

INCH-POUND

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 SUPERSEDING
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MILITARY SPECIFICATION

HOSE ASSEMBLY, NONMETALLIC, FUEL, COLLAPSIBLE, LOW TEMPERATURE
 WITH NON-REUSABLE COUPLINGS

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

1. SCOPE

1.1 Scope. This specification covers for ground fueling of aircraft with hydrocarbon fuels or non portable water where working pressures do not exceed 225 psi.

1.2 Classification. Hose assemblies shall be semi-conductive, collapsible wall with a fuel resistant liner, a synthetic material reinforcement, and a fuel, abrasion and ozone resistant cover. The following inside diameters with couplers shall apply: (See Table 1).

TABLE I. Hose dimensions.

HOSE ASSY Sizes	Inside Diameter (Inches)
1	2.00 \pm 0.03
2	2.50 \pm 0.05
3	3.00 \pm 0.05
4	4.00 \pm 0.06

1.2.1 Part number. Specification part number for items described in this specification will be formulated as shown in 6.3.1.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Resources & Logistics Services Division, SA-ALC/TILDD, Bldg 171, Post C-12, 485 Quentin Roosevelt Rd, Kelly AFB, TX 78241-6425 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

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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 are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

MILITARY

MIL-H-775	Packing of Hose, Hose Assemblies; Rubber, Plastic, Fabric, or Metal (Including Tubing); and Fittings, Nozzles, and Strainers
MIL-T-5624	Turbine, Fuel, Aviation, Grade JP-4, JP-5 and JP-5/JP-8ST
MIL-I-45208	Inspection System Requirements

STANDARDS

FEDERAL

FED-STD-H28	Screw Thread Standards for Federal Services
FED-STD-162	Hose, Rubber, Visual Inspection Guide For

MILITARY

MIL-STD-831	Test Reports, Preparation of
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(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this specification 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.

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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B121	Standard Specification for Leaded Brass Plate, Strip, and Rolled Bar
ASTM B124	Standard Specification for Copper and Copper Alloy Forging Rod, Bar, and Shapes
ASTM D156	Standard Method of Test for Saybolt Color of Petroleum Products
ASTM D380	Standard Method of Testing Rubber Hose
ASTM D412	Standard Method of Tension Testing of Vulcanized Rubber
ASTM D413	Standard Method of Test for Adhesion of Vulcanized Rubber (Friction Test)
ASTM D471	Standard Test Method for Rubber Property-Effects of Liquids
ASTM D518	Standard Test Method for Rubber Deterioration--Surface Cracking
ASTM D1149	Rubber Deterioration-Surface ozone cracking in a chamber
ASTM D1500	Test for ASTM Color of Petroleum Products (ASTM Color Scale)
ASTM D2276	Standard Test Method for Particulate Contaminant in Aviation Fuel
ASTM D3182	Rubber Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets
ASTM D3183	Preparation of Pieces for Test from other than Standard Vulcanized Sheets

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO 4649	Rubber Determination of Abrasion-Resistance Using 2 rotating cylindrical drum device (1985)
BS 5173	Method of Test for Hoses, Part 4, Electrical Tests

(Application for copies should be addressed to International Organization for Standardization, c/o American National Standards Institute, 1430 Broadway, New York, New York 10018.)

(Non-Government standards and other publications normally available from the organization that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

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2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, 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 First article. When specified, a sample shall be subjected to first article inspection (see 4.4 and 6.4). Change of material, production process or procedures shall not be implemented subsequent to first article approval without prior written government approval.

3.2 Components. The complete hose assembly shall consist of the basic hose; two non-reusable couplings, one attached to each end of the hose and a one-time use protective shipping caps, as applicable, for each coupling to prevent the entrance of dirt and other foreign matter.

3.3 Materials. Materials shall be as specified herein. If not specifically designated, the material shall be of the best quality and entirely suitable for the intended purpose and meet the requirements of this specification.

3.4 Hose. The hose shall consist of a synthetic rubber inner tube; synthetic braided, loomed, or plied reinforcement laminated between rubber layers and a synthetic rubber cover. (see FIG 1)

3.4.1 Liner material. The liner (inner tube) material shall be continuous, either calendared or extruded, black, fuel resistant synthetic rubber compounded to meet all the requirements of this specification. The liner shall be a smooth, continuous, free of pitting, blisters, depressions, grooves, holes, cuts, charge marks, slits, porosity, and foreign material. Spiral tube laps and die marks are acceptable.

3.4.1.1 Liner thickness. The liner thickness shall be not less than six-hundredths (0.06) of an inch when measured in accordance with ASTM D380.

