

INCH-POUND

MIL-PRF-53095A(AT)

19 January 1996

SUPERSEDING

MIL-H-53095(ME)

7 February 1990

PERFORMANCE SPECIFICATION

HOSE ASSEMBLIES, RUBBER, SYNTHETIC, LIQUID PETROLEUM FUELS, DISPENSING, COLLAPSIBLE, LOW TEMPERATURE

This specification is approved for use by the U.S. Army Tank-automotive and Armaments Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers collapsible, synthetic rubber, discharge hose assemblies for use in all ambient temperatures between -60 and +95 degrees Fahrenheit (°F) [-51 and +35 degrees Celsius (°C)].

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BUE, 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.

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1.2 Classification. The collapsible discharge hose assemblies will be of the following types, classes, and sizes, as specified (see 6.2):

Type I - Hose assembly, gasoline dispensing pump.

- Class 1 - Coupling halves, quick-disconnect, cam-locking type, hose shank; female both ends.
- Class 2 - Coupling halves, quick-disconnect, cam-locking type, hose shank; male both ends.
- Class 3 - Coupling halves, quick-disconnect, cam-locking type, hose shank; female one end, male other end.

Type II - Hose assembly, fuel trailers and carts.

- Class 1 - Coupling halves, quick-disconnect, cam-locking type, hose shank; female both ends.
- Class 2 - Coupling halves, quick-disconnect, cam-locking type, hose shank; male both ends.
- Class 3 - Coupling halves, quick-disconnect, cam-locking type, hose shank; female one end, male other end.

Type III - Hose assembly, fuel handling system.

- Class 1 - Coupling halves, quick-disconnect, cam-locking type, hose shank; female one end, male other end.

Type IV - Hose assembly, aircraft refueling.

- Class 1 - Couplings, replaceable compression type, internal pipe threads both ends.
- Class 2 - Couplings, replaceable compression type, external pipe threads both ends.
- Class 3 - Couplings, replaceable compression type, internal pipe threads one end, external pipe threads other end.

Sizes

| | |
|--------------------------------|--------------------|
| 1-inch [25.4 millimeters (mm)] | 2.5-inch (63.5 mm) |
| 1.25-inch (31.8 mm) | 3-inch (76.2 mm) |
| 1.5-inch (38.1 mm) | 4-inch (102 mm) |
| 2-inch (50.8 mm) | |

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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 addition 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 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

A-A-52506 - Clamps, Hose (Low-Pressure).

(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.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DRAWINGS

DEPARTMENT OF DEFENSE

13228E1768 - Gasket, Coupling Half, Quick Disconnect; Cam-Locking Type for Arctic Use.

(Copies of this drawing are available from the U.S. Army Tank-automotive and Armaments Command, AMSTA-TR-E/BLUE, Warren, MI 48397-5000.)

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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 issue of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

ANSI/ASQC Z1.4 - Sampling Procedures and Tables for Inspections by Attributes (DoD Adopted).

(Application for copies should be addressed to American Society for Quality Control, 611 East Wisconsin Avenue, Milwaukee, WI 53202-4606.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|-------|--|
| A167 | - Specification for Stainless Steel and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip (DoD Adopted). |
| D380 | - Rubber Hose (DoD Adopted). |
| D381 | - Existent Gum in Fuels by Jet Evaporation (DoD Adopted). |
| D412 | - Rubber, Properties in Tension (DoD Adopted). |
| D413 | - Rubber Property - Adhesion to Flexible Substrate (DoD Adopted). |
| D471 | - Rubber Property - Effect of Liquids (DoD Adopted). |
| D1053 | - Measuring Rubber Properties - Stiffening at Low Temperature Using Torsional Wire Apparatus (DoD Adopted). |

(Copies ASTM Standards may be obtained from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

2.4 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

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

3.2 Materials. Materials not specified herein and on the drawing shall be selected by the contractor and shall be capable of meeting all of the operational and environmental requirements specified herein (see 4.5.1 and 4.5.2). The hose assembly shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against corrosion and deterioration. Recovered materials shall be used to the maximum extent practicable. Asbestos, Cadmium, and radioactive material shall not be used in this item. Radioactive material is defined by Title 10, Code of Federal Regulations, Part 40, and material in which the radioactivity is greater than 0.002 microcuries per gram or 0.01 microcuries total activity for the item.

3.2.1 Metals. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion (see 4.5.2).

3.3 Design and construction. The hose assemblies shall consist of collapsible, reinforced, synthetic rubber hose with attached couplings/coupling halves, and fittings. The hose assembly shall consist of a hose section with couplings at each end firmly banded to the hose with hose clamps (see 4.5.2).

3.3.1 Hose. The hose shall be constructed of a compound inner tube, synthetic fiber reinforcement, and a compounded cover.

