



Standard Specification for Flexible, Expansion-Type Ball Joints for Marine Applications¹

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1. Scope

1.1 This specification covers the design, manufacture, and testing of ball joints utilized for accommodating thermal expansion and contraction, or mechanical movement of a pipeline carrying fluid. The ball joints are intended for use in systems operating above 0°F (18°C).

1.2 The following precautionary caveat pertains only to the test methods portion, Section 7, of 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 ASTM Standards:

A 395 Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures²
F 722 Specification for Welded Joints for Shipboard Piping Systems³

2.2 ANSI Standard:

B 31.1 Power Piping⁴

2.3 American Society of Mechanical Engineers:⁵

ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Pressure Vessels Section IX, Welding and Brazing Requirements

3. Ordering Information

3.1 Each purchase order or inquiry for ball joints to this specification shall include the following as applicable:

3.1.1 Title, number, and latest revision of this specification,

3.1.2 Manufacturer's part number or ball-joint type information,

3.1.3 Materials for ball joint and seals, if other than to this specification,

3.1.4 Service conditions,

3.1.4.1 Minimum and maximum operating temperature (°F),

3.1.4.2 Maximum operating pressure (psig),

3.1.5 Fluid media (internal),

3.1.6 Atmosphere or media (external),

3.1.7 ANSI pressure class, facing and drilling of flanged ends, and pipe schedule or wall thickness of ends for weld end joints,

3.1.8 Special end connections as defined by the purchaser,

3.1.9 Ball sphere or other special coatings, if required,

3.1.10 Qualification test report, if required,

3.1.11 Drawing requirements; for example, envelope drawing sufficiently detailed to describe the ball joint to be supplied, and

3.1.12 Other tests to satisfy customer requirements.

4. Materials and Manufacture

4.1 All pressure retaining components shall be fabricated from wrought or cast steel. Ductile iron complying with Specification A 395 may be used for the ball joint retaining ring in services not above 350 psig (2.41 N/mm²) or 450°F (232°C). Steel shall comply with one of the materials listed in Section VIII, Division 1, of the ASME Code, or ANSI B 31.1.

4.2 Bolting material shall be in accordance with ANSI B 31.1.

4.3 Ball spheres shall be coated in accordance with the manufacturer's standard practice or as specified by the customer's specification (see 3.1.9).

4.4 Corrosion shall be considered in the design as set forth in UG-25 of the ASME Code, Section VIII, Division 1.

4.5 Seals and packing material shall be suitable for the service intended. This includes being adequate for the pressure and temperature rating and having sufficient resistance to attack by the fluid media and atmosphere specified in Section 3.

¹ 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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² Annual Book of ASTM Standards, Vol 01.02.

³ Annual Book of ASTM Standards, Vol 01.07.

⁴ Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁵ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5900.