3.4.1.2 Liner tensile and elongation. The liner material shall have a tensile strength of not less than 1000 psi and an elongation of not less than 200 percent when tested in accordance with 4.7.1.2.

3.4.1.3 Liner percent volume change. The liner material shall not have more than thirty percent volume change when tested in accordance with 4.7.1.3.

3.4.1.4 Liner extractable material. The liner shall not have more than six percent of extractable matter when tested in accordance with 4.7.1.4.

3.4.1.5 Liner fuel contamination. The hose shall not contaminate fuel with more than 20 milligrams per 100 milliliters of extractable material when tested in accordance with 4.7.1.5.

3.4.1.6 Liner fuel discoloration. The color of the fuel following the fuel contamination test shall not be less than +15 saybolt when tested in accordance with 4.7.1.5.1.

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3.4.1.7 Liner low temperature. The liner material shall not crack when subjected to minus forty (-40) degrees Fahrenheit plus or minus two (2) degrees Fahrenheit when tested in accordance with 4.7.1.6.

3.4.2 Cover material. The cover shall be constructed of a black, abrasion resistant, ozone resistant and fuel resistant synthetic rubber material compounded to meet all the requirements of this specification. The quantity of material abraded shall not exceed 160 cubic millimeters in volume when tested in accordance with 4.7.2. The cover material shall be smooth, and free of pitting, blisters, depressions, grooves, holes, cuts, charge marks, slits, porosity, and foreign material. Wrap impressions are acceptable.

3.4.2.1 Cover thickness. The cover thickness shall be not less than six hundredths (0.06) of an inch. The dimensions shall be measured in accordance with 4.7.2.1.

3.4.2.2 Cover tensile and elongation. The cover material shall have a tensile strength of not less than 1000 psi and an elongation of not less than 200 percent when tested in accordance with 4.7.2.2.

3.4.2.3 Cover ozone resistance. The cover material shall not show signs of cracking when tested in accordance with 4.7.2.3 and examined as specified in ASTM D518.

3.4.2.4 Cover percent volume change. The cover material shall not have more than eighty percent volume change when tested in accordance with 4.7.2.4.

3.4.2.5 Cover low temperature resistance. The cover material shall not crack when subjected to minus forty (-40) plus or minus two (2) degrees Fahrenheit and tested in accordance with 4.7.2.5.

3.4.3 Reinforcement material. The reinforcement material shall be a synthetic yarn, cord or fabric that is braided, spiraled or plied and free of defects and geometrical irregularities. The reinforcement material shall be impregnated with an adhesive primer compatible with the cover and liner material. Two or more layers of reinforcement laminated between synthetic rubber layers not less than three hundredths (.03) of an inch thick shall be used in the hose carcass construction. The reinforcement material weave construction shall be such that it will allow the rubber layer on one surface to flow through the reinforcement and vulcanize with the rubber layer on other surface in such a manner as to encapsulate the reinforcement yarns with rubber. The reinforcement material shall not exist within the liner or cover thickness areas.

3.5 Hose.

3.5.1 Hose diameter. The hose inside diameter shall be as specified in Table I.

3.5.2 Length. The length of the hose shall be as specified, with a tolerance of +/- one (1) percent. The length measurement shall not include the couplings.

3.5.3 Hose electrical resistance. Electrical resistance of the hose assembly shall be 10^3 (minimum) to 10^6 (Maximum) ohm per meter.

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3.5.4 Adhesion. The hose liner and cover for unaged hose shall not exceed a separation rate of one inch per minute when subjected to a seventeen pound weight and held for not less than four minutes. For aged hose, the weight shall be 10 pounds. The test shall be in accordance with 4.6.8.

3.5.5 Low temperature flexibility. Hoses with an inside diameter at 2.50 inches or less shall not crack or require a force of more than 70 pounds to straighten it to an angle of 90 degrees within one minute when tested in accordance with 4.6.7. Hoses with an inside diameter of 3.00 inches or more shall not crack or require a force of more than 80 pounds to straighten it to an angle of 180 degrees within one minute when tested in accordance with 4.6.7.

3.5.6 Working pressure. The hose assembly working pressure shall be as specified in Table II when tested in accordance with 4.6.3.

3.5.7 Proof pressure. The hose assembly shall not leak, change in length more than seven percent or show any imperfections when subjected to proof pressure specified in Table II. The test shall be in accordance with 4.6.4.

3.5.8 Burst resistance. The hose assembly shall not blow out the coupling, burst, or develop a blister when subjected to the burst pressure as specified in Table II. The test shall be in accordance with 4.6.5.

