



## Standard Specification for Quick Disconnect Couplings (6 in. NPS and Smaller)<sup>1</sup>

This standard is issued under the fixed designation F1122; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This specification covers the manufacturing data required to produce a variety of styles and sizes of quick disconnect couplings up to and including NPS 6 for marine use that ensure interchangeability and safety of operation.

1.2 In general, quick disconnect couplings are hose and pipe end fittings that permit quick mechanical attachment by means other than bolted or threaded fittings. The method of attachment is a male coupling half (adapter) that fits into a female coupling half (coupler) of the same size. By closing attached cam handles, the coupling halves seal, permitting fluids to be transported under pressure through the quick disconnect coupling.

1.3 The values stated in this specification are in inch-pound units with SI units given in parentheses. The values of each system may not be exact equivalents. Therefore, each system should be considered separately.

1.4 The following safety hazards caveat pertains only to the test method described in this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

2.1 *ANSI Standards*:<sup>2</sup>

**B2.1** Pipe Threads

**B16.5** Pipe Flanges and Flanged Fittings, Steel-Nickel Alloy, and Other Special Alloys

**B16.24** Bronze Pipe Flanges and Flanged Fittings

**B16.42** Ductile Iron Pipe Flanges and Flanged Fittings

**B31.1** Power Piping Code

2.2 *MSS Standards*:<sup>3</sup>

**MSS-SP-6** Standard Finish for Contact Faces of Pipe Flanges and Connecting End Flanges of Valves and Fittings

**MSS-SP-25** Standard Marking System for Valves, Fittings, Flanges, and Unions

**MSS-SP-55** Quality Standard for Steel Castings for Valves, Flanges, and Fittings and Other Piping Components (Visual Method)

2.3 *ASME Standards*:<sup>4</sup>

**Section VIII, Division 1**, Pressure Vessels

**Section IX**, Welding and Brazing Qualifications

### 3. Definitions of Terms Specific to This Standard

3.1 *adapter*—one half of a quick disconnect coupling that fits into the coupler and seals against an elastomer gasket positioned inside the coupler.

3.2 *cam handles*—handles that are assembled to the coupler half which by closing engages the adapter sealing the coupling.

3.3 *coupler*—one half of a quick disconnect coupling that receives the adapter. This half contains the sealing gasket and cam handles (see Fig. 1).

NOTE 1—See Fig. 2 for a description of typical coupler pipe fittings.

### 4. Classification

4.1 Quick disconnect couplings shall consist of the following types:

4.1.1 *Standard Class*—This type is to be designed for a 4:1 burst factor of safety.

4.1.2 *Class I*—This type is to be designed for a 5:1 burst factor of safety.

4.2 Both Standard Class and Class I will be called quick disconnect couplings in the body of this specification unless otherwise specified.

### 5. Ordering Information

5.1 Purchase orders for quick disconnect couplings under this specification shall include the following applicable information:

5.1.1 Class.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.11 on Machinery and Piping Systems.

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<sup>2</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

<sup>3</sup> Available from Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), 127 Park St., NE, Vienna, VA 22180-4602.

<sup>4</sup> Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990.

