



Standard Specification for Reactive and Refractory Metal Clad Plate¹

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1. Scope

1.1 This specification covers plate consisting of a base metal to which is bonded, integrally and continuously, on one or both sides a layer of one of the following: titanium, zirconium, tantalum, niobium, and their alloys. The material generally is intended for pressure vessel use.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard. The values in parentheses and in metric tables are provided for information only.

2. Referenced Documents

2.1 ASTM Standards:²

A265 Specification for Nickel and Nickel-Base Alloy-Clad Steel Plate

A578/A578M Specification for Straight-Beam Ultrasonic Examination of Rolled Steel Plates for Special Applications

B265 Specification for Titanium and Titanium Alloy Strip, Sheet, and Plate

B393 Specification for Niobium and Niobium Alloy Strip, Sheet, and Plate

B551/B551M Specification for Zirconium and Zirconium Alloy Strip, Sheet, and Plate

B708 Specification for Tantalum and Tantalum Alloy Plate, Sheet, and Strip

2.2 ASME Code:³

Boiler and Pressure Vessel Code, Section IX Welding Qualifications

Boiler and Pressure Vessel Code, Section VIII Divisions 1, 2, 3

2.3 Military Standard:⁴

MIL-J-24445A Joint, Bimetallic Bonded, Aluminum to Steel

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 This material is considered as single-clad or double-clad dependent upon whether one or both sides of the base metal are covered by a cladding metal.

3.1.2 *base metal, n*—the component that comprises the greatest percentage of total thickness.

3.1.3 *cladding metal, or cladding metals, n*—the component, or components, which individually comprise less than the greatest percentage of total thickness.

3.1.4 *cladding operation, n*—the production event, which results in the formation of the bond between the cladding and base metal components, plus all related prebonding and post bonding operations, prior to supply to the purchaser.

3.1.5 *interface, n*—of the clad product, is that region of thickness in which the product transitions from essentially 100 % base metal to 100 % cladding metal. Also known as bond or bond zone.

3.1.6 *interlayer, n*—a metal layer of a type or grade different from the cladding metal and base metal, which is applied between the cladding and base metal.

3.1.7 *integrally and continuously bonded, adv*—a condition in which the cladding metal and base metal are brought together to form a metallurgical bond at essentially the entire interface of the two metals by means other than those processes that do not produce a homogeneous composite plate.

4. Ordering Information

4.1 Orders for material under this specification shall include the following information:

4.1.1 Quantity.

4.1.2 Product dimensions, including thickness of both cladding metal and base metal. It should state whether each thickness value is minimum or nominal. If not stated, thickness values shall be nominal.

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 B10.01 on Titanium.

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

⁴ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.