



Standard Specification for Zirconium and Zirconium Alloy Strip, Sheet, and Plate¹

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1. Scope

1.1 This specification² covers five grades of zirconium strip, sheet, and plate.

1.2 Unless a single unit is used, for example corrosion mass gain in mg/dm^2 , 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 method portions 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*:³

E8 Test Methods for Tension Testing of Metallic Materials

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E290 Test Methods for Bend Testing of Material for Ductility

3. Terminology

3.1 *Definitions*:

3.1.1 *annealed, n*—denotes material that exhibits a recrystallized grain structure.

3.2 *Lot Definition*:

3.2.1 *lot, n*—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.

3.3 *Forms*:

3.3.1 *strip, n*—a flat product, may be supplied in coil, less than 6 in. [150 mm] in width and from 0.005 in. [0.13 mm] to 0.188 in. [4.8 mm] in thickness.

3.3.2 *sheet, n*—a flat product 6 in. [150 mm] or more in width and from 0.005 in. [0.13 mm] to 0.188 in. [4.8 mm] in thickness.

3.3.3 *plate, n*—a flat product more than 0.125 in. [3.2 mm] in thickness.

4. Classification

4.1 The strip, sheet, or plate is to be furnished in five grades as follows:

4.1.1 *Grade R60700*—Low oxygen zirconium.

4.1.2 *Grade R60702*—Unalloyed zirconium.

4.1.3 *Grade R60704*—Zirconium-tin.

4.1.4 *Grade R60705*—Zirconium-niobium.

4.1.5 *Grade R60706*—Zirconium-niobium.

5. Ordering Information

5.1 Orders for material under this specification should include the following information, as applicable:

5.1.1 Standard designation and year of issue,

5.1.2 Quantity (weight or number of pieces),

5.1.3 Lot definition for continuous anneal, if applicable (3.2.1),

5.1.4 Form (3.3) and dimensions,

5.1.5 Grade (4.1),

5.1.6 Metallurgical condition, if not in the recrystallized annealed condition (6.3),

5.1.7 Chemical analysis of elements not listed (7.1.4),

5.1.8 Product analysis (7.1.3 and 7.3.1),

5.1.9 Tensile test temperature (8.1),

5.1.10 Material condition and finish (9.1 – 9.5),

5.1.11 Workmanship and appearance (11.1 and 11.3),

5.1.12 Purchaser inspection (15.1 and 15.2),

5.1.13 Rejection and referee (16.2),

5.1.14 Product marking, (18.1 and 18.1.1),

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.

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² For ASME Boiler and Pressure Vessel Code applications, see related Specification SB-551 in Section II of that Code.

³ 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.