3.3.1.1 Tube. The material of the tube shall be a low temperature elastomer. The material shall be smooth, free from pits, and shall be of uniform thickness. The thickness of the tube shall not be less than 0.078-inch (2 mm).

3.3.1.2 Reinforcement.

3.3.1.2.1 Sizes 1-inch through 2.5-inch hoses. The reinforcement material for the sizes 1-inch (25.4 mm) through 2.5-inch (63.5 mm) inside diameter (ID) hoses shall be one or more plies of low temperature synthetic cord which shall be evenly and firmly fabricated and thoroughly impregnated with a low temperature elastomeric compound which shall cause the plies to adhere firmly to each other and to the tube and cover. The reinforcement material shall be free from defects, dirt, knots, lumps, and irregularities of twist.

3.3.1.2.2 Sizes 3-inch and 4-inch hoses. The reinforcement material for the sizes 3-inch (76.2 mm) and 4-inch (102 mm) ID hoses shall be a fabric of two or more even-number layers of low temperature synthetic cord embedded in low temperature elastomeric compound, wound or

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plied in contradirection, and arranged so that there is a rubber bond through the space between each cord which will provide a continuous rubber bond from the inner tube through the reinforcement to the outer cover. The reinforcement shall be evenly and firmly fabricated and shall be free from defects, dirt, knots, lumps, and irregularities of twist.

3.3.1.2.3 **End reinforcement.** For types III and IV assemblies, each length of hose shall be constructed with an end reinforcement on each end not less than 14 inches (356 mm) long. The end reinforcement shall consist of one or more plies of fabric specified in 3.3.1.2.1.

3.3.1.3 **Cover.** The material for the cover shall be a low temperature elastomer. The cover shall be uniform in thickness and shall not be less than 0.188-inch (4.8 mm) thick for types I, II and IV hose assemblies. The cover thickness for the type III hose assembly shall not be less than 0.078-inch (2 mm).

3.3.1.4 **Diameters and weights.** The hose shall be furnished in the diameters and weights shown in table I (see 4.5.2).

TABLE I. Diameters and weights.

| Size (ID) | | |
|--------------------------------|--------------------------------------|--------------------------------------|
| inches (± 0.03 inch) | Outside diameter (inches at ends) | Pounds (lb) per foot (maximum) |
| <u>TYPES I AND II</u> | | |
| 1 | 1.5 ± 0.06 | 0.62 |
| 1.25 | 1.75 ± 0.06 | 0.88 |
| 1.5 | 2 ± 0.06 | 1 |
| 2 | $2.5 + 0.12$ or -0.06 | 1.12 |
| 2.5 | $3 + 0.12$ or -0.06 | 1.44 |
| 3 | $3.5 + 0.12$ or -0.06 | 1.75 |
| 4 | $4.5 + 0.12$ or -0.06 | 2.5 |
| <u>TYPES III AND IV</u> | | |
| 1 | 1.56 ± 0.06 | 0.75 |
| 1.25 | 1.81 ± 0.06 | 1 |
| 1.5 | 2.06 ± 0.06 | 1.12 |
| 2 | $2.56 + 0.12$ or -0.06 | 1.25 |
| 2.5 | $3.06 + 0.12$ or -0.06 | 1.56 |
| 3 | $3.62 + 0.12$ or -0.06 | 1.88 |
| 4 | $4.75 + 0.12$ or -0.06 | 2.62 |

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3.3.1.5 Length. The length of the hose assemblies shall be as specified in the contract or order (see 6.2) and shall be specified ± 2 percent, exclusive of fittings, and will be in feet with the last number expressed in tenths of a foot (see 4.5.2).

3.3.1.6 Electric bond. The hose shall have a continuous steel wire to effect an electric bond (see 6.3.1) between both ends of the hose when tested in accordance with 4.5.4.1.

3.3.2 Couplings. Couplings shall be securely attached to the hose to form a permanent electric bond with the steel wire.

3.3.2.1 Coupling halves (cam-locking type). Coupling halves for types I, II and III hose shall be of the male or female hose shank type, either aluminum alloy or copper alloy, as applicable (see 1.2).

3.3.2.2 Coupling, reattachable, screw-on. Couplings for type IV hose shall be in accordance with figures 1A and 1B, as applicable (see 1.2).

3.3.2.3 Coupling caps. Couplings used on type IV hose shall be provided with protective, closed end, reusable, threaded metal or plastic caps of suitable thickness and composition that will not be affected by a hard-film (grade 1) corrosion-preventive compound. Coupling halves shall be provided with dust caps or dust plugs conforming to figure 2 and figure 3.

3.3.2.4 Gasket. The gasket shall be in accordance with drawing 13228E1768. Where tolerances could cumulatively result in incorrect fits, the contractor shall provide tolerances within those prescribed on the drawing to insure correct fit and operation. Elastomeric gaskets shall be replaced with fluorosilicone gaskets conforming to drawing 13228E1768.

