

INCH-POUND

A-A-59567

29 June 2001

SUPERSEDING

ZZ-H-601E

June 11, 1990

COMMERCIAL ITEM DESCRIPTION

HOSE AND HOSE ASSEMBLIES, RUBBER (YARN OR FABRIC REINFORCED) WATER SERVICE

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. **SCOPE.** This (CID) covers yarn or fabric reinforced hose and hose assemblies for general use in water service.

2. CLASSIFICATION.

2.1 Grades and classes. Hose covered by this CID will be of the following grades and classes as specified (see 7.2):

Grade 1 - Commercial hose.

Grade 3 - Weather and ozone-resistant hose.

Class 1 - General water inner tube.

Class 2 - Potable water inner tube.

2.2 Sizes. Hose covered by this CID will be of the sizes (inside diameter) listed in table I, as specified (see 7.2).

3. SALIENT CHARACTERISTICS.

3.1 Description. These hose and hose assemblies are suitable for general use in water service, and depending on the grade and class, are suitable for water applications where resistance to deterioration by weather and ozone is required, and also for use with potable water.

3.2 Materials. Materials shall be free from defects that would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this CID are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use.

3.2.1 Rubber.

3.2.1.1 Grade 1. The rubber compound used in the construction of the cover and the class 1 tube of grade 1 hose shall be compounded from natural rubber, synthetic rubber, or a mixture of natural and synthetic rubber.

3.2.1.2 Grade 3. The rubber compound used in the cover of grade 3 hose shall be weather-resistant and ozone-resistant. The rubber compound used in class 1 inner tube and other parts of the hose shall be compounded from natural rubber, synthetic rubber, or mixtures of natural and synthetic rubber.

Beneficial comments (recommendations, additions, deletions) and any pertinent data that may be of use in improving this document should be addressed to: Defense Logistics Agency, Defense Supply Center, Columbus (DSCC-VAI), P.O. Box 3990, Columbus, OH 43216-5000.

3.2.1.3 Class 2 inner tube. Class 2 inner tube material for grades 1 and 3 hose shall be compounded from natural or synthetic rubber materials that are certified as safe for use in the transport of potable water in accordance with National Sanitation Foundation (NSF) Standard 61, or the Food and Drug Administration (FDA), Code of Federal Regulations 177.2600. The cured rubber shall meet the extraction requirements of 3.7.6.

3.2.2 Other material. Other materials shall be as specified hereinafter.

3.3 Construction. The hose shall consist of:

- a. An inner rubber tube.
- b. A ply or plies of cotton or suitable synthetic yarn or fabric.
- c. An outer rubber cover.

3.4 Reinforcement. The reinforcement shall consist of a ply or plies of braided, knit, or helically wound yarn or plies of fabric. Both the fabric and the yarn shall be made from high-grade cotton or synthetic fiber. The fabric and the yarn shall be free from defects and sufficiently strong to enable the hose to withstand the hydrostatic test pressures specified in table I and at the same time be soft and pliable.

3.4.1 Reinforcement plies. The reinforcement plies of yarn may be braided or knitted in one or more plies over the tube, or helically wound in multiples of two layers with alternate layers wound in opposite directions. If multiple plies of braided or knitted yarn are used, a distinct layer of rubber compound shall be used between the plies to facilitate adhesion to one another and to the tube and cover. A similar layer may be used between the plies of the helically wound reinforcements. When used, the plies of square woven fabric shall be wrapped at a bias of approximately 45° over the tube. The fabric shall overlap no less than 0.50 inch. The plies of fabric shall adhere to each other and, at the same time, adhere to the inner tube and to the outer cover.

3.5 Length. The length of hose up to and including 1.0 inch inside diameter shall be 25 feet or multiples thereof up to approximately 500 feet; hose 1.25 and 1.50 inches inside diameter shall be 25 feet or multiples thereof up to approximately 250 feet; hose over 1.50 inches inside diameter shall be 50 feet (see 7.2). Hose length, with a tolerance of ± 2 percent, shall be measured in accordance with ASTM D380.

3.6 Couplings. Unless otherwise specified (see 7.2), hose shall be furnished without couplings. When specified, a female and a male coupling shall be attached on each end of the hose. The couplings shall be capable of withstanding the test pressures specified in table I without leaking or slipping. On each end of the hose shall be attached one of the following couplings, as specified (see 7.2).

