

| INCH-POUND |

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SUPERSEDING
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MILITARY 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 nominal inside diameter (id).

Size 2.5 - 2.5 inches nominal id.

Size 4 - 4 inches nominal id.

Type II - Oily waste hose.

Size 2.5 - 2.5 inches nominal id.

Class 1 - Noncollapsible.

Class 2 - Collapsible.

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 N/A

FSC 4720

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this 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

FEDERAL

- QQ-A-601 - Aluminum Alloy Sand Castings.
- QQ-C-390 - Copper Alloy Castings (Including Cast Bar).
- WW-C-440 - Clamps, Hose, (Low-Pressure).

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- MIL-H-775 - Hose, Hose Assemblies; Rubber, Plastic, Fabric, or Metal (Including Tubing) and Associated Hardware: Packaging of.
- MIL-C-27487 - Coupling Halves, Quick-Disconnect, Cam-Locking Type.

STANDARDS

FEDERAL

- FED-STD-151 - Metal, Test Method.
- FED-STD-162 - Hose, Rubber, Visual Inspection Guide for.

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- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MS27021 - Coupling Half, Quick Disconnect, Cam-Locking Type,
- 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 federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center, (ATTN: NPODS), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

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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 issue of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- 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.

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

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, (except for related associated detail specifications, specification sheets, or MS standards), 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), the contractor shall furnish a complete hose assembly for first article inspection and approval (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. 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.

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).

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- d. A helix or helixes of round, galvanized, coppered, or unfinished (bright) 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 be polymerized synthetic rubber meeting 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) minimum | 1400 | -- | 4.5.10.1 |
| Ultimate elongation percent minimum | 300 | -- | 4.5.10.1 |
| Adhesion, pounds (lb) per inch of width, minimum | 12 | 12 | 4.5.10.5 |
| Properties after immersion in test fluid | | | |
| Tensile strength, psi minimum | 1000 | -- | 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 per inch of width, min. | 9 | 9 | 4.5.10.6 |
| Properties after accelerated aging | | | |
| Tensile strength, psi minimum | 1200 | -- | 4.5.10.3 |
| Ultimate elongation, percent minimum | 200 | -- | 4.5.10.3 |
| Ozone resistance, hose cover | No cracking | | 4.5.11 |

3.3.3 Reinforcement.

3.3.3.1 Fiber reinforcement. The fiber reinforcement shall consist of ply or plies of braided, knit, or spiralled yarn or plies of woven fabric. Both fabric or yarn shall be made from nylon, rayon or polyester.

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3.3.3.2 Wire reinforcement, class 1 only. The reinforcing wire shall be one or more helixes of round, galvanized, coppered or unfinished (bright) steel wire. The wire shall be placed between the fiber reinforcement, or as an alternate the carcass shall be comprised of synthetic filament warp yarns, interwoven with fillers of synthetic filament yarns, alternately spaced or, as a further alternate the helix of wire may be interwoven with textile reinforcement. 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 assure 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 4.5.2 through 4.5.4.

TABLE II. Dimension and weight properties.

| Size id | 1.5 inch | 2.5 inch | 4 inches |
|---------------------------------------|-------------|-------------|------------|
| Tolerance, inch, id | ± 0.047 | ± 0.062 | $\pm .062$ |
| Tube thickness, inch, min | 0.094 | 0.094 | 0.094 |
| Cover thickness, inch, min | 0.078 | 0.078 | 0.078 |
| Unit weight, pounds per foot, maximum | 1.5 | 2.5 | 3.0 |

3.5 Length. Unless otherwise specified (see 6.2), hose shall be 50 feet (ft) in length. Fittings shall be considered additions to hose length, and not part of the length of hose. Residual length of 47 feet remaining after removal of sections for tests (see 4.3.1) shall be acceptable.

3.5.1 Tolerance. A tolerance of +1 percent in length shall be permitted when hoses are measured as specified in 4.5.1.

3.6 Physical properties.

3.6.1 Dimensional stability. When tested in accordance with 4.5.6, the hose shall not change in length more than 10 percent nor change in outside diameter (od) more than 18 percent nor shall the twist be more than 2 degrees per foot while the hose is under the proof pressure. The hose 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 4.5.8.