3.5.9 Vacuum resistance. The hose assembly when subjected to a minimum internal vacuum of fifteen inches of mercury for not less than 5 minutes nor more than 15 minutes, the vacuum shall not cause separation of the liner from the reinforcement or the reinforcement from the cover. The test shall be in accordance with 4.6.11.

3.5.10 Age. The hose assembly hose cured date shall be no more than four (4) quarters old on the date of delivery to the procuring activity.

3.5.11 Collapsibility. Hose having ID of 2 inches shall coil to a diameter of 27 ± 2 inches and hoses having ID of $2\frac{1}{2}$ and 3 inches shall coil to a diameter of 30 ± 2 inches when tested in accordance with 4.6.10. Four inch ID hoses shall coil to 32 ± 2 inches. Test length shall be 50 feet ± 6 inches.

3.5.12 Durability. There shall be no evidence of leakage, pull off of fittings or other malfunctioning of the hose assemblies when tested in accordance with 4.5.11. The 4 inch ID hose assemblies will not be subjected to this test.

3.5.13 Hose identification requirements. The hose assembly shall be identified along its entire length with the following:

Manufacturer's Part
Manufacturer's CAGE
Hose Cure Date
Contract Number

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3.5.13.1 Identification data. The identification data shall be labeled, using a wear resistant material, longitudinally and continuously along hose side. The identification characters shall not be less than 0.2 inch high.

3.6 Couplings.

3.6.1 Couplings. A hose sample that meets this specification requirements shall be fitted with a coupling at each end. Couplings on the ends of the hoses shall be a one-time use, internally expandable, non-reusable design, two piece construction (see 4.7.4, 4.7.4.2 and 6.2). Male fitting body shall be of corrosion resistant brass (see 3.6.2 and 4.7.4). The serrated ferrule shall be of corrosion resistant brass or corrosion resistance steel (see 4.7.4). When expanded, these fittings shall have an inside diameter confirming to the nominal inside diameter of the hose. Couplings shall not move more than 0.03 inch during hose pressurization to proof pressure and shall be capable of performing free of failure for the expected life of the hose.

3.6.2 Male fitting material. The male fitting material shall be high strength corrosion resistant brass that meets or exceeds ASTM B121 or ASTM B124 specification requirements.

3.6.3 Coupling caps. The couplings shall be provided with protective one-time use, tapered or threaded caps for external threaded couplings. The caps may be of fuel and oil resistant polymer.

3.6.4 Coupling identification. The coupling ferrule shall be permanently identified with the following:

Coupling Manufacturer CAGE
Coupling Manufacturer Part Number

3.7 Workmanship. The hose and hose assemblies shall conform to the quality specified herein with no cuts, nicks, bruises, blister, sharp edges, or lumps, and shall be clean and smooth.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contractor 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, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All hose assemblies shall meet the requirements of this specification. The inspection set forth in this specification shall become 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 to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Inspection system requirements. Contractors inspection system shall be in accordance with MIL-I-45208.

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

- a. First article inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.4 First article inspection and testing. The first article inspection and testing shall consist of all the tests described under sections 4.6 thru 4.7, except where otherwise noted.

4.4.1 Samples. The first article test samples shall consist of the following hose lengths for each hose size which is to be furnished on the contract. Samples shall be identified in accordance with paragraph 3.5.13 thru 3.6.4 and any additional information required by the contract or purchase order.

- a. 30 feet length with couplings.
- b. 18 inch length with couplings.
- c. 15 inch length with couplings.

4.4.2 Test report. Upon completion of the first article tests, a test report shall be prepared in accordance with MIL-STD-831.

4.5 Production quality conformance. The production quality conformance inspection and tests shall consist of the following:

- a. Visual examination of hose assembly.
- b. Proof pressure test of hose assembly.
- c. Change in length test of hose assembly.

4.5.1 Individual tests. Each production hose assembly shall be subjected to the examination of product (4.5), proof pressure (4.6.4) and length change test (4.6.2).

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4.5.2.1 Production destructive test length. A test sample shall be randomly selected from every 1500 feet of production hose run to be tested and handled as follows in the order specified:

a. The production length shall be subjected to examination of product and proof pressure test. FED-STD-162 shall be used as a reference for visually encountered defects.

b. Eight feet of hose shall be cut from one end of the production length. The eight foot length shall then be cut into several samples suitable for performing the following tests:

1. Adhesion test.
2. Percent volume change test.
3. Low temperature test.
4. Tensile and elongation test.
5. Extractable matter and color change test.
6. Burst test.

