

ZZ-H-561J  
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SUPERSEDEDING  
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November 17, 1976

## FEDERAL SPECIFICATION

### HOSE, RUBBER, AND HOSE ASSEMBLIES, RUBBER, SMOOTH BORE, WATER SUCTION AND DISCHARGE

This specification was approved by the Assistant Administrator, Office of Federal Supply and Services, General Services Administration, for the use of all Federal agencies.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers wire-reinforced hose and hose assemblies for use with water pumps. The hose and hose assemblies shall be usable on both suction and discharge sides of the pump.

#### 1.2 Classification.

1.2.1 Grades, styles, and classes. Water hose shall be of the following grades, styles, and classes as specified (see 6.2.1).

- Grade A - Weather-, oil-, and ozone-resistant outer cover.
- Grade B - Weather-, and ozone-resistant outer cover.
- Style A - Hose ends constructed for shank, compression, or internally expanded fittings.
- Style C - Hose ends with built-in nipples.
- Style D - Hose ends constructed for straight nipples.
- Class 1 - General water use inner tube.
- Class 2 - Potable water use inner tube.

1.2.2 Sizes. Water hose shall be of the following sizes as specified (see 6.2.1). 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 6, 8, 10, and 12 inches inside diameter.

#### 2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

##### Federal Specifications

- WW-C-440 - Clamps, Hose, (Low-Pressure).
- WW-C-624 - Coupling Assembly, Hose (Garden, Water, and Water Suction).

FSC 4720

ZZ-H-561J

Federal Standards:

- FED-STD-123 - Marking for Shipment (Civil Agencies).
- FED-STD-162 - Hose, Rubber, Visual Inspection Guide For.

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards, and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.

(Federal Government activities may obtain copies of Federal standardization documents, and the Index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

Military Specifications:

- MIL-P-775 - Packaging of Hose, Hose Assemblies; Rubber, Plastic, Fabric, or Metal (Including Tubing); and Fittings, Nozzles, and Strainers.
- MIL-C-38404 - Couplings, Hose, Reattachable Screw-on.

Military Standards:

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.

(Copies of military specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

Federal Regulations:

- 21 CFR 177 - Federal Food and Drugs Act; Indirect Food Additives.

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM):

- A120 - Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
- A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D297 - Rubber Products-Chemical Analysis.
- D380 - Rubber Hose.
- D412 - Rubber Properties in Tension.
- D413 - Rubber Property-Adhesion to Flexible Substratum.
- D471 - Rubber Property-Effect of Liquids.
- D518 - Rubber Deterioration-Surface Cracking.
- D573 - Rubber-Deterioration in an Air Oven.
- D1149 - Rubber Deterioration-Surface Ozone Cracking in a Chamber (Flat Specimen).
- D3767 - Rubber-Measurement of Dimensions.

(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 specification and the references cited herein, the text of this specification shall take precedence.

### 3. REQUIREMENTS

3.1 First article. When specified (see 6.2.1), the contractor shall furnish a sample hose or hose assembly for first article inspection and approval (see 4.2.1 and 6.3).

3.2 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to ensure interchangeability of component parts, assemblies, accessories, and spare parts.

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

ZZ-H-561J

3.4 Design and construction. The hose shall consist of an inner tube of elastomeric material, layer or layers of textile reinforcement, a helical wire reinforcement, additional layer or layers of textile reinforcement, or the textile layer may be interwoven with the helical wire, and an outer cover of elastomeric material.

3.4.1 Outer cover. The outer cover shall be grade A or grade B as specified (see 6.2.1).

3.4.1.1 Grade A. The grade A outer cover shall be constructed of an elastomeric material that is weather-, oil-, and ozone-resistant.

3.4.1.2 Grade B. The grade B outer cover shall be constructed of an elastomeric material that is weather and ozone-resistant.

3.4.2 Inner tube. The inner tube shall be class 1 or class 2 as specified (see 6.2.1).

3.4.2.1 Class 1. The class 1 inner tube shall be constructed of an elastomeric material that is suitable for general water use.

3.4.2.2 Class 2. The class 2 inner tube shall be constructed of an elastomeric material that meets the requirements of the Federal Food and Drugs Act, Title 21, Code of Federal Regulations 177.2600. It shall meet the extraction requirements of 3.6.3.1 when tested as specified in 4.5.4. The supplier shall also submit a certificate of compliance, attesting that the compounds and concentrations of each ingredient used in the inner tube conforms with the Federal Food and Drugs Act.