3.3.3 Hose clamps. Each cam-locking type coupling half shall be banded to the hose with two hose clamps. The clamps shall conform to A-A-52506, type H, except the clamps shall be fabricated from corrosion-resistant steel conforming to ASTM A167. When installed and locked, the clamps shall have no protruding ends. The 1-inch (25.4 mm), 1.25-inch (31.8 mm), and 1.5-inch (38.1 mm) size couplings shall be banded to the hose with band clamps 0.5-inch (12.7 mm) in width; the 2-inch (50.8 mm) and 2.5-inch (63.5 mm) sizes with band clamps 0.625-inch or 0.75-inch (15.9 or 19 mm) in width; and the 3-inch (76.2 mm) and 4-inch (102 mm) sizes with band clamps 0.75-inch (19 mm) in width.

3.4 Performance.

3.4.1 Hydrostatic pressure. When tested as specified in 4.5.4.1, the hose with couplings attached shall not leak or show any imperfections in either the hose or couplings.

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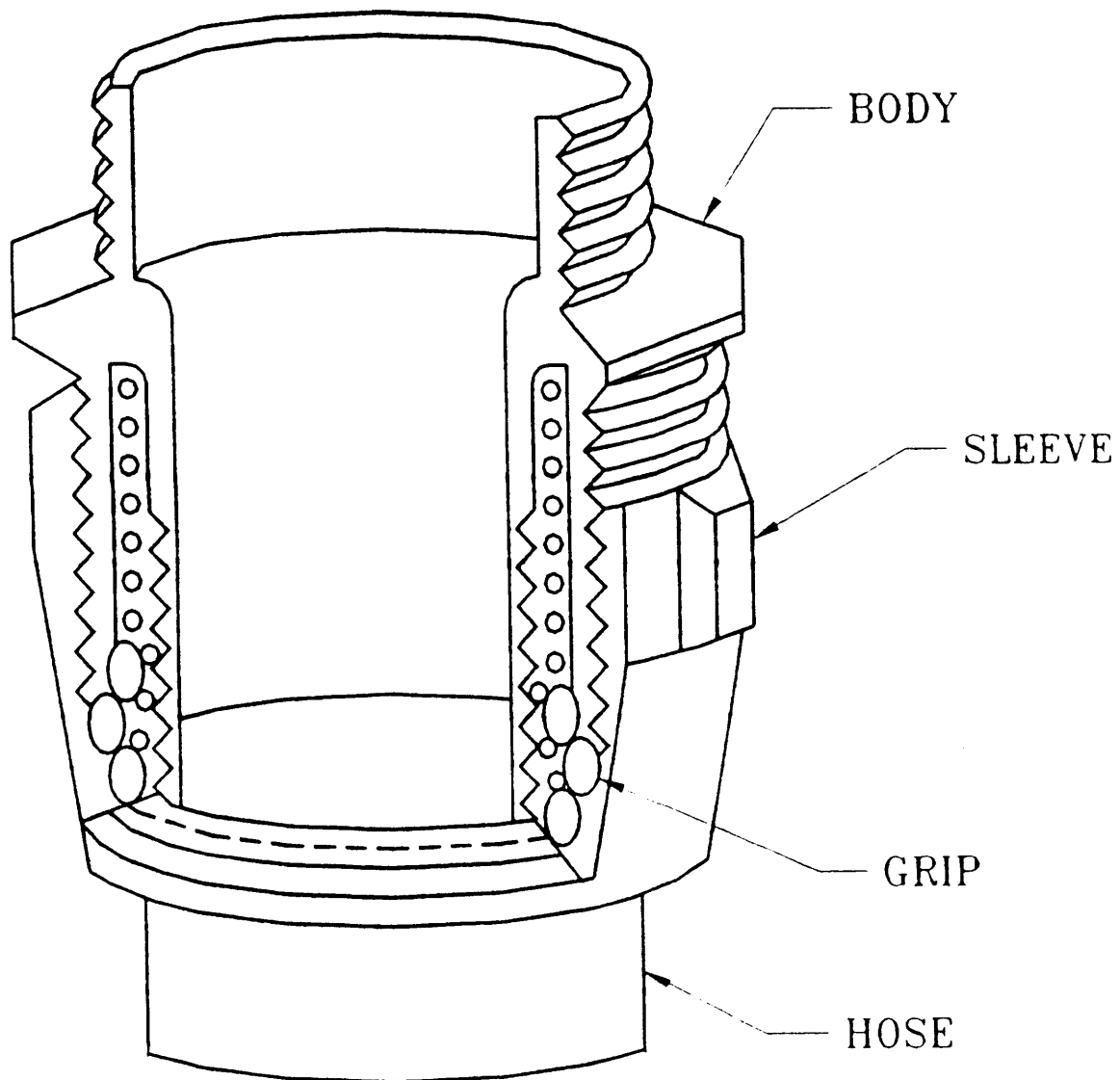


FIGURE 1A. Coupling, reattachable, screw-on.

