



Designation: B 299 – 99

Standard Specification for Titanium Sponge¹

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1. Scope

1.1 This specification covers virgin titanium metal melting stock. This virgin metal is commonly designated as sponge titanium because it is most commonly porous and spongelike in texture, although metal produced electrolytically is granular and is essentially nonporous.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

E 10 Test Method for Brinell Hardness of Metallic Materials²

E 120 Test Methods for Chemical Analysis of Titanium and Titanium Alloys³

3. Materials and Manufacture

3.1 Sponge titanium is usually prepared by reduction of titanium tetrachloride and gets its spongelike character from the processes involved in production. This spongy characteristic, however, is not considered essential and may be expected to vary greatly with manufacturing methods. For example, virgin titanium produced electrolytically is crystalline or granular in character and is essentially nonporous. The metal is usually supplied in lump or granular form. This specification, however, is not limited to metal prepared by reduction of the tetrachloride.

3.2 Only virgin titanium, free of scrap and intentionally added contaminants, shall be supplied under this specification. It shall be supplied in uniform, well-mixed blends, each of which shall be clearly designated.

4. Chemical Composition

4.1 The titanium metal supplied under this specification

shall conform to the chemical composition requirements prescribed in Table 1.

5. Hardness

5.1 The Brinell Hardness of a lot shall be the average of the hardness determinations on each button prepared as described in Section 5. The average hardness of each button for the lot shall not exceed the values specified in Table 1. Measurement shall be in accordance with Test Method E 10, using a 0.394 in. (10-mm) ball, 3307-lbf (1500-kgf) load, and 30-s dwell.

6. Sampling

6.1 The sampling method used shall be a matter of agreement between the manufacturer and the purchaser. The following are acceptable industrial practices:

6.1.1 The blend shall be sampled as required in 6.1.2 and 6.1.3 unless otherwise agreed upon between the manufacturer and the purchaser.

6.1.2 The sample for determining the conformance of the lot to the chemical and physical requirements shall be obtained by sampling the lot to produce a 0.25 % sample but not less than 30 lb (14 kg) providing the lot is crushed to a particle size of 1 in. (25.4 mm) or less in size. The blended evaluation sample shall be split to produce two or more samples 0.1 lb (45 g) or more each, to be melted into buttons, and one sample of at least 0.5 lb (227 g).

6.1.3 The buttons shall be melted in a furnace under an inert-gas atmosphere. The resulting 0.1-lb (45-g) buttons shall be checked for Brinell hardness and samples shall be taken from each button for the required chemical analysis. The 0.5-lb (227-g) sample shall be used for the metal, chlorine, hydrogen, and moisture analysis.

7. Retests

7.1 If the results of any test lot are not in conformance with the requirements of this specification, the lot may be retested at the option of the manufacturer. The frequency of the retest will double the initial number of tests. If the results of the retest conform to this specification, then the retest values will become the test values for certification. If the results of the retest fail to conform to this specification, the material will be rejected in accordance with Section 9. All test values, original and retest, shall be reported to the purchaser.

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 B10.01 on Titanium.

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² Annual Book of ASTM Standards, Vol 03.01.

³ Annual Book of ASTM Standards, Vol 03.05.