



Standard Specification for Metal Injection Molded (MIM) Materials¹

This standard is issued under the fixed designation B883; 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 ferrous metal injection molded materials fabricated by mixing elemental or pre-alloyed metal powders with binders, injecting into a mold, debinding, and sintering, with or without subsequent heat treatment.

1.2 This specification covers the following injection molded materials.

1.2.1 Compositions:

1.2.1.1 MIM-2200, low-alloy steel

1.2.1.2 MIM-2700, low-alloy steel

1.2.1.3 MIM-4605, low-alloy steel

1.2.1.4 MIM-4140, low-alloy steel

1.2.1.5 MIM-316L, austenitic stainless steel

1.2.1.6 MIM-17-4 PH, precipitation hardening stainless steel

1.2.1.7 MIM-420, ferritic stainless steel

1.2.1.8 MIM-430L, ferritic stainless steel

1.2.1.9 MIM-Cu, copper

1.3 Chemical composition limits are specified in [Table 1](#).

1.4 With the exception of the values for density and the mass used to determine density, for which the use of the gram per cubic centimetre (g/cm^3) and gram (g) units is the long-standing industry practice, the values in inch-pound units are to be regarded as standard. The values given in parentheses or in separate tables are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *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.*

¹ This specification is under the jurisdiction of ASTM Committee B09 on Metal Powders and Metal Powder Products and is the direct responsibility of B09.11 on Near Full Density Powder Metallurgy Materials.

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2. Referenced Documents

2.1 ASTM Standards:²

[B243 Terminology of Powder Metallurgy](#)

[B311 Test Method for Density of Powder Metallurgy \(PM\) Materials Containing Less Than Two Percent Porosity](#)

[B933 Test Method for Microindentation Hardness of Powder Metallurgy \(PM\) Materials](#)

[B962 Test Methods for Density of Compacted or Sintered Powder Metallurgy \(PM\) Products Using Archimedes' Principle](#)

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

[E18 Test Methods for Rockwell Hardness of Metallic Materials](#)

[E228 Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer](#)

[E350 Test Methods for Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron](#)

[E415 Test Method for Analysis of Carbon and Low-Alloy Steel by Spark Atomic Emission Spectrometry](#)

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

[E1086 Test Method for Analysis of Austenitic Stainless Steel by Spark Atomic Emission Spectrometry](#)

[E1461 Test Method for Thermal Diffusivity by the Flash Method](#)

[E1621 Guide for Elemental Analysis by Wavelength Dispersive X-Ray Fluorescence Spectrometry](#)

[F1089 Test Method for Corrosion of Surgical Instruments](#)

2.2 MPIF Standards:³

[MPIF Standard 35 Materials Standards for Metal Injection Molded Parts](#)

[MPIF Standard 50 Method for Preparing and Evaluating Metal Injection Molded \(MIM\) Debound and Sintered/Heat Treated Tension Test Specimens](#)

[MPIF Standard 51 Method for Determination of Microindentation Hardness of Powder Metallurgy Materials](#)

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.

³ Available from Metal Powder Industries Federation (MPIF), 105 College Rd. East, Princeton, NJ 08540-6692, <http://www.mpif.org>.

*A Summary of Changes section appears at the end of this standard