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DETAIL SPECIFICATION

HOSE AND HOSE ASSEMBLY, RUBBER, OIL AND GASOLINE, SUCTION AND DISCHARGE

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

1. SCOPE

1.1 Scope. This specification covers smooth-bore hose and hose assemblies for suction and discharge service in the transfer of fuels, such as Navy special fuel oil, diesel fuel, oil, jet fuel (JP-5 or JP-8), motor gasoline, and aviation gasoline. The hose is intended to handle petroleum products having an aromatic content no greater than 30 percent. The maximum working pressure of this hose is 150 pound-force per square inch (psi) (1 034 kilopascal (kPa)).

1.2 Classification. Hose covered by this specification is of one type, having a 4-, 6-, 8-, or 12-inch (102, 152, 203, or 305 millimeter (mm)) inside diameter (id), as specified (see 6.2).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Standards. The following standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

STANDARDS

FEDERAL

FED-STD-H28 - Screw-Thread Standards for Federal Services.
FED-STD-162 - Hose, Rubber, Visual Inspection Guide for.
FED-STD-601 - Rubber, Sampling, and Testing.

(Copies of these documents are available online at http://quicksearch.dla.mil.)

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Attn: VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to FluidFlow@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

ANSI B16.5	- Steel Pipe Flanges and Flanged Valves and Fittings Including Ratings for Class 150, 300, 400, 600, 900, 1,500 and 2,500.
ANSI B16.24	- Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1,500 and 2,500
ANSI/ASQ Z1.4	- Procedures, Sampling and Tables for Inspection by Attributes.

(Copies of these documents are available online at http://www.ansi.org.)

ASTM

ASTM B 26/B26	- Aluminum-Alloy Sand Castings.
ASTM B 443	- Nickel-Chromium-Molybdenum-Columbium Alloy Plate, Sheet, and Strip.
ASTM B 584	- Copper Alloy Sand Castings for General Applications.
ASTM D 297	- Rubber Products – Chemical Analysis.
ASTM D 380	- Testing Rubber Hose.
ASTM D 381	- Existent Gum in Fuels by Jet Evaporation.
ASTM D 412	- Tension Testing of Vulcanized Rubber.
ASTM D 413	- Rubber Property – Adhesion to Flexible Substrate.
ASTM D 471	- Rubber Property – Effect of Liquids.
ASTM D 573	- Rubber Deterioration in Air Oven.
ASTM D 1149	- Rubber Deterioration – Surface Ozone Cracking in a Chamber (Flat Specimens).
ASTM D 2702	- Rubber Chemicals – Determination of Infrared Absorption.
ASTM E 8/E8m	- Tension Testing of Metallic Materials.

(Copies of these documents are available online at http://www.astm.org.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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 (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term “recovered materials” means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

3.2.1 Rubber. The basic synthetic material used for the tube shall be a copolymer product. The basic synthetic materials used for the cover shall be of an oil-, abrasion-, oxidation weathering-, and sunlight-resistant material.

3.2.2 Wire reinforcement. The reinforcing wire or wires shall be round steel. The wire shall have the applicable tensile strength shown in table I when tested in accordance with 4.7.18.1. The wire shall be of such area as to enable the hose to meet the kink test specified in 3.9.

3.2.2.1 Flexibility of wire. The wire shall show no defects in the steel when tested as described in 4.7.18.2.

3.2.3 Carcass. Textile reinforcement of the hose shall be of synthetic fiber cord or woven fabric.

TABLE I. Physical properties of wire.

Wire diameter, inch	Tensile strength, psi	
	Minimum	Maximum
0.035 to 0.105 (1 to 3 (mm)) inclusive	180,000 (1 241 056 kPa)	300,000 (2 068 427 kPa)
More than 0.105 to 0.207 (3 to 5 mm) inclusive	150,000 (1 034 214 kPa)	240,000 (1 654 742 kPa)
More than 0.207 to 0.362 (5 to 9 mm) inclusive	120,000 (827 371 kPa)	210,000 (1 447 899 kPa)

3.2.4 Recycled, recovered environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Length. The length of hose shall be as specified (see 6.2), when measured in accordance with 4.7.1. The specified length shall be measured from face to face of the nipple, fitting, or coupling ends on hose.