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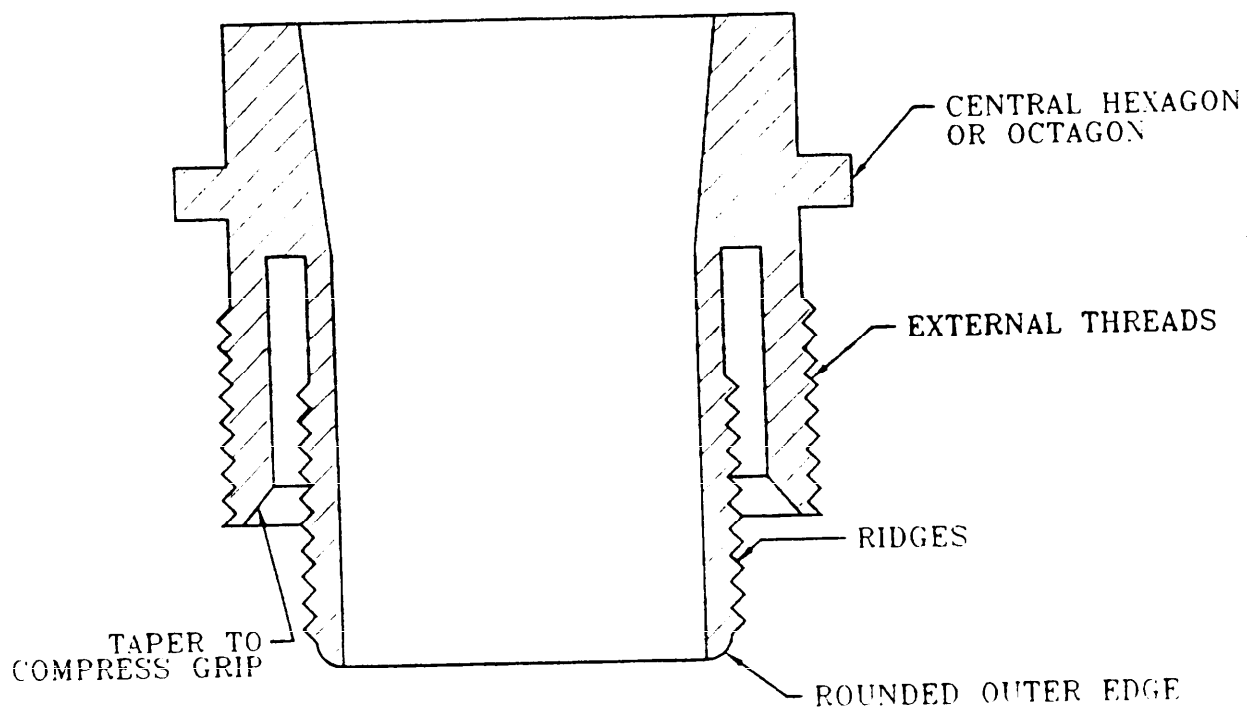


FIGURE 1B. Typical cross-section of coupling body.