3.4.3 Reinforcement.

3.4.3.1 Textile reinforcement. Textile reinforcement shall consist of one or more plies of loomed, woven fabric, braided or spiraled yarn of cotton or synthetic material, evenly and firmly applied. It shall be free of unsightly defects, dirt, knots, lumps, and irregularities of twist. It shall be applied above and below the helix of wire reinforcement and shall be well impregnated with an elastomeric material.

3.4.3.2 Wire reinforcement. A helix of wire, completely embedded in an elastomeric material, shall be installed between the upper and lower ply or plies of textile reinforcement, or the helix of wire may be interwoven with the textile reinforcement. The reinforcing wire shall be round, galvanized, coppered, or unfinished (bright) steel wire. The size, tensile strength, and spacing of the wire reinforcement shall be sufficient to meet the requirements specified herein. Corrugations in the hose shall not exceed that consistent with good manufacturing practice. When tested in accordance with 4.5.10 the wire shall show no defects in the steel.

3.4.4 Length. Hoses and hose assemblies shall be furnished in lengths as specified (see 6.2.1) with a tolerance of +/-2 percent when tested in accordance with 4.5.1 (see 6.4). Nipples, fittings, and couplings shall be considered additions to hose length, not part of the length.

3.4.5 Hose ends. Unless otherwise specified, hose ends shall be of a style that is appropriate for the type of fitting or coupling specified (see 3.5). When specified (see 6.2.1), hose ends shall be style A, C, or D.

3.4.5.1 Style A. When style A ends are specified, the helix reinforcement wire shall be terminated at the end of the hose (see figure 1A).

3.4.5.2 Style C. When style C ends are specified (see 6.2.1), each end of style C hose (4 inches in diameter and larger) shall be fitted with nipples conforming to size and dimension of figure 5. Nipples shall be made of steel pipe conforming to ASTM A120; schedule 40 for 4 inch and 6 inch sizes and schedule 30 for 8 inch, 10 inch, and 12 inch sizes. Bands on the nipples shall be steel and welded all the way around the pipe. The nipple shall be zinc-coated in accordance with ASTM A120 or otherwise adequately protected at exposed ends from corrosion after machining. The helix reinforcement wire shall extend over the end of the built-in nipple at least 1.5 inches under or over the wire binding the nipples (see figure 1B). At least one ply of fabric shall be between the binding wire and the cover. The nipple shall be secured to the hose by the vulcanization process. The nipple shall extend beyond the end of the hose to the length specified in table 1 (see figure 1).

3.4.5.3 Style D. When specified (see 6.2.1), each end of style D hose (4 inches in diameter and larger) shall be fitted with clamps and with nipples conforming to figure 6. Nipples shall be made of steel pipe conforming to ASTM A120. The nipple shall be zinc-coated in accordance with ASTM A120 or otherwise adequately protected at exposed ends from corrosion after machining. The inside diameter of the hose ends shall be large enough to accommodate the outside diameter of schedule 80 iron pipe.

3.5 Fittings and couplings. Hose and hose assemblies shall be fitted with fittings and couplings as specified (see 6.2.1). Unless otherwise specified (see 6.2.1), each length of hose, up to and including 4 inches inside diameter, shall be fitted with ribshank or expansion couplings (see 3.5.3) or compression-reattachable couplings (see 3.5.4). Female couplings shall be fitted with a synthetic rubber washer.

3.5.1 Flanges. Unless otherwise specified (see 6.2.1), each nipple shall be fitted with a standard steel flange for 150 pound working pressure. All steel surfaces shall be zinc-coated in accordance with ASTM A153.

3.5.1.1 Flanges for Navy requirements. When specified (see 6.2.1), flanges shall be in accordance with the requirements of figures 2, 3, and 4.

3.5.2 Clamps. Clamps shall be furnished and fitted when shank couplings or nipples without built-up bands are specified. Clamps conforming to WW-C-440 shall be corrosion-resistant steel, zinc-coated steel in accordance with ASTM A153, or copper alloy as specified (see 6.2.1). The clamps shall be capable of holding nipples and couplings in place without leakage or slippage when subjected to the proof pressure specified in table 1.

3.5.3 Shank and expansion couplings. Unless otherwise specified (see 6.2.1), shank and expansion couplings shall conform to WW-C-624.

3.5.4 Compression-reattachable couplings. Unless otherwise specified (see 6.2.1), compression-reattachable couplings shall conform to MIL-C-38404.

3.6 Performance. Hose and hose assemblies shall meet the mechanical and physical properties of table I and the requirements of 3.6.1 through 3.6.6.