3.3.1 Tolerances. For hose lengths over 20 feet (6 096 mm), a tolerance of ± 1 percent shall be permitted in the length of hose. For 20 feet (6 096 mm) and less, a tolerance of ± 2.5 inches shall be permitted.

3.4 Construction. The hose assembly shall be constructed as specified in 3.4.1 through 3.4.7 and in accordance with the dimensions and materials indicated in table II. The construction specified herein represents minimum requirements and is not intended to exclude hose having additional layers of textile reinforcement or compound, or hose having special sections of wire that will not sacrifice smoothness of bore or resistance to damage.

TABLE II. Physical requirements of hose.

Requirements	4-inch (102 mm) hose	6-inch (152 mm) hose	8-inch (203 mm) hose	12-inch (305 mm) hose
ID tolerance (plus or minus) inch (mm)	0.062 (2 mm)	+0.062 (+2 mm) -0.250 (-6 mm)	+0.062 (+2 mm) -0.250 (-6 mm)	+0.062 (+2 mm) -0.250 (-6 mm)
Thickness of tube – inch (mm) (min)	0.110 (3 mm)	0.110 (3 mm)	0.125 (3 mm)	0.125 (3 mm)
Thickness of cover – inch (mm) (min)	0.093 (2 mm)	0.110 (3 mm)	0.110 (3 mm)	0.110 (3 mm)
Minimum bend radii under pressure (feet (mm))*	3.5 (1 067 mm)	5.25 (1 600 mm)	7.0 (2 134 mm)	10.75 (3 277 mm)

* Does not apply to hose less than 25 feet (7 620 mm) long in 12-inch (305 mm) size.

3.4.1 Hose body. In addition to the description of materials specified in table II, the body of the hose shall consist of the following:

a. A synthetic rubber inner tube, properly compounded to resist motor gasoline, aviation gasoline, jet fuel (JP-5 or JP-8), petroleum oils, and salt water, as noted in 1.1 and as specified in 3.2.1.
b. Reinforcement shall consist of either braided or spiraled yarn or multiple plies of cord or woven fabric.
c. A helix of round wire or wires thoroughly embedded in synthetic rubber, as specified in 3.2.1, and connected to the hose nipple by a suitable wire to ensure static bond.
d. Reinforcement as described under b. shall be applied over the helix or wire.
e. An oil- and abrasion-resistant synthetic rubber cover compounded in accordance with 3.2.1 to give maximum resistance to oil, abrasion, oxidation weathering, and sunlight aging.

3.4.2 Tube and cover. The tube shall be smooth and free from pitting. The tube and cover shall be of uniform thickness and free from foreign substances. Phosphate plasticizers shall not be used in this product. The gage shall be in accordance with table II.

3.4.3 Rubber filling strip. The space between adjacent wires shall be filled with strips of a synthetic rubber compound.

3.4.4 Hose ends.

3.4.4.1 Hand-built wire reinforced construction. Hose ends on the hand-built wire reinforced hose shall be capped by application of the synthetic rubber compound used in the cover of the hose. The end configuration may be square, using the cover compound for a cap, or the end may be tapered so the cover compound will continue to the hose nipple. Each length of hose shall be fitted with either a nipple with flanges attached or swaged-on permanent-type couplings with flanges attached. Unless otherwise specified (see 6.2), the 4-inch (102 mm) size shall have integral swivel couplings (male and female) attached.

3.4.4.2 Horizontal braided/spiraled wire reinforced construction. Hose ends on the horizontal braided/spiraled-wire reinforced hose shall be sealed using the same compound used in the cover of the hose. Each length of hose shall be fitted with swaged-on permanent-type couplings, and shall have flanges attached thereto (see 6.5).

3.4.5 Textile reinforcement. Cotton of synthetic cord or woven fabric shall be free form unsightly defects, dirt, knots, lumps, and irregularities of twist.

