

INCH-POUND
MIL-DTL-20176G
7 November 1997
SUPERSEDING
MIL-H-20176F
19 May 1989

DETAIL SPECIFICATION

HOSE AND HOSE ASSEMBLY, RUBBER, SMOOTH BORE, LIGHT-WEIGHT SEWAGE DISCHARGE AND OILY WASTE 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, sewage discharge, and oily waste discharge rubber hose and hose assemblies.

1.2 Classification.

1.2.1 Types, classes, and sizes. Sewage hose and oily waste will be of the following types, classes, and sizes, as specified (see 6.2):

Type I - Sewage hose.

Size 1.5 - 1.5 inches (38.10 millimetre (mm)) nominal inside diameter (id).

Size 2.5 - 2.5 inches (63.50 mm) nominal id.

Size 4.0 - 4.0 inches (101.60 mm) nominal id.

Type II - Oily waste hose.

Size 2.5 - 2.5 inches (63.50 mm) nominal id.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data which may improve this document should be sent to: Commanding Officer (Code 15E2), Naval Construction Battalion Center, 1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

MIL-DTL-20176G

Class 1 - Noncollapsible.

Class 2 - Collapsible.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for 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 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 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 (see 6.2).

SPECIFICATION

FEDERAL

A-A-52506 - Clamps, Hose.

STANDARDS

MILITARY

MS27021 - Coupling Half, Quick Disconnect, Cam-Locking Type, Male, Hose Shank, Type II.
 MS27025 - Coupling Half, Quick Disconnect, Cam-Locking Type, Female, Hose Shank, Type VI.
 MS27028 - Coupling Half, Quick Disconnect, Cam-Locking Type, Cap, Dust, Type IX.
 MS27029 - Coupling Half, Quick Disconnect, Cam-Locking Type, Plug, Dust, Type X.

(Unless otherwise indicated, copies of the above specification and standards are available from the Defense Automated Printing Services, Attn: DoDSSP, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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

MIL-DTL-20176G

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-Z1.4 - Sampling Procedures and Tables for Inspection by Attributes.

(Application for copies should be addressed to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036.)

ASTM

- ASTM B 26/B26 - Aluminum-Alloy Sand Castings.
- ASTM B 271 - Copper-Base Alloy Centrifugal Castings.
- ASTM D 380 - Testing Rubber Hose.
- ASTM D 412 - Tension Testing of Vulcanized Rubber.
- ASTM D 413 - Adhesion of Vulcanized Rubber (Friction Test).
- ASTM D 471 - Change in Properties of Elastomeric Vulcanizates Resulting from Immersion in Liquids.
- ASTM D 518 - Surface Cracking of Stretched Rubber Compounds.
- ASTM D 573 - Accelerated Aging of Vulcanized Rubber by the Oven Method.
- ASTM D 1149 - Accelerated Ozone Cracking of Vulcanized Rubber.
- ASTM E 1282 - Standard Guide for Specifying the Chemical Compositions and Selecting Sampling Practices and Quantitative Analysis Methods for Metal and Alloys.

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

2.4 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 shall take 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 4.2.1 and 6.3.

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

MIL-DTL-20176G

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.

3.3 Construction.

3.3.1 Principal parts. Hose shall consist of the following:

- a. An inner rubber tube (see 3.3.2).
- b. An outer cover (see 3.3.2).
- c. Ply or plies of reinforcement material (see 3.3.3.1).
- d. A helix or helixes of round steel wire (class 1 only) (see 3.3.3.2).
- e. End fittings (see 3.3.4).

3.3.2 Rubber components. Rubber used in the inner tube, outer cover, and friction material shall meet the physical properties of table I and 3.6.4.

TABLE I. Physical properties of types I and II hose material.

