

MIL-H-4497A(USAF)

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 Superseding
 MIL-H-4497(USAF)
 7 May 1952

MILITARY SPECIFICATION

 HOSE, COTTON, RUBBER LINED, WATER, BRAIDED
 CONSTRUCTION, WITH COUPLINGS

1. SCOPE

1.1 This specification covers one type of natural or synthetic rubber, low temperature, fire hose.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on the date of invitation for bids, form a part of this specification:

SPECIFICATIONS

Military

MIL-C-7580	Couplings, Fire Hose, Reusable, High Pressure
MIL-P-7936	Parts And Equipment, Aeronautical, Preparation For Delivery

STANDARDS

Federal

FED Test Method STD No. 601	Rubber; Sampling and Testing
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Military

MIL-STD-129	Marking For Shipment And Storage
MIL-STD-130	Identification Marking of U. S. Military Property

(Copies of specifications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

FSC 4210

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3. REQUIREMENTS

3.1 Material. The hose shall be uniform in quality, free from defects, and shall conform to the requirements specified herein. Materials not specifically designated shall be of the highest quality and entirely suitable for their intended use.

3.2 Construction. The hose shall consist of a compounded inner tube, cotton or synthetic fiber reinforcement and an outer rubber cover. It shall be constructed to retain the specified couplings without slipping or leaking.

3.2.1 Tube. The tube of the hose shall consist of a continuously extruded nonblooming rubber resistant to water. The bore shall be clear, free from pitting and of uniform thickness in accordance with the best manufacturing practices.

3.2.2 Cotton or synthetic fiber reinforcement. The reinforcement of the hose shall consist of braided cotton or synthetic yarn of sufficient strength.

3.2.3 Cover. The cover of the hose shall consist of a non-blooming rubber suitably compounded to resist abrasion and sun cracking. It shall be of uniform thickness and free from pitting.

3.3 Size

3.3.1 Diameter. The hose shall be furnished in 3/4-inch, 1-inch, and 1 1/4-inch inside diameter sizes as specified by the procuring activity with tolerances as indicated in table I.

TABLE I

Physical Requirements

Nominal inside diameter (inch)	Tolerance inside diameter (inch)	Outside diameter (inch)	Tolerance outside diameter (inch)	Proof Pressure (lb/sq in)	Burst pressure (min) (lb/sq in)
3/4	±1/32	1-5/16	±1/16	1500	2500
1	±1/32	1-9/16	±1/16	1500	2500
1-1/4	±1/32	1-13/16	±1/16	600	1200

3.3.2 Length. Unless otherwise specified the hose shall be furnished in lengths of 50 ± 1 feet.

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3.4 Tensile strength and ultimate elongation. The tensile strength and ultimate elongation of the tube and cover shall not be less than 1250 psi and 200 percent respectively. The tensile strength and ultimate elongation of the tube and cover after aging shall not be less than 75 percent of the original values.

3.5 Proof pressure. The hose assembly shall withstand the proof pressure specified in table I without twisting more than 10.5 degrees per foot.

3.6 Burst pressure. The hose assembly shall not burst or leak when subjected to the burst pressure specified in table I.

3.7 Pull resistance. The hose shall not break nor lose its couplings when subjected to a pull of 450 pounds directed along the longitudinal axis.

3.8 Low temperature flexibility. The hose shall not break nor show signs of cracking when bent around a mandrel at -65° F.

3.9 Adhesion. The adhesion between the tube and plies, between the plies, and between the cover and plies shall not be less than 12 pounds per inch.

3.10 Age. Hose shall be no more than 2 quarters old from the date of manufacture to date of delivery for use on military equipment.

3.11 Concentricity. The inside diameter and outside diameter shall be concentric within 0.040 total indicator reading.

3.12 Couplings. Unless otherwise specified, the hose shall be fitted with reusable couplings conforming to MIL-C-7580. One coupling shall be externally threaded, and the other shall be internally threaded. Couplings shall be securely fastened to the hose.