3.6.1 Hydrostatic pressure requirements. Hose and hose assemblies shall be subjected to the hydrostatic pressure specified in table I.

3.6.1.1 Proof pressure. When tested in accordance with 4.5.2.1, at the proof pressure specified in table I, the hose or hose assemblies shall not leak or 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.

3.6.1.2 Burst pressure. When tested in accordance with 4.5.2.2, there shall be no failure of the hose or hose assembly at the minimum burst pressure specified in table I.

3.6.2 Crush resistance. During the crush resistance test specified in 4.5.3, the smallest outside diameter shall be not less than 85 percent of the original outside diameter. After release of the load, the smallest outside diameter shall be not less than 95 percent of the original outside diameter.

3.6.3 Resistance to water.

3.6.3.1 Extraction of class 2 inner tube. The extractable nonvolatile matter in class 2 inner tube shall not exceed 21 milligrams per square inch when the tubes are tested as specified in 4.5.4.

3.6.4 Oil resistance of grade A hose cover.

3.6.4.1 Oil resistance. The tensile strength of the cover stock of grade A hose shall not decrease more than 60 percent of the original value after being subjected to ASTM No. 3 oil conforming to ASTM D471 in accordance with 4.5.5. In addition, the maximum permissible volume swell in ASTM No. 3 oil shall be 100 percent.

3.6.5 Accelerated aging. The tensile strength of the tube and cover after the accelerated aging process specified in 4.5.6 shall not decrease by more than 20 percent of the original value while the elongation of the tube and cover after similar aging shall not decrease by more than 50 percent.

3.6.6 Ozone resistance. The cover stock of grade A or grade B hose at the end of the exposure time (see 4.5.7) shall show no visible cracking under 7 times magnification.

3.7 Strainers and spanner wrench. When specified (see 6.2.1), suction strainers and spanner wrenches shall be furnished.

ZZ-H-561J

### 3.8 Identification marking.

3.8.1 General water use hose (class 1). Each length of hose shall be marked in a color that contrasts with the color of the hose cover. Marking shall be accomplished either by in laying a rubber or suitable material brand or by applying a suitable composition ink bonding the marking onto the cover in such a manner that the marking ink cannot be removed except by mechanical means. The marking shall consist of the manufacturer's name or trademark, the quarter and year of manufacture, the words Water - Suction, the symbol ZZ-H-561, the grade, the style, the class of the hose, and the words NOT FOR USE WITH POTABLE WATER. Hose shall be marked at regular intervals not exceeding 25 feet. Letters shall be at least 0.25-inch high. An alternative method of marking may be by application of a continuous embossed strip along the entire length, vulcanizing the hose, and subsequently removing the strip, leaving a continuous relief identification area. When marking is accomplished by this alternative, no color contrast is required.

3.8.2 Potable water use hose (Class 2). When class 2 hose is specified (see 6.2.1), each hose length shall be marked in the same manner as specified in 3.8.1), except that the words POTABLE WATER USE ONLY shall be substituted for NOT FOR USE WITH POTABLE WATER.

3.9 Workmanship. The finished hose shall be uniform in thickness. The inner tube and the cover shall be smooth and free from pits and blisters. Reinforcement wire shall not be crushed and shall not protrude through the cover or tube.

## 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 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 assure supplies and services conform to prescribed requirements.

4.1.1 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 a sample hose or hose assembly when a first article is required (see 3.1, 6.2.1 and 6.3). 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, 6 feet of helix wire for the flexibility test shall be submitted.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.4, the tests of 4.5, and the preparation for delivery 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 grade, style, class, and size offered for delivery at one time shall be considered a lot for the purpose of inspection. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for a complete reinspection. Resubmitted lots shall be reinspected using tightened inspection. If the rejected lot was screened, reinspection shall be limited to the defect causing rejection. If the lot was reprocessed, reinspection shall be performed for all defects. Rejected lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.3.1 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.

4.3.2 Sampling for tests. Tests shall be based on inspection level S-3 and an AQL of 4.0 percent defective.

4.3.2.1 Sampling for helix wire test. A 6-foot length of helix wire taken from the same lot of wire used in the manufacture of the hose shall be submitted.

4.4 Examination. Each of the sample hose lengths selected in accordance with 4.3 shall be visually and dimensionally examined to determine conformance with all the requirements of this specification. The classification of defects in FED-STD-162 shall be used to determine and evaluate defects through visual inspection.

