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INCH-POUND

MIL-H-17505E(NAVY)
16 April 1990
SUPERSEDING
MIL-H-17505D(NAVY)
6 December 1985

MILITARY SPECIFICATION

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

This specification is approved for use by the Department of the Navy, and is available 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), 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).

1.2 Classification. Hose covered by this specification will be of one type.

1.2.1 Size. Hose covered by this specification will be the inside diameter (ID) sizes listed in table II, as specified (see 6.2).

1.2.2 Part identifying number. See 6.5 and tables IV and V.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, Port Hueneme, CA 93043-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC/NA 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 specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

MILITARY

MIL-H-775 - Hose, Hose Assemblies; Rubber, Plastic, Fabric, or Metal (Including Tubing) and Associated Hardware: Packaging of

STANDARDS

FEDERAL

FED-STD-H28 - Screw-Thread Standards for Federal Services.
FED-STD-151 - Metal, Test Methods.
FED-STD-162 - Hose, Rubber, Visual Inspection Guide for.
FED-STD-601 - Rubber, Sampling, and Testing.

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from 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 which is current on the date of 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, 1500, and 2500.
ANSI B16.24 - Bronze Flanges and Flanged Fittings, 150 and 300 Pound.

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 26/B26M - Aluminum-Alloy Sand Castings.
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 518 - Rubber Deterioration - Surface Cracking.
ASTM D 573 - Rubber Deterioration in Air Oven.
ASTM B 584 - Copper Alloy Sand Castings for General Applications.
ASTM D 1149 - Rubber Deterioration - Surface Ozone Cracking in a Chamber (Flat Specimens).
ASTM D 2702 - Rubber Chemicals - Determination of Infrared Absorption.

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

(Non-Government standards and other publications are normally available from the organizations 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 specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.2.1 and 6.4).

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 products 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 are allowed under this specification.

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3.2.1 Rubber. The basic synthetic material used for the tube shall be a copolymer product of butadiene and acrylonitrile. The basic synthetic materials used for the cover shall be polymerized chloroprene or an equally oil, abrasion, and sunlight resisting material.

3.2.2 Wire reinforcement. The reinforcing wire or wires shall be round, galvanized, coppered, or unfinished (bright) steel wire having the applicable tensile strength shown in table I when tested in accordance with 4.5.18.1. The wire shall be of such area as to enable the hose to meet the kink test specified in 3.9.

TABLE I. Physical properties of wire.

Wire diameter, inch	Tensile strength, psi	
	Minimum	Maximum
0.035 to 0.105 inclusive	180,000	300,000
More than 0.105 to 0.207 inclusive	150,000	240,000
More than 0.207 to 0.362 inclusive	120,000	210,000

3.2.2.1 Flexibility of wire. The wire shall show no defects in the steel when tested as described in 4.5.18.2.

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

3.3 Length. The length of hose shall be as specified (see 6.2), when measured in accordance with 4.5.1. 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 (ft) a tolerance of ± 1 percent (%) shall be permitted in the length of hose. For 20 feet and under, a tolerance of ± 2.5 inch (in.) shall be permitted.

3.4 Construction. The hose assembly shall be constructed as specified in 3.4.1 through 3.4.8 and in accordance with the dimensions and materials indicated in table II.

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TABLE II. Physical requirements of hose.

	4-inch hose	6-inch hose	8-inch hose	12-inch hose
ID tolerance (plus or minus) inch	±0.062	+0.062 -0.250	+0.062 -0.250	+0.062 -0.250
Thickness of tube - inch (min)	0.110	0.110	0.125	0.125
Thickness of cover - inch (min)	0.093	0.110	0.110	0.110
Minimum bend radii under pressure (feet)*	3.5	5.25	7.0	10.75

*Does not apply to hose less than 25 feet long in 12 inch 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) petroleum oils, and salt water, as noted in the scope of this specification and as specified in 3.2.1.
b. Reinforcement consisting of either braided or spiraled yarn or multiple plies of cord or woven fabric held together with rubber compound. The reinforcing plies shall be made of cotton or synthetic fibers.
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, such as a copper static wire to insure 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 light aging.