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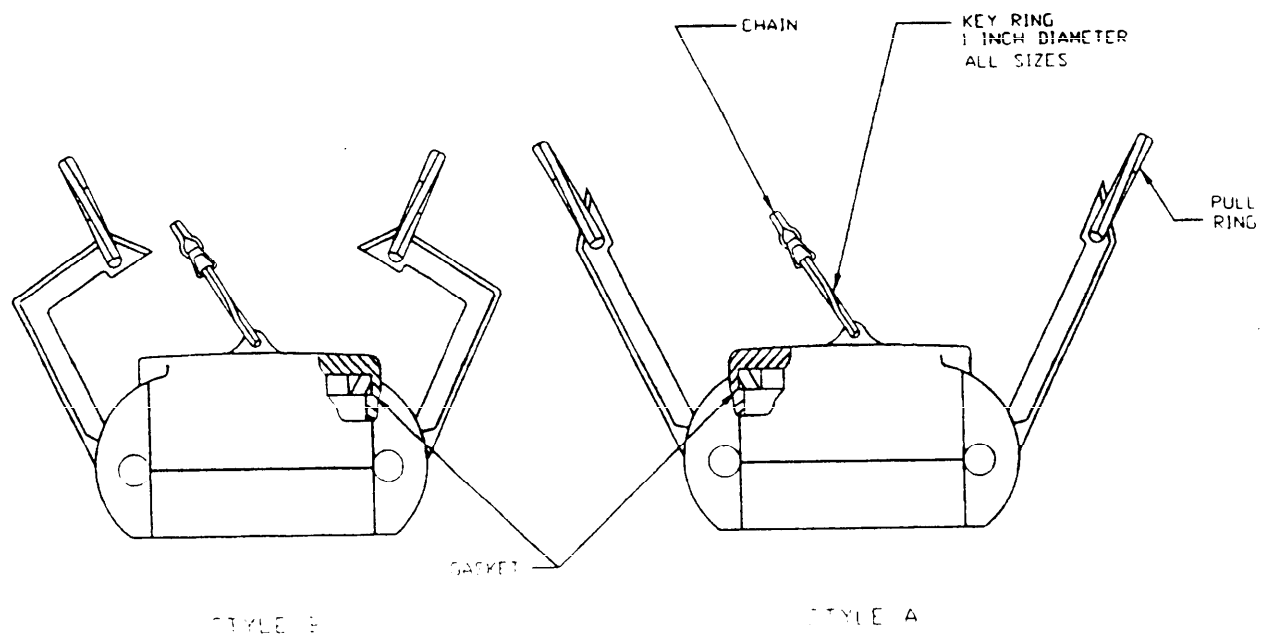
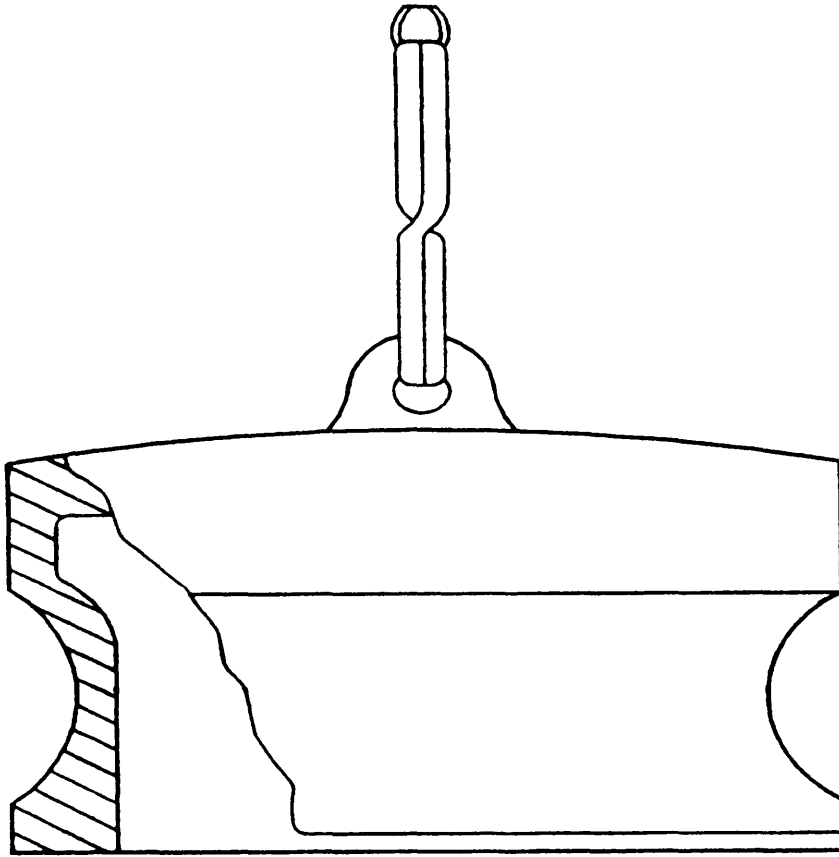


FIGURE 2. Dust-plugs.

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FIGURE 3. Dust-plug.

3.4.1.1 Length change and twist. When tested as specified in 4.5.4.2, the length of hose shall not change more than ± 3 percent and shall not twist either clockwise or counterclockwise more than one-half turn (180 degrees) in 25 feet [7.62 meters (m)].

3.4.1.2 Minimum burst. When tested as specified in 4.5.4.3, each type of hose shall have a minimum burst pressure as specified in table V.

3.4.2 Tensile strength. The tensile strength of the tube shall be not less than 1250 pounds per square inch (psi) [8600 kilopascals (kPa)] and the tensile strength of the cover shall not be less than 1000 psi (6900 kPa) when tested as specified in 4.5.4.4. The tensile strength of the tube and cover after immersion, when tested as specified in 4.5.4.5, shall be not less than 40 percent or less than 600 psi (4140 kPa) (whichever is greater) of the tensile strength obtained before immersion.

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3.4.3 Ultimate elongation. When tested as specified in 4.5.4.4, the ultimate elongation of the tube and cover shall not be less than 200 percent or, when tested as specified in 4.5.4.5, shall be not less than 40 percent of the original elongation obtained before immersion.

3.4.4 Adhesion.

3.4.4.1 Original. When tested as specified in 4.5.4.6, the original adhesion between tube and plies, between the plies, and between the cover and the plies shall not be less than 10 pounds (4.5 kg).

3.4.4.2 After fill test. When tested as specified in 4.5.4.7, the adhesion between the tube and plies, between the plies, and between the cover and the plies shall not be less than 6 pounds (2.7 kg).