4.5.3 Rejection and retest. When an item selected from a production run fails to meet the requirements specified herein, items still on hand or produced later shall not be accepted until the extent and cause of failure have been determined and appropriately corrected. The contractor shall explain to the Government representative the cause of failure and the action taken to preclude recurrence. After correction, all the sample tests shall be repeated.

4.6 Hose assembly test methods.

4.6.1 Examination of hose assemblies. Hose assemblies shall be examined to determine compliance with the requirements of this specification with regards to workmanship, identification, materials, size, construction, length, age, couplings and coupling caps. Defects found during visual inspection of assemblies shall be identified, categorized, and referenced in accordance with FED-STD-162.

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TABLE II. Hose dimensional and physical requirements.

PRESSURES, PSI			
HOSE INSIDE DIAMETER (INCH)	WORKING MAXIMUM	PROOF MINIMUM	BURST MINIMUM
2.00 ± 0.03	225	400	900
2.50 ± 0.05	225	400	900
3.00 ± 0.05	225	400	900
4.00 ± 0.05	225	400	900

4.6.2 Hose dimensional requirements. The hose length and diameter dimensions shall be measured in accordance with ASTM D380.

4.6.3 Working pressure. The hose assembly shall be tested in accordance with ASTM D380.

4.6.4 Proof pressure. The hose assembly proof pressure shall be tested in accordance with ASTM D380.

4.6.5 Burst pressure. Hose assembly burst pressure resistance shall be tested in accordance with ASTM D380.

4.6.6 Flexibility. The hose shall be flexible without any permanent change in length when an empty hose sample is coiled around a drum with a diameter equal to ten times the hose nominal inside diameter.

The required length of the sample shall be determined by the following computation.

$$L = \pi (D + d)$$

where:

L = Length of test sample

$\pi = 3.1416$

D = Test drum diameter (based on 10 times the hose nominal inside diameter)

d = Hose nominal inside diameter

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4.6.7 Low temperature flexibility. The two and two and one-half inch inside diameter hose sample shall be bent and held in a U-shape and subjected to a temperature of forty (-40) degrees Fahrenheit plus or minus two degrees for not less than seventy-two hours. A five foot sample of uncoupled hose shall be used for the low temperature flexibility test. The three inch inside diameter hose sample shall be bent into a concave shape such that the ends of the hose sample are forty inches apart and subjected to a temperature of minus forty (-40) degrees Fahrenheit plus or minus two degrees for not less than seventy-two hours. A five foot sample of uncoupled hose shall be used for the low temperature flexibility test.

4.6.8 Adhesion. The hose liner and cover for unaged hose shall not exceed a separation rate of one inch per minute when tested in accordance with ASTM D380 and ASTM D413 and subjected to a seventeen pound weight and held for not less than four minutes. In addition, for aged hose after being bored aged using fuel B for 168 hours at 72 ± 2 degrees Fahrenheit the separation rate shall not exceed one inch per minute when subjected to a ten pound weight and held for not less than 4 minutes.

4.6.9 Hose assembly electrical resistance test. The electrical resistance of the hose assembly, measured from coupling to coupling using a 500 volt source, shall be within the limits of 10^3 (minimum) to 10^6 (maximum) ohms per meter for the unpressured hose and during the proof pressure, paragraph 4.6.4, and flexibility, paragraph 4.6.6 tests. Tests shall be in accordance with BS 5173.

4.6.10 Collapsibility test. Hoses having ID of 2 inches shall be tested by winding cylindrically (not spirally) an uncoupled 50 feet ± 6 inch length around a reel having a diameter of $9 \pm 1/8$ inch. The second coil and each succeeding coil shall be centered directly over the previous coil. After winding, the diameter of the coils of hose shall be measured at the point of greatest diameter. The same procedure shall be used for 2½, 3 and 4 inch ID hose, except a $13 \pm 1/8$ inch reel shall be used.

4.6.11 Durability. A hose assembly shall be installed on a hose reel. The reel hub shall have a diameter of not more than 16 inches and shall be capable of accommodating the length of hose wound in multiple layer in a single hose width wide coil. The hose shall be unwrapped from the hose reel, filled with JP-4 fuel conforming to MIL-T-5624, and pressurized to a hydrostatic pressure of 50 ± 5 psi. The hose shall then be evacuated through the hose reel (at least 95 percent of the fuel shall be removed) and rewound on the reel. Evacuation vacuum shall be 15 ± 2 inches of mercury. (An automotive vacuum gage shall be installed at the outboard or nozzle end of the hose.) This cycle of unreeling pressurizing, evacuation and reeling shall be accomplished 1000 times. The hose shall then be unreeled, rotated 180 degrees, filled with JP-4, or commercial equivalent, and an additional 1000 cycles accomplished. The rewinding of the hose on the hose reel shall be accomplished neatly without twisting, with the hose wound tightly. At the completion of this test, the hose shall be subjected to a hydrostatic pressure of 50 percent of the proof pressure in Table I for not less than 3 minutes. The hose shall than be destructive tested by cutting through one side of the hose longitudinally and examined. If the hose has tube separation or the inner tube has cracks, cuts or pits, it shall be cause for rejection.

