



Designation: B 523/B 523M – 012

Standard Specification for Seamless and Welded Zirconium and Zirconium Alloy Tubes¹

This standard is issued under the fixed designation B 523/B 523M; 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 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 Nov. Oct. 10, 20042. Published ~~January~~ December 2002. Originally published as B 523 – 70. Last previous edition B 523/B 523M – 9701.

1. Scope

1.1 This specification² covers three grades of zirconium and zirconium alloy seamless and welded tubes.

1.2 Unless a single unit is used, for example corrosion mass gain in mg/dm², the values stated in either inch-pound or SI units are to be regarded separately as standard. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. SI values cannot be mixed with inch-pound values.

1.3 The following precautionary caveat pertains only to the test methods portion 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 370 Test Methods and Definitions for Mechanical Testing of Steel Products³

B 551 Specification for Zirconium and Zirconium Alloy Strip, Sheet, and Plate⁴

E 8 Test Methods for Tension Testing of Metallic Materials⁵

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁶

E 213 Practice for Ultrasonic Examination of Metal Pipe and Tubing⁷

E 426 Practice for Electromagnetic (Eddy-Current) Examination of Seamless and Welded Tubular Products, Austenitic Stainless Steel and Similar Alloys⁷

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *annealed*—for purposes of this specification “annealed” denotes material that exhibits a recrystallized grain structure.

3.2 Lot Definitions:

3.2.1 *castings*—a lot shall consist of all castings produced from the same pour.

3.2.2 *ingot*—no definition required.

3.2.3 *rounds, flats, tubes, and wrought powder metallurgical products (single definition, common to nuclear and non-nuclear standards)*—a lot shall consist of a material of the same size, shape, condition, and finish produced from the same ingot or powder blend by the same reduction schedule and the same heat treatment parameters. Unless otherwise agreed between manufacturer and purchaser, a lot shall be limited to the product of an 8 h period for final continuous anneal, or to a single furnace load for final batch anneal.

3.2.4 *sponge*—a lot shall consist of a single blend produced at one time.

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

² For ASME Boiler and Pressure Vessel Code Applications, see related Specification SB-523 in Section II of that Code.

³ *Annual Book of ASTM Standards*, Vol 01.03.

⁴ *Annual Book of ASTM Standards*, Vol 02.04.

⁵ *Annual Book of ASTM Standards*, Vol 03.01.

⁶ *Annual Book of ASTM Standards*, Vol 14.02.

⁷ *Annual Book of ASTM Standards*, Vol 03.03.