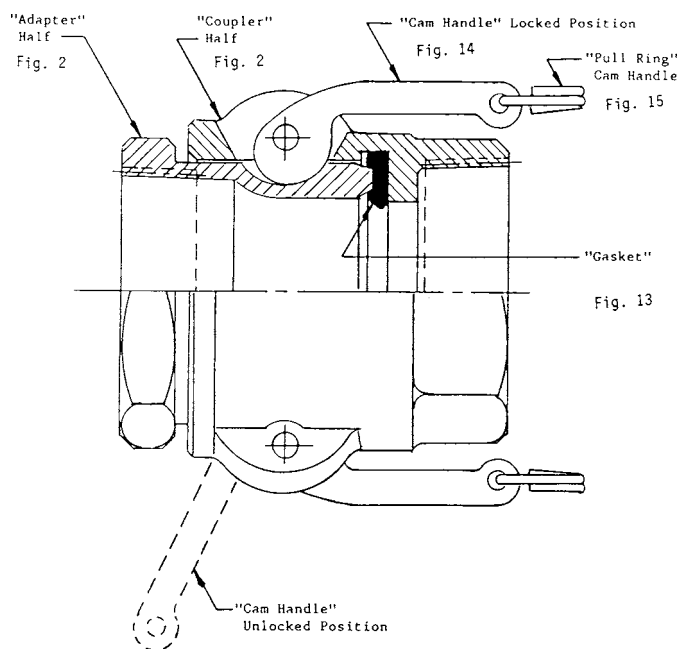


FIG. 1 Typical Coupler Assembly

5.1.2 Size and type of each coupling half-end connection.  
(Example: 2- by 1½-in. NPT).

5.1.3 ASTM material designation and date including alloy specifications for the following:

5.1.3.1 Adapter and coupler halves,

5.1.3.2 Cam handle, and

5.1.3.3 Cam handle pivot pin.

5.1.4 Product or fluid in applicable system.

5.1.5 Shipping instructions.

5.1.6 Any special requirements, such as testing, coatings, and threads.

## 6. Materials and Manufacture

### 6.1 Materials:

6.1.1 Pressure-retaining parts shall be manufactured from material specifications and grades listed in **Section VIII, Division 1**, of the ASME Boiler and Pressure Vessel Code or ANSI B31.1.

6.1.2 All other materials of construction shall be of the type specified by the user and shall conform to ASTM, ASME, or Metal Power Industry Federation material specifications. Materials not identified by the ordering data shall be of the manufacturer's standard and of the same quality used for the intended purpose in commercial practice.

6.1.3 All material incorporated in the work covered by this specification shall be new. The use of rebuilt or used products are not allowed under this specification.

6.1.4 Gaskets are to be produced from a compressible elastomeric material and shall be compatible with the fluid to be transferred (see 5.1.4).

### 6.2 Manufacture:

6.2.1 Adapters and couplers are to be produced as castings or forgings. Cam handles may be produced by casting, forging, or sintered metal processes. Established commercial processing methods are to be used to produce these parts, provided

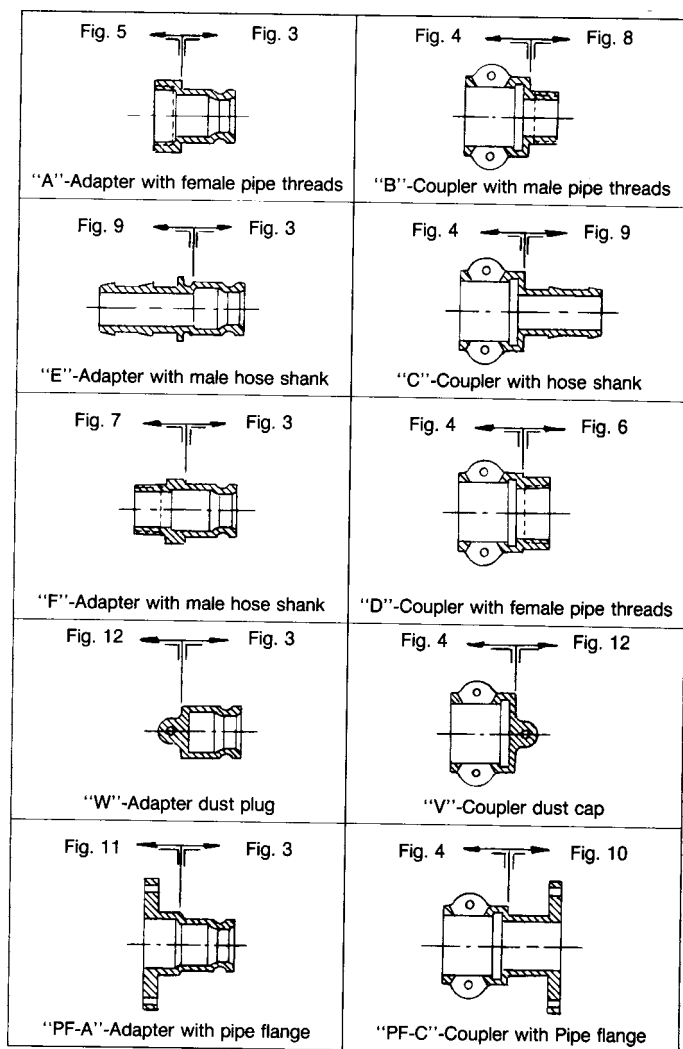


FIG. 2 Adapter/Coupler Types (End Dimensional Data Located in Tables Indicated by Arrows)

chemical and physical properties are consistent with those cataloged for the specified materials.

6.2.2 Pipe threads on the service end of couplers or adapters, when specified, shall meet ANSI B2.1.

6.2.3 Flanges on the service end of couplers or adapters, when specified, shall meet ANSI B16.5, B16.24, or B16.42.

6.2.4 Flanges shall be finish machined to specifications shown in MSS-SP-6.

6.2.5 Cam handles assembled to the coupler are to have a safety locking device to ensure against the handles being opened unintentionally or vibrating open. This locking device must require a separate, deliberate effort in the opening operation over the standard handle operation.

6.2.6 Cam handles shall be manufactured to contain the adapter within the coupler under rated pressure with no leakage occurring. The cam action shall not distort the couplers rendering the coupler unusable. The force required to close the cam handles shall be adequate to prevent leakage, but shall be easily attainable through hand operation by an average strength person. Handles should not need to be

6.2.7 Welding procedure qualifications, welder performance qualifications, and welding materials shall be in accordance with ANSI B 31.1 and Section IX of the ASME Code. Brazing or soldering shall not be used. Where radiography is required (see 12.1), all welds shall be butt welds.

## 7. Other Requirements

7.1 All couplings shall have a maximum allowable working pressure of not less than 150 psi (1034 kPa).

7.2 Maximum allowable working pressure (MAWP) for a Standard Class coupling shall be 25 % of its burst pressure.

7.3 Maximum allowable working pressure for a Class I coupling shall be 20 % of its burst pressure.

7.4 Burst pressure shall be determined in accordance with Section VIII, Division 1 of the ASME Code.

## 8. Dimensions

8.1 The dimensions and tolerances required to ensure interchangeability of adapter and coupler halves, of common sizes, shall be as given in Figs. 3-15.

8.2 Sizes as listed in the tables correspond to NPS for piping systems.

## 9. Workmanship, Finish, and Appearance

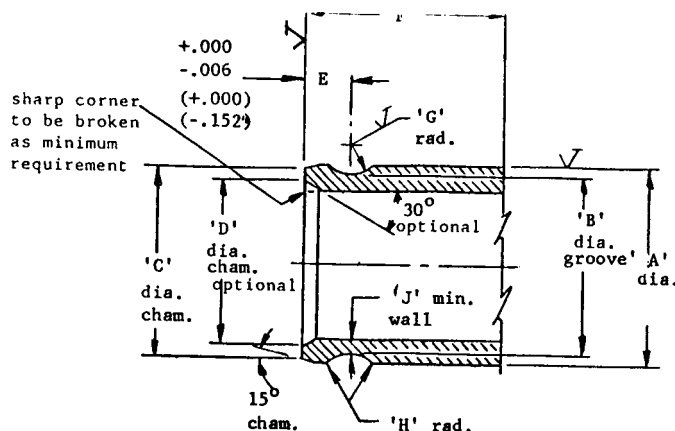
9.1 Couplings are to be produced with quality workmanship. Casting surface quality is to be in accordance with MSS-SP-55. Machined surfaces are to be finish machined to a 125- $\mu$ in. (3175- $\mu$ mm) (AA) finish or better with no porosity showing.

9.1.1 Couplings are to be free of burrs or sharp edges. Machined surfaces are to be free of nicks or scratches that may affect the sealing capabilities of the couplings.

9.1.2 Surfaces are to be sound with good appearance and true pattern. Internal surfaces, if not machined, shall be smooth, as expected from good quality casting, and free from any flaw that would render the part unsafe for its intended use.

9.2 Cam handles are to be smooth, having no burrs or sharp edges. Cam closing surface is to be continuous, providing an increasing axial pull on mating adapter until proper seating against the gasket occurs.

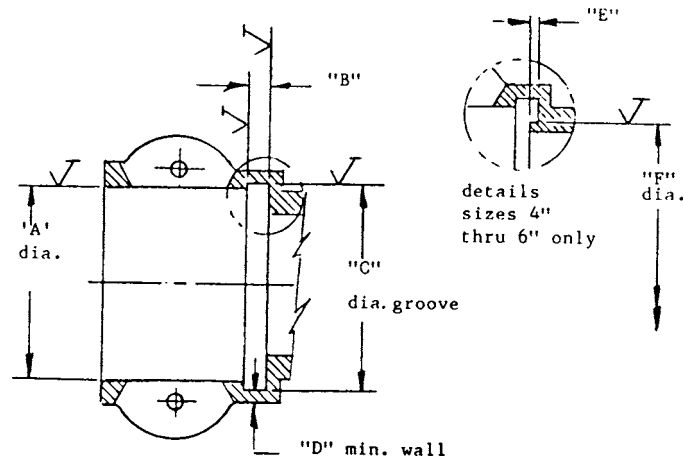
9.3 Defective parts are not to be repaired by welding, brazing, or any other method, to fill porosity or other flaws in the casting.



