Designation: B 299 – 01

# Standard Specification for Titanium Sponge[1]

This standard is issued under the fixed designation B 299; 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. 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 Materials[2]

E 120 Test Methods for Chemical Analysis of Titanium and Titanium Alloys[3]

## 3. Terminology

3.1 *Lot Definitions:*

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

3.1.2 *ingot*—no definition required.

3.1.3 *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.

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

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

## 4. Materials and Manufacture

4.1 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.

4.2 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.

## 5. Chemical Composition

5.1 The titanium metal supplied under this specification shall conform to the chemical composition requirements prescribed in Table 1.

## 6. Hardness

6.1 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.

## 7. Sampling

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

7.1.1 The blend shall be sampled as required in 7.1.2 and 7.1.3 unless otherwise agreed upon between the manufacturer and the purchaser.

7.1.2 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

[1] This specification is under the jurisdiction of ASTM Committee B10 on Reactive and Refractory Metals and Alloysand is the direct responsibility of Subcommittee B10.01on Titanium.

Current edition approved Nov. 10, 2001. Published January 2002. Originally published as B 299 - 55 T. Last previous edition B 299 - 99.

[2] *Annual Book of ASTM Standards,* Vol 03.01.

[3] *Annual Book of ASTM Standards,* Vol 03.05.

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