3.4.2 Tube and cover. The tube shall be smooth, free from pitting, and the tube and cover shall be of uniform thickness and be free of substances that may affect quality adversely. Phosphate plasticizers shall not be used in this product. The gage shall be in accordance with table II.

3.4.3 Construction. 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.

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

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3.4.5 Hose ends.

3.4.5.1 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 as shown in figure 1, 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 (see figure 1) or swaged-on permanent-type couplings (see figure 3) with flanges attached. Unless otherwise specified (see 6.2), the 4-inch size shall have integral swivel couplings (male and female) attached as shown in figure 2 (see 6.6).

3.4.5.2 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 (see figure 3), and shall have flanges attached thereto (see 6.6).

3.4.6 Textile reinforcement. Cotton or synthetic cord or woven fabric should be evenly and firmly applied and shall be free from unsightly defects, dirt, knots, lumps, and irregularities of twist.

3.4.7 Nipples and flanges. For oil transfer, steel, bronze, or brass nipples and flanges, or integral flanged aluminum-alloy nipples may be used. For gasoline and JP-5 transfer, bronze, 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 apart on the exterior of the nipple (see figure 1). The steel flanges shall be the screwed, welded, or welded slip-on type of forged steel in the 150 pound (lb) 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 lb class with dimensions, facings, and drillings in accordance with ANSI B16.24. Use of epoxy resin as a thread sealant is acceptable.

3.4.7.1 Integral flanged aluminum-alloy-nipples. The composition of the integral flanged aluminum-alloy nipple shall conform to alloy B443.0 temper F be reinforced to withstand usage comparable to that of the steel specified in or alloy 356.0 temper T6 of ASTM B 26/B 26M. The fillet of the flanged nipple shall be reinforced to withstand usage comparable to that of the steel specified in 3.4.7. The nipple portion of the aluminum-alloy nipple shall have cast bands on the exterior of the nipple in the position shown in figure 1, or may be assemblies made up from aluminum-alloy-pipe with aluminum bands welded on and forged aluminum-alloy slip-on welding flanges and shall be equivalent to that shown on figure 1 in maintaining 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.

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3.4.7.2 Method of securing nipple to hose. Nipples shall be made an integral part of the hose. This shall be accomplished by means of a round, copperized, galvanized, or unfinished (bright) steel wire spiraled over the textile carcass over the nipple area (see figure 1). The helix wire or wires shall be carried over the nipple area to provide additional anchorage and 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, as shown on figure 2, shall be secured to the 4-inch hose in the same manner and shall protrude 12 inches into the hose.

3.4.8 Integral swivel connection couplings. The integral swivel couplings, as shown in figure 2, for the 4-inch hose shall have two bands cast, brazed, or shrunk onto the exterior in positions shown for the nipple on figure 1 and of construction such that the integral nipples shall interface with hose in the same manner as do the nipples as shown in figure 1. Threads and dimensions shall be as shown in figure 2 except that the dimension from rubber washer outward left to swivel face shall be 13/16 inch and the thread length on external threads shall be 1-1/8 inch. 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 4.5.4.

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 4.5.11, 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 4.5.16, the soluble non-volatile matter in the tube shall not exceed 6 percent.

3.8 Hydrostatic pressure requirements.

3.8.1 Hydrostatic proof pressure. Each hose shall be tested as described in 4.5.5 and shall withstand an internal pressure of 250 psi without leakage or indication of weakness or deterioration.

3.8.2 Stability (dimensional changes). When subjected to the 250 psi hydrostatic pressure test of 4.5.5, the hose shall not change in length more than 7.5 percent of the original length. The permanent elongation shall not exceed 2.5 percent.

