



## Standard Specification for Sintered Aluminum Structural Parts<sup>1</sup>

This standard is issued under the fixed designation B 595; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This specification covers sintered aluminum structural parts made primarily from aluminum powders to which controlled amounts of master alloys or elemental copper, magnesium, and silicon have been added by blending.

1.2 This specification covers the following variables:

1.2.1 *Composition*—Depending upon levels of copper, magnesium, and silicon content, two grades, and

1.2.2 *Density*—Type.

1.3 Parts ordered to this specification will be in one of the following conditions:

1.3.1 As-sintered,

1.3.2 As-repressed for additional density, or

1.3.3 All other conditions plus heat treated.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

### 2. Referenced Documents

2.1 *ASTM Standards*:

B 243 Terminology of Powder Metallurgy<sup>2</sup>

B 328 Test Method for Density, Oil Content, and Interconnected Porosity of Sintered Metal Structural Parts and Oil-Impregnated Bearings<sup>2</sup>

E 8 Test Methods for Tension Testing of Metallic Materials<sup>3</sup>

### 3. Terminology

3.1 *Definitions*—Definitions of powder metallurgy terms can be found in Terminology B 243. Additional descriptive information is available in the Related Material Section of Volume 02.05 of the *Annual Book of ASTM Standards*.

### 4. Ordering Information

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

4.1.1 Dimensions (see 9.1),

4.1.2 Chemical composition (see 6.1),

4.1.3 Density (see 7.1),

4.1.4 State of heat treatment,

4.1.5 Mechanical property requirements (see 8.1), and

4.1.6 Certification (see 14.1).

### 5. Materials and Manufacture

5.1 Structural parts shall be made by molding and sintering metal powders to produce finished parts conforming to the requirements of this specification.

### 6. Chemical Composition

6.1 The material shall conform to the requirements of Table 1.

6.2 The chemical analysis shall be made in accordance with the methods prescribed in the latest edition of the *Annual Book of ASTM Standards*, Vol 03.05, or any other approved method agreed upon between the manufacturer and the purchaser.

### 7. Density

7.1 The parts shall conform to the density range prescribed in Table 2.

7.2 The density shall be measured in accordance with Test Method B 328.

7.3 If the density does not vary more than 0.1 g/cm<sup>3</sup> from one section of the structural part to any other section, the overall density shall fall within the limits prescribed in Table 2.

7.4 If the density varies more than 0.1 g/cm<sup>3</sup> from one section of the structural part to any other section, the manufacturer and the purchaser shall agree upon a critical section of the part where the stresses are the highest. The density of this critical section rather than the average density shall fall within the limits prescribed in Table 2.

### 8. Mechanical Properties

8.1 The manufacturer and the purchaser shall agree on qualification tests for the determination of mechanical properties.

8.2 These tests shall be performed on production parts.

8.3 These tests shall be determined after consideration of the function of the part.

8.4 The limits and sampling plan shall be agreed upon between the manufacturer and purchaser.

8.5 All shipments of parts subsequent to the establishment

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 02.05.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 03.01.