4.5 Tests. Each hose length selected shall be subjected to the applicable tests specified in table II and 4.5.1 through 4.5.10. Failure to comply with the requirements of section 3 shall constitute cause for rejection.

4.5.1 Hose length measurement. Each hose selected shall be measured for length in accordance with ASTM D3767. Prior to measurement of length, the hose shall be elongated by 10 lb/in<sup>2</sup> water pressure for 10 minutes (see 6.4).

4.5.2 Hydrostatic tests.

ZZ-H-561J

TABLE II. Test methods.

Test	Method	Reference
Hose size, inside diameter	ASTM D3767	table I
Hose length	ASTM D3767	3,4.4 and 4.5.1
Hydrostatic tests:		
Proof pressure	ASTM D380	3.6.1.1 and 4.5.2.1
Burst pressure	ASTM D380	3.6.1.2 and 4.5.2.2
Crush resistance		table I, 3.6.2, and 4.5.3
Resistance to water:		
Extraction		3.6.3 and 4.5.4
Resistance to oil	ASTM D471	3.6.4 and 4.5.5
Accelerated aging	ASTM D573	3.6.5 and 4.5.6
Ozone resistance	ASTM D518 and D1149	3.6.6 and 4.5.7
Tube and cover thickness	ASTM D3767	table I
Friction (adhesion)	ASTM D380 and D413	table I and 4.5.8
Tensile strength and ultimate elongation of tube and cover	ASTM D412	table I and 4.5.9
Helix wire:		
Flexibility		4.5.10

4.5.2.1 Proof pressure test. Each hose length, complete with couplings, shall be subjected to the applicable hydrostatic test pressure specified in table I in accordance with ASTM D380, except that the pressure shall be maintained for 2 minutes. Any blistering or leaking of the hose shall be cause for rejection.

4.5.2.2 Burst pressure test. Each hose or hose assembly selected shall be subjected to the applicable hydrostatic test pressure specified in table I in accordance with ASTM D380.

4.5.3 Crush resistance test. Crush resistance shall be determined by centering a 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. The plates shall be brought together at a rate of 2 inches per minute until the applicable crush resistance load specified in table I has been applied. The distance between plates shall be measured with a steel rule and expressed in percent of the original outside diameter. The load shall be released and the minimum outside diameter of the hose at the center of the compressed area shall be measured and reported in percent of the original outside diameter.

4.5.4 Extraction of class 2 hose test. The inner tube surface of one hose selected shall be extracted in distilled water at reflux temperature in accordance with the following procedure:

- a. Remove a 1-inch ring of rubber inner tube and cut or buff away the outer surface until the surface is smooth.
- b. Cut sufficient length of inner tube to obtain approximately 10 grams, based on a minimum thickness of 0.047 inch.

- c. Subject sample to distilled water, at reflux temperature, for 7 hours in an extraction apparatus as shown in ASTM D297, figure 1.
- d. Filter the solution through No. 40 Whatman filter paper or equivalent and collect the extract in a tared container.
- e. Extract the rubber sample in an additional 50-75 cubic centimeters of distilled water at a reflux temperature for 2 more hours and repeat step d. Combine the extract solutions and evaporate to dryness. The container and residue shall be dried in an oven at 221 deg +/-5 deg Fahrenheit (F) for 1 hour, cooled in a desiccator and weighed. The weight of the residue shall be recorded. A blank shall be run using the same amount of distilled water. After making allowance for the blank, the weight of the residue shall be recorded to the nearest milligram.
- f. Report the amount of matter extracted from the rubber in milligrams per square inch of surface.

4.5.5 Oil resistance test of grade A hose cover. The rubber cover of grade A hose selected shall be subjected to ASTM oil No. 3 for 70 hours at 212 deg +/- 3.6 deg F in accordance with the method specified in ASTM D471. The change in tensile strength and amount of volume swell shall be based on original cross sectional areas.

4.5.6 Accelerated aging test. The resistance of the tube and cover to accelerated aging shall be determined as described in ASTM D573 except that the time of aging shall be 70 hours and the temperature of aging shall be 212 deg F. Tensile strength and ultimate elongation tests shall be used to determine the amount of deterioration.

4.5.7 Resistance to ozone test. The sample of grade A or grade B cover stock shall be tested for ozone resistance in accordance with procedure B of ASTM D518 and ASTM D1149 except that after conditioning for 24 hours in an ozone-free atmosphere the looped sample shall be exposed for 72 hours at 104 deg +/- 3.6 deg F to an atmosphere containing 50 parts per hundred million of ozone.

