

INCH-POUND**MIL-H-26521J****21 June 1995****SUPERSEDING****MIL-H-26521H****8 JULY 1993****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 collapsible synthetic rubber hose assemblies for ground fueling of aircraft with hydrocarbon fuels or non-potable water where working pressures do not exceed 225 psi.

1.2 **Classification.** Hose assemblies shall be static dissipating, 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 ± 0.06
2	2.50 ± 0.06
3	3.00 ± 0.06
4	4.00 ± 0.06

1.2.1 **Part identifying number.** Specification part identifying number (PIN) for items described in this specification will be formulated as shown in 6.2.1.

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
MIL-T-83133	Turbine, Fuel, Aviation, Kerosene Types, NATO F-34 (JP-8) & F-35

STANDARDS

FEDERAL

FED-STD-H28/10	Screw Thread Standards for Federal Services Section 10 Hose, Coupling and Fire hose Coupling Screw Threads.
FED-STD-162	Hose, Rubber, Visual Inspection Guide For

MILITARY

MIL-STD-831	Test Reports, Preparation of
MIL-STD-961	Preparation of Military Specifications and Associated Documents

(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 that 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 PETROLEUM INSTITUTE

API BULLETIN 1529 Aviation Fueling Hose

(Application for copies should be addressed to American Petroleum Institute, 1220 L Street Northwest, Washington DC 20005)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 121	Standard Specification for Leaded Brass Plate, Strip, and Rolled Bar
ASTM B 124	Standard Specification for Copper and Copper Alloy Forging Rod, Bar, and Shapes
ASTM D 156	Standard Method of Test for Saybolt Color of Petroleum Products
ASTM D 380	Standard Method of Testing Rubber Hose
ASTM D 412	Standard Method of Tension Testing of Vulcanized Rubber
ASTM D 413	Standard Method of Test for Adhesion of Vulcanized Rubber (Friction Test)
ASTM D 471	Standard Test Method for Rubber Property-Effects of Liquids
ASTM D 518	Standard Test Method for Rubber Deterioration--Surface Cracking
ASTM D 1149	Rubber Deterioration-Surface ozone cracking in a chamber
ASTM D 1500	Test for ASTM Color of Petroleum Products (ASTM Color Scale)
ASTM D 2276	Standard Test Method for Particulate Contaminant in Aviation Fuel
ASTM D 3182	Rubber Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets
ASTM D 3183	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

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(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.)

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, 4.6 through 4.7 and 6.3) 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 (see FIG. 1), 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 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. 2)

3.4.1 Liner material. The liners (inner tube) material shall be continuous, either calendered or extruded, 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 D 380.

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 4.7.1.1.

3.4.1.3 Liner volume change. The liner material shall not have more than thirty percent increase in volume when tested in accordance with 4.7.1.2.

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3.4.1.4 Liner extractable material. The liner shall not have more than six percent of extractable matter when tested in accordance with 4.7.1.3.

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 4.7.1.4.

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.

3.4.1.7 Liner low temperature. The liner material shall not crack when subjected to minus forty (-40) 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, ozone resistant and fuel resistant synthetic rubber material compounded to meet all the requirements of this specification. 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.

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 4.7.2.1.

3.4.2.3 Cover ozone resistance. The cover material shall not show signs of cracking when tested in accordance with 4.7.2.2 and examined as specified in ASTM D 518.

3.4.2.4 Cover volume change. The cover material shall not have more than eighty percent volume change when tested in accordance with 4.7.2.3.

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 4.7.2.4.

3.4.2.6 Cover Material Abrasion Resistance. The quantity of material abraded shall not exceed 160 cubic millimeters in volume when 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. 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 the 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.

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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 \pm one (1) percent. The length measurement shall not include the couplings.

3.5.3 Hose electrical resistance. Electrical resistance of the hose assembly shall not exceed 10^6 ohm per meter. (Reference 4.6.8)

3.5.4 Adhesion. Minimum force required to separate adjacent layers of the hose shall be no less than 17 lb./inch width when pulled at 2 inch/minute, and after bore aging the hose with JP-4, JP-8 or commercial jet A and A1 fuel for 168 ± 2 hours at 72 ± 2 degrees F, not less than 10 lb/inch width at 2 inch/minutes pull rate. The test shall be conducted per section 4.6.7.