3.4.6 Nipples and flanges. For oil transfer, steel, bronze, or brass nipples and flanges, or integral flanged aluminum-alloy nipples may be used. For gasoline, JP-5 and JP-8 transfer, bronze, brass, or integral flanged aluminum-alloy nipples and flanges shall be used, as specified (see 6.2). The steel nipples shall be cut from standard pipe and the exterior ends shall be consistent with the type of flanges to be used with regards to fastening. If the nipple is threaded, it shall be in accordance with FED-STD-H28. Two bands shall be welded or shrunk not less than 2 inches (51 mm) apart on the exterior of the nipple. The steel flanges shall be screwed, welded, or welded slip-on type of forged steel in the 150-pound (68 kilograms (kg)) class, with dimensions, facings, and drillings in accordance with ANSI B16.5 Bronze and brass flanges shall be screwed, welded, or welded slip-on type in the 150-pound (68 kg) class with dimensions, facings, and drillings in accordance with ANSI B16.24. Use of epoxy resin as a thread sealant is acceptable.

3.4.6.1 Integral flanged aluminum-alloy nipples. The composition of the integral flanged aluminum-alloy nipple shall conform to ASTM B 443.0 alloy temper F. The nipple shall be reinforced to withstand usage comparable to that of the steel specified in, or alloy 356.0 temper T6 of ASTM B 26/B26. The fillet of the flanged nipple shall be reinforced to withstand usage comparable to that of the steel specified in 3.4.6. The nipple portion of the aluminum-alloy nipple shall have cast bands on the exterior of the nipple.

Nipples shall be made an integral part of the hose by means of a round, steel wire spiraled over the textile carcass over the nipple area. The helix wire or wires shall be carried over the nipple area to provide additional anchorage. End blocks of plies of fabric impregnated with synthetic rubber compound shall be applied over the nipple area tapering into the hose body. The integral swivel couplings shall be secured to the 4-inch (102 mm) hose in the same manner and shall protrude 12 inches (305 mm) into the hose. As an option, assemblies may be assembled using aluminum-alloy pipe with aluminum bands welded on and forged aluminum-alloy slip-on welding flanges. The assemblies shall maintain strength and tightness. The flange dimensions and drillings shall be the same as specified for steel flanges except that the flange shall not have a raised face.

3.4.7 Integral swivel connection couplings. The integral swivel couplings for the 4-inch (102 mm) hose shall have two bands cast, brazed, or shrunk into the exterior. Construction shall be such that the integral nipples shall interface with the hose in the same manner as do the nipples. The composition of the integral swivel couplings shall conform to ASTM B 584, copper alloy, UNS No. C 84400.

3.5 Resistance to vacuum. The hose shall not collapse or blister or show any other indication of failure when subjected to a vacuum as specified in 4.7.4.

3.6 Volume swell of tube and cover compound. The percentage of swelling of the tube and cover in the special testing fuel, as determined by the method specified in 4.7.11, shall be not greater than 50 percent for the tube and 80 percent for cover.

3.7 Soluble nonvolatile requirement of tube compound. When tested as described in 4.7.16, the soluble nonvolatile matter in the tube shall be not greater than 6 percent.

3.8 Hydrostatic pressure requirements.

3.8.1 Hydrostatic proof pressure. Each hose shall be tested as described in 4.7.5 and shall withstand an internal pressure of 250 psi (1 724 kPa) without leakage or indication of weakness or deterioration.

3.8.2 Stability (dimensional changes). When subjected to the 250 psi (1 724 kPa) hydrostatic pressure test of 4.7.5, the hose shall not change in length more than 7.5 percent of the original length. The permanent elongation shall be not greater than 2.5 percent.

3.8.3 Minimum bend test. A length of hose, when tested as specified in 4.7.6, shall not be damaged.

3.8.4 Burst pressure. The hose shall have a burst pressure of not less than 600 psi (4 137 kPa). The burst test shall be conducted in accordance with 4.7.7. The hose assembly shall not leak at fittings or show any signs of slippage of the couplings before the hose fails.

3.9 Kink test. A length of hose shall be subjected to the test described in 4.7.8 and shall not kink or flatten under this test at no internal pressure.

3.10 Electrical conductivity. A low-resistance connection shall be provided by bonding the nipples to the built-in hose reinforcing wire or wires. The wire shall be so applied that the bonding will not be broken by flexing of the hose in service, and will ensure elimination of static at all times.