Physical properties	Tube and cover	Reinforcement plies	Test requirements paragraph
Initial properties.			
Tensile strength, pounds per square inch (psi) (kilopascal (kPa)).	1400 (9 653 kPa)	--	4.5.10.1
Ultimate elongation percent minimum.	300	--	4.5.10.1
Adhesion, pounds (lb) (kilogram (kg) per inch (millimetre (mm)) of width, minimum.	12 (83 kg)	12 (83 kg)	4.5.10.5
Properties after immersion in test fluid.			
Tensile strength, psi (kPa) minimum.	1000 (6 895 kPa)	--	4.5.10.2
Ultimate elongation, percent minimum.	150	--	4.5.10.2
Volume increase, percent maximum.	100	100	4.5.10.4
Adhesion, lb (kg) per inch (mm) of width, minimum.	9 (62 kg)	9 (62 kg)	4.5.10.6
Properties after accelerated aging.			
Tensile strength, psi (kPa) minimum.	1200 (8 274 kPa)	--	4.5.10.3
Ultimate elongation, percent minimum.	200	--	4.5.10.3
Ozone resistance, hose cover.	No cracking		4.5.11

MIL-DTL-20176G

3.3.3 Reinforcement.

3.3.3.1 Fiber reinforcement. The fiber reinforcement shall consist of ply or plies of braided, knit, spiraled yarn, or plies of woven fabric.

3.3.3.2 Wire reinforcement (class 1 only). The reinforcing wire shall have the physical and dimensional properties required to enable the hose to conform to 3.6.3 and 3.6.5.

3.3.4 Hose ends. Unless otherwise specified (see 6.2), the ends shall be fitted with a male and female coupling as specified in 3.7.1. The coupling shall be secured with clamps specified in 3.7.3. When caps are specified (see 6.2), they will be furnished in accordance with 3.7.2. The cut ends of wire reinforcement shall be recessed or other adequate means provided to ensure that the hose will remain free from sharp or projected wires in normal use.

3.4 Dimensional and unit weight properties. Dimensions for and unit weight of hose shall conform to the requirements of table II when tested as specified in 4.6.2 through 4.6.4.

TABLE II. Dimension and weight properties.

Size id	1.50-inch (38 mm)	2.50-inch (64 mm)	4.00-inch (102 mm)
Tolerance, inch (mm), id	± 0.047 (± 1 mm)	± 0.062 (± 2 mm)	± 0.062 (± 2 mm)
Tube thickness, inch (mm), min	0.094 (2 mm)	0.094 (2 mm)	0.094 (2 mm)
Cover thickness, inch (mm), min	0.078 (2 mm)	0.078 (2 mm)	0.078 (2 mm)
Unit weight, pounds per foot (kg·m), maximum	1.5 (1 kg·m)	2.5 (1 kg·m)	3.0 (1 kg·m)

3.5 Length. Unless otherwise specified (see 6.2), hose shall be 50 feet (ft) (15 240 mm) in length. Fittings shall be considered additions to hose length, and not part of the length of hose. Residual length of 47 feet (14 326 mm) remaining after removal of sections for tests (see 4.4.2) shall be acceptable.

3.5.1 Tolerance. A tolerance of ± 1 percent in length shall be permitted when hoses are measured as specified in 4.6.1.

3.6 Physical properties.

3.6.1 Dimensional stability. When tested in accordance with 4.6.6, the hose shall not change in length more than 10 percent nor change in outside diameter (od) more than 18 percent. The twist shall be not more than 2 degrees per foot while the hose is under the proof pressure. The hose

MIL-DTL-20176G

shall retain no more than 5 percent change in length or 3 percent change in od after release of the pressure.

3.6.2 Tensile pull. The hose assembly shall be capable of withstanding a tensile pull of not less than the loads shown in table III for the applicable size when tested in accordance with 4.6.8.

TABLE III. Physical properties of hose assemblies at temperatures of 70 degrees Fahrenheit (°F) ± 4 °F (21 degrees Celsius (°C) ± 2 °C).