3.5.5 Low temperature flexibility. The hose shall be flexible at temperatures ranging down to minus forty (- 40) plus or minus two (2) degrees Fahrenheit. The manufacturer shall submit hose testing results indicating the maximum registered torque required to bend the hose around the test drum at a temperature of $- 40 \pm 2$ degrees F. Test results shall be reported in foot-pounds force (lb-ft). The test shall be conducted in accordance with 4.6.6.

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

TABLE II. Hose dimensional and physical requirements.

PRESSURES, PSI			
HOSE INSIDE DIAMETER (INCH)	WORKING MAXIMUM	PROOF MINIMUM	BURST MINIMUM
2.00 ± 0.06	225	400	900
2.50 ± 0.06	225	400	900
3.00 ± 0.06	225	400	900
4.00 ± 0.06	225	340	900

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3.5.10 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 4.6.9. Four inch ID hoses shall coil to 32 ± 2 inches. Test length shall be 50 feet ± 6 inches.

3.5.11 Durability. There shall be no evidence of leakage, pull off of fittings or other malfunctioning of the hose assemblies when tested in accordance with 4.6.10. The 4 inch ID hose assemblies will not be subjected to this test.

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

Part Identifying Number (PIN) in accordance with MIL-STD-961
 Manufacturer's CAGE
 Hose Cure Date
 Contract Number
 (Reference 6.2.1)

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

3.5.12.2 Hose assembly serial number. Each hose assembly shall be identified with a, wear resistant and discernible to the naked eye, serial number placed 12 ± 2 feet from each hose end or on the nut portion of the coupling.

3.6 Couplings.

3.6.1 Couplings. A hose sample that meets this specification requirements shall be fitted with an API 1529 male 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 6.2). Male fitting body shall be of corrosion resistant brass (See 3.6.2). The serrated ferrule shall be of corrosion resistant brass that meets or exceeds ASTM. B 121 OR ASTM. B 124 specification requirements or 300 series corrosion resistance steel. The coupling shall be furnished with standard male NPT (American Standard Taper Thread) threads. The threads shall conform to FED STD H28/10 Screw-thread standards for Federal Services, Section 10 or latest revision. When expanded, these fittings shall have an inside diameter conforming to the nominal inside diameter of the hose. Slippage of hose/coupling connection shall not exceed 0.03 inch due to hose pressurization to proof pressure. This measurement shall be made after hose assembly depressurization from proof pressure. Couplings shall be capable of performing free of failure for the expected life of the hose. The couplings used shall meet all of the requirements of this specification.

3.6.2 Male fitting material. The male fitting material shall be high strength corrosion resistant brass that meets or exceeds ASTM. B 121 or ASTM. B 124 specification requirements.

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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.

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 through 4.7, except where otherwise noted. First article tests may be waived for bidders that have satisfactorily tested hose assembly to this MIL-H-26521J specification requirements and passed the tests for the particular hose assembly within twelve months of submittal of bid. Also, manufacturers who have successfully completed first article testing and whose production hoses have performed satisfactorily in the field may be waived for sizes smaller than originally tested.

4.4.1 Samples. The first article test samples shall consist of the following hose lengths for each hose size that is to be furnished on the contract. Samples shall be identified in accordance with paragraph 3.5.2 through 3.6.4 and any additional information required by the contract or purchase order.

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- a. 12 inch length uncoupled - For adhesion tests (para. 4.6.7)
- b. 36 inch length with couplings - For working pressure test (para. 4.6.3), proof pressure test (para. 4.6.4), burst pressure test (para. 4.6.5), electrical resistance test (para. 4.6.8) and couplings tests (para. 4.6.11 and 4.7.4)
- c. 50 foot length with couplings - For collapsibility test (4.6.9) and durability test (para. 4.6.10)

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).