3.4.5 Volume increase. When tested as specified in 4.5.4.5, the volume increase of the tube specimen after immersion in test fluid shall not exceed 40 percent, and the volume increase of the cover specimen shall not exceed 70 percent.

3.4.6 Low temperature flexibility.

3.4.6.1 Low temperature bend. There shall be no evidence of cracking of the tube or cover material when tested in accordance with 4.5.4.8.

3.4.6.2 Modulus of elasticity. When tested as specified in 4.5.4.9, the cover and tube shall not exceed a Young's modulus of 10,000 psi (69,000 kPa).

3.4.7 Existent gum content. When tested as specified in 4.5.4.10, the remainder shall be not more than 20 milligrams per 100 milliliters of test fuel.

3.5 Identification marking. Unless otherwise specified (see 6.2), all markings on the hoses shall be permanent and legible and include as a minimum the following information (see 4.5.2 and 6.2).

- a. The name of the manufacturer
- b. The quarter and year of manufacture
- c. "Liquid Petroleum Fuel, Collapsible, Low Temperature,"
- d. The part identifying number (PIN)
- e. The type of hose being manufactured
- f. The working pressure for each type of hose (see table V)
- g. A longitudinal yellow stripe no less than 0.12-inch (3.2 mm) thick (type II hose only)

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3.6 **Workmanship.** The hose assemblies shall conform to the quality requirements specified herein with no cuts, bruises, blisters, sharp edges, or lumps, and shall be clean and smooth (see 4.5.2).

4. VERIFICATION

4.1 **Classification of inspection.** The inspection conditions specified herein are classified as follows:

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

4.2 **First article inspection.** Unless otherwise specified (see 6.2), first article inspection shall be performed on preproduction or initial production samples as specified when a first article sample is required (see 3.1). This inspection shall include the examinations of 4.4 (see table II), and the tests of 4.5.4.1 through 4.5.4.10 (see table III).

TABLE II. Classification of defects.

| Category | Defect | Method of inspection |
|---------------|--|----------------------|
| Major: | | |
| 101 | Materials not as specified (see 3.2). | Visual |
| 102 | Materials not resistant to corrosion and deterioration (see 3.2). | SIE 1/ |
| 103 | Dissimilar metals are not effectively insulated from each other (see 3.2.1). | Visual |
| 104 | Diameters and weights not as specified (see 3.3.1.4). | SIE 1/ |
| 105 | Length of hose not as specified (see 3.3.1.5). | SIE 1/ |
| 106 | Design and construction not as specified (see 3.3). | Visual |
| 107 | Identification marking missing, illegible, or not as specified (see 3.5). | Visual |
| 108 | Workmanship not as specified (see 3.6). | Visual |

1/ SIE = Standard Inspection Equipment.

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TABLE III. Classification of inspections.

| Title | Requirement | Inspection | First article | Conformance tests |
|----------------------------------|-------------|------------|---------------|-------------------|
| Hydrostatic | 3.4.1 | 4.5.4.1 | X | |
| Length change and twist | 3.4.1.1 | 4.5.4.2 | X | X |
| Burst pressure | 3.4.1.2 | 4.5.4.3 | X | |
| Tensile strength | 3.4.2 | 4.5.4.4 | X | X |
| Tensile strength after immersion | 3.4.3 | 4.5.4.5 | X | |
| Adhesion | 3.4.4.1 | 4.5.4.6 | X | X |
| Adhesion after immersion | 3.4.4.2 | 4.5.4.7 | X | |
| Low temperature bend | 3.4.6.1 | 4.5.4.8 | X | |
| Modulus of elasticity | 3.4.6.2 | 4.5.4.9 | X | |
| Existent gum | 3.4.7 | 4.5.4.10 | X | |

4.3 Conformance inspection. Conformance inspection shall include the examinations of 4.4 and the following tests: 4.5.4.2, 4.5.4.4, and 4.5.4.6.

4.4 Examination.

4.4.1 Sampling. Samples from an inspection lot for conformance inspection shall be selected in accordance with ANSI/ASQC Z1.4. Any redesign or modification of the contractor's standard to comply with specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements of requirements of 3.2 through 3.6 as listed in table II. Noncompliance with any specified requirement or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.5 Method of inspection.

4.5.1 Materials. Conformance to 3.2 shall be determined by inspection of contractor records providing proof or certification that materials conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing and quality control standards, vendor catalogs and certifications, industry standards, test reports, and rating data.

4.5.2 Defects. Conformance to 3.2, 3.2.1, 3.3, 3.3.1.4, 3.3.1.5, 3.5, and 3.6 shall be determined by examination for the defects listed in Table II. Examination shall be visual, tactile, or by measurement with SIE.

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4.5.3 Test conditions. Unless otherwise specified (see 6.2), ambient air temperature shall be $73 \pm 18^\circ\text{F}$ ($23 \pm 10^\circ\text{C}$), barometric pressure shall be 28.5 ± 2.3 inches mercury (Hg) (725 ± 50 -75 mm Hg), and relative humidity shall be 50 ± 30 percent.

