



Standard Specification for Materials for Ferrous Powder Metallurgy (PM) Structural Parts¹

This standard is issued under the fixed designation B783; 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 a variety of ferrous PM structural materials and includes a classification system or material designation code. The classification system used in this specification includes chemical composition, minimum tensile; 0.2 % offset yield strength for as-sintered materials and minimum ultimate tensile strength for heat-treated materials (sinter hardened or quenched and tempered). It also contains minimum density and maximum coercive field strength requirements for iron-phosphorus materials.

1.2 Material classification is governed by the designation code which is explained in [Appendix X1](#). The data provided display typical mechanical properties achieved under commercial manufacturing procedures. Physical and mechanical property performance characteristics can change as a result of subsequent processing steps beyond the steps designated in this standard.

1.3 With the exception of density values for which the g/cm^3 unit is the industry standard, property values stated in inch-pound units are the standard. Values in SI units result from conversion. They may be approximate and are only for information.

2. Referenced Documents

2.1 ASTM Standards:²

- [A839 Specification for Iron-Phosphorus Powder Metallurgy Parts for Soft Magnetic Applications](#)
- [B243 Terminology of Powder Metallurgy](#)
- [B528 Test Method for Transverse Rupture Strength of Powder Metallurgy \(PM\) Specimens](#)
- [B962 Test Methods for Density of Compacted or Sintered](#)

¹ This specification is under the jurisdiction of ASTM Committee B09 on Metal Powders and Metal Powder Products and is the direct responsibility of Subcommittee B09.05 on Structural Parts.

Current edition approved Nov. 1, 2013. Published November 2013. Originally approved in 1988. Last previous edition approved in 2010 as B783–10. DOI: 10.1520/B0783-13.

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.

[Powder Metallurgy \(PM\) Products Using Archimedes' Principle](#)

[B963 Test Methods for Oil Content, Oil-Impregnation Efficiency, and Surface-Connected Porosity of Sintered Powder Metallurgy \(PM\) Products Using Archimedes' Principle](#)

[E8 Test Methods for Tension Testing of Metallic Materials](#)

[E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications](#)

[E1019 Test Methods for Determination of Carbon, Sulfur, Nitrogen, and Oxygen in Steel, Iron, Nickel, and Cobalt Alloys by Various Combustion and Fusion Techniques](#)

[2.2 MPIF Standard:³](#)

[MPIF Standard 35 Materials Standards for PM Structural Parts](#)

3. Terminology

3.1 *Definitions*—Definitions of powder metallurgy terms can be found in Terminology [B243](#). Additional descriptive information is available in the Related Materials section of Vol 02.05 of the *Annual Book of ASTM Standards*.

4. Ordering Information

4.1 Materials for parts conforming to this specification shall be ordered by material designation code.

4.2 Orders for parts under this specification may include the following information:

4.2.1 Certification and test reports, if required (see Section [11](#)),

4.2.2 Test methods and mechanical properties other than strength (see [8.2](#) and [8.3](#)),

4.2.3 Density (see [7.1](#)),

4.2.4 Porosity or oil content (see [7.2](#)), and

4.2.5 Special packaging if required.

5. Materials and Manufacture

5.1 Structural parts shall be made by compacting and sintering metal powders with or without subsequent heat-treating. Parts may also be made by repressing or repressing and resintering sintered parts, if necessary, with or without

³ Available from MPIF, 105 College Road East, Princeton, NJ 08540.