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4.6.12 Couplings. A hose sample that meets this specification requirements shall be fitted with a coupling at each end. After the sample is conditioned, the joint between the coupling and the hose shall withstand a maximum cyclic surge pressure of zero to 225 psi for not less than 15000 cycles without leakage or visible coupling movement of not more than three-hundredths (0.03) of an inch when tested in accordance with 4.7.4.1.

4.7 Hose components materials test methods.

4.7.1 Liner material. The liner material shall be a fuel resistant synthetic rubber capable of meeting all the requirements of this specification. The liner shall be a smooth and continuous either calendered or extruded, free of pitting, blisters, depressions, grooves, holes, cuts, charge marks, slits, porosity, and foreign material.

4.7.1.1 Liner thickness. The liner thickness dimensions shall be measured in accordance with ASTM D380.

4.7.1.2 Liner tensile and elongation. The liner material tensile strength and elongation shall be tested in accordance with ASTM D380 and ASTM D412.

4.7.1.3 Liner percent volume change. The liner material shall be immersed for seventy hours in ASTM reference fuel B at room temperature and tested in accordance with ASTM D380 and ASTM D471.

4.7.1.4 Liner extractable material. The liner material shall be immersed for ninety-six (96) hours in ASTM reference fuel B at 104 degree Fahrenheit plus or minus two (2) degrees Fahrenheit and tested in accordance with ASTM D2276.

4.7.1.5 Liner fuel contamination. The liner material shall be extracted with ASTM reference fuel B. A twelve inch long and three inch diameter hose sample shall be used for the test. The sample shall be plugged at one end with a glass plug. Fill the hose sample with reference fuel B specified in ASTM D471 and allow to stand for three days at 64 \pm 2 degrees Fahrenheit. Drain and refill with fresh fuel B. Repeat the procedure daily for four additional days. On the eighth day drain and fill the hose sample with fresh reference fuel B and allow to stand for three additional days at 64 \pm 2 degrees Fahrenheit. On the final cycle, the fuel from the sample hose shall be tested in accordance with ASTM D2276. If sample hose with a diameter other than three inch diameter is used then adjust the allowable amount of contaminate as follows:

$$\left[\frac{\text{(mg/100 ml results) (Hose sample inside diameter)}}{\text{adjusted}} \right] \text{Three inch diameter of specified sample} = \text{mg/100 ml}$$

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TABLE III. Physical properties.

TEST	SPECIFICATION	REQUIREMENT
TENSILE STRENGTH	ASTM D380 ASTM D412	1000 PSI (MIN)
ULTIMATE ELONGATION	ASTM D380 ASTM D412	200 % (MIN)
VOLUME INCREASE	ASTM D380 ASTM D471	30% (MAX) LINER 80% (MAX) COVER
FUEL PARTICULATE MATTER	ASTM D2276	6% (MAX)
DISCOLORATION	ASTM D156/D1500	+15 SAYBOLT (MIN)
ADHESION	ASTM D380 ASTM D413	LINER/COVER (MAX) ONE INCH/MINUTE
FLEXIBILITY DRUM DIAMETER LENGTH		
LOW TEMPERATURE FLEXIBILITY	ASTM D380	DOWN TO -40 +2 DEG F
SAMPLE PREPARATION	ASTM D3182/D3183	

4.7.1.5.1 Liner fuel discoloration. The liner shall be tested in accordance with ASTM D156 and ASTM D1500.

4.7.1.6 Liner low temperature. The liner material shall be subjected to minus forty degrees Fahrenheit plus or minus two degrees Fahrenheit for five (5) hours and tested in accordance with ASTM D380.

4.7.2 Cover material. The cover material shall be an abrasion, fuel and ozone resistant rubber material capable of meeting all the requirements of this specification. The cover shall be smooth, and free of pitting, blisters, depressions, grooves, holes, cuts, charge marks, slits, porosity, and foreign material. Wrap impressions are acceptable. The abrasion resistance shall be ascertained using the procedures of ISO 4649, method A and the results shall be within the limit specified in 3.4.2.