- a. Shank type coupling with interlocking clamps. Hose fitted with interlocking couplings (removable), when required, shall include a serrated nipple and two sections of a clamp equipped for gripping and compressing the hose surface against the nipple. The clamp shall have grooved or waffled interior surfaces and shall have holes for fastening with four bolts. For hose with inside diameter sizes up to and including 0.75 inch, a two-bolt clamp shall be furnished. The protecting end of the nipple shall have a recess in the outer surface to engage the fingers of the clamps. The swivel nut used for tightening the female and male portions of the coupling shall be either hexagonal or octagonal.
- b. Shank type couplings and clamps or ferrules. Shank type couplings and clamps or ferrules, when required, shall be in accordance with WW-C-624, type I or type II. Clamps shall conform to CID A-A-52506.

- c. Internal expansion ring-type. The internal expansion ring-coupling, when required, shall be in accordance with WW-C-624, type III.

TABLE I. Physical requirements for hose and hose assemblies.

Nominal size in inches (in.) (inside diameter)	0.25 0.375	0.50 0.625 0.75	1.0	1.25 1.50	2.0 2.50	3.0 3.50 4.0
Tolerance, inside diameter, plus or minus (in.)	0.031	0.031	0.062	0.062	0.062	0.062
Thickness, minimum (in.): Tube Cover	0.050 0.050	0.060 0.050	0.060 0.050	0.060 0.050	0.062 0.062	0.094 0.078
Number of reinforcement plies (minimum): Wrapped Braided or knit Helically wound	2 1 2	2 1 2	2 2 2	2 2 2	2 2 2	2 2 2
Hydrostatic test pressure, minimum, pounds per square inch (psi) Proof test ^{1/} Burst test	300 600	300 600	300 600	250 500	200 400	200 400
Adhesion, minimum, lb/in. Between cover and plies Between tube and plies Between plies ^{2/}	8 6 8	8 8 8	8 8 8	8 8 8	8 8 8	8 8 8
Tensile strength (before aging) minimum, psi: Tube Cover	800 1000	800 1000	800 1000	800 1000	800 1000	800 1000
Ultimate elongation (before aging) minimum percent: Tube Cover	150 200	150 200	150 200	150 200	150 200	150 200

^{1/} The hydrostatic proof test shall be made only when hose is purchased with couplings. The hose shall not contract in diameter during the test.

^{2/} When applicable.

3.6.1 Rubber washers. Female couplings shall be fitted with a rubber washer suitable for the purpose.

3.6.2 Threads. The coupling connection ends shall be threaded in accordance with FED-STD-H28.

3.7 Physical requirements. The hose shall conform to all of the requirements specified in table I when tested in accordance with the test method specified in table II, with any modification to the method specified herein.

3.7.1 Tensile strength and elongation. The tensile strength and elongation of the hose tube and cover, before aging, shall be as specified in table I when tested in accordance with the test method specified in table II.

TABLE II. Test methods.

Physical Requirement	Test Method	Reference
Hose size inside diameter	ASTM D380	Table I
Hose length		3.5
Thickness of tube and cover		Table I
Tensile strength and elongation of tube and cover	ASTM D412	3.7.1
Adhesion	ASTM D413	3.7.2
Hydrostatic pressure	ASTM D380	3.7.3 3.7.4
Proof pressure test		
Burst pressure test		
Accelerated aging	ASTM D573	3.7.5
Extraction in distilled water grade 3, class 2	ASTM D297	3.7.6
Ozone resistance grade 3, cover	ASTM D1149	3.7.7

3.7.2 Adhesion. The minimum force required for separation of cover and plies, tube and plies, or between plies shall be as specified in table I when tested in accordance with the test method specified in table II.

3.7.3 Proof pressure, coupled assemblies. Hose fitted with couplings shall withstand the proof pressure specified in table I for at least one minute when applied in accordance with the test method specified in table II. Water shall be used as the test media. Leakage or other evidence of defects shall be cause for rejection.

3.7.4 Burst pressure. The hose shall withstand the burst pressure specified in table I when applied in accordance with the test method specified in table II. Water shall be used as the test media. Leakage or other evidence of defects shall be cause for rejection.

