



Designation: B 391 – 9903

Standard Specification for Niobium and Niobium Alloy Ingots¹

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¹ This specification is under the jurisdiction of ASTM Committee B-10 on Reactive and Refractory Metals and Alloys and is the direct responsibility of Subcommittee B10.03 on Niobium and Tantalum.

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1. Scope

1.1 This specification covers unalloyed and alloyed niobium ingots prepared by vacuum- or plasma-arc melting or electron-beam melting to produce consolidated metal for processing to various mill shapes.

NOTE 1—Committee B-10 has adopted “niobium” as the designation for Element No. 41, formerly named “columbium.”

1.2 The materials covered by this specification are:

1.2.1 R04200-Type 1—Reactor grade unalloyed niobium,

1.2.2 R04210-Type 2—Commercial grade unalloyed niobium,

1.2.3 R04251-Type 3—Reactor grade niobium alloy containing 1 % zirconium, and

1.2.4 R04261-Type 4—Commercial grade niobium alloy containing 1 % zirconium.

1.3 Unless a single unit is used, for example force for hardness testing in kN, the values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 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:

E 10 Test Method for Brinell Hardness of Metallic Materials²

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications³

3. Ordering Information

3.1 Orders for material under this specification shall include the following information, as applicable:

3.1.1 ASTM standard number and year of issue,

3.1.2 Type (see 1.2),

3.1.3 Quantity in weight or pieces,

3.1.4 Size, diameter and length,

3.1.5 Method of manufacture (Section 4),

3.1.6 Chemistry (Section 5), (see 5.2),

3.1.7 Hardness (Section 6.2),

3.1.8 Permissible overshipment (see 7.1),

3.1.9 Quality and finish (see 8.2 and 8.6),

3.1.10 Sampling (Section 8),

3.1.11 Marking (Section 9),

3.1.12 Packaging (Section 15),

3.1.13 Packaging (Section 16),

3.1.14 Required (Section 16), and

² Annual Book of ASTM Standards, Vol 03.01.

³ Annual Book of ASTM Standards, Vol 14.02.