3.8.3 Minimum bend test. A length of hose, when tested as specified in 4.5.6, shall not be damaged.

3.8.4 Burst pressure. The hose shall have a minimum burst pressure of 600 psi. The burst test shall be conducted in accordance with 4.5.7. The hose assembly shall not leak at fittings or show any signs of slippage of the couplings before the hose fails.

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3.9 Kink test. A length of hose shall be subjected to the test described in 4.5.8 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 insure 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 4.5.10 and 4.5.12, the minimum tensile strength of the tube shall be 1,250 psi and the tensile strength of the cover shall be 1,800 psi when tested as specified in 4.5.9. 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 4.5.9.

3.11.2 Tube and cover after immersion. After subjection to the immersion test specified in 4.5.10, the tensile strength of the tube and cover shall be not less than 40 percent of the original tensile strength or 600 psi (whichever is greater) and elongation shall be at least 150 percent.

3.11.3 Tube and cover after accelerated aging of compounds. After aging as specified in 4.5.12, 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 4.5.12, 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) minimum	Tube	Cover	Reinforcement plies	Test paragraphs
Initial	23	23	23	4.5.14
After filling	17	17	17	4.5.15

3.13 Ozone resistance of hose cover. The cover stock of the hose at the end of the exposure time (see 4.5.13) shall show no visible cracking under 7X magnification.

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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" shall be inlaid in the cover and vulcanized thereto. Hose 25 feet or more in length shall have brands inlaid in the cover at two places on each length beginning 4 feet from the ends. The letters shall be at least 0.250-inch high. Hose less than 25 feet in length shall have one inlaid brand approximately in the center.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or 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 the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a 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.

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

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

a. First article inspection (see 4.2.1).
b. Quality conformance inspection (see 4.2.2).

4.2.1 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 6.4). This inspection shall include the examination of 4.4 and the tests of 4.5. 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 length of hose, without helix wire for the adhesion test; 6 feet of helix wire for tensile strength and flexibility test; and an 8 foot length of hose with couplings for the burst test.

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4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4, the tests of 4.5, and the packaging inspection of 4.6. This inspection shall be performed on the samples selected in accordance with 4.3.

4.3 Sampling. Sampling and inspection procedures shall be in accordance with MIL-STD-105. 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.

4.3.1 Sampling for examination. (See 6.7.1.)

4.3.2 Sampling for tests.

4.3.2.1 Sampling for length, inside diameter, resistance to vacuum, minimum bend and kink tests. (See 6.7.2.)

4.3.2.2 Sampling for hydrostatic and electrical conductivity tests. All hose submitted shall be subjected to the hydrostatic and electrical conductivity tests specified in 4.5.5.

4.3.2.3 Sample for adhesion tests. A 2 foot 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 4.5.14 and 4.5.15.

4.3.2.4 Sample for wire tests. The manufacturer shall submit 6 feet 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 4.5.18.

4.3.2.5 Sample for physical tests. An 8 foot length of hose with couplings identical to the hose submitted for the lot shall be submitted for the burst test specified in 4.5.7. At the completion of the burst test, additional tests shall be conducted as specified in 4.5.3, 4.5.9 through 4.5.13, 4.5.16, and 4.5.17 on an undamaged section of the 8 foot sample of hose submitted for the burst test.

4.4 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 3.15).

4.5 Tests.

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

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

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4.5.3 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 4.3.2.5 to determine conformance to 3.4. The thicknesses shall be determined by the procedure 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.

4.5.4 Resistance to vacuum. Hose selected shall be subjected for 5 minutes to a vacuum test equivalent to 20 inches 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.

4.5.5 Hydrostatic pressure test. Each length of hose, complete with fittings, flanges, or adapters (or all), shall be subjected to a 250 psi 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.
c. Mark off a test length of 50 inches, clear of the end reinforcement, for later measurement of elongation.
d. Increase the pressure, over a period of 5 minutes, from 10 psi to half the test pressure of 250 psi (125 psi) 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 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.
g. Electrical conductivity: While subjected to 250 psi 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 at least 15 minutes, raise the pressure again to 10 psi. 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. 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.

