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August 21, 1989
SUPERSEDING
WW-C-624D
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AMENDMENT 1
April 22, 1985

FEDERAL SPECIFICATION

COUPLING ASSEMBLY, HOSE (GARDEN, WATER, AND WATER SUCTION)

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers couplings used with garden, water, and water suction hose.

1.2 Classification. Couplings will be of the following types, styles, and sizes, as specified (see 6.2).

1.2.1 Types and styles.

Type I - Ribbed shank (see figure 1).

Style 1 - Short shank with octagon or hex swivel.

Style 2 - Short shank with pin lug swivel.

Style 3 - Long shank with octagon or hex swivel.

Style 4 - Long shank with pin lug swivel.

Class A - Garden hose.

Sizes - 1/2, 5/8, and 3/4 inch (nominal).

Class AA - Water hose.

Sizes - 3/4, 1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, and 6 inches (nominal).

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.

FSC 4730

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Type II - Expansion shank or compression ferrule (see figure 2).

Style 5 - Expansion shank.

Style 6 - Compression ferrule.

Class A - Garden hose.

Sizes - 1/2, 5/8, and 3/4 inch (nominal).

Class AA - Water hose.

Sizes - 1/2, 5/8, 3/4, and 1 inch (nominal).

Type III - Expansion ring (see figure 3).

Style 7 - Rocker lug swivel.

Style 8 - Pin lug swivel.

Style 9 - Long handle swivel.

Class AA - Water hose.

Sizes - 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, and 6 inches (nominal).

Class B - Water suction hose.

Sizes - 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, and 6 inches (nominal).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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).

SPECIFICATIONS

Federal Specification:

WW-C-440 - Clamps, Hose (Low-Pressure)

Federal Standards:

FED-STD-H28/10 - American National Hose Coupling and Fire-Hose Coupling Threads

FED-STD-123 - Marking for Shipment (Civil Agencies)

Military Specification:

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

Military Standards:

MIL-STD-105 - Sampling procedures and Tables for Inspection by Attributes

MIL-STD-129 - Marking for Shipment and Storage

(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.)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Standard commercial product. The couplings shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in the couplings being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model.

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 insure 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 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.

3.4 Design. Couplings shall consist of the various components specified in 3.5.1, 3.5.2, and 3.5.3 and similar to the applicable figures. Components of the coupling shall not be mixed in the sense of dissimilar metals that will be subject to galvanic corrosion when the coupling sections are connected and a flow is produced through the hose and coupling assembly (see 6.3).

3.5 Coupling components.

3.5.1 Type I couplings. Unless otherwise specified (see 6.2), type I coupling parts shall be cast or machined from copper alloy (brass), zinc-

base-alloy, stainless steel, or steel and coupling components shall consist of the following (see figure 1).

- a. Female section.
- b. Swivel nut for female section (see 3.7).
- c. Male section.
- d. Gasket recess in swivel (recess may be omitted provided the standard commercial gasket does not fall out when the two sections are disconnected).
- e. Clamps (one for each male and female section, or ferrules (outside crimp) (one for each male and female section, for styles 1 and 2).

3.5.1.1 Dimensions, figure 1. Dimension A shall be sized so as not to restrict the free flow of the hose attached; B shall be as required to accommodate the hose specified; and C shall be as required to meet the pull-off and leakage requirements and to accommodate the required clamps(s) or ferrule(s) (see table I). Clamps or ferrules shall not extend closer than 1/16 inch to the end of the shank.

TABLE I. Dimension C (minimum) (inches).

For hose size	Styles 1 and 2	Styles 3 and 4
1/2	1-1/8	1-1/8
5/8	1-1/8	1-1/8
3/4	1-1/8	1-1/8
1	1-1/8	1-1/8
1-1/4	1-3/4	2
1-1/2	1-3/4	2-1/2
2	2-3/16	3-1/2
2-1/2	2-1/2	4
3	3-1/4	5
3-1/2	3-7/8	5-1/2
4	4-3/8	5-3/4
4-1/2	4-1/2	5-7/8
5	5-3/8	5-7/8
6	6-3/8	6-1/2

3.5.2 Type II couplings. Unless otherwise specified (see 6.2), type II couplings shall be cast, machined, pressed or extruded from copper alloy (brass), cartridge brass, stainless steel, steel, zinc-base-alloy, or heat stabilized 6/6 nylon and coupling components shall consist of the following (see figure 2).

- a. Female section with expandable smooth shank for ribbed ferrules or ribbed shank for compression ferrules.
- b. Swivel nut for female section (see 3.7).
- c. Male section with expandable smooth shank for ribbed ferrules or ribbed shank for compression ferrules.
- d. Gasket recess in swivel (recess may be omitted provided the standard commercial gasket does not fall out when the two sections are disconnected).
- e. Ribbed ferrule or compression ferrule for each male and female section.