3.11 Physical properties of tube and cover.

3.11.1 Tube and cover before aging or immersion. Prior to subjection to the immersion and aging tests specified in 4.7.10 and 4.7.12, the tensile strength of the tube shall be not less than 1,250 psi (8 618 kPa). The tensile strength of the cover shall be 1,800 psi (12 411 kPa) when tested as specified in 4.7.9. The ultimate elongation of the tube and cover of the hose shall be not less than 250 percent for the tube and 300 percent for the cover when tested in accordance with 4.7.9.

3.11.2 Tube and cover after immersion. After subjection to the immersion test specified in 4.7.10, the tensile strength of the tube and cover shall be not less than 40 percent of the original tensile strength or 600 psi (4 137 kPa) (whichever is greater). Elongation shall be not less than 150 percent.

3.11.3 Tube and cover after accelerated aging of compounds. After aging as specified in 4.7.12, the tensile strength of the tube and cover shall be not less than 80 percent of the original tensile strength. After aging as specified in 4.7.12, the ultimate elongation of the tube and cover shall be not less than 50 percent of the original ultimate elongation.

3.12 Adhesion. The adhesion between the component parts of the hose shall conform to the requirements listed in table III, when tested as specified in the referenced paragraphs.

TABLE III. Minimum loads for adhesion test.

Adhesion Pounds-force per inch (lb-f/in) (kPa) minimum	Tube	Cover	Reinforcement plies	Test paragraphs
Initial	23 (159 kPa)	23 (159 kPa)	23 (159 kPa)	4.7.1.14
After filling	17 (117 kPa)	17 (117 kPa)	17 (117 kPa)	4.7.15

3.13 Ozone resistance of hose cover. The cover stock of the hose at the end of the exposure time (see 4.7.13) shall show no visible cracking under 7X magnification.

3.14 Identification marking. Each length of hose shall be branded with manufacturer's name and trademark and the month and year of manufacture. The words "Oil and Gasoline Suction and Discharge 150 psi" (1 034 kPa) shall be inlaid in the cover and vulcanized thereto. Hose 25 feet (7 620 mm) or greater in length shall have brands inlaid in the cover at two places on each length beginning 4 feet (1 219 mm) from the ends. The letters shall be not less than 0.250-inch (6 mm) high. Hose less than 25 feet (7 620 mm) in length shall have one inlaid brand approximately in the center.

4. VERIFICATION

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

a. First article inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 First article inspection. The first article inspection shall be performed on one sample hose length when a first article is required (see 3.1, 6.2, and 6.3). This inspection shall include the examination of 4.6 and the tests of 4.7. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract. In addition to the first article, the following shall be submitted: a 2-foot (610 mm) length of hose, without helix wire for the adhesion test; 6 feet (1 829 mm) of helix wire for tensile strength and flexibility test; and an 8-foot (2 438 mm) length of hose with couplings for the burst test.

4.3 Conformance inspection. The quality conformance inspection shall include the examination of 4.6 and the tests of 4.7. This inspection shall be performed on the samples selected in accordance with 4.5.

4.4 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.5 Sampling. Sampling and inspection procedures shall be in accordance with ANSI Z1.4. All hose and hose assemblies of the same type and size offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.5.1 Sampling for examination. Guidance for inspection level and an Acceptance Quality Level (AQL) is provided in 6.6.1.

4.5.2 Sampling for tests.

4.5.2.1 Sampling for length, inside diameter, resistance to vacuum, minimum bend and kink test. Guidance for inspection level and AQL is provided in 6.6.2.

4.5.2.2 Sampling for hydrostatic and electrical conductivity tests. All hose submitted shall be subjected to the hydrostatic and electrical conductivity tests specified in 4.7.5.

4.5.2.3 Sample for adhesion tests. A 2-foot (610 mm) length of hose identical to the hose submitted for the lot, except that it shall be without helix wire and nipples, shall be submitted for the adhesion tests specified in 4.7.14 and 4.7.15.

4.5.2.4 Sample for adhesion tests. The manufacturer shall submit 6 feet (1 829 mm) of wire taken from the same lot of wire used in the manufacture of the hose submitted for the tensile strength and flexibility test specified in 4.7.18.

4.5.2.5 Sample for physical tests. An 8-foot (2 438 mm) length of hose with couplings identical to the hose submitted for the lot shall be submitted for the burst test specified in 4.7.7. At the completion of the burst test, additional tests shall be conducted as specified in 4.7.3, 4.7.9 through 4.7.13, 4.7.16, and 4.7.17 on an undamaged section of the 8-foot (2 438 mm) sample of hose submitted for the burst test.

4.6 Examination. Each of the sample hose lengths selected shall be visually and dimensionally examined to determine conformance with all the requirements of this specification not involving tests. The classification of defects in FED-STD-162 shall be used to determine and evaluate defects through visual inspection. In addition to the defects listed in FED-STD-162, the hose sample shall be examined for the following defect: (Minor) Marking not as specified (see 3.14).

4.7 Tests.

4.7.1 Length. Hose selected shall be measured for length including fittings (see 3.3).

4.7.2 Inside diameter. Hose selected shall have the id measured in accordance with ASTM D 380 to determine conformance to table II.

4.7.3 Tube and cover thicknesses. The thicknesses of the tube and cover shall be measured on specimens removed from each end of the hose section obtained in accordance with 4.5.2.5 to determine conformance to 3.4. The thicknesses shall be determined by the procedures given in ASTM D 380. The respective values found for the tube thickness shall not be averaged, but shall be regarded as independent measurements, each of which shall meet the requirement. The respective values for the cover thicknesses shall be treated in the same manner.

4.7.4 Resistance to vacuum. Hose selected shall be subjected for 5 minutes to a vacuum test equivalent to 20 inches (508 mm) of mercury. One end of the hose shall be equipped with a transparent cap and an electric light shall be used to permit visual examination for collapse or failure.

4.7.5 Hydrostatic pressure test. Each length of hose, complete with fittings, flanges, or adapters (or all), shall be subjected to a 250 psi (1 724 kPa) pressure test as follows:

a. Lay out the hose as straight as possible.
b. Fill with water, venting to remove all air and apply a pressure of 10 psi (69 kPa).
c. Mark off a test length of 50 inches (1 270 mm), clear of the end reinforcement, for later measurement of elongation.
d. Increase the pressure, over a period of 5 minutes, from 10 psi (69 kPa) to half the test pressure of 250 psi (1 724 kPa), (125 psi (862 kPa)), hold this for 10 minutes, then reduce pressure over a period of 5 minutes to zero.
e. Raise the pressure over a period of 5 minutes to the full test pressure of 250 psi (1 724 kPa), and hold it for 10 minutes.
f. Before releasing the full test pressure, measure the distance between the test marks to ascertain the temporary elongation and record the increase as a percentage of the original length measured at 10 psi (69 kPa).
g. Electrical conductivity: While subjected to 250 psi (1 724 kPa) pressure, each length of hose shall be tested for electrical conductivity in an electrical circuit. Any hose that does not meet electrical conductivity requirements (see 3.10) shall be rejected.
h. Reduce pressure over a period of 5 minutes to zero.
i. On the first hose tested in each lot, after an interval of not less than 15 minutes, raise the pressure again to 10 psi (69 kPa). Measure the distance between the test marks to ascertain the permanent elongation and record the increase as a percentage of the original length measured at 10 psi (69 kPa). No other hose in the lot will require testing provided that this hose meets the permanent elongation requirement. If the hose does not meet the permanent elongation requirement, all hose in the lot shall be tested.

4.7.6 Minimum bend test under pressure. Hose selected shall be subjected to 150 psi (1 034 kPa) hydrostatic pressure and bent to the appropriate radius specified in table II.

4.7.7 Burst pressure test. A hydrostatic pressure shall be applied equal to four times the working pressure of 150 psi (1 034 kPa) (600 psi (4 137 kPa)). This pressure shall be attained at a uniform arate of not less than 300 psi (2 068 kPa) and not greater than 1,000 psi (6 895 kPa) per minute. The pressure shall then be raised until the hose fails; the pressure at which it fails shall be recorded.

4.7.8 Kink test. Empty hose when laid out on a flat surface in a curve drawn with a radius as given in table II, shall attain this curved position without kinking or flattening.

4.7.9 Initial tensile properties. Initial tensile strength and ultimate elongation shall be determined by the procedure given in ASTM D 412, using specimens cut with die C.

4.7.10 Tensile properties after immersion. The tensile strength and ultimate elongation after immersion in ASTM D 471 reference fuel B for 70 ± 0.50 hours at 73 ± 4 degrees Fahrenheit (°F) (23 ± 2 degrees Celsius (°C)) shall be determined in accordance with ASTM D 471, using specimens cut with die C of ASTM D 412. Tensile strength shall be based on the swollen cross sectional area of the specimen.

4.7.11 Volume change after immersion. The change in volume of samples of the tube and cover after immersion in ASTM D 471 reference fuel B for 70 ± 0.50 hours 73 ± 4°F (23 ± 2°C) shall be determined in accordance with ASTM D 471. The change in volume shall be reported as a percent of the original volume.

4.7.12 Accelerated aging of compounds. The resistance of the tube and cover to accelerated aging shall be determined in accordance with ASTM D 573, using specimens cut with die C of ASTM D 412, except that the time aging shall be 70 ± 0.50 hours at 212°F (100°C). Tensile strength and ultimate elongation tests shall be used to determine the amount of deterioration.

4.7.13 Resistance to ozone. The sample of cover stock shall be tested for ozone resistance in accordance with procedure B of ASTM D 1149, except that after conditioning for 24 hours in an ozone-free atmosphere the looped sample shall be exposed for 72 hours at 104 ± 4°F (40 ± 2°C) to an atmosphere containing 50 parts per hundred million of ozone.

4.7.14 Initial adhesion. The adhesion of the tube and cover to the reinforcement, and of the plies of reinforcement to each other, shall be determined in accordance with the machine method of ASTM D 413.

4.7.14.1 Specimens. Strip or ring specimens shall be prepared in accordance with ASTM D 380, except that the specimen shall be not less than of 8 inches (203 mm) in length. For determining adhesion between plies of reinforcement, the plies to be separated must be at opposing angles. Three specimens of each interface shall be tested.

4.7.15 Adhesion after filling. A 12-inch (305 mm) length of the hose shall be suitably stoppered and filled with aromatic hydrocarbon fluid conforming to ASTM D 471 reference fuel B, and maintained at a temperature of +75°F, ± 5°F (+23°C, ± 3°C) for 48 hours. Ring specimens, as described in ASTM D 413, shall be cut from the 12-inch (305 mm) piece of hose and tested in accordance with ASTM D 413 (machine method) within 15 minutes after the removal of the test fluid. Nonconformance to 3.12 shall constitute failure of this test.

4.7.16 Nonvolatile extractable material.

4.7.16.1 Test specimen. Each specimen shall consist of strips about 0.063-inch (2 mm) square by 2 inches (51 mm) long, totaling about 5 grams in weight, cut from buffed pieces of the tube of the hose.

4.7.16.2 Procedure. The specimens shall be weighed and placed in an extraction thimble in the block tin condenser extraction apparatus shown in ASTM D 297, figure 1. One hundred milliliter (mL) of ASTM reference fuel A of ASTM D 471 shall be added to the flask. The specimen shall be extracted for 46 ± 0.50 hours at such a rate that 2.50 to 3.50 minutes are required to fill and empty the extraction cup. The extract shall be poured into a weighed container. The specimen and flask shall be rinsed with 25 mL of fresh fuel A and the wash added to the extract. The nonvolatile residue shall be determined from the extract according to ASTM D 381, except that the evaporation time shall be 45 minutes. The weight of the residue shall be expressed as percent of the original weight of the specimen. The test shall be performed in duplicate and results averaged.

4.7.17 Phosphate plasticizer test. Phosphate plasticizer shall be determined qualitatively in accordance with method 15825 of FED-STD-601. Use a small piece of clean sodium about the size of a pea, a test tube about 3 inches (76 mm) long, and the specimens of the residue remaining after a nonvolatile extractable material test as specified in 4.5.16. The procedure shall be repeated if phosphorus is found, omitting addition of the nonvolatile extractable material in order to determine whether phosphorus was present in any form in any of the reagents used.

4.7.17.1 Phosphate plasticizer test, alternate method. An alternate method for determining phosphate plasticizer qualitatively shall be in accordance with ASTM D 2702. Use the specimen of residue remaining after the nonvolatile extractable material test as specified in 4.7.16. The procedure shall be repeated if phosphorus is found, omitting the addition of the nonvolatile extractable material in order to determine whether phosphorus was present in any form in any of the reagents used.