4.5.2 Production destructive tests. Test samples shall be randomly selected from production hose to be tested and handled as follows in the order specified:

- a. Sample sizes shall be determined using TABLE III.
- b. 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.
- c. 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. Volume change test
 - 3. Low temperature flexibility test
 - 4. Tensile and elongation test
 - 5. Extractable matter test
 - 6. Burst resistance test
 - 7. Color change test

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d. Hose assemblies subjected to destructive test will not be included as part of the contract quantity for delivery.

TABLE III. Sample Size Relative to Production Size.

Production Quantity of Assemblies	Sample Size for Tests c.1, c.4, c.6	Sample Size for Tests c.2, c.3, c.5, c.7
0 - 50	1	0
51 - 150	2	0
151 - 300	3	1
301 - 500	4	2

NOTE: Increase sample size by one for every 500 additional production quantity.

4.5.3 Rejection and retest. When an item from a selected sample from production fails to meet the requirements of 4.5.2, the sample shall be retested in accordance with ASTM D 380.

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 regard 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.

4.6.2 Hose dimensional requirements. The hose length and diameter dimensions shall be measured in accordance with ASTM D 380.

4.6.3 Working pressure. The hose assembly shall be tested in accordance with ASTM D 380.

4.6.4 Proof pressure. The hose assembly proof pressure shall be tested in accordance with ASTM D 380.

4.6.5 Burst pressure. Hose assembly burst pressure resistance shall be tested in accordance with ASTM D 380.

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4.6.6 Low temperature flexibility. The flexibility tests shall be carried out with an empty length of hose, the length of which is calculated as follows:

$$\text{Hose Length} = 3.142 D + 4d$$

where: D = Test drum diameter
d = Hose diameter

Determine the external test drum diameter based on the hose diameter using TABLE IV.

TABLE IV. Test Drum External Diameter in Relation to Hose Diameter.

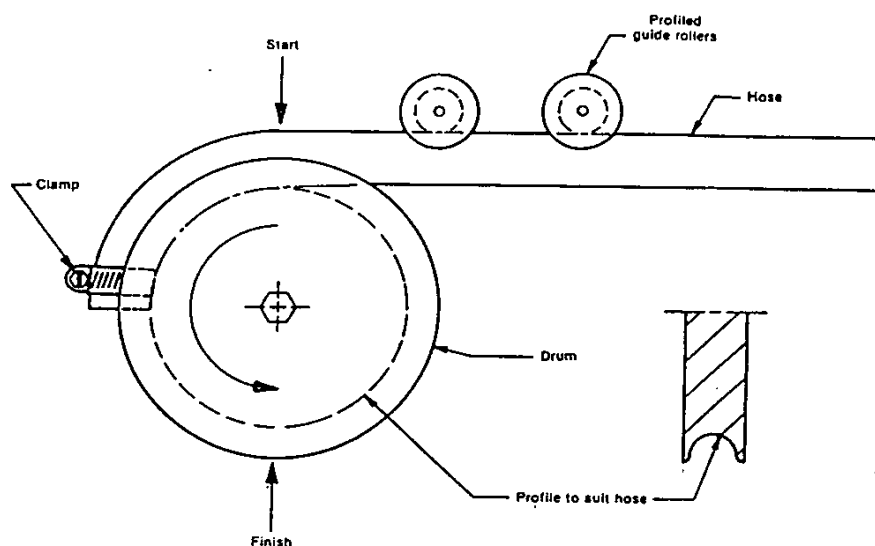
Hose Diameter (d)	Test Drum External Diameter (D)
Inches	Inches
2	20
2.50	25
3	30
4	40

- a. Determine the hose length and the external test drum diameter from TABLE IV and the equation above.
- b. Attach the hose to the test drum with the clamp as shown in TEST FIXTURE A.
- c. Place the test drum and hose specimen in a cold box/bath to lower their temperature to - 40 degrees F.

Note: The test drum and specimen for hoses with inside diameters of 3 inches and smaller shall be kept in the cold box/bath during the test to ensure the test temperature is maintained. For the hose with inside diameter of 4 inches, the test drum and specimen must be at the test temperature but may be removed from the cold box/bath for the test procedure. In this case the test must be initiated within 30 seconds of removal from the cold box/bath.