3.13 Marking for identification. Marking for identification shall be in accordance with MIL-STD-130. The following additional information shall appear:

Date of Manufacture (Quarter and Year)

3.14 Workmanship. Workmanship shall be of the quality necessary to produce hose and couplings free from defects that would adversely affect service performance.

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4. QUALITY ASSURANCE PROVISIONS

4.1 Unless otherwise specified herein the supplier is responsible for the performance of all inspection requirements prior to submission for Government inspection and acceptance. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. Inspection records of the examinations and tests shall be kept complete and available to the Government as specified in the contract or order.

4.2 Classification of tests. The inspection and testing of the hose shall be classified as acceptance tests.

4.3 Sampling. For each lot of 500 lengths or less on the order, a 20-foot sample shall be selected at random for tests to determine compliance with the requirements specified in section 3. The sample selected shall be subjected to the tests described under 4.4.

4.4 Test methods

4.4.1 Examination of product. All hose shall be carefully examined in order to insure conformance to the requirements of this specification with respect to materials, construction, size, concentricity, marking, and workmanship.

4.4.2 Tensile strength and elongation. The test specimen used for obtaining tensile strength and elongation shall be dumbbell specimens cut with a No. III die and shall be prepared and tested as indicated in Federal Test Method Standard No. 601, methods 4111 and 4121, respectively.

4.4.3 Proof pressure. Each hose assembly comprising the order shall be subjected, for at least 1 minute, to the proof pressure specified in table I using water as the test medium, as described in Federal Test Method Standard No. 601, method 10211. Measurements for twist shall be taken at the proof pressure listed in table I, as described in Federal Test Method Standard No. 601, method 10331, and shall not exceed 10.5 degrees per foot.

4.4.4 Burst pressure. The burst pressure specimen shall be prepared and tested as specified in Federal Test Method Standard No 601, method 10011.

4.4.5 Pull resistance. One end of a 3-foot section of hose with the couplings attached shall be firmly held in a vise while a pull is applied to the other coupling at a rate of separation of 1 inch per minute. The assembly shall be subjected to 450 pounds pull.

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4.4.6 Low temperature flexibility. A specimen of hose shall be cooled to a temperature of $-67^{\circ} \pm 2^{\circ}$ F for 72 ± 2 hours and then bent over a mandrel having a diameter equal to 15 times the outside diameter of the hose.

4.4.7 Adhesion. Adhesion shall be determined in accordance with the machine method outlined in Federal Test Method Standard No. 601, method 8011, using ring specimens.

4.4.8 Air aging. Specimens shall be given an accelerated aging by subjection to dry circulating air for 7 days at $158^{\circ} \pm 2^{\circ}$ F, as described in Federal Test Method Standard No. 601, method 7001. Determination of properties after aging shall be made not less than 16 hours nor more than 48 hours after removal from the oven.

4.5 Rejection and retests. When any representative sample fails to meet the requirements of the specification, the lot represented shall be rejected. Any hose assembly failing to meet the requirements of the individual tests shall be rejected. Hose assemblies that have been rejected may be replaced or repaired to correct the defects, and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and action taken to correct the defects shall be furnished the inspector. Units rejected after retest shall not be resubmitted without the specific approval of the procuring activity.

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, and packing. Hose assemblies shall be preserved, packaged, and packed in accordance with the applicable levels of Specification MIL-P-7936 (see 6.2).

5.2 Marking. Unit packages, intermediate packages, and shipping containers shall be marked in accordance with the requirements of MIL-STD-129. The nomenclature shall be as follows:

Hose, Cotton, Rubber Lined, Water,
Braided Construction, With Couplings

6. NOTES

6.1 Intended use. The hose covered by this specification is intended to be used as a high pressure water hose for fire crash trucks.

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6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification
- b. Inside diameter required (see table I).
- c. Length (see 3.3.2).
- d. Couplings (see 3.12).
- e. Selection of applicable levels of preservation, packaging, and packing (see 5.1).

NOTICE: When Government drawings, specifications, or other data are used for any purposes other than in connection with definitely related Government procurement operations, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

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