



Designation: B653/B653M – 11

Standard Specification for Seamless and Welded Zirconium and Zirconium Alloy Welding Fittings¹

This standard is issued under the fixed designation B653/B653M; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers fittings, factory made from three grades of zirconium and zirconium alloys. The term welding fittings applies to butt-welding parts such as 45 and 90° elbows, 180° returns, caps, tees, reducers, lap-joint stub ends, and other types.

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as the standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

1.3 *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:*²

[B493 Specification for Zirconium and Zirconium Alloy Forgings](#)

[B523/B523M Specification for Seamless and Welded Zirconium and Zirconium Alloy Tubes](#)

[B550/B550M Specification for Zirconium and Zirconium Alloy Bar and Wire](#)

[B551/B551M Specification for Zirconium and Zirconium Alloy Strip, Sheet, and Plate](#)

[B614 Practice for Descaling and Cleaning Zirconium and Zirconium Alloy Surfaces](#)

[B658/B658M Specification for Seamless and Welded Zirconium and Zirconium Alloy Pipe](#)

[Zirconium and Zirconium Alloy Pipe](#)

2.2 *ANSI Standards:*

[B16.9 Wrought Steel Butt-Welding Fittings](#)³

[B36.19 Stainless Steel Pipe](#)³

2.3 *Manufacturers' Standardization Society of the Valve and Fittings Industry Standards:*

[SP-25 Standard Marking System for Valves, Fittings, Flanges, and Unions](#)⁴

[SP-43 Standard Practice for Light Weight Stainless Steel Fittings](#)⁴

2.4 *American Society of Mechanical Engineers:*

[ASME Boiler and Pressure Vessel Code, Sections VIII and IX](#)⁵

3. Terminology

3.1 *Lot Definitions:*

3.1.1 *weld fittings, n*—definition is to be mutually agreed upon between manufacturer and the purchaser.

4. Classification

4.1 The fittings are furnished in three grades as follows:

4.1.1 *Grade R60702 (PZ 2)*—Unalloyed zirconium.

4.1.2 *Grade R60704 (PZ 4)*—Zirconium-tin.

4.1.3 *Grade R60705 (PZ 5)*—Zirconium-niobium.

5. Ordering Information

5.1 Orders for materials under this specification shall include the following information:

5.1.1 Quantity,

5.1.2 Name of material (zirconium fittings),

5.1.3 Grade number (see 4.1),

5.1.4 ASTM designation and year of issue,

5.1.5 Hydrostatic test requirements (see 10.2),

5.1.6 Inspection requirements (see 11.1),

¹ This specification is under the jurisdiction of ASTM Committee B10 on Reactive and Refractory Metals and Alloys and is the direct responsibility of Subcommittee B10.02 on Zirconium and Hafnium.

Current edition approved April 1, 2011. Published April 2011. Originally approved in 1979. Last previous edition approved in 2006 as B653/B653M – 06. DOI: 10.1520/B0653_B0653M-11.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ Available from Manufacturers Standardization Society of the Valve and Fittings Industry (MSS), 127 Park St., NE, Vienna, VA 22180-4602, <http://www.mss-hq.com>.

⁵ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, <http://www.asme.org>.