4.5.4 Performance.

4.5.4.1 Hydrostatic. Each length of hose, with fittings such as couplings and adapters attached, shall be subjected to a hydrostatic pressure test as specified in table IV. The electric bond (see 6.4.1) shall be determined while full test pressure is applied. Nonconformance to 3.4.1 and 3.3.1.6 shall constitute failure of the test.

TABLE IV. Hydrostatic test.

| Hose assembly type | Inch size | Hydrostatic test pressure 1/ (psig) |
|--------------------|------------|-------------------------------------|
| I | All | 100 |
| II | All | 175 |
| III | 1 thru 2.5 | 200 |
| III | 3 | 250 |
| III | 4 | 250 |
| IV | 1 thru 2.5 | 200 |
| IV | 3 | 250 |
| IV | 4 | 250 |

1/ The pressure on each hose shall be maintained for 30 seconds.

4.5.4.2 Length change and twist. A measurement of the original length of each length of hose shall be made, with the hose laid out in a straight horizontal position, after a pressure of 10 psig (69 kPag) is applied and maintained. With a crayon or soft pencil, make a mark on the top surface of the hose cover at each end adjacent to the coupling. These marks are used as a means of measuring the amount of twist during the test. The pressure shall then be increased to 100 psig (690 kPag) and held for 30 seconds. With the pressure still maintained, the final length measurement and the final twist measurement shall be taken. The percent change in length shall be calculated as plus for increase and minus for decrease in length. Nonconformance to 3.4.1.1 shall constitute failure of the test.

4.5.4.3 Minimum burst. A sample of not less than 3 feet (0.91 m) nor more than 6 feet (1.83 m) shall be cut from the one length selected from each 100 lengths for burst and physical tests. The hose shall be subjected to a hydrostatic test pressure in accordance with table V. The pressure shall be supplied at a uniform rate sufficient to develop the test pressure in 10 ± 2 seconds. Nonconformance to 3.4.1.2 shall constitute failure of the test. The remaining section of hose from

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which the test sample has been taken shall be accepted as a full length, provided the sample meets all the requirements of the specification.

TABLE V. Burst and working pressures.

| Hose assembly type | Size ID (inches) | Burst pressure (psig) (min) | Working pressure (psig) |
|--------------------|------------------|-----------------------------|-------------------------|
| I | All | 200 | 50 |
| II | All | 350 | 88 |
| III | 1 thru 2.5 | 400 | 100 |
| III | 3 | 500 | 125 |
| III | 4 | 600 | 150 |
| IV | 1 thru 2.5 | 400 | 80 |
| IV | 3 | 500 | 100 |
| IV | 4 | 600 | 120 |

4.5.4.4 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 D412. Nonconformance to 3.4.2 and 3.4.3 shall constitute failure of these tests.

4.5.4.5 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 rubber cover and rubber tube of hose or hose assemblies selected in accordance with 4.4.1 shall be determined in accordance with ASTM D471. The temperature of immersion shall be $73 \pm 2^{\circ}\text{F}$ ($23 \pm 1^{\circ}\text{C}$). The immersion time shall be 48 hours. The immersion fuel shall be 70% isooctane and 30% toluene by volume. The immediate deteriorated properties method shall be used in determining changes in tensile strength and ultimate elongation. Nonconformance to 3.4.2, 3.4.3, and 3.4.5 shall constitute failure of these tests.

4.5.4.6 Original adhesion. From hose or hose assemblies selected under 4.4.1, prepare ring or strip specimens as described in ASTM D380. The adhesion shall be determined in accordance with the machine method of ASTM D413. Nonconformance to 3.4.4.1 shall constitute failure of this test.

4.5.4.7 Adhesion after immersion in fuel. Specimens prepared as specified in 4.5.4.6 shall be immersed in fluid as specified in 4.5.4.5 for 48 hours at $73 \pm 2^{\circ}\text{F}$ ($23 \pm 1^{\circ}\text{C}$). Within 15 minutes after removal of the specimens from the fluid, the adhesion shall be determined in

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accordance with the machine method of ASTM D413. Nonconformance to 3.4.4.2 shall constitute failure of this test.

4.5.4.8 Low temperature bend test. Buffed specimens of the tube and cover, 4 inches (102 mm) long and 0.25 inch (6.4 mm) wide, shall be clamped in a concave shape between plates, 2.5 inches (63.5 mm) apart and at least 2 inches (50.8 mm) wide, in such a manner that the bend in the test piece does not protrude beyond the edges when the plates are brought together, and that the ends are not held for more than 1.25 inches (31.8 mm). After exposure to $-67 \pm 2^\circ\text{F}$ ($-55 \pm 1^\circ\text{C}$) for 72 hours, the plates shall be moved rapidly together until the ends of the specimens are not more than 1 inch (25.4 mm) apart. Nonconformance to 3.4.6.1 shall constitute failure of the test.