4.7.2.1 Cover thickness. The cover thickness shall be not less than six hundredths (0.06) of an inch. The dimensions shall be measured in accordance with ASTM D380.

4.7.2.2 Cover tensile and elongation. The cover material shall have a tensile strength of not less than 1000 psi and an elongation of not less than 200 percent when tested in accordance with ASTM D380 and D412.

4.7.2.3 Cover ozone resistance. The cover material shall not show signs of cracking when subjected to a 24-hour conditioning period and an exposure of 72 +/- 0.5 hours at 104 degrees Fahrenheit to an atmosphere containing 100 +/- 10 parts per hundred million (PPHM) of ozone in accordance with ASTM D1149. Examine specimen as specified in 3.4.2.3.

4.7.2.4 Cover percent volume change. The cover material shall not have more than eighty percent volume change after a seventy hour immersion in ASTM reference fuel B at room temperature and tested in accordance with ASTM D380 and ASTM D471.

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4.7.2.5 Cover low temperature resistance. The cover material shall not crack when subjected to minus forty degrees Fahrenheit plus or minus two degrees Fahrenheit for five (5) hours and tested in accordance with ASTM D380.

4.7.3 Reinforcement material. The reinforcement material shall meet this specification requirements.

4.7.4 Coupler material. The male fitting material shall be high strength corrosion resistant brass that meets or exceeds ASTM B121 or ASTM B124 specification requirements. The serrated ferrule material shall be high strength corrosion resistant brass that meets or exceeds ASTM B121 or ASTM B124 specification requirements or as suitable corrosion resistant steel.

4.7.4.1 Coupler pressure cycling test. The test sample shall be conditioned filling with ASTM fuel B and allowing it to soak for not less than twenty-four hours. After the twenty-four soak period the ASTM fuel B shall be drained prior to starting the cycling test. The pressure cycling test shall be started within four hours after draining the ASTM fuel B. The pressure shall be 225 psi alternately applied for sixty seconds and then released to zero psi for thirty seconds at a rate of 30 cycles per hour. The test shall be conducted for one hour on a thirty-six inch hose assembly at ambient temperature. Water may be used as the pressure test medium. At the end of the test the coupling shall be carefully removed and the hose examined to determine that no cuts or failure of the hose lining have occurred.

4.7.4.2 Coupling threads. The couplings shall be furnished with standard male NPT (American Standard Taper Thread) threads or female NPSH (American Standard Straight Pipe Thread). The threads shall conform to FED STD H28/10 Screw-thread standards for Federal Services, Section 10 or latest revision.

5. PACKAGING

5.1 Preservation-packaging. Hose assemblies shall be preserved and packaged level A or C in accordance with MIL-H-775 as specified.

5.1.1 Packing. Packing shall be levels A, B or C in accordance with MIL-H-775 as specified.

5.1.2 Marking. Interior and exterior shipping containers shall be marked in accordance with the following:

- a. Stock number.
- b. Part number.
- c. Contract number.
- d. Hose length, inside diameter, and working pressure.
- e. Coupling part number.

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5.1.3 Hose shipment conditions. To prevent damage due to severe kinking during shipment and storage, each hose assembly shall be individually wrapped on a spool or hoop having a diameter not less than ten (10) times the hose inside diameter. The width of the spool or hoop shall be wide enough to accept at least one wrap of hose. The wrapping area of the hoop or spool shall be cut or designed so that one end fitting can be nested or embedded tangentially in the core. The spool or hoop may be made from wood or other suitable material and of such design that it will not damage adjacent hoses when hoses are stocked without boxes.

6. NOTES

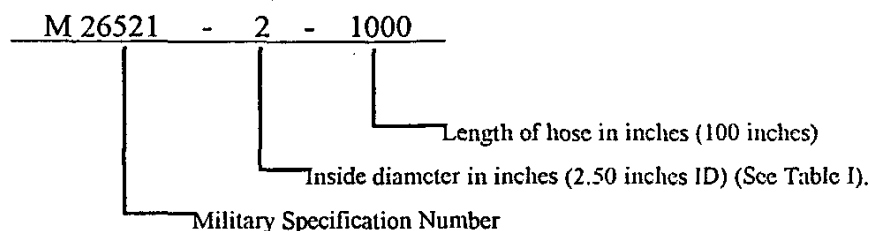
(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Hose assemblies covered by this specification are intended for use in exceptional fuel servicing of aircraft with aromatic hydrocarbon aviation fuel. Exceptional fuel servicing is defined for this specification as hot refueling, hot and cold integrated combat turns and fueling of passenger aircraft with passengers on board. The hose assemblies will be used on pantographs, hydrant systems and fuel servicing mobile equipment where the 225 psi rated maximum working pressure includes peak surge pressure.