4.5.8 Adhesion test. From hose or hose assemblies selected, prepare ring or strip specimens as described in ASTM D380. The adhesion shall be determined in accordance with the machine method of ASTM D413.

4.5.9 Tensile strength and ultimate elongation test. The tensile strength and ultimate elongation of the cover and tube of the hose or hose assemblies shall be determined in accordance with ASTM D412.

4.5.10 Helix wire flexibility test. The helix wire shall be wrapped six full tight turns around a mandrel having a diameter three times the diameter of the wire. The wrapped wire shall show no defects in the steel after wrapping. Cracking or breaking of the wire shall constitute a defect. Flaking or peeling of the galvanized or coppered coating of the wire shall not be considered a defect (see 3.4.3.2).

4.6 Preparation for delivery inspection. An examination shall be made to determine compliance with the requirements of section 5. The sample unit

ZZ-H-561J

shall be one unit prepared for shipment. Sampling shall be in accordance with MIL-STD-105. The inspection level shall be S-2 with an AQL of 4.0 percent defective.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation and packing. Preservation and packing shall be in accordance with the requirements of MIL-P-775 with the level of preservation and the level of packing as specified (see 6.2.1).

### 5.2 Marking.

5.2.1 Military agencies. Shipments to Military agencies shall be marked in accordance with MIL-STD-129.

5.2.2 Civil agencies. Shipments to civil agencies shall be marked in accordance with FED-STD-123.

## 6. NOTES

### 6.1 Intended use.

6.1.1 Class 1 hose. Class 1 hose and hose assemblies are intended for mines, construction work, general contracting, and general suction service.

6.1.2 Class 2 hose. Class 2 hose and hose assemblies are intended as a means of conveying potable water in suction and discharge services, such as distillation units and tank farms.

### 6.2 Ordering data.

6.2.1 Procurement requirements. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Grade, style, and class required (see 1.2.1, 3.4.1, 3.4.2, 3.4.5 through 3.4.5.3 and 3.8.2).
- c. Size required (see 1.2.2).
- d. If first article is required for inspection and approval (see 3.1, 4.2.1, and 6.3).
- e. Length required (see 3.4.4).
- f. Type of fittings or couplings and clamps required (see 3.4.5.2, 3.4.5.3 and 3.5 through 3.5.4).
- g. If other than 150 pound, standard steel flanges are required (see 3.5.1 and 3.5.1.1).
- h. If clamps are to be corrosion-resistant steel, zinc-coated steel, or copper alloy (see 3.5.2).
- i. If shank or expansion couplings are to be other than as specified (see 3.5.3).
- j. If compression-reattachable couplings are to be other than as specified (see 3.5.4).
- k. If suction strainers and spanner wrenches are required (see 3.7).
- l. Level of preservation and level of packing required (see 5.1).

ZZ-H-561J

6.2.2 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an approved DD Form 1664, Data Item Description (DID), and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of paragraph 7-104.9(n) of the Defense Acquisition Regulations are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraphs:

Paragraph No.	Data requirements title	Applicable DID No.	Option
3.4.2.2	Certificate of compliance	DI-E-2121	

(DIDs related to this specification, and identified in section 6 will be approved and listed as such in DoD 5000.19L, Vol. II, Acquisition Management Systems and Data Requirements Control List. Copies of DIDs required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

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 4.2.1 and 3.1. The first article should consist of a sample hose or hose assembly. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.4 Hose length measurement. Hose containing an embedded helical wire tends to shrink abnormally during shipment and storage. Actual length should be determined by measurement of the hose while it is under 10 lb/in<sup>2</sup> pressure.

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

ZZ-H-561F	ZZ-H-561G and ZZ-H-561H	22-H-561J
Grade A	Grade A	Grade A
Grade B	Grade B	Grade B
Type I	Type I	Not designated
Type II	Type II	Not designated
Not designated	Style A	Style A
Not designated	Style B	Style A
Not designated	Style C	Style C
Not designated	Style D	Style D
Not designated	Class 1	Class 1
Not designated	Class 2	Class 2

ZZ-H-561J

MILITARY INTEREST:

Custodians

Army - ME  
Navy - YD  
Air Force - 99

CIVIL AGENCY COORDINATING ACTIVITIES

DOT - ACO  
GSA - FSS  
HHS - FEC  
USDA - AFS

Review Activities

Army - GL  
Air Force - 82  
DLA - CS

PREPARING ACTIVITY:

Navy - YD

Project No. 4720-0491

User Activities

Army - CE  
Navy - MC, SH

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein.