

INCH-POUND

MIL-PRF-370H
 01 February 1999
 SUPERSEDING
 (See 6.3)

PERFORMANCE SPECIFICATION

HOSE 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 standard collapsible and non-collapsible, lightweight collapsible, and low temperature non-collapsible elastomeric, liquid fuel transfer hose and hose assemblies.

1.2 Classification. The hose and hose assemblies will be of the following types, sizes, classes, styles, material, and lengths. (See 6.2, 6.8, and 6.9)

1.2.1 Type.

- Type A – Collapsible
- Type B – Non-collapsible
- Type C – Collapsible, lightweight (4 and 6-inch nominal diameter only)
- Type D – Non-collapsible low temperature

1.2.2 Size. The nominal inside diameter of hose and hose assembly will be identified by a two-digit size code as follows:

Size 01	–	0.50 - inch	Size 06	–	2.00 - inch
Size 02	–	0.75 - inch	Size 07	–	2.50 - inch
Size 03	–	1.00 - inch	Size 08	–	3.00 - inch
Size 04	–	1.25 - inch	Size 09	–	4.00 - inch
Size 05	–	1.50 - inch	Size 10	–	6.00 - inch

1.2.3 Class. The hose and hose assembly classes will be as follows:

- Class 0 – Without fittings
- Class 1 – Male fitting on one end and female fitting on other end

Beneficial comments, (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-D/210, Warren, MI 48397-5000 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

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

MIL-PRF-370H

- Class 2 – Male fitting both ends
- Class 3 – Female fitting both ends
- Class 4 – Sexless both ends

1.2.4 Style. The end fitting style will be as follows:

- Style 0 – Bulk hose
- Style A – Cam-locking end fittings
- Style B – Re-attachable (reusable) compression end fitting up to 4-inch
- Style C – Grooved end fittings
- Style D – One-time-use internal expanded end fittings up to 4-inch
- Style E – Quick-disconnect, sexless couplings

1.2.5 Material. The material used in the end fittings will be as follows:

- Material A – Aluminum
- Material B – Brass
- Material C – Corrosion resistant steel
- Material D – Steel (carbon)
- Material O – Other

1.2.6 Length. The hose and hose assembly length will be expressed in feet, to 4 significant figures, with the last digit indicating tenths of a foot. For example, 5000 is 500 feet; 0505 is 50 feet, six inches. (see 6.8.1)

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 Specification, standards, and handbooks. 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).

FEDERAL

- A-A-59326 – Coupling Halves, Quick-Disconnect Cam-Locking
- A-A-59377 – Quick-disconnect, Sexless Couplings
- FED-STD-595B – Colors used in Government Procurement

MIL-PRF-370H

(Unless otherwise indicated, copies of the above specifications , standard, and handbook 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 SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM D 380 – Standard Test Methods for Rubber Hose (DoD adopted)
- ASTM D 381 – Standard Test Method for Existent Gum in Fuels by Jet Evaporation (DoD adopted)
- ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension (DoD adopted)
- ASTM D 413 – Standard Test Methods for Rubber Property - Adhesion to Flexible Substrate (DoD adopted)
- ASTM D 471 – Standard Test Method for Rubber Property - Effect of Liquids (DoD adopted)
- ASTM D 518 – Standard Test Method for Rubber Deterioration on Surface Cracking (DoD adopted)
- ASTM D 746 – Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact (DoD adopted)
- ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials (DoD adopted)
- ASTM D 1053 – Standard Test Methods for Rubber Property - Stiffening at Low Temperatures: Flexible Polymers and Coated Fabrics (DoD adopted)
- ASTM D 1149 – Standard Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber (DoD adopted)
- ASTM D 2137 – Standard Test Methods for Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

- ASME B1.20.1 – Pipe Threads, General Purpose (Inch)

(Application for copies should be addressed to American Society of Mechanical Engineers Inc., United Engineering Center, 345 E 47th St., New York, NY 10017-2304.)

AMERICAN WATER WORKS ASSOCIATION (AWWA)

MIL-PRF-370H

AWWA C606 - Grooved and Shouldered Joints (DoD adopted)

(Application for copies should be addressed American Water Works Association, 6666 West Quincy Avenue, Denver, Colorado 80235.)

2.4 Order of precedence In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications or specification sheets), 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 shall be finished lengths, as specified, consisting of an elastomeric tube, reinforcement, stiffening (non-collapsible only), and a cover. Hose assemblies shall be the defined types, sizes and lengths of hose, equipped with end fittings as specified. The hose and hose assemblies shall be suitable for use in the transfer of aromatic hydrocarbon fuels. (see 6.2)

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspections in accordance with 4.2.

3.3 Operational requirements.

3.3.1 Hose size and weight. All type A, B, and D hoses shall conform to the size requirements as specified in Table I, and type C hoses shall conform to the size and weight requirements in Table II.

TABLE I. Type A, B, and D hose diameters and tolerances.

Size code	Inside diameter (inch)	Outside diameter (inch)
050	0.50 ±.03	1.06 ±.03
075	0.75 ±.03	1.37 ±.03
100	1.00 ±.06	1.62 ±.06
125	1.25 ±.06	1.87 ±.06
150	1.50 ±.06	2.12 ±.06
200	2.00 ±.06	2.66 ±.06
250	2.50 ±.06	3.19 ±.06
300	3.00 ±.06	3.75 ±.06
400	4.00 ±.06	4.75 ±.06
600	6.00 ±.06	6.87 +.12 -.06.

TABLE II. Type C hose diameter, tolerance, and weight.

Size code	Inside diameter (inch)	Weight lb/foot (maximum)
400	4.06 ±.06	1.50
600	6.06 ±.06	2.00

MIL-PRF-370H

3.3.2 Length. The length of hose and hose assembly shall be the actual hose length exclusive of the end fittings. A tolerance on the length of ± 2 percent shall be permitted.

3.3.3 Tube and cover. The tube and cover shall be an elastomer compound meeting the performance requirements as specified herein. The tube shall be smooth, free of pits, and of a uniform thickness. The cover shall be ultraviolet stable and ozone resistant. Contractor shall certify all finished hoses to be resistant to aromatic hydrocarbon fuels, and to have no deleterious effects upon, or be degraded by the following fuels:

- a. Automotive gasolines, including gasohol.
- b. Aviation gasoline.
- c. Turbine fuels including Jet A, Jet A-1, and JP-8 (see 6.7.7 and 6.7.8).
- d. Diesel fuels, including navy distillate fuel.

3.3.4 Static bond. The hose shall contain a continuous embedded static wire(s) or other electrical conductor(s). The conductor(s) shall provide a continuous electrical bond between the hose ends, to include fittings. The maximum resistance shall not be greater than 1.5 ohms per linear foot of hose. The bond shall not break when the hose is coiled, sharply bent, or subjected to internal or external pressures as specified.

3.3.5 End fittings. End fittings shall be as identified by class, style, and material and sized for the hose size specified. Noncorrosive devices (see 6.6) shall be used for the attachment of end fittings to the hose. All end fittings shall be securely attached to the hose to prevent slippage or leakage under normal operation and when subjected to hydrostatic proof pressure.

3.3.5.1 Coupling halves, quick-disconnect cam-locking type. Cam-locking end fittings shall be class 1 in accordance with A-A-59326.

3.3.5.2 Grooved end fittings. Grooved end of the hose fitting adapters shall be in accordance with Table 4 (Cut grooving dimensions - Steel, aluminum, brass, and other metallic pipe of IPS dimensions), AWWA C606-97. Hose adapter section of the grooved end fitting shall be sized to fit the inside diameter of hose as specified in Table I for non-collapsible type hoses and Table II for the collapsible type hoses. The grooved end fittings shall be rated at 150 psi.

3.3.5.3 Re-attachable screw-on hose couplings. The re-attachable compression type fitting (see figure 1), shall consist of an outer sleeve, inner body & tailpiece, and wire compression grip. The tailpiece shall have one end threaded with National (American) Standard Pipe Taper (NPT) threads in accordance with ASME B1.20.1, for attachment to existing assemblies and a hose shank type end for hose attachment. The hose shank end of the tailpiece shall have the sleeve threaded over the tailpiece which allow the hose to be compressed and firmly secured to the tailpiece. When the sleeve is fully engaged it shall extend beyond the hose end of the tailpiece but shall not cover any of the NPT thread. The sleeve shall have at least four flat surfaces to permit use of a standard wrench for tightening or loosening. The couplings, when installed in accordance with the manufacturers' instructions, shall secure in hose and withstand a repeated, longitudinal pull on the hose of 450 pounds without becoming detached. The end fitting shall withstand the applied pressures, in accordance with Table IV, without leakage, deformation, or slippage of the hose.

MIL-PRF-370H

3.3.5.4 One-time-use end fittings. The one-time-use internal expanded fittings shall have an internal expanding tailpiece and external ferrule. The tailpiece shall grip and press the hose wall against the external ferrule. When installed, these fittings shall have an inside diameter conforming to the nominal inside diameter of the hose.

3.3.5.5 Quick-disconnect, sexless Couplings. The sexless couplings shall be type 1 and class A or B in accordance to A-A-59377. The couplings shall be reusable and sized to mate 2.00- or 3.00-inch inside diameter of type A, B, and D hoses.

3.3.6 Hydrostatic pressure. The hose assembly shall have the capability to withstand internal pressures and external forces. All type A, B, and D hoses shall follow the requirements as specified in Table IV, and type C hose shall follow the requirements as specified in Table V.

3.3.6.1 Proof pressure. At the appropriate proof pressure (see Tables V and VI), the hose assembly shall not leak nor have deleterious imperfections. There shall be no slippage or pullout of the fitting from the hose. The length of the hose shall not change more than ± 7 percent when subjected to proof pressure for at least 30 seconds. Type A hose shall not twist more than one-half turn (180 degrees) in 25 feet when subjected to proof pressure for at least 30 seconds.

TABLE IV. Pressure, crush resistance and bend radius requirements for types, A, B, and D hose

Hose nominal I.D. (in)	Proof pressure (psig, min.)	Burst pressure (psig, min.)	Working pressure (psig, ref)	Crush resistance (lb) type B and D	Bend radius (in) type B and D
0.50	150	500	125	200	2.75
0.75	150	500	125	200	3.50
1.00	150	500	125	200	4.00
1.25	150	500	125	200	5.00
1.50	150	500	125	225	6.00
2.00	125	400	100	250	8.00
2.50	125	375	94	325	10.0
3.00	100	300	75	325	12.00
4.00	100	300	75	325	16.00
6.00	100	300	75	325	24.00

TABLE V. Pressure requirements for type C hose.

Hose nominal I.D. (in)	Proof pressure (psig, min.)	Burst pressure (psig, min.)	Working pressure (psig ref)
4.00	225	600	150
6.00	225	600	150

MIL-PRF-370H

3.3.6.2 **Burst pressure.** At the specified burst pressure (see Tables IV and V), the hose or assembly shall not leak or have any imperfections. There shall be no slippage or pullout of the fitting from the hose.

3.3.7 **Hose physical and chemical properties.** The requirements for the physical and chemical properties, by hose type, are defined in Table VI. The requirements column of the table shall be minimum level for acceptability. Test procedures as listed in the ASTM column shall be used as augmented or modified by the noted paragraphs.

TABLE VI. Hose physical and chemical properties.

Physical properties	Hose type				Requirements	Test methods	
	A	B	C	D		ASTM	Spec para
Tensile strength (orig.): tube – Cover –	X	X	X	X	≥ 1250 psi	D 412	4.5.4
	X	X		X	≥ 1250 psi	D 412	4.5.4
			X		≥ 1000 psi	D 412	4.5.4
Tensile strength after immersion:							
fuel –	X	X	X	X	≥ 40% of original or 600 psi, which ever is greater.	D 471	4.5.5
Water (14 days) –			X		≥ 40% of original or 600 psi, which ever is greater.	D 471	4.5.5.1
Water (42 days) –			X		≥ 25% of original or 300 psi, which ever is greater	D 471	4.5.5.1
Ultimate elongation (orig.)	X	X		X	≥ 200%	D 471	4.5.4
Ultimate elongation after immersion:							
Fuel –	X	X	X	X	≥ 100%	D 471	4.5.5
Water (14 days) –			X		≥ 40% of original	D 471	4.5.5.1
Water (42 days) –			X		≥ 25% of original	D 471	4.5.5.1
Volume increase after immersion:							
Tube –	X	X		X	≤ 60%	D 471	4.5.5
			X		≤ 40%	Sec. 10	
Cover –	X	X		X	≤ 100%	D 471	4.5.5
			X		≤ 70%	Sec. 10	

MIL-PRF-370H

TABLE VI. Hose physical and chemical properties - Continued

Physical properties	Hose type				Requirements	Test methods	
	A	B	C	D		ASTM	Spec para
Adhesion between reinforcement and: tube – cover –	X X	X X	X X	X X	≥ 10 lbf/in ≥ 10 lbf/in	D 413 D 413	4.5.6 4.5.6
Adhesion after immersion (fuel):	X	X		X	≥ 6 lbf/in	D 413	4.5.7
Adhesion after fill test (fuel): Tube – Cover –			X X		≥ 8 lbf/in 9 lbf/in	D 413 D-413	4.5.7.1 4.5.7.1
Low temperature Flexibility	X	X			(Young's modulus) 10000 psi	D 1053	4.5.8.1
Torsional rotation			X		≥ 5	D 1053	4.5.8.2
Brittleness				X	No cracking of the tube	D 471 D 746 D 2137	4.5.8.3
Modulus of elasticity: Tube – Cover –				X X	$\leq 10,000$ psi $\leq 5,000$ psi	D 790	4.5.8.4
Existent gum	X	X	X	X	≤ 20 mg/100 ml of test fluid ≤ 6 mg/100 ml of test fluid	D 471 D 381 D 471 D 381	4.5.9 4.5.9
Crush resistance: Under load – After load release –		X X		X X	$\geq 85\%$ of original diameter $\geq 95\%$ of original diameter		4.5.10 Table IV 4.5.10 Table IV
Ozone resistance	X	X	X	X	No visible cracking under 7X lens	D 518 D 1149	4.5.11
Bend radius		X		X	No deformation, crimping, or loss of pressure		4.5.12
Weight/foot: 4.00 inch – 6.00 inch –			X X		1.50 lb/foot 2.00 lb/foot		4.5.13

MIL-PRF-370H

3.4 Environmental.

3.4.1 Operating and storage temperatures. The hose and hose assemblies shall withstand, without degradation of specified performance, operating and storage temperatures in accordance with Table VII.

TABLE VII. Hose operating and storage temperatures.

Type	Operating temperature	Storage temperature
A, B, C	-25 to 140 °F	-30 to 160 °F
D	-60 to 95 °F	-65 to 145 °F

3.5 Interface.

3.5.1 Existing hose assemblies. The hose or hose assemblies defined herein are required to interface with existing equipment and hose assemblies. The interface points, end fittings, shall be controlled. Reattachable end fittings shall be as specified herein; A-A-59326 shall be used for cam-locking fittings; A-A-52592 shall be used for grooved end fittings; and A-A-59377 shall be used for quick disconnect sexless couplings.

3.6 Sustainment.

3.6.1 Materials. The manufacturer shall select materials capable of meeting all the operational and environmental requirements specified herein. The hose assemblies shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide against corrosion and deterioration during storage and operational conditions experienced.

3.6.2 Recycled, recovered, or environmentally preferable materials. Recovered materials shall be used to the maximum extent practicable, provided the components meet all other requirements of this specification. Used, rebuilt, or remanufactured components shall not be incorporated into the hose or hose assemblies.

3.7 Color and Marking. Unless otherwise specified, the cover color shall be Tan 686, #33446, or Flat Black, #37038 of FED-STD-595, general match. The hose markings shall be as specified in the contract, or order (see 6.2).

4. VERIFICATION

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

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article inspection. The first article inspection shall be performed on first article production hose and hose assemblies (see 3.2 and 6.2). This inspection shall include the examinations of Table VIII and tests indicated in Table IX. Nonconformance to any specified requirement, the failure of any test, or the presence of one or more defects shall be cause for rejection. (see 6.4)

MIL-PRF-370H

4.3 Conformance inspection. The conformance inspection shall be performed on all hose and hose assembly production units and shall include the examinations of Table VIII. Nonconformance to any specified requirement, or the presence of one or more defects shall be cause for rejection.

4.4 Examination. Examinations shall be conducted as specified in Table VIII.

TABLE VIII. Examination schedule.

Exam	Description	Reqt para	Method of inspection
E-1	Hose type not as specified	3.1	Visual/Doc.
E-2	Hose size not as specified	3.1, 3.3.1	Visual/Doc/SIE
E-3	Hose length not as specified	3.3.2	SIE
E-4	Tube not as specified	3.3.3	Visual/Doc.
E-5	Cover not as specified	3.3.3	Visual/Doc.
E-6	Finished hose not resistant to aromatic hydrocarbon fuels as specified	3.3.3	Doc.
E-7	End fittings and noncorrosive device not as specified.	3.3.5	Visual/Doc.
E-8	Cam-locking end fitting not as specified	3.3.5.1	Visual/Doc.
E-9	Grooved end fitting not as specified	3.3.5.2	Visual/Doc.
E-10	Re-attachable screw-on hose coupling not as specified	3.3.5.3	Visual/Doc.
E-11	One-time-use end fitting not as specified	3.3.5.4	Visual/Doc.
E-12	Quick-disconnect, sexless coupling not as specified	3.3.5.5	Visual/Doc.
E-13	Materials not as specified	3.6	Visual
E-14	Material not corrosion resistant or treated to be made corrosion resistant for the applicable storage and operating environment	3.6.1	Visual
E-15	Used, rebuilt, or remanufactured components, pieces or parts incorporated in the hose assembly	3.6.2	Visual
E-16	Cover color not as specified.	3.7	Visual
E-17	Marking not as specified.	3.7	Visual

Doc. = Documentation

SIE = Standard Inspection Equipment

4.5 Tests Testing shall be conducted as specified in Table IX.

MIL-PRF-370H

4.5.1 Inspection conditions.

4.5.1.1 Test temperature. Testing shall be conducted at ambient temperatures between 32 °F and 120 °F.

4.5.1.2 Test medium. Unless otherwise specified the test medium shall be water.

4.5.1.3 Test specimens. When required test specimens shall be cut from first article production hose.

4.5.2 Proof pressure. Each first article length of hose or hose assembly shall be subjected to the hydrostatic tests of ASTM D 380 for elongation, twist, and proof pressure. The test pressure shall be as specified in 3.3.6.1 and shall be maintained for not less than 30 seconds. The static bond shall be verified while full proof test pressure is being applied. Nonconformance to 3.3.4 or 3.3.6.1 shall constitute failure of this test.

TABLE IX. Test schedule.

Test	Hose type				Test description	Reqt para	Test para
	A	B	C	D			
T-1	X	X	X	X	Static bond (at pressure)	3.3.4	4.5.2
T-2	X	X	X	X	Proof pressure	3.3.6.1, Table IV,V	4.5.2
T-3	X				Twist (at pressure)	3.3.6.1	4.5.2
T-4	X	X	X	X	Burst pressure	3.3.6.2	4.5.3
T-5	X	X	X	X	Tensile strength (orig.)	Table VI	4.5.4
T-6	X	X	X	X	Tensile strength after fuel immersion	Table VI	4.5.5
T-7			X		Tensile strength after water immersion	Table VI	4.5.5.1
T-8	X	X		X	Ultimate elongation (orig.)	Table VI	4.5.4
T-9	X	X	X	X	Ultimate elongation after fuel immersion	Table VI	4.5.5
T-10			X		Ultimate elongation after water immersion	Table VI	4.5.5.1
T-11	X	X	X	X	Volume increase after fuel immersion	Table VI	4.5.5
T-12	X	X	X	X	Adhesion (orig.)	Table VI	4.5.6
T-13	X	X		X	Adhesion after fuel immersion	Table VI	4.5.7
T-14			X		Adhesion after water immersion	Table VI	4.5.7.1
T-15	X	X			Flexibility (low temp.)	Table VI	4.5.8.1
T-16			X		Torsional rotation (low temp.)	Table VI	4.5.8.2

MIL-PRF-370H

TABLE IX. Test schedule - Continued.

Test	Hose type				Test description	Reqt Para	Test para
	A	B	C	D			
T-17				X	Brittleness	Table VI	4.5.8.3
T-18				X	Modulus of elasticity	Table VI	4.5.8.4
T-19	X	X	X	X	Existent gum	Table VI	4.5.9
T-20		X		X	Crush resistance	Table VI	4.5.10
T-21	X	X	X	X	Ozone resistance	Table VI	4.5.11
T-22		X		X	Bend radius	Table VI	4.5.12
T-23			X		Weight / foot	Table VI	4.5.13
T-24	X				Reattachable coupling	3.5.1	4.5.14

4.5.3 Minimum burst pressure. The hose or hose assembly shall be subjected to the straight bursting pressure test in ASTM D 380. Nonconformance to 3.3.6.2 shall constitute failure of this test.

4.5.4 Tensile strength and ultimate elongation. The tensile strength and ultimate elongation of the cover and tube of the hose and hose in assemblies shall be determined in accordance with ASTM D 412. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.5 Tensile strength, ultimate elongation, and volume change after immersion. After fuel immersion, the changes in tensile strength, ultimate elongation, and volume of the cover and tube of the hose and hose in each assembly shall be determined in accordance with ASTM D 471. 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. ASTM D 471 shall be used to determine volume change. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.5.1 Tensile strength, ultimate elongation after water immersion for type C hose. Tensile strength and ultimate elongation after water immersion shall be determined in accordance with ASTM D 471. The immersion test shall be performed in accordance with ASTM D 471 after 336 hours immersion and after 1008 hours immersion. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.6 Original adhesion. The original (dry) adhesion shall be determined in accordance with the machine method of ASTM D 413, using test specimens (see 4.5.1.3). Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.7 Adhesion after immersion in fuel for types A, B, D. Test specimens (see 4.5.1.3) shall be immersed in fuel in accordance with ASTM D 471, reference fuel B. The specimens shall be immersed for a period of 70 hours. Within 15 minutes after removal of the specimens from the

MIL-PRF-370H

fluid, the adhesion shall be determined in accordance with the machine method of ASTM D 413. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.7.1 Adhesion after fill test for type C. A 12.00 inch section of hose shall be stoppered and filled with ASTM D 471 reference fuel B. The section of hose with the test fluid shall be maintained at a temperature of 160 ± 2 °F for not less than 46 hours. At the conclusion of the 46 hour cycle, cool the hose to 71 ± 9 °F and stabilize the temperature. Within 15 minutes after removal of the test fluid, specimens shall be cut from the hose and tested in accordance with ASTM D 413, machine method. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.8 Low temperature flexibility.

4.5.8.1 Type A and B flexibility. A test for low temperature flexibility shall be conducted in accordance with routine inspection and acceptance procedures specified in ASTM D 1053, except a gaseous media shall be used. The test temperature shall be -26 ± 2 °F. The exposure time shall be 168 hours. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.8.2 Type C torsional rotation. The test for apparent modulus of rigidity or torsional rotation (low temperature flexibility) shall be conducted in accordance with ASTM D 1053. The test shall be conducted after samples have been conditioned for 168 hours at -26 ± 2 °F. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.8.3 Type D brittleness. The specimens shall be prepared and tested in accordance with method B of ASTM D 2137. Condition test specimens in accordance with ASTM D 471 reference fuel B, for 96 hours. Remove the specimens from the fuel and air-dry them for 48 hours. When dry, oven age the specimens for 24 hours at 130 ± 2 °F. After oven-aging, test the samples in accordance with ASTM D 746. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.8.4 Type D modulus of elasticity. Determine the modulus of elasticity at -60 ± 2 °F in accordance with ASTM D 790, method II, procedure B on samples (see 4.5.1.3) of tube and cover compounds. The samples shall have been conditioned in ASTM D 471 reference fuel B, for 96 hours, then air dried and oven-aged as specified for brittleness. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.9 Existent gum. A hose specimen 14.00 inches long shall be cut from the selected test item. One end of the hose shall be stoppered with a clean noncorrosive plug, and secured with a suitable clamp. The hose shall be filled to within 2.00 inches of the open end with ASTM D 471, reference fuel B, and plugged in manner similar to the bottom. A sample of the fuel shall be retained for later use. This hose section shall be stored in a vertical position for 168 hours at a temperature of 100 ± 4 °F. At the end of each 24-hour period, the fuel shall be agitated for 5 minutes by moving the specimen from the vertical to the horizontal and back to the vertical position at a rate of 2 cycles per minute. On completion of the 168-hour period, the fuel shall be agitated, as before, for 5 minutes and immediately removed. The removed fuel shall be tested for existent gum in accordance with the air-jet solvent wash method of ASTM D 381. The retained fuel sample shall be tested at the same time and with the same method. The existent gum from the

MIL-PRF-370H

original fuel sample shall be subtracted from the existent gum obtained from the fuel removed from the test hose. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.10 Type B and D crush resistance. Crush resistance shall be determined by centering a 12.00 inch length of hose between 3.00 inch wide, parallel plates in such a way that a 3.00 inch length of hose is being compressed. The plates shall be brought together at a rate of 2.00 inches per minute until the applicable crush resistance load specified in Table IV is reached. The distance between the plates shall be determined to 0.01 inch accuracy. The results shall be expressed as a percentage of the original outside diameter. Static bond shall be measured at maximum crushing force. The load shall be released and the minimum outside diameter of the hose, at the center of the compressed area, shall be measured with the same accuracy. The results shall be expressed as a percentage of the original outside diameter. Nonconformance to 3.3.4 and the requirements of Table VI shall constitute failure of this test.

4.5.11 Ozone resistance. Specimens of the cover, prepared as described in procedure A of ASTM D 518, shall be mounted in a 20 percent elongated condition, 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 ± 1 °C (104 ± 1 °F), to an atmosphere containing 50 ± 10 parts per hundred million (pphm) of ozone. On completion of the test, the specimen shall be examined for visible cracking under a 7X lens. Nonconformance to the requirements of Table VI shall constitute failure of this test.

4.5.12 Type B and D bend radius. A 20 foot section of hose, of specified nominal I. D. shall be subjected to the proof pressure in a 90 degree bend at the designated radius (see Table IV). Nonconformance to the requirements of Table IV shall constitute failure of this test.

4.5.13 Weight. A 20 foot section of type C hose shall be weighed on a scale that measures in not greater than one-quarter pound increments. The weight in pounds per foot shall be calculated. Nonconformance to the requirements of Table II shall constitute failure of this test.

4.5.14 Reattachable coupling test. The coupling shall be installed in an appropriately sized hose, approximately six foot in length. The hose assembly shall be hung vertically, and by attachment only to the coupling and used to lift a dead weight of 450 pounds not less than one inch off the surface and back to it. The test shall be repeated for a total of ten cycles. On completion of the lifts, the coupling to hose interface shall be examined for hose slippage and separation. Hose slippage or separation shall constitute failure of this test. On successful completion of the pull test, the hose assembly shall be subjected to the proof pressure test, in accordance with 4.5.2, for not less than five minutes. Any leakage, deformation, or separation of the coupling shall constitute failure of this test.

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 materiel 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

MIL-PRF-370H

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 that may be helpful, but is not mandatory.)

6.1 Intended use. The hose and hose assemblies is military unique and intended to be used for the transfer of liquid hydrocarbon fuels in a battle field environment. The hose and hose assemblies must interface with existing petroleum equipment requiring military unique fittings (MIL-C-38404). The vagaries of the battlefield require petroleum equipment specification to exceed commercially available products in the range of performance. The expected operating terrain and climate are unique and beyond the design of similar commercial items.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Classification of hose and hose assembly required (see 1.2).
- c. Length of hose and hose assembly required (see 1.2.6 and 3.3.2).
- d. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
- e. When first article inspection is required, time frame for submission, and number of units required (see 3.2).
- f. Cover color and marking requirements (3.7).
- g. Packaging required (see 5.1).
- h. When an abrasion resistance test for type C hose is required (see 6.5).

6.3 Superseded documents. The following documents are superseded by this specification; MIL-H-370G dated 6 January 1994; MIL-H-53073B dated 20 May 1993; MIL-H-53096(ME) dated 7 February 1990; A-A-52554 dated 27 January 1996.

6.4 First article. When a first article inspection is required, the item(s) should be a first article production unit(s). The sample should consist of one or more items as specified (see 6.2). The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of the first article test results, and disposition of the sample.

6.5 Abrasion resistance for type C hose. Cut three samples from the hose and perform the abrasion appraisal on the cover. The appraisal must be performed in accordance with ASTM D 3389, method A, using abrasion wheel H-22 with neither additional weight nor counterweight applied. The number of cycles to expose the reinforcing material should be included in the first article test report. Abrasion results are for information only and must not be used as criterion for acceptance of hose assemblies.

MIL-PRF-370H

6.6 Noncorrosive device. Appropriate hose band specified in SAE J1508 can be used as guidance for noncorrosive devices.

6.7 Definitions.

6.7.1 Collapsible hose. Hose or hose in assemblies that do not have integral stiffening and may be collapsed to ribbon form.

6.7.2 Non-collapsible hose. Hose or hose in assemblies that have a spiral or helix of stiffening material added between the cover and tube to provide resistance to collapse.

6.7.3 Cover. The outer layer of material on a hose, or hose in an assembly, that is in contact with the atmosphere.

6.7.4 Reinforcing material. Synthetic material in fiber, cord, or mat used to provide additional tensile strength.

6.7.5 Tube. The inner layer of material in a hose, or hose in an assembly, that is in contact with the product being carried by the hose.

6.7.6 Recovered materials. Recovered materials are those materials that have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials.

6.7.7 JP-8. An aviation turbine fuel, of the kerosene type, with corrosion inhibitor, lubricity improving, and fuel system icing inhibitor additives.

6.7.8 Jet A and jet A-1. A relatively high flash point distillate of the kerosene type.

6.8 Cross-reference of classification

MIL-H-370G

1.2 Type

Type I - Non-Wire Reinforced

Type II - Wire Reinforced, Noncollapsible

MIL-PRF-370H

1.2.1 Type

Type A - Collapsible

Type B - Non-Collapsible

Type C - Collapsible, lightweight (4 and 6-inch nominal diameter only)
(added)

Type D - Non-collapsible low temperature
(added)

MIL-PRF-370H

1.2 Size

Size 1 - 1/2-inch
 Size 2 - 3/4 - inch
 Size 3 - 1 - inch
 Size 4 - 1 1/4 - inch
 Size 5 - 1 1/2 - inch
 Size 6 - 2 - inch
 Size 7 - 2 1/2 - inch
 Size 8 - 3 - inch
 Size 9 - 4 - inch
 Size 10 - 6 - inch

1.2 Class

Class 0 - Bulk hose (without Fittings)

* Classes 1-3 remain the same

1.2 Style

Style 0 - Bulk Hose (without fittings)
 Style A - Banded Shank (Reattachable)
 Style B - Compression (Reattachable)

Style D - Internal Expanded (One time Threaded).

1.2.2 Size

Size 01 - 0.50 - inch
 Size 02 - 0.75 - inch
 Size 03 - 1.00 - inch
 Size 04 - 1.25 - inch
 Size 05 - 1.50 - inch
 Size 06 - 2.00 - inch
 Size 07 - 2.50 - inch
 Size 08 - 3.00 - inch
 Size 09 - 4.00 - inch
 Size 10 - 6.00 - inch

1.2.3 Class

Class 0 - Without fittings

Class 4 - Sexless both ends (added)

1.2.4 Style

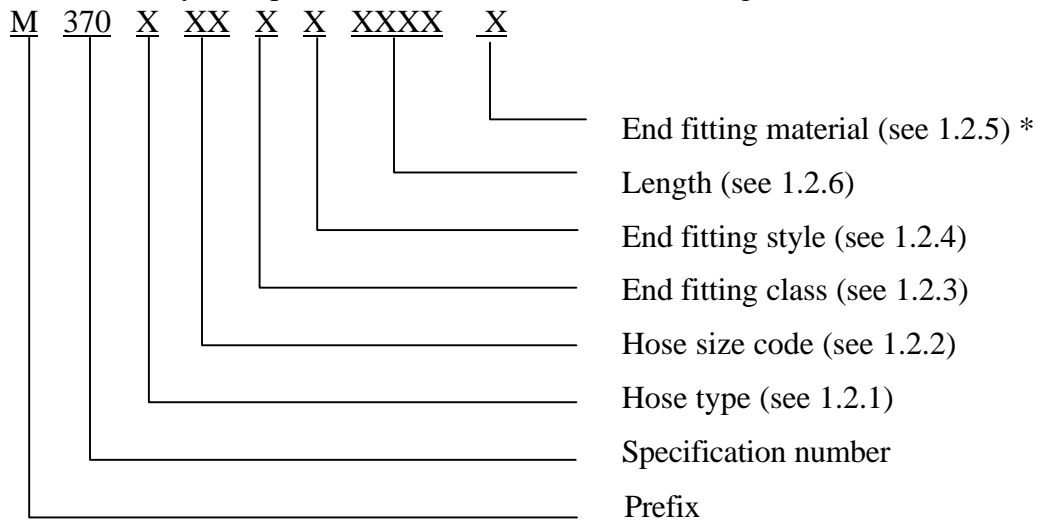
Style 0 - Bulk Hose
 Style A - Cam-locking end fittings
 Style B - Reattachable (reusable)
 Compression end fitting up to 4-inch
 Style C - Grooved end fittings (added)
 Style D - One-time-use internal expanded
 End fittings up to 4-inch
 Style E - Quick-disconnect, sexless
 Couplings (added)

1.2.5 Material (added)1.2.6 Length (added)

6.8.1 Change of unit. Please note that the length of hose and hose assembly specified in MIL-H-370G was in inches, and the length specified in this document is in feet. Simple conversion needs to be made in reference to the previous procured items.

MIL-PRF-370H

6.9 Part or identifying number. This part or identifying number (PIN) of hose and hose assemblies covered by this specification is created in the following form (see 6.2).



* End fitting material is added with respect to the PIN in MIL-H-370G.

Example: M370B101A5000C (A reinforced, non-collapsing hose conforming to this specification, 6-inches in diameter, style of male one end female other end, cam-locking class fittings, a length of 500 feet, and fittings made of aluminum).

Example: M370C092C0055C (A lightweight, collapsible hose conforming to this specification, 4-inches in diameter, style of male fitting both ends, with grooved end class fittings, a length of five feet six inches, and fittings made of aluminum)

6.10 Subject term (key word) listing.

Cam-locking
Collapsing
Hoseline
Low temperature
Static bond
Torsional rotation
Transfer

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

MIL-PRF-370H

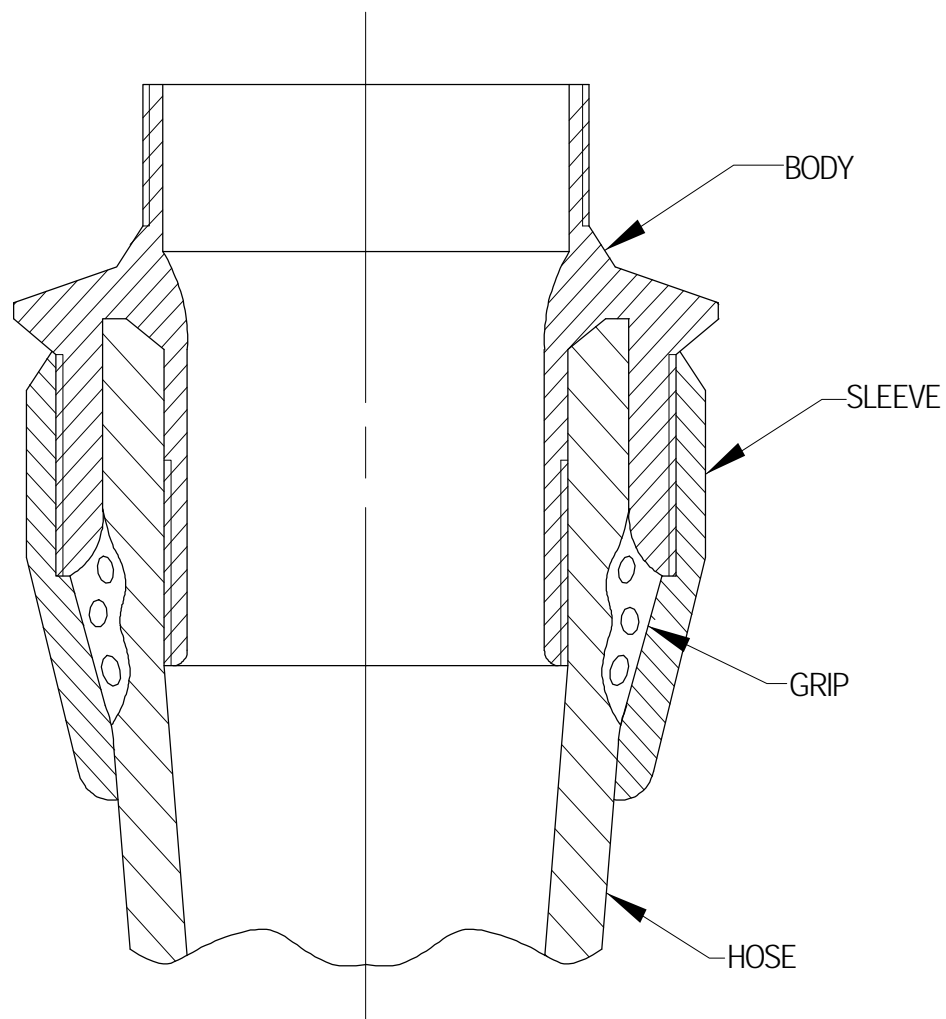


FIGURE 1. Compression type reattachable coupling - For guidance only.

MIL-PRF-370H

Custodian:

Army - AT
Navy - SH
Air Force - 99

Preparing activity:

Army - AT

(Project 4720 -0235)

Review activities:

Air Force - 82
DLA - CC

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 must 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-PRF-370H	2. DOCUMENT DATE (YYMMDD) 990201
-----------------------	------------------------------------	-------------------------------------

3. DOCUMENT TITLE
HOSE 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 (2) DSN (If applicable)	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME Rebecca Li	b. TELEPHONE (Including Area Code) (1) Commercial (810)574-4152 (2) DSN 786-4152
c. ADDRESS (Include Zip Code) US Army Tank-automotive and Armaments Command Attn: AMSTA-TR-D/210 (R.L.) Warren, MI 48397-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 681-9340 DSN 761-9340