<u>Size of hose</u> (id) inches (mm)	<u>Test Loads</u>		<u>Flexibility</u> <u>bend radius</u> (min) inch (mm)	<u>Pressure psig</u> Working proof burst
	Tensile pull lb (kg)	Crush resistance lb (kg)		
1.5 (38.10 mm)	1,500 (680 kg)	225 (102 kg)	5.0 (127 mm)	150 (1 034 kPa (gage)) 300 (2 068 kPa (gage)) 600 (4 137 kPa (gage))
2.5 (63.50 mm)	2,000 (907 kg)	325 (147 kg)	6.0 (152 mm)	150 (1 034 kPa (gage)) 300 (2 068 kPa (gage)) 600 (4 137 kPa (gage))
4.0 (101.60 mm)	2,750 (1 247 kg)	325 (147 kg)	9.0 (229 mm)	100 (689 kPa (gage)) 200 (1 379 kPa (gage)) 400 (2 758 kPa (gage))

3.6.3 Flexibility.

3.6.3.1 Class 1. A length of hose with no internal pressure applied shall be subjected to the tests of 4.6.9.1. Hose shall not kink or flatten when subjected to the minimum bend radius given in table III.

3.6.3.2 Class 2. Hose shall be flexible enough to coil a 50-foot (15 240 mm) hose length into a diameter of not greater than 3.25 feet (991 mm) (see 4.6.9.2).

3.6.4 Low temperature bend. Specimens of the tube and cover shall not crack when tested as specified in 4.6.10.7.

3.6.5 Crush resistance, (class 1 only). When hose sections are tested as specified in 4.6.12 to the loads in table III for the appropriate size, the od shall be not less than 90 percent of the original od for the 1.5- and 2.5-inch (38 mm and 64 mm) sizes. The od shall be not less than 85 percent of the original od for the 4-inch (102 mm) size. Following release of the load, the smallest od shall be not less than 98 percent of the original od (see 4.6.12).

MIL-DTL-20176G

3.6.6 Hydrostatic proof pressure. When tested as specified in 4.6.5 at the appropriate proof pressure (see table III), the hose assemblies shall not leak nor show any imperfections in either the hose or the fittings. There shall be no indication of slippage or pullout of the fitting from the hose.

3.6.7 Burst pressure. When tested as specified in 4.6.7, each size hose or hose assembly shall have no failure of hose under the applicable minimum burst pressure shown in table III.

3.7 Fittings.

3.7.1 Quick-disconnect cam-locking couplings. Unless otherwise specified (see 6.2), hose shall be fitted with quick-disconnect cam-locking male and female brass couplings. Male couplings shall conform to MS27021, type II. Female couplings shall conform to MS27025, type VI. Brass male and female couplings shall be made of material conforming to ASTM B 271, alloy C83600 or C92200. When aluminum material is specified (see 6.2), couplings shall be made of hard-coated anodized aluminum conforming to ASTM B 26/B26, alloy 356.0, temper T6 (see 4.6.13).

3.7.2 Coupling caps. When specified (see 6.2), the male couplings shall be provided with MS27028, type IX dust caps, and the female couplings shall be provided with MS27029, type X dust plugs. Brass dust caps and dust plugs shall be made of material conforming to ASTM B 271, alloy C83600 or C92200. Aluminum dust caps and dust plugs shall be made of material conforming to ASTM B 26/B26, alloy 356.0, temper T6 (see 4.6.13).

3.7.3 Clamps. Unless otherwise specified (see 6.2), clamps shall be made of corrosion-resistant steel and shall conform to A-A-52506. Two 0.75-inch (19 mm) clamps shall be provided for each coupling on the 2.5- and 4-inch (64 and 102 mm) id hose. For the 1.5-inch (38 mm) id hose, either one 0.75-inch (19 mm) clamp or two 0.50-inch (13 mm) clamps shall be provided. The clamps shall be capable of holding couplings in place on the hose without slipping or leaking when subjected to the hydrostatic proof test specified in 4.6.5, and the pull force test specified in 4.6.8.

3.8 Marking. Each length of hose shall be marked with a color that contrasts with the color of the hose cover. The marking shall consist of:

- The manufacturer's name or trademark.
- The quarter and year of manufacture.
- The symbol MIL-PRF-20176G.
- The maximum allowable working pressure followed by the designation "MAWP" and the word "SEWAGE" for type I hose, and the words "OILY WASTE" for type II hose.

Hose shall be marked continuously or at regular intervals of not greater than 10 feet (3 048 mm). All letters and numbers shall be not less than 0.25-inch (6 mm) for size 1.5 (38 mm) hose, and 0.75-inch (19 mm) for sizes 2.5 and 4.0 (64 and 102 mm). The designations "SEWAGE" and "OILY WASTE" which shall have letters not less than 1-inch (25 mm) (see 4.4.1).

MIL-DTL-20176G

3.9 Workmanship. When examined in accordance with 4.5, the inner tube outer cover and ends of the hose shall not have more than the total visual defects allowed.

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 or hose assembly when a first article is required (see 3.1, 6.2, and 6.3). This inspection shall include the examination of 4.5, and the tests of 4.6. 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.

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

4.4 Sampling. Sampling and inspection procedures shall be in accordance with ANSI-Z1.4. The unit of product shall be one hose assembly. All hose assemblies offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.4.1 Sampling for examination. Guidance for inspection level and an Acceptable Quality Level (AQL) is provided in 6.5.1.

4.4.2 Sampling for tests. Guidance for inspection level and an AQL is provided in 6.5.2.

4.5 Examination. Each of the sample hose lengths shall be examined for compliance with the requirements in section 3 of this document. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.6 Tests.

4.6.1 Length. Hose selected shall be measured for length as specified in ASTM D 380.

4.6.2 Inside diameter. Hose selected shall have the id measured in accordance with ASTM D 380.

MIL-DTL-20176G

4.6.3 Tube and cover thicknesses. A 4-foot (1 219 mm) length of hose identical to the hose submitted for the lot, except that it shall be without helix wire, shall be submitted. Hose shall be inspected for measurements of the tube and cover thicknesses and the tests for the properties of the rubber components (see 4.6.10 through 4.6.10.7 and 4.6.11). The thicknesses of the tube and cover shall be measured on specimens removed from each end of the hose section to determine conformance to 3.4. The thicknesses shall be determined by the procedure given in ASTM D 380, except that only buffed specimens shall be measured. The respective values found for the tube thickness shall not be averaged, but shall be regarded as independent measurements, each of which should meet the requirement. The respective values for the cover thicknesses shall be treated in the same manner.

4.6.4 Unit weight. The unit weight of hose samples selected shall be determined by weighing the hoses without couplings. The reading shall be accurate to the closest lb (kg). The weight of each hose shall be divided by its length to determine conformance to 3.4. The entire lot shall be rejected if any sample hose fails to meet the requirement for unit weight.

4.6.5 Hydrostatic proof pressure. Each hose assembly in the lot shall be subjected to the proof pressures specified in table III, in accordance with ASTM D 380. The proof pressure shall be held for 5 minutes and the hose and fittings examined for leakage or other indication of weakness. Nonconformance to 3.6.6 shall constitute failure of this test.

4.6.6 Dimensional stability. The effect of the proof test pressure on the length, od, and twist of all sample hoses using water as the test fluid shall be determined as specified in 4.6.5 and ASTM D 380. Before starting the test, a 10 psig (69 kPa (gage)) hydrostatic pressure shall be established in the hose, and the length, od, and zero index for twist shall be measured (see ASTM D 380). At the end of the 5-minute period of 4.6.5 and while the pressure is maintained, the length, od, and twist of the hose shall be measured for the determination of dimensional stability while the hose is under proof pressure. The pressure shall then be reduced to zero psig and the hose left in this condition for 5 minutes. At the end of this period, the diameter and length of the hose shall be measured. Nonconformance to 3.6.1 shall constitute failure of this test.

4.6.7 Burst pressure. One hose section not less than 32 inches (813 mm) in length, shall be submitted for the burst pressure test. The burst pressure of this section in the straight condition shall then be determined in accordance with ASTM D 380. Nonconformance to 3.6.7 shall constitute failure of this test.

4.6.8 Tensile pull load. One hose section not less than 12 inches (305 mm) in length, shall be submitted for the tensile pull test. The section of hose shall be equipped with couplings and clamps (see 3.7.1 and 3.7.3). The assembly shall be subjected to the tensile pull loads specified in table III for the appropriate size for a period of not less than 5 minutes without damage or slippage of couplings. Nonconformance to 3.6.2 shall constitute failure of this test.

MIL-DTL-20176G

4.6.9 Flexibility.

4.6.9.1 Class 1. A length of hose selected from the lot shall be laid out on a surface and forced into a curve drawn with a radius as specified in table III. The curved section shall attain the curvature without kinking or flattening. Nonconformance to 3.6.3.1 shall constitute failure of this test.

4.6.9.2 Class 2. A 50-foot (15 240 mm) hose assembly selected from the lot shall be wound without a reel into a tight coil having a 3.25-foot (991 mm) diameter at a temperature of $60\text{ }^{\circ}\text{F} \pm 10\text{ }^{\circ}\text{F}$ ($16\text{ }^{\circ}\text{C} \pm 6\text{ }^{\circ}\text{C}$) (see 3.6.3.2).

4.6.10 Properties of rubber components. The properties of rubber components, except the swelling in testing oil of the friction rubber on the reinforcing fabric, shall be determined on longitudinal specimens prepared from the hose section obtained in accordance with 4.6.3. After separating and buffing, smooth the tube and cover samples shall be permitted to rest not less than 30 minutes before preparing test specimens. The swelling in testing oil of the friction rubber shall be determined using a vulcanized sample of the rubber friction used to impregnate the fabric reinforcement. The sample shall be 6 by 6 inches (152 by 152 mm) by 0.08 ± 0.01 -inch (2 ± 0.3 mm), and shall be of the same composition and an equivalent cure as the friction used in the hose. Nonconformance to the requirements of table I shall constitute failure of the tests.

4.6.10.1 Initial physical properties. Initial tensile strength and ultimate elongation shall be determined by ASTM D 412 using specimens cut with die C.

4.6.10.2 Physical properties after immersion. Tensile strength and ultimate elongation shall be determined after being subject to ASTM IRM903 Oil (formerly ASTM Oil No. 3) for 70 hours at $212\text{ }^{\circ}\text{F} \pm 4\text{ }^{\circ}\text{F}$ ($100\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$) in accordance with the method specified in ASTM D 471. The change in tensile strength shall be based on the original cross-section area of the sample.

4.6.10.3 Physical properties after oven aging. The tensile strength and ultimate elongation after oven aging shall be determined in accordance with ASTM D 573, using specimens cut with die III, except that the aging period shall be 70 ± 0.25 hours at $212\text{ }^{\circ}\text{F} \pm 4\text{ }^{\circ}\text{F}$ ($100\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$).

4.6.10.4 Volume change after immersion. The change in volume in percent of the original volume, after immersion shall be determined on samples of the tube, cover, and friction material. Sample shall be immersed in ASTM IRM903 Oil (formerly ASTM Oil No. 3) for 70 ± 0.25 hours at $212\text{ }^{\circ}\text{F} \pm 4\text{ }^{\circ}\text{F}$ ($100\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$) in accordance with the method specified in ASTM D 471.

4.6.10.5 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 Machine Method of ASTM D 413 and shall meet the requirement of 3.3.2.

MIL-DTL-20176G

4.6.10.5.1 Specimens. Strip or ring specimens shall be prepared in accordance with ASTM D 380, except that the specimen shall be not less than 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.

4.6.10.6 Adhesion after immersion. The adhesion of the tube and cover to the reinforcement, and of the plies of reinforcement to each other, shall be determined after immersion of test specimens (see 4.6.10.5.1). Samples shall be immersed in ASTM Reference Fuel B of ASTM D 471 for 70 ± 0.25 hours at $75 \text{ }^\circ\text{F} \pm 4 \text{ }^\circ\text{F}$ ($24 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$). The test procedure for adhesion shall be the Machine Method of ASTM D 413 except that the wet specimen shall be tested within 0.25 hours after it is removed from the fluid.

4.6.10.7 Low-temperature bend test. Buffed specimens of tube and cover shall be subjected to the low-temperature bend test specified in ASTM D 380. The test specimens shall be held at $-20 \text{ }^\circ\text{F} \pm 2 \text{ }^\circ\text{F}$ ($-29 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$) for 72 hours prior to flexing. Evidence of cracking of the test specimens shall be cause for rejection.

4.6.11 Resistance to ozone. Rubber cover samples shall be selected in accordance with 4.6.3. Samples shall be tested for ozone resistance in accordance with procedure B of ASTM D 518 and ASTM D 1149, except for the looped sample. Looped samples, after conditioning for 24 hours in an ozone-free atmosphere, shall be exposed for 70 ± 0.25 hours at $104 \text{ }^\circ\text{F} \pm 2 \text{ }^\circ\text{F}$ ($40 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$) to an atmosphere containing 100 parts per hundred million of ozone. Any signs of cracking shall be cause for rejection.

4.6.12 Crush resistance (class 1 only). One hose section not less than 12 inches (305 mm) in length, shall be submitted for the crush test. Crush resistance shall be determined by centering the 12-inch (305 mm) length of hose between 3-inch (76 mm) wide, parallel metal plates in such a way that a 3-inch (76 mm) length of hose is being compressed. The plates shall be brought together at a rate of 2 inches (51 mm) per minute until the applicable crush resistance force specified in table III has been applied. The distance between plates shall be measured and expressed as a percent of the original od. The load shall be released and the minimum od of the hose at the center of the compressed area shall be measured and expressed in percent of the original. Nonconformance to 3.6.5 shall be cause for rejection of the lot.

4.6.13 Chemical composition. Couplings used for the tensile pull test (see 4.6.8) shall be used to determine the chemical composition. Couplings, both male and female, shall be drilled to obtain 2-ounce (62 gram (g)) sample of chips or drillings from each. The chemical composition of each unit shall be determined in accordance with ASTM E 1282. Failure to comply with the applicable composition specified in 3.7.1 shall be cause for rejection of the lot.

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

MIL-DTL-20176G

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 assemblies covered by this specification are intended as a means of transferring ship sewage and oil waste to receiving facilities as follows:

- a. Surface ship sewage from collection, holding and transfer systems to shore or barge receiving facilities - 4-inch (102 mm) "SEWAGE" hose.
- b. Submarine sewage from sanitary tanks to shore, tender or barge receiving facilities - 2.5-inch (64 mm) "SEWAGE" hose.
- c. Surface ship and submarine oily waste from bilges to shore, barge, or tender receiving facilities - 2.5-inch (64 mm) "OILY WASTE" hose.
- d. Smaller surface vessel or barge sewage from sanitary tanks to shore or tender receiving facilities - 1.5-inch (38 mm) "SEWAGE" hose.

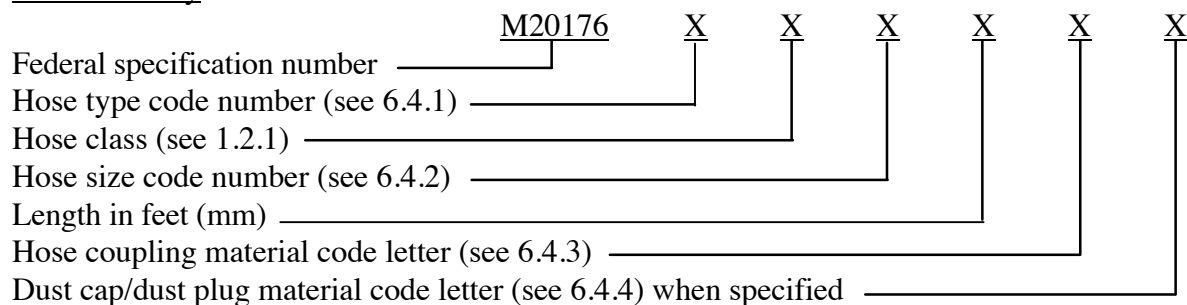
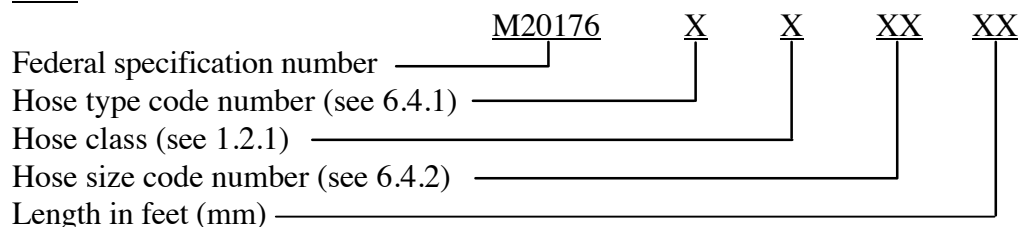
6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Type, class, and size of hose required (see 1.2.1).
- c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- d. When first article is required for inspection and approval (see 3.1, 4.2, and 6.3).
- e. When couplings are not required (see 3.3.4 and 3.7.1).
- f. When caps are required (see 3.3.4).
- g. When different length hose is required (see 3.5).
- h. When coupling material is to be aluminum (see 3.7.1).
- i. When dust caps and dust plugs are required and the material required (see 3.7.2).
- j. When different type clamps are required (see 3.7.3).
- k. 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 4.2. The first article should consist of one hose or hose assembly (see 6.2). The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

MIL-DTL-20176G

6.4 Part or Identifying Number (PINs). The specification number, type, size, class, hose length, coupling material, and dust cap/dust plug material are combined to form PINs for each item covered by this document (see 1.2). PINs for the hose, and hose assembly are established as follows:

Hose assemblyHose

6.4.1 Hose type. Hose type is designated by a one-digit code number (see table IV).

TABLE IV. Hose type code number.

Hose type code number	1	2
Hose type	Type I	Type II

6.4.2 Hose size. Hose size is designated by a two-digit code number (see table V).

TABLE V. Hose size code number.

Hose size code number	15	25	40
Hose size, id inches (mm)	1.5 (38)	2.5 (64)	4 (102)

6.4.3 Hose coupling material. Hose coupling material is designated by one-code letter (see table VI).

TABLE VI. Hose coupling material code letter.

Hose coupling material code letter	A	B
Hose coupling material	Aluminum	Brass

MIL-DTL-20176G

6.4.4 Dust cap/dust plug material. Dust cap/dust plug material is designated by one-code letter (see table VII).

TABLE VII. Dust cap/dust plug material code letter.

Dust cap/dust plug material code letter	A	B
Dust cap/dust plug material	Aluminum	Brass

6.5 Sampling procedures.

6.5.1 Sampling for examination. Recommended inspection level is II and AQL is 2.5 for major defects and 4.0 for minor defects (see 4.3.1).

6.5.2 Sampling for tests. Recommended inspection level is II and AQL is 2.5 (see 4.3.2).

6.6 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.

4720-01-146-5889

4720-01-153-1423

4720-01-153-8351

4740-01-235-5997

6.7 Subject term (key word) listing.

Adhesion

Burst pressure

Couplings

Crush resistance

Hydrostatic proof pressure

Reinforcement

Tensile pull

6.8 Supersession data. This specification replaces Military Specification MIL-H-20176F dated 19 May 1989.

MIL-DTL-20176G

Custodians:

Army - ME

Navy - YD1

Air Force - 99

Preparing Activity:

Navy - YD1

(Project 4720-0104)

Review Activities:

Navy - SH

Air Force - 82

DLA - CC