6.2 Couplers. The couplings used shall meet all of the requirements of this specification.

6.3 Ordering data.

6.3.1 The hose assembly ordering number configuration shall be as follows:



6.3.2 Acquisition requirements.

6.3.2.1 Acquisition documents for the hose assembly should specify the following:

- a. Title, number, and date of this purchase description.
- b. Inside diameter required.
- c. Length of hose assembly required.
- d. Applicable levels of preservation, packaging and packing required.
- e. Hose assemblies subjected to destructive test will not be included as part of the contract quantity for delivery.

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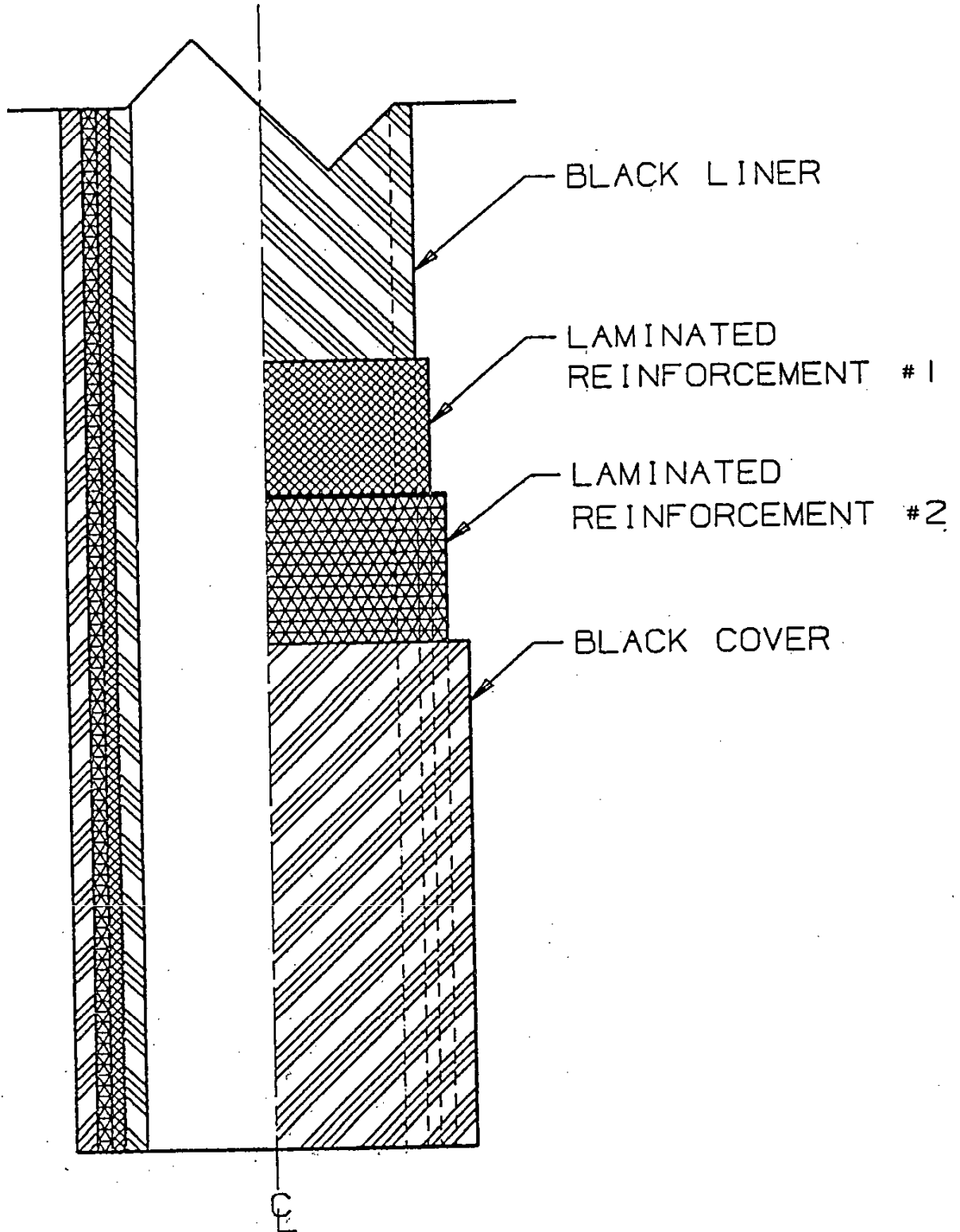