4.7.18 Helix wire.

4.7.18.1 Tensile strength. The tensile strength of the wire shall be determined in accordance with ASTM E8/E8m.

4.7.18.2 Flexibility. The helix wire or wires shall be wrapped six full tight turns around a mandrel of a diameter three times the diameter of the wire. The wrapped wire shall show no defects in the steel after wrapping. Flaking or peeling of wire coating shall not be considered a defect.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. Hose and hose assembly are intended for use in the transfer of oil and gasoline from anchored tankers and barges to shore stations capable of handling discharge pressures up to 150 psi (1 034 kilopascal (kPa)).

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Size and length of hose required (see 1.2 and 3.3).
c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
d. When first article is required for inspection and approval (see 3.1 and 4.2).
e. Whether end connections different from those specified herein are required (see 3.4.4.1).
f. Whether bronze or integral flanged aluminum alloy nipples and flanges are to be used (see 3.4.6).
g. Packaging requirements (see 5.1).

6.3 First article. When a first article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor's current inventory as specified in 4.1. The first article should consist of one hose or hose assembly. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.4 Part or Identifying Number (PINs). The specification number and size are combined to form PINs for hose and hose assembly covered by this document (see 1.2). PINs for the hose and hose assembly are established as follows:

	MP17505F	X	X	XX	XX
Federal specification number					
Hose size code letter (see 6.4.1)					
End connections code number (see 6.4.2)					
Length in feet (mm)					
Length in inches (mm)					

6.4.1 Hose size. Hose size is designated by one code letter (see table IV).

TABLE IV. Hose size code letter.

Hose size code letter	A	B	C	D
Hose id (inches (mm))	4 (102 mm)	6 (152 mm)	8 (203 mm)	12 (305 mm)

6.4.2 End connections material. Material of hose is designated by a one-digit code number (see table V).

TABLE V. Hose end connections material code numbers.

End connection material code number	End connections	Material		
		Nipple	Flange	Swivel coupling
1	Flanges and nipples	Steel	Steel	
2	Flanges and nipples	Aluminum	Aluminum	
3	Flanges and nipples	Bronze	Bronze	
4	Flanges and nipples	Brass	Brass	
5	Swivel couplings and nipples			Composition A of MIL-F-19488

6.5 End fittings. The 4-inch integral swivel couplings as specified in 3.4.4.1 and 3.4.7 may be obtained from Moon-Allenco, Easton, PA, with the designation “2950 Integral Nipples.” End fittings specified in 3.4.4.2 may be obtained from Mulconroy Division, Dixon Valve and Coupling Company, Philadelphia, PA, with the designation Mulconroy style TM “Holedall” coupling.

6.6 Sampling procedures.

6.6.1 Sampling for examination. Examination should be based on inspection level II and Acceptable Quality Level (AQL) of 2.5 percent defective for major defects and 4.0 percent defective for minor defects (see 4.5.1).

6.6.2 Sampling for length, inside diameter, resistance to vacuum, minimum bend and kink tests. Tests specified in 4.7.1, 4.7.2, 4.7.4, 4.7.6, and 4.7.8 should be based on inspection level II and AQL of 2.5 percent defective (see 4.5.2).

6.7 Supersession data. This specification replaces Military Specification MIL-H-17505E(NAVY) dated 16 April 1990.

6.8 National Stock Numbers (NSNs). The following is a list of NSNs assigned which correspond to this federal specification. The list may not be indicative of all possible NSNs associated with the federal specification.

NSN	Nomenclature
4720-00-034-7813	Hose Assembly, Nonmetallic.
4720-00-200-0351	Hose Assembly, Nonmetallic.
4720-00-200-0353	Hose Assembly, Nonmetallic.
4720-00-230-6516	Hose Assembly, Nonmetallic.
4720-00-289-1408	Hose Assembly, Nonmetallic.

6.9 Subject term (key word) listing.

Fuels
Petroleum transfer

6.10 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website at http://www.epa.gov/osw/hazard/wastemin/priority.htm. Included in the list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see Section 3).

6.11 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

CONCLUDING MATERIAL

Custodian:
Navy – YD

Preparing Activity:
DLA-CC

Review Activities:
Navy – SH

(Project 4720-2014-046)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.