.9
X		X	Ozone resistance.	3.5.9	4.5.2.10
X		X	Bend radius.	3.5.10	4.5.2.11

4.4 Quality conformance inspection.

4.4.1 Lot size. A bulk hose lot shall consist of not more than 10,000 feet (3048 m) of hose produced over a period not to exceed 30 days. A hose

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assembly lot shall contain not more than 10,000 feet (3048 m) of hose. Each lot shall contain hose or hose assemblies as applicable, of one nominal size, manufactured under essentially the same conditions by the same manufacturer.

4.4.2 Sampling. Sampling of hose and hose assemblies for examination and tests shall be in accordance with MIL-STD-105. Test sections shall be cut from the hose or hose assembly and shall be of sufficient length for the performance of the required tests.

4.4.2.1 Bulk hose samples. Bulk hose samples shall be selected at random at the time of manufacture at the rate of three samples per lot. Each sample shall consist of sufficient hose to conduct the specified tests.

4.4.2.2 Hose assembly samples. Hose assembly samples shall be made from hose selected at random, at the time of assembly of fittings and hose, at the rate of three samples per lot. Each sample shall consist of sufficient hose assemblies to conduct the specified tests.

4.4.3 Examination. Samples selected in accordance with 4.4.2 shall be examined as specified in 4.5.1.

4.4.4 Tests.

4.4.4.1 Individual. Each length of hose or each hose assembly shall be tested as specified table II. Failure of the test shall be cause for rejection.

4.4.4.2 Samples. Samples selected in accordance with 4.4.2 shall be tested as specified in table II. Crush resistance test (see 4.5.2.9) is to be performed only on type II hose.

4.5 Inspection procedure.

4.5.1 Examination. The hose and hose assembly shall be examined as specified herein for the following defects:

Major

101. Dimensions not as specified (see 3.1).
102. Materials not as specified (see 3.3).
103. Materials are not resistant to corrosion and deterioration or treated to be made resistant to corrosion and deterioration of the applicable storage and operating environments (see 3.3.1).
104. Used, rebuilt, or remanufactured components, pieces, or parts incorporated in the hose and hose assemblies (see 3.3.2).
105. Hose cover not clean and smooth (see 3.3.3.2 and 3.4.1.2).
106. Hose cover scuffed or bruised, so that braid is exposed (see 3.3.3.2 and 3.4.1.2).
107. Hose not as specified (see 3.3.4.1.1, 3.3.4.1.2, and 3.4.1).
108. Dust plug or cap missing (see 3.3.5).
109. Clamps not as specified (see 3.3.5.2.1).
110. Hose cut or damaged by fitting assembly (see 3.3.5.3).

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- 111. Coupling halves not as specified (see 3.3.7.2).
- 112. Identification marking missing, illegible, or not as specified (see 3.6).
- 113. Hose cover color not as specified (see 3.6).
- 114. Workmanship not as specified (see 3.7).

4.5.2 Tests.

4.5.2.1 Hydrostatic. Each length of hose or hose assembly shall be subjected to the hydrostatic tests of ASTM D 380 for elongation, twist, and proof pressure, using water as the test fluid. The test pressures shall be as specified in table I. The electric bond (see 6.5) shall be determined while full test pressure is applied. Nonconformance to 3.4.1.3.1, 3.4.1.3.2, 3.4.2.1, or 3.5.1.1 shall constitute failure of this test.

4.5.2.2 Burst pressure. The hose or hose assembly shall be subjected to the straight bursting test specified in ASTM D 380. Nonconformance to 3.5.1.2 shall constitute failure of this test.

4.5.2.3 Tensile strength and ultimate elongation. The tensile strength and ultimate elongation of the rubber cover and the rubber tube of the hose or hose assemblies shall be determined in accordance with ASTM D 412. Nonconformance to 3.5.2 and 3.5.3 shall constitute failure of these tests.

4.5.2.4 Tensile strength, ultimate elongation, and volume change after fuel immersion. After fuel immersion, the changes in tensile strength, ultimate elongation, and volume change of the cover and tube of hose or hose assemblies selected in accordance with 4.4.2, shall be determined in accordance with ASTM D 471. The temperature of immersion shall be 23 ± 1 °C. The immersion time shall be 70 hours. The immersion fuel shall be ASTM D 471, reference fuel B. The immediate deteriorated properties method shall be used in determining changes in tensile strength and ultimate elongation. Nonconformance to 3.5.2, 3.5.3, or 3.5.5 shall constitute failure of this test.

4.5.2.5 Original adhesion. From hose or hose assemblies selected under 4.4.2, prepare ring or strip specimens as described in ASTM D 380. The adhesion shall be determined in accordance with the machine method of ASTM D 413. Nonconformance to 3.5.4.1 shall constitute failure of this test.

4.5.2.6 Adhesion after immersion in fuel. Specimens prepared as described in 4.5.2.5 shall be immersed in fluid as specified in 4.5.2.4 for 70 hours at $23, \pm 1.1$ °C. Within 15 minutes after removal of the specimens from the fluid, the adhesion shall be determined in accordance with machine method of ASTM D 413. Nonconformance to 3.5.4.2 shall constitute failure of this test.

4.5.2.7 Low temperature flexibility.

4.5.2.7.1 Hose, all sizes. A test for low temperature flexibility shall be made in accordance with routine inspection and acceptance procedures specified in ASTM D 1053, except that a gaseous media (section 8) will be used. The test temperature for the cover and tube shall be $-32, \pm 2$ °C. The exposure

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time shall be 7 days. Nonconformance to 3.5.6.1 shall constitute failure of this test.

4.5.2.8 Existent gum. A test specimen of not less than 14 inches long shall be cut from the hose selected in accordance with 4.4.2. The bottom end of the specimen shall be stoppered with a clean noncorrosive plug, 2 inches long, secured in the end of the specimen with a suitable clamp. The specimen shall then be filled within 2 inches from top with fluid as specified in 4.5.2.4, and plugged in a manner similar to the bottom. This specimen shall then be stored in a vertical position for 7 days at an ambient temperature of $38, \pm 2$ °C. At the end of each 24-hour period, the fuel shall be agitated for 5 minutes by moving the hose from the vertical to the horizontal position at a rate of 2 cycles per minute. At the completion of the 7-day storage period, fuel shall again be agitated in the specimen for 5 minutes and immediately removed from the hose. The removed fuel shall be tested for existent gum in accordance with the air-jet solvent wash method of ASTM D 381. A sample of test fuel before entering hose shall be tested at the same time and by the same method. The existent gum of this sample shall be subtracted from the existent gum obtained from the fuel removed from the test hose. Nonconformance to 3.5.7 shall constitute failure of this test.

4.5.2.9 Crush resistance. Crush resistance shall be determined by centering a 12-inch length of hose between 3-inch wide, parallel metal plates in such a way that a 3-inch length of hose is being compressed. The plates shall be brought together at a rate of 2 inches per minute until the applicable crush resistance load specified in table I has been applied. The distance between plates shall be measured with a steel rule and expressed in percent of the original outside diameter. The load shall be released and the minimum outside diameter of the hose at the center of the compressed area shall be measured and reported in percent of original outside diameter. Nonconformance to 3.4.1.3.2 or 3.5.8 shall constitute failure of this test.

4.5.2.10 Ozone resistance. Specimens of the cover, prepared as described in procedure A of ASTM D 518, shall be mounted in a 20 percent elongated position and tested in accordance with ASTM D 1149. After conditioning for 24 hours in an ozone-free atmosphere, the mounted specimens shall be exposed for 336 hours at $40, \pm 1$ °C, to an atmosphere containing 50 parts, ± 10 parts, per hundred million (pphm) of ozone. Upon completion of the test, the specimens shall be examined. Nonconformance to 3.5.9 shall constitute failure of this test.

4.5.2.11 Bend radius. The test specimen shall be subjected to the bend radius and proof test pressure specified in table 1. Nonconformance to 3.5.10 shall constitute failure of this test.

4.6 Inspection of packaging. The preservation, packing, and marking of the hoses and hose assemblies shall be examined to determine compliance with the quality assurance provisions of MIL-H-775.