3.7.5 Accelerated aging. After accelerated aging, and when tested in accordance with the test method specified in table II, hose tensile strength shall be not less than 80 percent of the values specified in table I, and the ultimate elongation shall be not less than 50 percent of the values specified in table I. Accelerated aging shall be in accordance with ASTM Test Method D573, except that the time for aging shall be 70 hours at a temperature of 212 °F.

3.7.6 Extraction of class 2 hose. The extractable nonvolatile matter in class 2 inner tube shall not exceed 21 milligrams per square inch when the tubes are tested as shown below:

- a. Remove a 1-inch ring of inner tube and cut or buff away the outer surface until the surface is smooth. Cut a length of inner tube to obtain a sample weighing approximately 10 grams, based on a minimum thickness of .050 inch.
- b. Subject the sample to distilled water at reflux temperature for 7 hours in an extraction apparatus as shown in figure 1 of ASTM Test Method D297.
- c. Filter the solution through #40 filter paper and collect the extract in a tared container.
- d. 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 c. Combine the extract solutions and evaporate to dryness. The container and residue shall be dried in an oven at 221±5 °F for one hour, cooled in a desiccator and weighed. 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. The milligrams per square inch shall be determined by dividing the weight of extract by the sample total surface area (length x width in inches x 2).

3.7.7 Ozone resistance, grade 3. The rubber cover of grade 3 hose shall show no visible cracking under 2X magnification when subjected to ozone in accordance with ASTM Test Method D1149. The samples shall be mounted in a 20 percent elongated position, conditioned for 24 hours in an ozone-free atmosphere, then exposed for 72 hours at 104 °F to an atmosphere containing 50 parts per hundred million (pphm) of ozone.

3.8 Marking of hose.

3.8.1 General water hose. 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 other suitable material, or by applying a suitable composition ink, bonding the marking onto the cover so that the marking 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 word "water", the symbol "A-A-59567", the grade, the class of hose and the words "NOT FOR USE WITH POTABLE WATER". Hose shall be marked at regular intervals of not more than 25 feet. Letters shall be at least 0.125-inch high for sizes 0.25-inch to 0.625-inch inside diameter inclusive. Hose in sizes 0.75-inch and larger shall have letters at least 0.25-inch high. An alternative method of marking may be by the application of a continuous embossed strip along the entire length, vulcanizing the hose, and subsequently removing the strip, leaving a continuous relief identification area. Identification shall include the manufacturer's name or trademark, the word "water", the symbol "A-A-59567", the grade, the class of hose, and the words "NOT FOR USE WITH POTABLE WATER" shall be repeated at maximum intervals of 36 inches. When the alternative method of marking is used, no color contrast is required.

3.8.2 Potable water hose, class 2. When class 2 is specified (see 7.2), 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 used in place of "NOT FOR USE WITH POTABLE WATER".

4. **REGULATORY REQUIREMENTS.** The offerer/contractor is encouraged to use recovered material to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

5. **PRODUCT CONFORMANCE.**

5.1 Responsibility for inspection. The contractor is responsible for the performance of all inspections (examination and tests).

5.2 Product conformance. The products provided shall meet the salient characteristics of this CID; conform to the producer's own drawings, specifications, standards, and quality assurance practices; and be the same product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance.

5.3 Examination. Each hose or hose assembly shall be visually and dimensionally examined for compliance with requirements. Examination requiring testing to determine conformance to salient characteristics shall be accomplished by subjecting hose sample specimens to the tests and methods specified in table II. Unless otherwise specified (see 7.2), sampling shall be in accordance with ANSI/ASQ Z1.4. Any modification necessary following failure to meet the specified requirements shall

receive particular attention for adequacy and suitability. This element of inspection shall encompass all examinations of material, configuration, performance and marking requirements. Non-compliance with any specified requirement, or the presence of one or more defects, shall constitute cause for rejection.

6. PACKAGING. Preservation, packing, and marking shall be as specified in the contract or purchase order.

7. NOTES.

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

7.1 Intended use.

7.1.1 Grade 1, class 1. Grade 1, class 1 hose is intended for general water discharge services.

7.1.2 Grade 3, class 1 or class 2. Grade 3, class 1 or class 2 hose is intended for water applications where resistance to deterioration by weather and ozone is required.