NOTE 1—Unidentified tolerances; fractional =  $\pm 1/64$  ( $\pm 0.4$ ), decimal =  $+0.000/-0.005$  ( $+0.000/-0.127$ ), angular =  $\pm 2^\circ$  ( $\pm 0.035$  rad)

| Size  | Dimensions, in. (mm) |                  |                    |                   |                 |                   |                 |               |               |
|-------|----------------------|------------------|--------------------|-------------------|-----------------|-------------------|-----------------|---------------|---------------|
|       | A                    | B                | C                  | D                 | E               | F                 | G               | H             | J             |
| 1/2   | 1.264<br>(32.1)      | 1.035<br>(26.3)  | 17/32<br>(31)      | 27/32<br>(21)     | 0.471<br>(12)   | 1<br>(25.4)       | 0.378<br>(9.6)  | 1/16<br>(1.6) | 3/32<br>(2.4) |
|       | 1.264<br>(32.1)      | 1.035<br>(26.3)  | 17/32<br>(31)      | 31/32<br>(24.6)   | 0.471<br>(12)   | 1<br>(25.4)       | 0.378<br>(9.6)  | 1/16<br>(1.6) | 3/32<br>(2.4) |
| 3/4   | 1.446<br>(36.7)      | 1.144<br>(29)    | 1 1/8<br>(34.9)    | 1 3/32<br>(27.8)  | 0.565<br>(14.3) | 1 5/16<br>(33.3)  | 0.378<br>(9.6)  | 3/32<br>(2.4) | 3/32<br>(2.4) |
|       | 1.792<br>(45.5)      | 1.388<br>(35.2)  | 1 23/32<br>(43.6)  | 1 1/4<br>(31.7)   | 0.690<br>(17.5) | 1 9/16<br>(39.7)  | 0.441<br>(11.2) | 1/8<br>(3)    | 1/8<br>(3)    |
| 1 1/4 | 2.105<br>(53.4)      | 1.690<br>(42.9)  | 2 1/32<br>(51.6)   | 1 9/16<br>(39.7)  | 0.690<br>(17.5) | 1 5/8<br>(41.3)   | 0.441<br>(11.2) | 1/8<br>(3)    | 1/8<br>(3)    |
|       | 2.484<br>(63.1)      | 2.065<br>(52.4)  | 2 13/32<br>(61.1)  | 1 15/16<br>(49.2) | 0.848<br>(21.5) | 1 7/8<br>(47.6)   | 0.441<br>(11.2) | 1/8<br>(3)    | 1/8<br>(3)    |
| 2     | 2.985<br>(75.8)      | 2.545<br>(64.6)  | 2 7/8<br>(73)      | 2 7/16<br>(61.9)  | 0.848<br>(21.5) | 1 15/16<br>(49.2) | 0.441<br>(11.2) | 1/8<br>(3)    | 5/32<br>(4)   |
|       | 3.604<br>(91.5)      | 3.202<br>(81.3)  | 3 1/2<br>(88.9)    | 3 3/32<br>(78.6)  | 0.895<br>(22.7) | 2<br>(50.8)       | 0.503<br>(12.8) | 1/8<br>(3)    | 5/32<br>(4)   |
| 2 1/2 | 4.708<br>(119.6)     | 4.307<br>(109.4) | 4 19/32<br>(116.7) | 4 1/8<br>(104.8)  | 0.895<br>(22.7) | 2 1/16<br>(52.4)  | 0.503<br>(12.8) | 1/8<br>(3)    | 7/32<br>(5.6) |
|       | 5.728<br>(145.5)     | 5.312<br>(134.9) | 5 5/8<br>(142.9)   | 5 1/8<br>(130.2)  | 0.897<br>(22.8) | 2 1/8<br>(54)     | 0.503<br>(12.8) | 1/8<br>(3)    | 7/32<br>(5.6) |
| 3     | 6.929<br>(176)       | 6.362<br>(161.6) | 6 13/16<br>(173)   | 6 5/32<br>(156.4) | 0.963<br>(24.5) | 2 1/4<br>(57.1)   | 0.659<br>(16.7) | 1/8<br>(3)    | 7/32<br>(5.6) |
|       |                      |                  |                    |                   |                 |                   |                 |               |               |