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TABLE III. Physical properties of hose assemblies at temperatures of 70 degrees Fahrenheit (°F) + 4°F.

| Size of Hose (id inches) | Test Loads | | Flexibility Bend radius (min) (inch) | Pressure psig | | |
|--------------------------------|----------------------|---------------------------|--------------------------------------------|---------------|-------|-------|
| | Tensile pull (lb) | Crush Resistance lb | | Working | Proof | Burst |
| 4.0 | 2750 | 325 | 9 | 100 | 200 | 400 |
| 2.5 | 2000 | 325 | 6 | 150 | 300 | 600 |
| 1.5 | 1500 | 225 | 5 | 150 | 300 | 600 |

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 4.5.9.1 and 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 hose length into a maximum diameter of 3.25 feet. (See 4.5.9.2.)

3.6.4 Low temperature bend. Specimens of the tube and cover shall not crack when tested as specified in 4.5.10.7.

3.6.5 Crush resistance, class 1 only. When hose sections are tested as specified in 4.5.12 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 sizes and not less than 85 percent of the original od for the 4-inch size. Following release of the load, the smallest od shall be not less than 98 percent of the original od (see 4.5.12).

3.6.6 Hydrostatic proof pressure. When tested as specified in 4.5.5 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, and 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 4.5.7, 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 bronze couplings. Male couplings shall conform to MIL-C-27487, type II (MS27021). Female couplings shall conform to type VI (MS27025). Bronze male and female couplings shall be made of material conforming to QQ-C-390, alloy 836 or 922. When aluminum material is specified (see 6.2), couplings shall be made of hard-coated anodized aluminum conforming to QQ-A-601, alloy 356.0, temper T-6 (see 4.5.13).

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3.7.2 Coupling caps. When specified (see 6.2), the male couplings shall be provided with type IX (MS27028) dust caps, and the female couplings shall be provided with type X (MS27029) dust plugs in accordance with MIL-C-27487. Bronze dust caps and dust plugs shall be made of material conforming to QQ-C-390, alloy 836 or 922. Aluminum dust caps and dust plugs shall be made of material conforming to QQ-A-601, alloy 356.0, temper T6 (see 4.5.8).

3.7.3 Clamps. Unless otherwise specified (see 6.2), clamps shall be made of corrosion-resistant steel and shall conform to type H of WW-C-440. Two 0.75-inch clamps shall be provided for each coupling on the 2.5- and 4-inch id hose. For the 1.5-inch id hose either one 0.75-inch clamp or two 0.50-inch 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 4.5.5, and the pull force test specified in 4.5.8.

3.8 Marking. Each length of hose shall be marked with a color that contrasts with the color of the hose cover. Marking shall be accomplished by inlaying a rubber or suitable material brand or by applying a suitable composition ink and bonding the marking onto the cover to prevent the marking from being removed except by mechanical means. The marking shall consist of the manufacturer's name or trademark, the quarter and year of manufacture, the symbol MIL-H-20176F, 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 more than 10 feet. All letters and numbers shall be at least 0.75 inch for sizes 4 and 2.5, and 0.25 inch for size 1.5 hose, except for the designations "SEWAGE" and "OILY WASTE" which shall have letters at least 1-inch high (see 4.4).

3.9 Workmanship. When examined in accordance with 4.4, the inner tube outer cover and ends of the hose shall not have more than the total visual defects allowed.

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

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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 or hose assembly 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.

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. The unit of product shall be one hose assembly. All hose assemblies offered for delivery at one time shall be considered a lot for purpose of inspection.

4.3.1 Sampling for examination. (See 6.6.1.)

4.3.2 Sampling for tests. (See 6.6.2.)

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 3.8).

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4.5 Tests.

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

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

4.5.3 Tube and cover thicknesses. A 4 foot length of hose identical to the hose submitted for the lot, except that it shall be without helix wire, shall be submitted for the measurements of the tube and cover thicknesses and the tests for the properties of the rubber components (see 4.5.10 through 4.5.10.7 and 4.5.11). 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.

4.5.4 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. 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.

4.5.5 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.

4.5.6 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 4.5.5 and ASTM D 380. Before starting the test, a 10 lb 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 4.5.5 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.

4.5.7 Burst pressure. One hose section not less than 32 inches 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.

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4.5.8 Tensile pull load. One hose section not less than 12 inches 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.

4.5.9 Flexibility.

4.5.9.1 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.

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

4.5.10 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 4.5.3. 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 by 0.080 ± 0.010 inch, 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.

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

4.5.10.2 Physical properties after immersion. Tensile strength and ultimate elongation shall be determined after being subject to ASTM oil No. 3 for 70 hours at $212^{\circ}\text{F} \pm 4^{\circ}\text{F}$ 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.