3.5.2.1 Dimensions, figure 2. Dimension A shall be sized so as to suit the inside diameter (ID) of the hose specified; B shall be as required to meet

the pull-off and leakage requirements; and C and D shall be sized to suit the outside diameter of the hose specified and meet the pull-off and leakage requirements. Dimension D shall not exceed dimension B and shall not extend closer than 1/16 inch to the end of the shank.

3.5.3 Type III couplings. Unless otherwise specified (see 6.2), type III couplings shall be cast or matches from copper alloy (brass), stainless steel or steel and coupling components shall consist of the following (see figure 3).

- a. Female section.
- b. Swivel nut for female section with nut to bowl retainer (see 3.7).
- c. Male section.
- d. Gasket recess in swivel.
- e. Expansion ring, one for each male and female section.

3.5.3.1 Dimensions, figure 3. Dimensions A, B, F (see table II), and G shall be as required to fit the specified hose and meet the pull-off and leakage requirements. Dimension C shall be so sized as not to restrict the free flow of the hose. Dimensions D and E shall be as required to accommodate the appropriate standard spanner wrench.

TABLE II. Dimensions B and F (minimum) (inches).

For hose size	B	F
1-1/2	1-1/2	1-1/4
2	1-1/2	1-1/4
2-1/2	1-3/4	1-1/2
3	2-1/4	1-7/8
3-1/2	2-1/4	2
4	2-1/4	2
4-1/2	2-1/4	2
5	2-1/4	2
6	2-1/4	2

3.5.3.2 4 1/2 X 4 inch coupling. The 4 1/2 X 4 inch coupling shall have a 4.5 inch NH thread and shall accommodate the 4-inch ID hose.

3.5.3.3 Detail sections AA and BB of figure 3. Pellets, ball bearings or square-cross-section piston-ring attachment of the swivel to the hose bowl may be used in place of still thread or groove shown.

3.6 Tightening provisions.

3.6.1 Type I. The male section shall have either lugs or wrench flats, and the swivel nut on the female section shall have rocker lugs, pin lugs, or wrench flats. When specified (see 6.2), wrench surfaces may be as specified in 3.6.2.

3.6.2 Type II. Wrenching surfaces may be octagon, hexagon, ridged, or knurled and shall be located on the swivel nut only.

3.6.3 Type III. Unless otherwise specified (see 6.2), rocker lugs, pin lugs, or long handles shall be located on the swivel nut only. When specified (see 6.2), rocker lugs, pin lugs, or long handles shall be located on both male and female sections.

3.7 Swivel nuts. Swivel nuts shall be of the same material as the male and female sections or of other suitable material that is compatible with and

will not cause galvanic action in the coupling and shall meet the requirements of 3.13 through 3.13.2.1 (see 6.2).

3.8 Expansion rings. Unless otherwise specified (see 6.2), expansion rings for type III couplings shall be made from seamless copper alloy (brass) tubing. Expansion rings shall be sized for the particular application specified to prevent pull-off and leakage when tested in accordance with 4.5.1 and 4.5.2.

3.9 Ferrules. Unless otherwise specified (see 6.2), ferrules for styles 1 and 2 type I and for type II couplings shall be made from sheet, tubing, or locking straps of copper alloy (brass), stainless steel, or zinc-coated steel.

3.10 Gaskets. Unless otherwise specified (see 6.2), gaskets shall be made of natural or synthetic rubber, a combination of these materials or polyvinyl chloride. Gaskets shall be of nominal size for the specific coupling and shall be the standard commercial size and shall not fall out of the coupling when the two sections are disconnected.

3.11 Clamps for type I couplings. Unless otherwise specified (see 6.2), clamps shall be types A through H conforming to WW-C-440.

3.12 Threads. Threads as specified (see 6.2), shall be NH or NPSH of FED-STD-H28/10 for types I and III couplings. Threads for type II, class A couplings shall be NHR (rolled) of FED-STD-H28/10 when design of the coupling is of thin material that will not permit cut-threads and still meet the pull and proof tests of 3.13 and 3.13.1. Threads shall be NH (cut) on the swivel nut for the female section and NH (cut or cast) on the male shank for type II class A couplings designed of thick material and for type II class AA couplings.

3.13 Performance requirements. All couplings shall be given a 150 pound (lb) pull test prior to the hydrostatic test.

3.13.1 Types I and II, class A couplings. Type I and II, class A couplings (garden hose) shall not leak when subjected to a 100 pound per square inch (psi) internal hydrostatic proof pressure test (see 4.5.1). Tests shall be performed with couplings attached to hoses specified in 3.4.

3.13.2 Types I, II, and III, class AA couplings. Types I, II, and III, class AA couplings shall not leak when subjected to an internal hydrostatic proof pressure of 300 psi for 1/2 through 1 inch, 250 psi for 1-1/4 and 1-1/2 inch, 200 psi for 2 through 4 inch, and 100 psi for 4-1/2 through 6 inch (see 4.5.1). Tests shall be performed with couplings attached to hoses specified in 3.4.

3.13.2.1 Type III, class B couplings. Type III, class B couplings shall not leak when subjected to an internal hydrostatic proof pressure as in 3.13.2 and a vacuum test of 22-inch mercury vacuum (see 4.5.2).

3.13.3 Requisition of coupling without hose. When couplings are requisitioned without hose, the same tests shall be performed with the type and size hose attached representative of that to be used for the intended application of the coupling as indicated in the contract or purchase order (see 6.2).

3.14 Finish. All nonmating surfaces shall be made smooth by grinding, polishing, shot blasting, and sand blasting, or wire brushing and shall be

free of burrs. All mating and gasket surfaces shall be 125 microinch root-mean-square finish or smoother. On all castings, the external corrugations shall be a uniform annular groove around the periphery of the shanks and shall have a clean parting line.

3.14.1 Zinc-base alloy couplings. Zinc-base-alloy couplings shall have a corrosion-resisting coating of chromium, cadmium, zinc, or chromate at the option of the manufacturer, after threading.

3.14.2 Steel couplings. Steel couplings shall be zinc coated after threading.

3.15 Workmanship. Couplings shall be produced, finished, and fitted in accordance with the requirements of this specification. The swivel nut of the female part shall turn freely by hand. All threaded parts shall be relieved, at least to the bottom of the threads to assure proper mating of the parts. Threads shall not be rough or eccentric, and male and female parts shall go together easily. The edges of expansion rings shall be rounded and smooth. The edges at the ends of the male and female section shanks shall be rounded and smoothed for ease in installing the hose and to prevent damage to the hose.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 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. The unit of product shall be one complete coupling assembly. All couplings of the same type, style and size offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.4 Examination. Each unit selected shall be examined to verify compliance with this specification. Examination shall be conducted as

specified in table III.

TABLE III. Classification of defects.

Categories	Defects	Paragraph requirements
Major		
101	Type and style not as specified.	1.2.1
102	Size not as specified.	1.2.1
103	Mixture of parts of dissimilar materials subject to galvanic corrosion.	3.4 and 3.7
104	Gasket falls out of nut.	3.5.1, 3.5.2, and 3.10
105	Material not as specified.	3.5, 3.5.2, 3.5.3, and 3.7
106	Component parts missing or damaged.	3.5.1, 3.5.2, and 3.5.3
107	Dimensions not as specified.	3.5.1.1, 3.5.2.1, and 3.5.3.1
108	Clamps not as specified.	3.11
109	Threads not as specified.	3.12
110	Annular grooves on shanks of coupling not uniform.	3.14
111	Finish not as specified.	3.14, 3.14.1, 3.14.2, and 3.15
112	Parts do not go together easily.	3.15
Minor:		
201	Rough or eccentric threads.	3.15
202	Swivel nut not easily turned by hand.	3.15
203	Edges of expansion rings not rounded and smooth.	3.15
204	Edges of ends of male and female sections not rounded and smooth.	3.15

4.5 Tests.

4.5.1 Pull load and hydrostatic proof test. Couplings sampled in accordance with 4.3.2.1 shall be attached to the applicable hose (see 3.4), and subjected to a 150-lb pull load for a minimum of 1 minute using either a suitable tensile testing machine or the dead weight method. After completion of the pull test, couplings shall be hydrostatically tested with water as the test fluid for at least 1 minute. Couplings shall not leak, slip, pull off, or blow off the hose when subjected to the applicable pull and hydrostatic stresses specified in 3.13 through 3.13.2.1.

4.5.2 Vacuum test. This test shall be performed after tests of 4.5.1. The male and female sections shall be coupled which in effect will have blocked the open ends, or open ends of the hoses shall be blocked and sealed. A source for vacuum and an accurate vacuum gage shall be adapted to the test sample. A dry 22-inch mercury vacuum shall be developed within the test sample and then the vacuum source shall be closed off. The 22-inch mercury vacuum shall be held without any loss of the coupling seal between male and female sections or where the hose is joined to the coupling sections.

4.6 Preparation for delivery inspection. The inspection of the preservation, packing, and marking shall be in accordance with the requirements of section 4 of MIL-P-775.