FIG. 3 Adapter End Dimensions



NOTE 1—Unidentified tolerances; fractional =  $\pm 1/64$  ( $\pm 0.4$ ), angular =  $\pm 2^\circ$  ( $\pm 0.035$  rad), decimal =  $\pm 0.005$  ( $\pm 0.127$ )

| Size  | Dimensions, in. (mm) |       |                                 |       |       |         |
|-------|----------------------|-------|---------------------------------|-------|-------|---------|
|       | A                    | B     | C                               | D     | E     | F       |
| 1/2   | 1.274                | 1/4   | 1 <sup>27</sup> / <sub>64</sub> | 3/32  | ...   | ...     |
|       | (32.3)               | (6.3) | (36.1)                          | (2.4) | ...   | ...     |
| 3/4   | 1.274                | 1/4   | 1 <sup>27</sup> / <sub>64</sub> | 3/32  | ...   | ...     |
|       | (32.3)               | (6.3) | (36.1)                          | (2.4) | ...   | ...     |
| 1     | 1.464                | 9/32  | 1 <sup>19</sup> / <sub>32</sub> | 3/32  | ...   | ...     |
|       | (37.2)               | (7.1) | (40.5)                          | (2.4) | ...   | ...     |
| 1 1/4 | 1.810                | 9/32  | 2                               | 1/8   | ...   | ...     |
|       | (46)                 | (7.1) | (50.8)                          | (3)   | ...   | ...     |
| 1 1/2 | 2.123                | 9/32  | 2 1/4                           | 1/8   | ...   | ...     |
|       | (53.9)               | (7.1) | (57.1)                          | (3)   | ...   | ...     |
| 2     | 2.508                | 9/32  | 2 11/16                         | 1/8   | ...   | ...     |
|       | (63.7)               | (7.1) | (68.3)                          | (3)   | ...   | ...     |
| 2 1/2 | 3.009                | 9/32  | 3 3/16                          | 5/32  | ...   | ...     |
|       | (76.4)               | (7.1) | (81)                            | (4)   | ...   | ...     |
| 3     | 3.628                | 9/32  | 3 25/32                         | 5/32  | ...   | ...     |
|       | (92.1)               | (7.1) | (96)                            | (4)   | ...   | ...     |
| 4     | 4.732                | 9/32  | 4 15/16                         | 7/32  | 3/32  | 3 29/32 |
|       | (120.2)              | (7.1) | (125.4)                         | (5.6) | (2.4) | (99.2)  |
| 5     | 5.752                | 9/32  | 5 31/32                         | 7/32  | 3/32  | 4 51/64 |
|       | (146.1)              | (7.1) | (151.6)                         | (5.6) | (2.4) | (121.8) |
| 6     | 6.948                | 9/32  | 7 9/64                          | 7/32  | 3/32  | 5 29/32 |
|       | (176.5)              | (7.1) | (181.4)                         | (5.6) | (2.4) | (150)   |

FIG. 4 Coupler End Dimensions

9.4 Gaskets are to be produced having parallel sealing faces. Faces are not to contain any imperfections that will allow leakage to occur at working pressure.

## 10. Number of Tests

10.1 A prototype coupling of each size of each particular design shall be tested to determine conformance to this specification.

10.2 Each coupling shall be tested as outlined in production testing of 11.2.

## 11. Test Methods

11.1 Prototype testing of each size of each particular design shall be as follows. Maintain the indicated test pressures for at least 1 min without leakage.

11.1.1 Pressure test to twice the MAWP after having been cycled (connected, closed, opened, and disconnected) three times.

11.1.2 Pressure test at MAWP while applying a moment of 1000 in.-lbs (113 N·M) to one coupling half attempting to twist it loose. Reapply MAWP after the moment is removed.

11.2 *Production Test*—Hydrostatically test each coupling to 1.5 times MAWP.

11.3 The test apparatus for 11.2 is to be a state-of-the-art device, designed to apply internal pressure to the coupling halves with gasket in place. Dye the fluid used to apply the hydrostatic pressure to facilitate observation of leakage should leakage occur.

## 12. Inspection

12.1 Nondestructive examination of welds shall be performed as required by ANSI B31.1. Additionally, 100 % radiography of all welds is required for couplings equal to or greater than 4-in. (100-mm) nominal diameter and when the nominal wall thickness is greater than 0.375 in. (9.4 mm).

12.2 The manufacturer is responsible for the inspection and testing of each coupling and assuring conformity to this specification. Samples selected for inspection, at least one coupling from each lot of 100 or fraction thereof, are to be dimensionally checked 100 % to verify adherence to this specification. Couplings having threads are to be inspected using proper thread gages. The entire lot of couplings shall be