FIGURE 1. Hose section

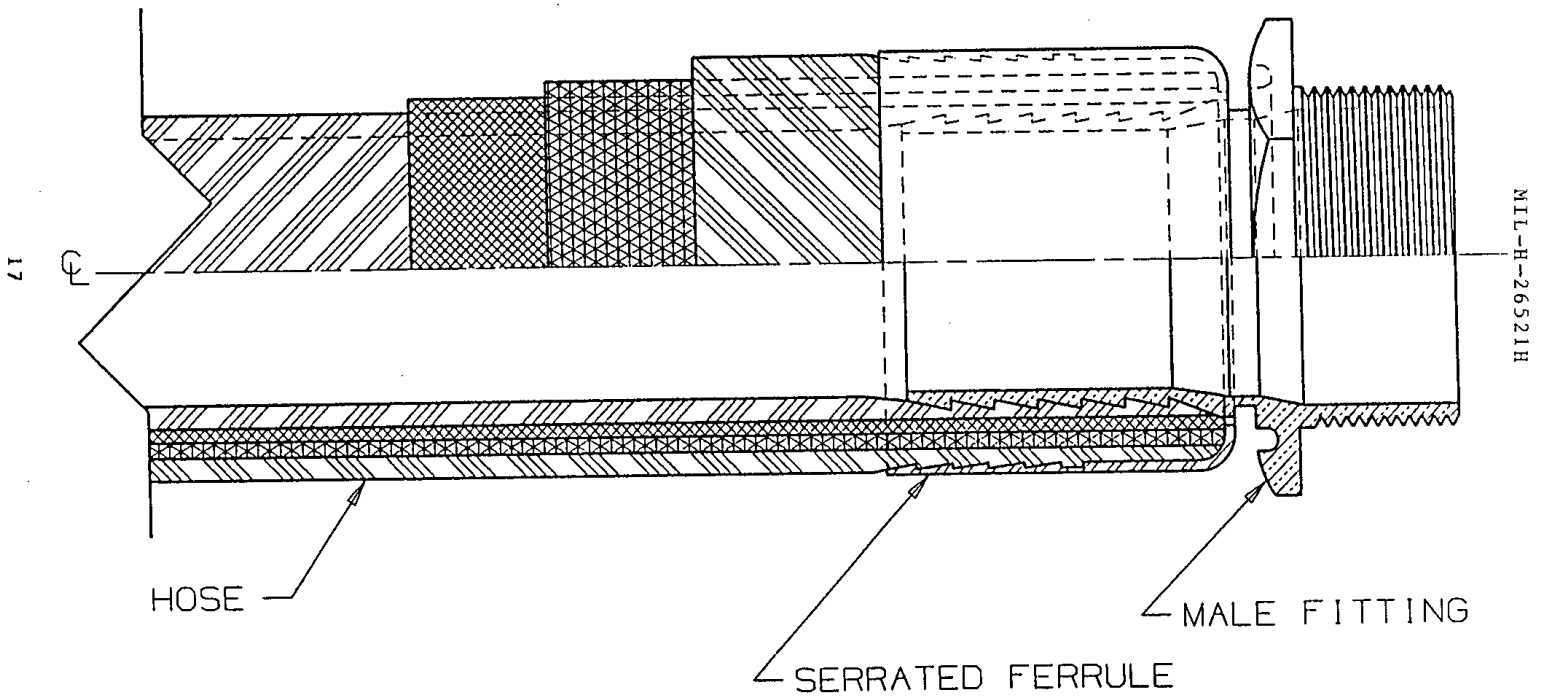


FIGURE 2. Permanent type coupler

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6.4 First article test waiver. First article tests may be waived if bidders have satisfactorily tested hose assembly to this MIL-H-26521G specification requirements and passed the tests for the particular size hose assembly under solicitation within twelve months of submittal of bid. Production conformance testing shall not be waived.

6.5 Certification. The hose assembly shall be accompanied by certificate indicating the working pressure and that it has passed the proof pressure test required by this specification.

6.6 Reclaimed materials. The use of reclaimed materials shall be encouraged to the maximum extent possible.

6.7 Subject term (key word) listing.

Inner tube (liner)
Reinforcement
Cover
Coupler (male fitting and serrated ferrule)

6.8 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:
Air Force - 99

Review activities:
Army - AR, AV
Navy - YD
DLA - CS

Preparing activity:
Air Force - 82

(Project No. 4720-0043)