4.5.6 Minimum bend test under pressure. Hose selected shall be subjected to a 150 psi hydrostatic pressure and bent to the appropriate radius specified in table II.

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4.5.7 Burst pressure test. A hydrostatic pressure shall be applied equal to four times the working pressure of 150 psi (600 psi). This pressure shall be attained at a uniform rate of not less than 300 and not more than 1,000 psi per minute. The pressure shall then be raised until the hose fails; the pressure at which it fails shall be recorded.

4.5.8 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.

4.5.9 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.

4.5.10 Tensile properties after immersion. The tensile strength and ultimate elongation after immersion in ASTM Reference Fuel B for 70 ± 1/2 hours at 73 ± 4 degrees Fahrenheit (^{o}F) 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.

4.5.11 Volume change after immersion. The change in volume of samples of the tube and cover after immersion in ASTM Reference Fuel B for 70 ± 1/2 hours at 73 ± 4^{o}F shall be determined in accordance with ASTM D 471. The change in volume shall be reported as a percent of the original volume.

4.5.12 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 of aging shall be 70 ± 1/2 hours at 212^{o}F. Tensile strength and ultimate elongation tests shall be used to determine the amount of deterioration.

4.5.13 Resistance to ozone. The sample of cover stock shall be tested for ozone resistance in accordance with procedure B of ASTM D 518 and 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^{o}F to an atmosphere containing 50 parts per hundred million of ozone.

4.5.14 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.

4.5.14.1 Specimens. Strip or ring specimens shall be prepared in accordance with ASTM D 380, except that the specimen shall be a minimum of 8 inches 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.

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4.5.15 Adhesion after filling. A 12-inch 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 + 23°C, ±3°C (+75°F, ±5°F) for 48 hours. Ring specimens, as described in ASTM D 413, shall be cut from the 12-inch 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.

4.5.16 Nonvolatile extractable material.

4.5.16.1 Test specimen. Each specimen shall consist of strips about 1/16-inch square by 2 inches long, totaling about 5 grams in weight, cut from buffed pieces of the tube of the hose.

4.5.16.2 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 milliliters (mL) of ASTM Reference Fuel A of ASTM D 471 shall be added to the flask. The specimen shall be extracted for 46 ± 1/2 hours at such a rate that 2-1/2 to 3-1/2 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 type I fuel 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.

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

4.5.17.1 Phosphate plasticizer test, alternate method. An alternate method for determining phosphate plasticizer qualitatively shall be in accordance with ASTM D 2702 using the specimen of residue remaining after the nonvolatile extractable material test specified in 4.5.16. 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.

4.5.18 Helix wire.

4.5.18.1 Tensile strength. The tensile strength of the wire shall be determined in accordance with method 211.1 of FED-STD-151.

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4.5.18.2 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 the galvanized or coppered coating of the wire shall not be considered a defect.

4.6 Packaging inspection. The inspection of the preservation, packing, palletization, and marking of the hose shall be in accordance with the requirements of section 4 of MIL-H-775.

5. PACKAGING

5.1 Preservation, packing, and marking. Preservation, packing, and marking shall be in accordance with the requirements of MIL-H-775 with the level of preservation and the level of packing as specified (see 6.2). When specified (see 6.2), hoses shall be palletized.

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 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.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
c. Size and length of hose required (see 1.2.1 and 3.3).
d. When first article is required for inspection and approval (see 3.1).
e. Whether end connections different from those specified herein are required (see 3.4.5.1).
f. Whether flanges (and nipples) shall be steel (for oil service) or bronze or aluminum (for gasoline service) (see 3.4.7).
g. Level of preservation and level of packing required (see 5.1).
h. When palletization is required (see 5.1).
i. Definitive Military Specification Part Number (see 6.5).

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6.3 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.475-1 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

6.4 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 4.2.1. 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.

6.5 Part identifying number. The part identifying part number is a definitive part number which will be formulated to identify each item covered by this specification. The part number will be formulated by selecting from the requirement options available in this specification as follows:

Hose assembly.