7.1.3 Class 2 inner tube. Grade 1 or grade 3 hose with class 2 inner tube is for use with potable water.

7.2 Ordering Data. Acquisition documents should specify the following:

- a. Title, number, and date of this CID.
- b. Grade, class, and size (see 2.1, 2.2, 3.8.2, and 7.6.1).
- c. Length of hose required (see 3.5).
- d. If couplings are required and, if so, the types (see 3.6).
- e. Sampling plan, if other than as specified (see 5.3).
- f. Packaging requirements (see 6).

7.3 Addresses for obtaining copies of referenced documents.

7.3.1 Copies of ASTM standards are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

7.3.2 Copies of ANSI/ASQ standards are available from the American National Standards Institute, 11 W. 42nd Street, New York, NY 10036, or from the American Society for Quality, 611 East Wisconsin Ave, Milwaukee, WI 53202-3005.

7.3.3 The Code of Federal Regulations (CFR) and the Federal Acquisition Regulation may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

7.3.4 Copies of National Sanitation Foundation (NSF) standards are available from NSF International, P.O. Box 130140, Ann Arbor, MI 48113-0140.

7.3.5 Activities outside the Federal Government may obtain copies of federal specifications, standards and commercial item descriptions as specified in the General Information section of the Index of Federal Specifications, Standards, and Commercial Item Descriptions. The Index is for sale on a subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

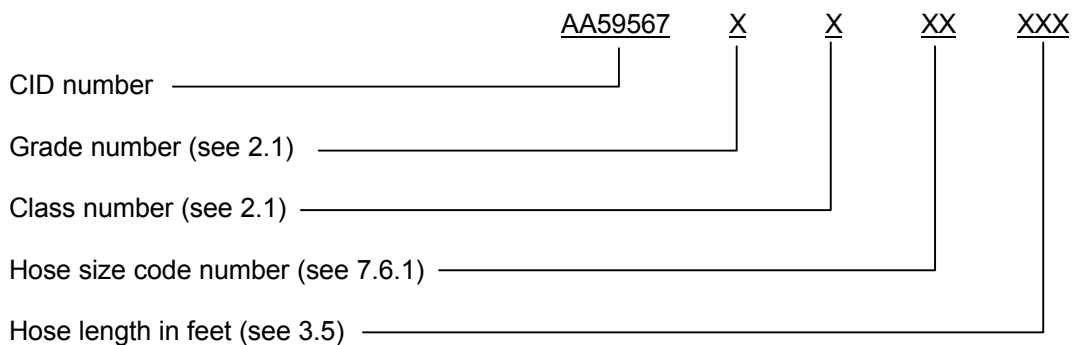
7.4 Working pressure. The maximum working pressures for the hose covered by this CID are shown in table III.

TABLE III. Maximum working pressures.

Hose Size (ID) (inches)	Maximum working pressure (psi)
0.25	150
0.375	150
0.50	150
0.625	150
0.75	150
1.0	150
1.25	125
1.50	125
2.0	100
2.5	100
3.0	100
3.5	100
4.0	100

7.5 Yarn or fabric-reinforced hose. The terms yarn or fabric-reinforced hose, as defined in this CID, cover the following types: wrapped, braided, knit, or helically wound reinforcements.

7.6 Part or Identifying Number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor. The PIN to be used for a hose or hose assembly acquired using this CID is generated as follows:



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

TABLE IV. Hose size code number.

Hose size code no.	04	06	08	10	12	16	20
Hose ID (inches)	0.25	0.375	0.50	0.625	0.75	1.0	1.25

Hose size code no.	24	32	40	48	56	64	
Hose ID (inches)	1.50	2.0	2.5	3.0	3.5	4.0	

7.7 Key words.

Cover, outer
Ozone-resistant
Plies, reinforcement
Rubber, natural
Rubber, synthetic
Tube, inner

MILITARY INTERESTS:

Custodians:

Army – AT
Air Force – 99
Navy – SH
DLA - CC

Review activities:

Army – MI
Navy - MC, OS, SA
Air Force – 71

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA – FSS
DOT – FAA - ACO
HHS - FEC

Preparing activity:

DLA - CC

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