5. PACKAGING

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5.1 Preservation. Preservation shall be level A or level C, as specified (see 6.2).

5.1.1 Level A. Each hose and hose assembly shall be preserved in accordance with the level A preservation requirements in 3.4.1.1 of MIL-H-775.

5.1.2 Level C. Level C preservation shall be in accordance with 3.4.1.2 of MIL-H-775.

5.2 Packing. Packing shall be level A, level B, or level C, as specified (see 6.2).

5.2.1 Level A. The hose and hose assemblies shall be packed in accordance with the level A packing requirements in 3.4.2.4.1 of MIL-H-775.

5.2.2 Level B. The hose and hose assemblies shall be packed in accordance with the level B packing requirements in 3.4.2.4.1 of MIL-H-775.

5.2.3 Level C. Level C packing shall be in accordance with 3.4.2.7 of MIL-H-775.

5.3 Marking. In addition to any special marking specified in the contract or purchase order (see 6.2), marking shall be in accordance with MIL-STD-129.

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 hose and hose assemblies covered by this specification are for suction and discharge of liquid fuels such as high aromatic gasoline, JP-4, JP-8, and diesel fuels. The hose assemblies shall be operable throughout the temperature range 52 to -32 °C.

6.2 Acquisition requirements. Acquisition documents should specify the following:

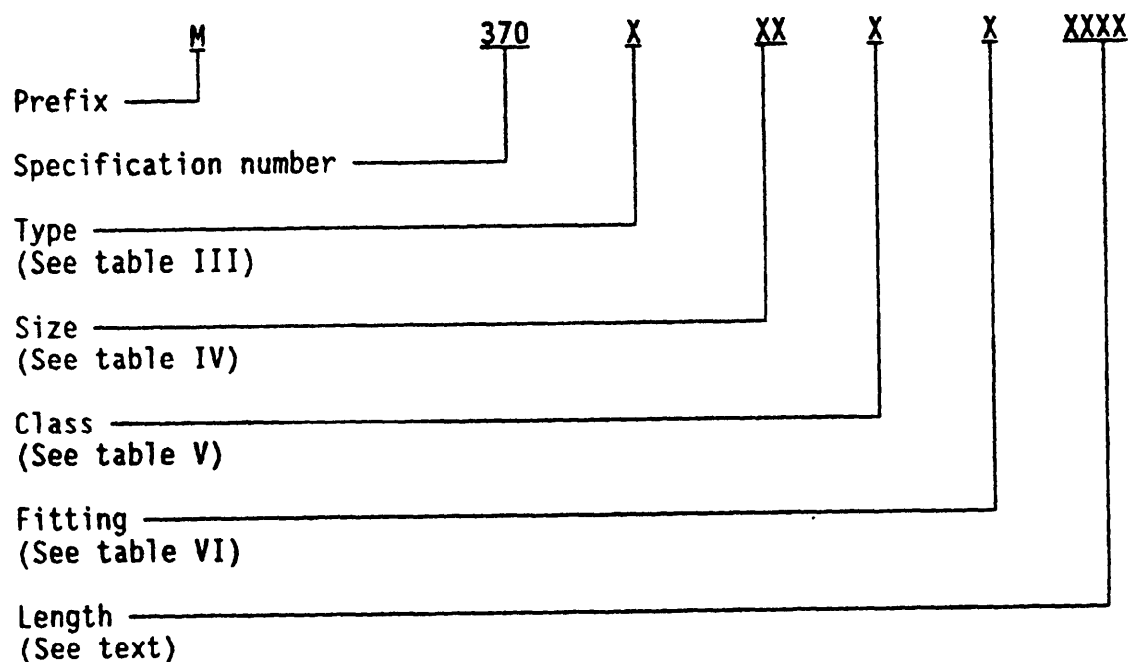
- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- c. When a first article is not required (see 3.2).
- d. Style A fittings (if other than as specified (see 3.3.5.2)).
- e. Style thread required if other than specified (see 3.3.6).
- f. Color of hose cover (see 3.4.1.2).
- g. Contrasting color of longitudinal stripe on hose (see 3.6).
- h. Part or identifying number (see 3.6 and 6.4 through 6.4.5).
- i. Level of preservation and level of packing required (see 5.1 and 5.2).
- j. Any special marking required (see 5.3).

6.3 First article. When a first article inspection is required, the items should be a preproduction item. The first article should consist of one or more units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of the

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first article test results and disposition of the first article. Invitation for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously tested, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.4 Part or identifying number. The part or identifying number (PIN) of hose and hose assemblies covered by this specification shall be designed in the following form (see 3.6 and 6.2).



Example: M370-B08B2B1700 - Hose assembly, in accordance with MIL-H-370, type II, (type II - wire reinforced), size 8 (3 inches), class 1 (male fitting one end, female fitting on the other end), style A (banded shank reattachable), length (170.0 inches long).

6.4.1 Classification. The hose and hose assemblies shall be the types (see table III), sizes (inside diameter) (see table IV), classes (see table V), styles (see table VI), and lengths (see 6.4.5) (see 6.2 and 6.4).

TABLE III. Type designator.

Symbol	Characteristics
A	Type I - Non-wire reinforced
B	Type II - Wire reinforced, noncollapsible

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6.4.2 Size. The hose and hose assembly size is identified by a two digit code number as shown in table IV.

TABLE IV. Size designator.

Code No.	Inside Diameter
01	Size 1 - 1/2-inch (0.500-inch)
02	Size 2 - 3/4-inch (0.750-inch)
03	Size 3 - 1-inch (1.00-inch)
04	Size 4 - 1-1/4-inch (1.25-inch)
05	Size 5 - 1-1/2-inch (1.50-inch)
06	Size 6 - 2-inch (2.00-inch)
07	Size 7 - 2-1/2-inch (2.50-inch)
08	Size 8 - 3-inch (3.00-inch)
09	Size 9 - 4-inch (4.00-inch)
10	Size 10 - 6-inch (6.00-inch)

6.4.3 Class. The hose assembly class is identified by a one letter symbol as shown in table V.

TABLE V. Class designator.

Symbol	Characteristics
A	Class 0 - Bulk Hose (without fittings).
B	Class 1 - Male fitting on one end and female fitting on other end.
C	Class 2 - Male fitting both ends.
D	Class 3 - Female fittings both ends.

6.4.4 Fitting. The hose assembly fitting style is identified as a single code numeral as shown in table VI.

TABLE VI. Fitting designator.

Code No.	Characteristics
1	Style 0 - Bulk Hose (without fittings).
2	Style A - Banded shank (reattachable).
3	Style B - Compression (reattachable-threaded).
4	Style D - Internal expanded (one time threaded).

6.4.5 Length. The length of hose or hose assemblies shall be specified ± 2 percent, exclusive of fittings and written in clear text and will be in inches with the last number expressed in tenths of an inch.

6.5 Electrical bond. An electrical bond eliminates a difference in potential between objects.

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6.6 Subject (key word) listing.

Liquid hydrocarbon suction lines
Liquid hydrocarbon Discharge lines
Elastomeric hose
Hose, fuel

6.7 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:

Army - ME
Navy - YD
Air Force - 99

Preparing activity:

Army - ME

Project 4720-0015

Review activities:

Navy - SH, MC
Air Force - 82
DLA - CS

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.

RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-H-370G	2. DOCUMENT DATE (YYYYDD) 940106
3. DOCUMENT TITLE Hoses and Hose Assemblies, Nonmetallic: Elastomeric, Liquid Fuel		
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)	d. TELEPHONE (Include Area Code) (1) Commercial (if applicable) (2) DSN	7. DATE SUBMITTED
8. PREPARING ACTIVITY		
a. NAME Carolyn B. Johnson	b. TELEPHONE (Include Area Code) (1) Commercial (703) 704-3468 (2) DSN 654-3468	
c. ADDRESS (Include Zip Code) ARMY BELVOIR RDE CTR ATTN SATBE ISE 10101 GRIDLEY RD STE 104 FT BELVOIR VA 22060-5818	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: DEFNS QLTy & STDZN OFC 5203 LEESBURG PIKE STE 1403 FLS CHURCH VA 22041-3466 Telephone (703) 756-2340 DSN 289-2340	