Definitive military specification part number	M17505	X	X	XX	XX
Military specification number					
Hose size code letter (see 6.5.1)					
End connections code number (see 6.5.2)					
Length in feet					
Length in inches					

6.5.1 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)	4	[illegible]	[illegible]	12

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6.5.2 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 connections 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 nipple	Bronze	Bronze	
4	Swivel couplings and nipples			Composition A of MIL-F-19488

6.6 End fittings. The 4 inch integral swivel couplings as specified in 3.4.5.1 and 3.4.8 can be obtained from Moon-Allenco, Easton, PA., with the designation "2950 Integral Nipples." End fittings specified in 3.4.5.2 can be obtained from Mulconroy Division, Dixon Valve and Coupling Co., Philadelphia, PA., with the designation Mulconroy style TM "Holedall" coupling.

6.7 Sampling procedures.

6.7.1 Sampling for examination. Examination shall be based on inspection level II and an Acceptable Quality Level (AQL) of 2.5 percent defective for major defects and 4.0 percent defective for minor defects (see 4.3.1).

6.7.2 Sampling for length, inside diameter, resistance to vacuum, minimum bend and kink tests. Tests specified in 4.5.1, 4.5.2, 4.5.4, 4.5.6, and 4.5.8 shall be based on inspection level II and an AQL of 2.5 percent defective (see 4.3.2).

6.8 Subject term (key word) listing.

Marking
Petroleum transfer
Specifications
Tests

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

Custodian:
Navy - YD

Review Activities:
Navy - SH
DLA - CS

Preparing Activity:
Navy - YD

(Project 4720-N046)

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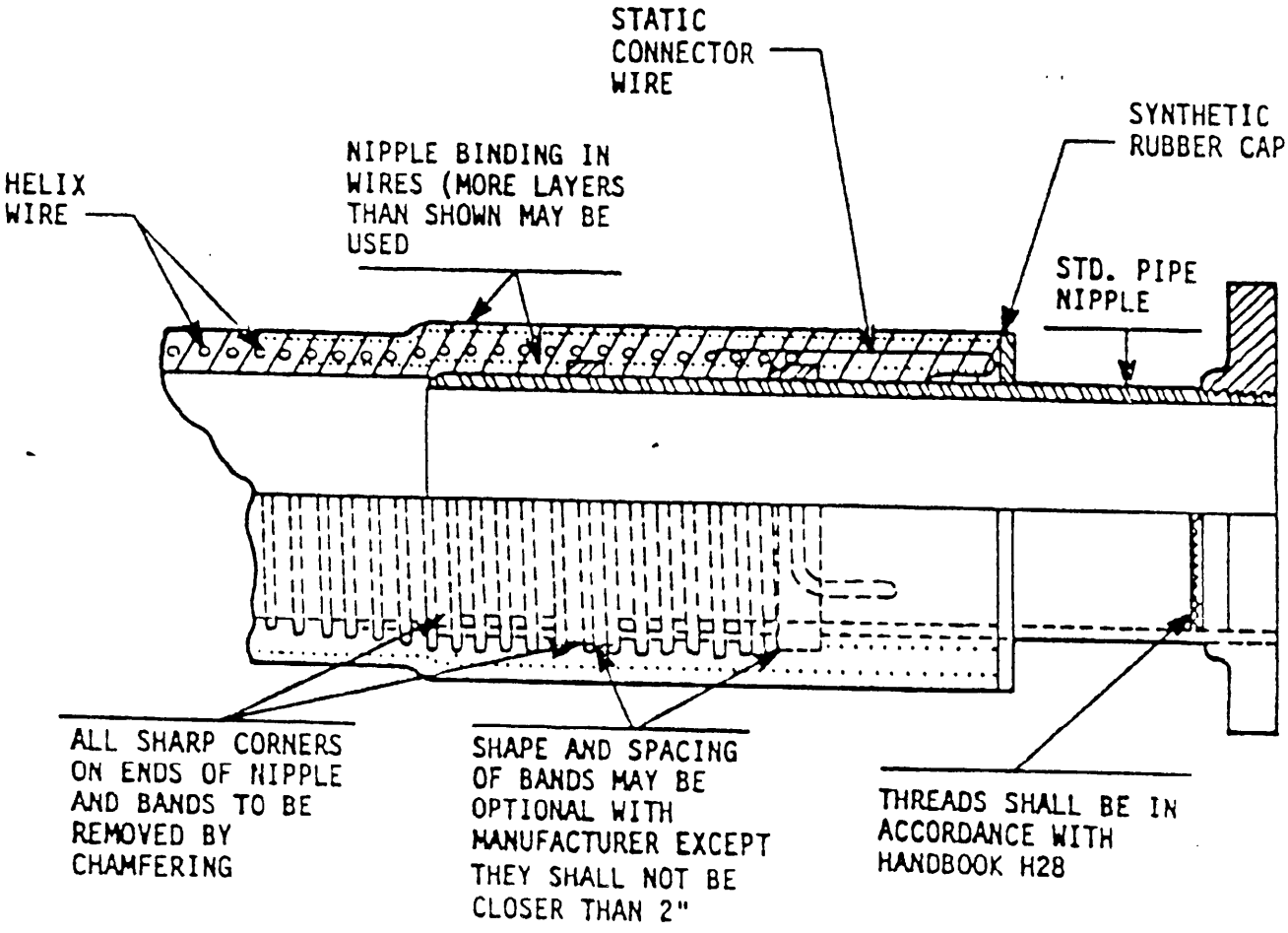

FIGURE 1. Method of securing nipple in hose.

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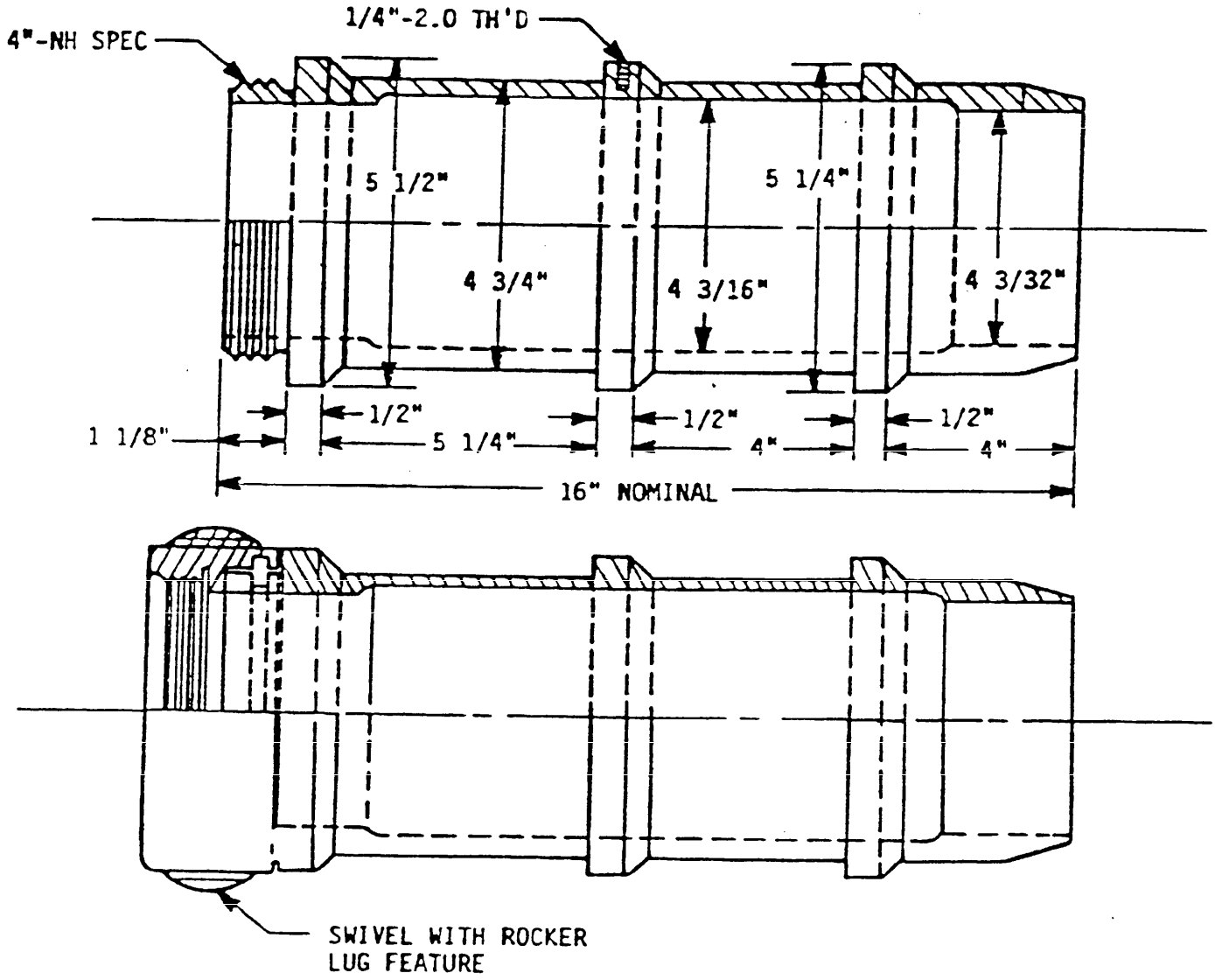

FIGURE 2. Swivel connection coupling for 4-inch hose.

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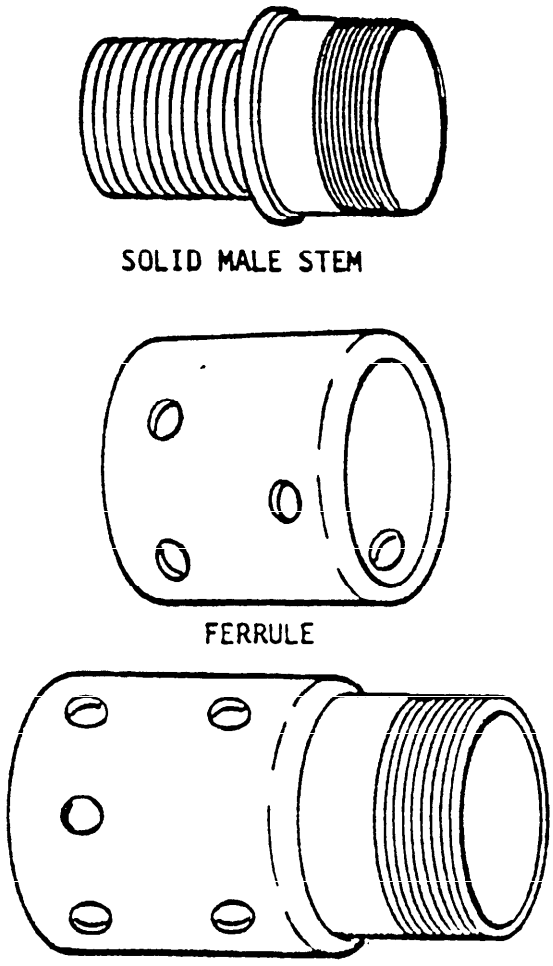

FIGURE 3. Swaged-on permanent type coupling.

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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.
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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	MIL-H-17505E(NAVY)	16 April 1990

3. DOCUMENT TITLE

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

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	b. TELEPHONE (Include Area Code)	
DR. HOWARD A. PORTE, Project Manager Equipment Criteria Development Division Civil Engineer Support Office	(1) Commercial (805) 982-5801 X-439	(2) AUTOVON 551-5801 X-439
ADDRESS (Include Zip Code) Naval Construction Battalion Center Code 1564H Port Hueneme, CA 93043-5000	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	