4.5.4.9 Modulus of elasticity. A test for low temperature flexibility shall be made in accordance with routine inspection and acceptance procedures specified in ASTM D1053, except that a gaseous media (section 8) will be used. The test temperature for the cover and tube shall be $-26 \pm 4^\circ\text{F}$ ($-32 \pm 2^\circ\text{C}$). The exposure time shall be 7 days. Nonconformance to 3.4.6.2 shall constitute failure of the test.

4.5.4.10 Existent gum. A test sample of hose, not less than 14 inches long (356 mm), shall be selected and the bottom plugged with a clean corrosion-resisting steel cylinder 2 inches (50.8 mm) long secured in place with a clamp. The sample shall be filled to within 2 inches (50.8 mm) of the top with test fuel (70% isooctane and 30% toluene). The top end of the hose shall be plugged in a manner similar to the bottom. The sample shall then be stored in a vertical position for 7 days at an ambient temperature of 100°F (38°C). At the end of each 24 hours, the fuel in the sample shall be agitated for 5 minutes by moving the hose back and forth from a vertical to a horizontal position at a rate of 2 cycles per minute. At the end of the 7-day storage period, the fuel shall again be agitated in the sample 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 D381. A blank shall be run on the test fluid at the same time and by the same method. The existent gum of the blank fluid shall be subtracted from the existent gum obtained from the test fluid removed from the hose. Nonconformance to 3.4.7 shall constitute failure of the 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 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 of 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.

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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 assemblies covered by this specification are intended for use in connection with dispensing liquid petroleum fuels at low temperature [-60 °F (-51 °C)] environment as follows:

Type I - Primarily for use with gasoline dispensing pumps.

Type II - Primarily for use on fuel trailers and carts.

Type III - Primarily for use with Marine Corps amphibious assault fuel handling systems capable of handling light petroleum fuels.

Type IV - Primarily for use with aircraft refuelers.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Type, class, and size of hose assembly required (see 1.2).
- 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. When a first article is not required (see 3.1).
- e. When the Government will conduct any or all of the first article examinations and tests. When the Government will conduct some but not all of the first article examinations and tests, the contracting officer should specify which examinations and tests will be conducted by the contractor (see 3.1).
- f. Identification markings if other than specified (see 3.5).
- g. Part or identifying number required (see 3.5 and 6.4).
- h. Level of preservation and packing required (see 5.1).

6.3 Definition.

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

6.4. Part or identifying number (PIN). The PIN to be used for hose assemblies covered by this specification are designed as follows (see 3.5 and 6.2):

MIL-PRF-53095A(AT)

Part or identifying number

M53095 - XX X XXXX

Length designator (see 3.3.1.5)

Size designator (see table VII)

Type and class designator (see table VI)

Prefix

Example: M53095-91A500 - Hose assembly in accordance with MIL-PRF-53095, type I (gasoline dispensing pump), class 1 (coupling halves, quick-disconnect, cam-locking type, hose shank; female both ends), size 1 inch (25.4 mm), length 50 feet (15.2 m).

6.4.1 Type and class. The hose assembly type and class are identified by a 2-digit code number as shown in table VI.

TABLE VI. Type and class designator.

| Type | | | | Class |
|------|----|-----|----|-------|
| I | II | III | IV | |
| 01 | 02 | 03 | 04 | 1 |
| 05 | 06 | - | 08 | 2 |
| 09 | 10 | - | 12 | 3 |

6.4.2 Size. The hose assembly size is identified by a 1-letter symbol as shown in table VII.

TABLE VII. Size designator.

| Symbol | Size (inside diameter) |
|--------|---------------------------|
| A | 1 inch (25.4 mm) |
| B | 1.25 inch (31.8 mm) |
| C | 1.5 inch (38.1 mm) |
| D | 2 inch (50.8 mm) |
| E | 2.5 inch (63.5 mm) |
| F | 3 inch (76.2 mm) |
| G | 4 inch (102 mm) |

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6.5 Subject term (key word) listing.

Arctic
Carts
Coupling halves
Coupling halves, cam-locking type
Couplings
Cover
Elastomer
Pumps, gasoline
Refuelers, aircraft
Trailers
Tubes

6.6 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.

Custodian:
Army - AT

Preparing activity:
Army - AT

(Project 4720-0089)

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RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-PRP-53095A(AT)

2. DOCUMENT DATE (YYMMDD)
960119

DOCUMENT TITLE

Hose Assembly, Rubber, Synthetic, Liquid Fuels, Dispensing, Collapsible, Low Temperature

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

REASON FOR RECOMMENDATION

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b. ORGANIZATION

c. ADDRESS (Include Zip Code)

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7. DATE SUBMITTED
(YYMMDD)

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