5. PREPARATION FOR DELIVERY

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

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

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

6.1 Intended use. Couplings covered by this specification are intended for use with water hose conforming to ZZ-H-601 at pressures up to 150 pounds per square inch gage (psig), garden hose conforming to L-H-520 at pressures up to 75 psig and water suction hose conforming to ZZ-H-561 at zero psi absolute.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in acquisition documents:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2).
- c. Type, style, and class of coupling required (see 1.2).
Note: When combinations of class AA, and B nut styles are required, specify the particular combinations selected (see 1.2.1, 3.6.3, 6.3 and figure 3). (See 6.2.2 for SPN).
- d. Size of couplings required and particular hose application (see 1.2).
- e. Material required for coupling (see 3.4, 3.5.1, 3.5.2, and 3.7).
- f. Gasket recess required (see 3.5.1 and 3.5.2).
- g. Whether clamps or ferrules required for A and AA couplings (see 3.5.1 and 3.11).
- h. Type of shank and ferrule required (see 3.5.3a and 3.5.3c.).
- i. Wrench surface required (see 3.6.1).
- j. Different expansion ring required (see 3.8).
- k. Different ferrules required (see 3.9).
- l. Different gasket required (see 3.10).
- m. Threads required (see 3.12).
- n. When coupling only is required, specify intended application and type and size hose to be used (see 3.13.3).
- o. Level of preservation and level of packing required (see 5.1).

6.3 Part or Identifying Number (PIN). PINs were developed to identify items covered by this specification for cataloging purposes. The PIN consists of the specification identifier (WW-C-624), the PIN type, class, and style codes from table IV, and the PIN size code from table V (see 6.2).

Example:

WW-C-624 -1G -1 -04

Specification identifier
Type and class (table IV)
Style table IV
Size table V

The above identifies a 1/2-inch garden hose coupling with a short ribbed shank with octagon or hexagon swivel nut.

TABLE IV. PIN codes for type, class, and style.1/

Type	Class	Style	PIN type and Class Code	PIN Style Code
I	A	1	1G	1
		2	1G	2
		3	1G	3
		4	1G	4
I	AA	1	1W	1
		2	1W	2
		3	1W	3
		4	1W	4
II	A	5	2G	5
		6	2G	6
	AA	5	2W	5
		6	2W	6
III	AA	7	3W	7
		8	3W	8
		9	3W	9
III	B	7	3S	7
		8	3S	8
		9	3S	9

1/ NOTE: See 1.2.1 for cross-reference of type, class, and style designators to noun name.

TABLE V. Size codes for all types.1/

Class A Size	AA Size	B Size	PIN size code
1/2			-04
5/8			-05
3/4	3/4		-06
	1		-08
	1-1/4		-10
	1-1/2	1-1/2	-12
	2	2	-16
	2-1/2	2-1/2	-20
	3	3	-24
	3-1/2	3-1/2	-28
	4	4	-32
	4-1/2	4-1/2	-34
	5	5	-40
	6	6	-48

1/ NOTE: The size indicates the nominal size of the coupling to fit the hose with that ID, i.e., size 1/2 is for a coupling to fit the

1/2-inch ID hose.

6.4 Class AA, B coupling combinations. Any combination of style 7, 8, or 9, type III couplings are permissible when specified. For example, couplings could be ordered with style 8 on the swivel section and style 9 on the male section. To prevent galvanic corrosion, material compatibility should be considered.

6.5 Cross-reference of classifications. A cross-reference of old to new classifications resulting from specification revisions is as follows.

WW-C-624B	WW-C-624C	WW-C-624D and WW-C-624E
Type A (hex swivel)	Type A, style 1	Type I, class A, style 1
Type A (pin swivel)	Type A, style 2	Type I, class A, style 2
None	Type A, style 3	Type I, class A, style 3
None	Type A, style 4	Type I, class A, style 4
Type A (hex swivel)	Type AA, style 1	Type I, class AA, style 1
Type A (pin swivel)	Type AA, style 2	Type I, class AA, style 2
None	Type AA, style 3	Type I, class AA, style 3
None	Type AA, style 4	Type I, class AA, style 4
None	None	Type III, class AA, style 7
None	None	Type III, class AA, style 8
None	None	Type III, class AA, style 9
Type B, B-1	Type B, style 1	Type III, class B, style 7
Type B, B-2	Type B, style 2	Type III, class B, style 8
Type B, B-3	Type B, style 3	Type III, class B, style 9
None	Type C	Type II, class A, style 5
None	Type D	Type II, class AA, style 6
None	None	Type II, class A, style 5
None	None	Type II, class AA, style 6

6.6 Fire hose couplings. Fire hose couplings are covered by WW-C-621.

MILITARY INTERESTS:

Custodians

Army - ME
Navy - YD
Air Force - 99

Review Activities

Air Force - 82
DLA - CS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD

Project No. 4730-1115

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.