4.5.10.3 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 $212^{\circ}\text{F} \pm 4^{\circ}\text{F}$.

4.5.10.4 Volume change after immersion. The change in volume in percent of the original volume, after immersion in ASTM oil No. 3 for 70 ± 0.25 hours at $212^{\circ}\text{F} \pm 4^{\circ}\text{F}$ in accordance with the method specified in ASTM D 471, shall be determined on samples of the tube, cover, and friction material.

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

4.5.10.5.1 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.

4.5.10.6 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 the test specimens (see 4.5.10.5.1) have been immersed in ASTM Reference Fuel B of ASTM D 471 for 70 hours \pm 0.25 hour at $75^{\circ}\text{F} \pm 4^{\circ}\text{F}$. The test procedure for adhesion shall be the Machine Method of ASTM D 413 except that the wet specimen shall be tested within 15 minutes after it is removed from the fluid.

4.5.10.7 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 $-20^{\circ}\text{F} \pm 2^{\circ}\text{F}$ for 72 hours prior to flexing. Evidence of cracking of the test specimens shall be cause for rejection.

4.5.11 Resistance to ozone. Rubber cover samples selected in accordance with 4.5.3 shall be tested for ozone resistance in accordance with procedure B of ASTM D 518 and ASTM D 1149, except that the looped sample after conditioning for 24 hours in an ozone-free atmosphere shall be exposed for 70 ± 0.25 hour at $104^{\circ}\text{F} \pm 2^{\circ}\text{F}$ to an atmosphere containing 100 parts per hundred million of ozone. Any signs of cracking shall be cause for rejection.

4.5.12 Crush resistance, class 1 only. One hose section not less than 12 inches in length, shall be submitted for the crush test. Crush resistance shall be determined by centering the 12-inch length of hose between 3-inch wide, parallel metal plates in such a way that a 3-inch length of hose is being compressed (see figure 1). The plates shall be brought together at a rate of 2 inches 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.

4.5.13 Chemical composition. Couplings used for the tensile pull test (see 4.5.8) shall be used to determine the chemical composition. Couplings, both male and female, shall be drilled to obtain a 2-ounce sample of chips or drillings from each. The chemical composition of each unit shall be

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determined either by method 111.2 or method 112.2 of FED-STD-151. Failure to comply with the applicable composition specified in 3.7.1 shall be cause for rejection of the lot.

4.6 Packaging inspection. The preservation, packing, and marking of the hose shall be inspected to verify conformance to the requirement of section 5 of this specification.

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).

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 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 "SEWAGE" hose.
- b. Submarine sewage from sanitary tanks to shore, tender or barge receiving facilities - 2.5-inch "SEWAGE" hose.
- c. Surface ship and submarine oily waste from bilges to shore, barge, or tender receiving facilities - 2.5-inch "OILY WASTE" hose.
- d. Smaller surface vessel or barge sewage from sanitary tanks to shore or tender receiving facilities - 1.5-inch "SEWAGE" hose.

6.2 Acquisition requirements. Acquisition documents should 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 2.1.1 and 2.2).
- d. When first article is required for inspection and approval (see 3.1, 4.2.1, and 6.4).
- e. If couplings are not required (see 3.3.4 and 3.7.1).
- f. If different length hose is required (see 3.5).
- g. When coupling material is to be aluminum (see 3.7.1).
- h. If dust caps and dust plugs are required and the material required (see 3.7.2).
- i. If different type clamps are required (see 3.7.3).
- j. Level of preservation and level of packing required (see 5.1).

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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 should 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 (see 6.2). The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.5 Part or Identifying Number (PIN). The specification PIN is a definitive PIN which will be formulated to identify each item covered by this specification. The PIN will be formulated by selecting from the requirement options available in this specification as follows:

Hose assembly

| Definitive specification PIN | M20176 | X | X | XX | XX | X | X |
|---------------------------------------------------------------------------------|--------|---|---|----|----|---|---|
| Specification number _____ | | | | | | | |
| Hose type code number (see 6.5.1) _____ | | | | | | | |
| Hose class (see 1.2.1) _____ | | | | | | | |
| Hose size code number (see 6.5.2) _____ | | | | | | | |
| Length in feet _____ | | | | | | | |
| Hose coupling material code letter (see 6.5.3) _____ | | | | | | | |
| Dust cap/dust plug material code letter (see 6.5.4) <u>when specified</u> _____ | | | | | | | |

Hose

| Definitive specification PIN | M20176 | X | X | XX | XX |
|-----------------------------------------|--------|---|---|----|----|
| Specification number _____ | | | | | |
| Hose type code number (see 6.5.1) _____ | | | | | |
| Hose class (see 1.2.1) _____ | | | | | |
| Hose size code number (see 6.5.2) _____ | | | | | |
| Length in feet _____ | | | | | |

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6.5.1 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 |

6.5.2 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 | 1.5 | 2.5 | 4 |

6.5.3 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 | Bronze |

6.5.4 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 | Bronze |

6.6 Sampling procedures.

6.6.1 Sampling for examination. Recommended Inspection Level is II and Acceptable Quality Level (AQL) is 2.5 for major defects and 4.0 for minor defects (see 4.3.1).

6.6.2 Sampling for tests. Recommended Inspection Level is II and AQL is 2.5 (see 4.3.2).

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6.7 Subject term (key word) listing.

Adhesion
 Burst pressure
 Couplings
 Crush resistance
 Hydrostatic proof pressure
 Reinforcement
 Tensile pull

6.8 Cross-reference of classifications. The following hoses were previously classified as indicated:

| <u>MIL-H-20176C</u> | <u>MIL-H-20176D and MIL-H-20176E</u> | <u>MIL-H-20176F</u> |
|---------------------|------------------------------------------|---------------------|
| Not designated | Type I | Type I, Class 1 |
| Not designated | Type II | Type II, Class 1 |
| Type I | Not designated | Type I, Class 2 |
| Type II | Not designated | Type II, Class 2 |

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.

Custodians:

Army - ME
 Navy - YD
 Air Force - 99.

Preparing activity :

Navy - YD

(Project 4720-0768)

Review activities:

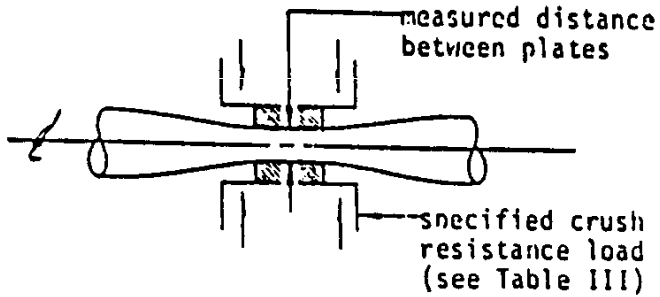
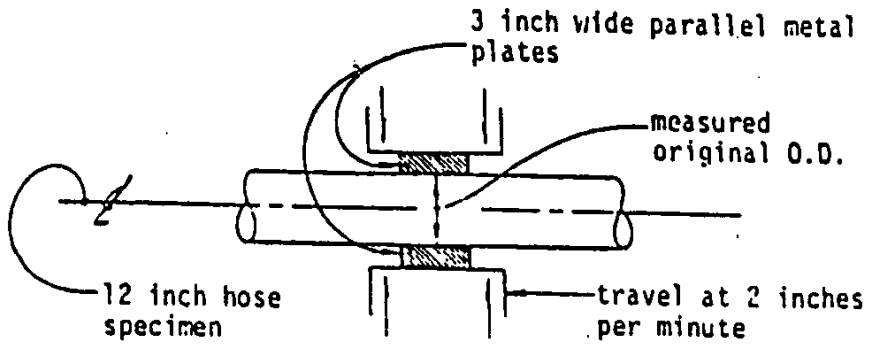
Navy - SH
 DLA - CS
 Air Force - 82

User activity:

Navy - CG

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START: (NO LOAD)



TEST LOAD

Note: Measure final O.D. after release of load.

POST-TEST

FIGURE 1. Crush resistance test fixture.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. DOCUMENT NUMBER MIL-H-20176F | 2. DOCUMENT TITLE HOSE AND HOSE ASSEMBLY, RUBBER, SMOOTH BORE, LIGHT WEIGHT SEWAGE DISCHARGE AND OILY WASTE DISCHARGE |
| 3a. NAME OF SUBMITTING ORGANIZATION | 4. TYPE OF ORGANIZATION (Mark one) <input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____ |
| b. ADDRESS (Street, City, State, ZIP Code) | |
| 5. PROBLEM AREAS a. Paragraph Number and Wording: b. Recommended Wording: c. Reason/Rationale for Recommendation: | |
| 6. REMARKS | |
| 7a. NAME OF SUBMITTER (Last, First, MI) - Optional | b. WORK TELEPHONE NUMBER (Include Area Code) - Optional |
| c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional | 8. DATE OF SUBMISSION (YYMMDD) |

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)