- d. Rotate the test drum using a torque wrench with a dial indicator. The drum must be rotated 180 degrees within 10 seconds.
- e. Record the maximum registered torque required to bend the hose around the test drum. Report the test result in foot-pounds (lb-ft).
- f. Verify that the hose is flexible.
- g. Proof test hose after this test. Then split hose lengthwise and inspect for cracks, breaks and layers separation. Failure of this test is cause for rejection of the production lot.

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TEST FIXTURE A -- Test Fixture for Cold Flexibility Evaluation

4.6.7 Adhesion Test Method. Sample preparation and testing shall be in accordance with ASTM D 380 and ASTM D 413 using the "Ring" or "Strip 90 degrees" method, at a rate of 2 inch/minute, using a tension tester (stress strain machine), at 72 ± 2 degrees F. The test specimen must be pulled completely around the circumference of the hose, with the average value around the circumference being 17 lb/inch width, and 10 lb/inch width after bore aging the hose with JP-4, JP-8 or commercial jet A and A1 fuel for 168 ± 2 hours at 72 ± 2 degrees F.

4.6.8 Hose assembly static dissipation test. The electrical resistance of the hose assembly, measured from coupling to coupling using a 500 volt source, shall not exceed 10^6 ohms per meter for an unpressurized hose after the proof pressure, paragraph 4.6.4, and flexibility, paragraph 4.6.6 tests. Tests shall be in accordance with BS EN 28031.

4.6.9 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 $2\frac{1}{2}$, 3 and 4 inch ID hose, except a $13 \pm 1/8$ inch reel shall be used.

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4.6.10 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, JP-8 or commercial commercial jet A and A1 fuel, 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, JP-8, or commercial jet A and A1 fuel, 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 minimum internal vacuum of fifteen inches of mercury for not less than 5 minutes nor more than 15 minutes. The hose shall then 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 then 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.

4.6.11 Couplings. A three foot 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.

4.6.12 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 smooth and continuous either calendered or extruded, free of pitting, blisters, holes, porosity and foreign material. Cuts shall not exceed 0.03 inches in depth.

4.7 Hose components materials test methods.

4.7.1. Liner thickness. The liner thickness dimensions shall be measured in accordance with ASTM D 380.

4.7.1.1 Liner tensile and elongation. The liner material tensile strength and elongation shall be tested in accordance with ASTM D 380 and ASTM D 412.

4.7.1.2 Liner volume change. The liner material shall be immersed for seventy hours in ASTM reference fuel B 72 ± 2 degrees F and tested in accordance with ASTM D 380 and ASTM D 471.

4.7.1.3 Liner extractable material. Perform the fuel-soluble matter test based on ASTM D 2276, in conjunction with the procedures given below.

- a. Cut a sample of hose liner into pieces of approximately 0.12 square inches.

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- b. Extract 5 ± 0.01 grams of the sample into 100 milliliters of Reference Fuel B in accordance with ASTM D 471.
- c. Store the test fluid and sample in a glass flask for 96 hours at 104 ± 2 degrees F. Suitable precaution should be taken to prevent loss by evaporation.
- d. Filter the flask contents into a pre-weighed hemispherical glass dish of suitable size, washing both the residue in the flask and the filter with a further quantity of fuel.
- e. Evaporate the contents of the dish on a boiling water bath and heat the residue in a ventilated air oven for 2 hours at 302 ± 5 degrees F.
- f. Calculate the weight of the extractable residual matter as a percentage of the original test sample weight. The percentage of extractable residual matter shall not exceed the limit specified in 3.4.1.4.

TABLE V. TESTS QUICK REFERENCE SUMMARY

TEST	SPECIFICATION	REQUIREMENT
TENSILE STRENGTH	ASTM D 380 ASTM D 412	1000 PSI (MIN)
ULTIMATE ELONGATION	ASTM D 380 ASTM D 412	200 % (MIN)
VOLUME CHANGE	ASTM D 380 ASTM D 471	30% (MAX) LINER 80% (MAX) COVER
FUEL EXTRACTABLE MATERIAL	ASTM D 2276	6% (MAX)
DISCOLORATION	ASTM D 156/D 1500	+15 SAYBOLT (MIN)
ADHESION	ASTM D 380 ASTM D 413	LINER/COVER (MIN) 17 LBS UNAGED 10 LBS AGED
FLEXIBILITY DRUM DIAMETER LENGTH		
LOW TEMPERATURE FLEXIBILITY	ASTM D 380	DOWN TO -40 ± 2 DEG F
ABRASION	ISO 4649	160 CUBIC MILLIMETERS (MAX)
LINER FUEL CONTAMINATION	ASTM D 471 ASTM D 2276	20 MG/100 ML (MAX)
SAMPLE PREPARATION	ASTM D 3182/D 3183	

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4.7.1.4 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 or non-contaminating metal plug. Fill the hose sample with reference fuel B specified in ASTM D 471 and allow to stand for three days at 72 ± 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 72 ± 2 degrees Fahrenheit. On the final cycle, the fuel from the sample hose shall be tested in accordance with ASTM D 2276. If sample hose with a diameter other than three inch diameter is used then adjust the allowable amount of contaminate as follows:

$$\frac{(\text{mg/100 ml results}) (\text{Hose sample inside diameter})}{\text{adjusted}} = \text{mg/100 ml}$$

Three inch diameter of specified sample

4.7.1.5 Liner fuel discoloration. The liner shall be tested in accordance with ASTM D 156 and ASTM D 1500.

4.7.1.6 Liner low temperature. The liner material shall be subjected to minus forty (-40) plus or minus two (2) degrees Fahrenheit for five (5) hours and tested in accordance with ASTM D 380.

4.7.2 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 D 380.

4.7.2.1 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 D 380 and D 412.

4.7.2.2 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 D 1149. Examine specimen as specified in 3.4.2.3.

4.7.2.3 Cover volume change. The cover material shall not have more than eighty percent volume change after a 70 hour immersion in ASTM reference fuel B at 72 ± 2 degrees F and tested in accordance with ASTM D 380 and ASTM D 471.

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4.7.2.4 Cover low temperature resistance. The cover material shall not crack when subjected to minus forty (-40) plus or minus two (2) degrees Fahrenheit for five (5) hours and tested in accordance with ASTM D 380.

4.7.2.5 Cover material abrasion resistance. The abrasion resistance shall be ascertained using the procedures of ISO 4649, Method A and the results shall be within the limit specified in 3.4.2.6..

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

4.7.4. 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 hour 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 15,000 cycles on a thirty-six inch hose assembly at 72 ± 2 degrees F. 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 exceeding 0.03 inches in depth or failure of the hose lining have occurred.

5. PACKAGING

5.1 Packaging and marking. Packaging and marking shall be in accordance with ASTM D 3951 or as specified in the contract or purchase order. When specified in the contract or purchase order, Government packaging shall be as follows:

5.1.1 Preservation and packing. Hose assemblies shall be packaged in accordance with MIL-H-775.

5.2 Marking. Marking shall be in accordance with MIL-STD-129.

5.3 Special Markings. Shipping containers shall be marked in accordance with the following:

- a. Stock number
- b. Part Identifying Number (PIN) in accordance with MIL-STD-961
- c. Contract number
- d. Hose length, inside diameter, and working pressure

6. NOTES

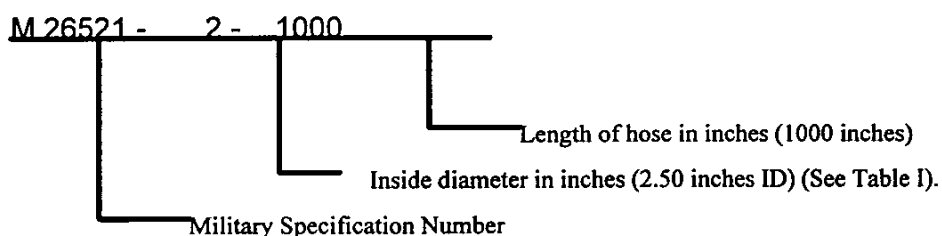
(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

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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 Ordering data.

6.2.1 The hose assembly ordering Part Identifying Number (PIN) shall be as follows:

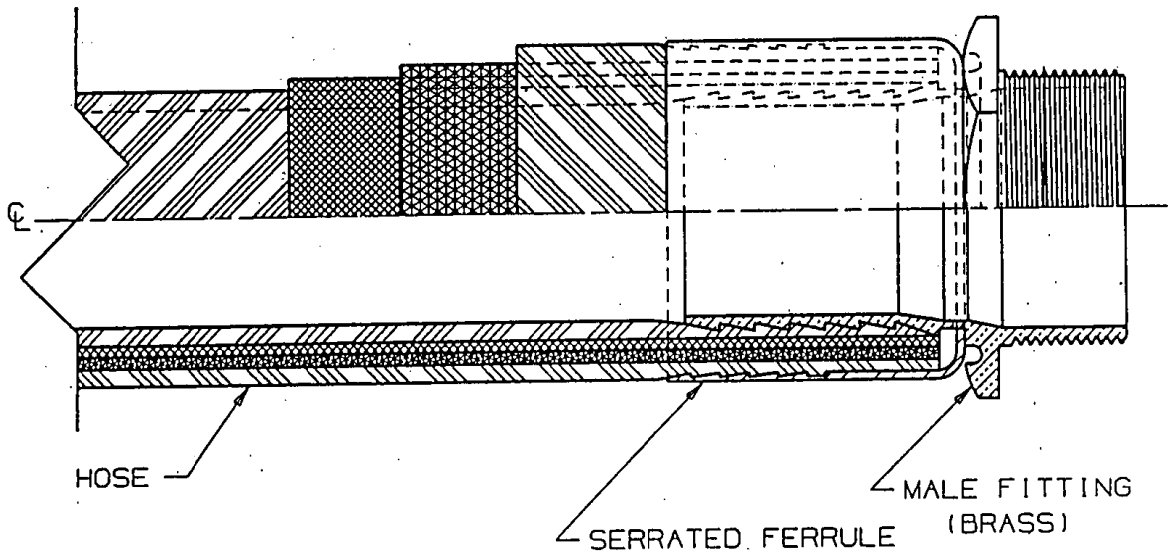


6.2.2 Acquisition requirements.

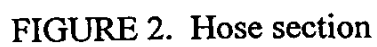
6.2.2.1 Acquisition documents for the hose assembly should specify the following:

- Title, number, and date of this specification
- Inside diameter required
- Length of hose assembly required
- Applicable levels of preservation, packaging and packing required

FIGURE 1. Permanent type coupler



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6.3 First article test waiver. First article tests may be waived if bidders have satisfactorily tested hose assembly to these MIL-H-26521J specification requirements and passed the tests for the particular size hose assembly under solicitation within twelve months of submittal of bid. (For additional information concerning first article test requirements, refer to 4.4.) Production conformance testing shall not be waived.

6.4 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.

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

6.6 Supersession data. Major changes for hose and couplings are as follows:

Rev F - MIL-C-38404 or MIL-C-27487, NPT male or NPSH female.

Rev G - MIL-H-26521G design/performance requirements.

Rev J - API 1529 male coupling, NPT threads only. MIL-C-27487. MIL-C-38404 is no longer applicable to hose covered by this specification.

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

Preparing activity:
Air Force - 82

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

(Project No. 4720-0065)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:		1. DOCUMENT NUMBER MIL-H-26521J	2. DOCUMENT DATE (YYMMDD) 21 June 95
3. DOCUMENT TITLE HOSE ASSEMBLY, NONMETALLIC, FUEL, COLLAPSIBLE, LOW TEMPERATURE WITH NON-REUSABLE COUPLINGS			
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) AUTOVON (if applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME SA-ALC/TILDD 485 QUENTIN ROOSEVELT RD KELLY AFB TX 78241		b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON	
c. ADDRESS (Include Zip Code)		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) 756-2340 AUTOVON 289-2340	