



Standard Specification for Iron-Base Powder Metallurgy (PM) Bearings (Oil- Impregnated)¹

This standard is issued under the fixed designation B439; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers the requirements for porous iron-base metallic sleeve, flange, thrust, and spherical bearings that are produced from metal powders utilizing powder metallurgy (PM) technology and then impregnated with oil to supply operating lubrication.

1.2 Listed are the chemical, physical, and mechanical specifications for those standardized ferrous PM materials that have been developed specifically for the manufacture of self-lubricating bearings.

1.3 This standard is a companion to Specification B438 that covers the requirements for porous oil-impregnated bronze-base bearings.

1.4 Typical applications for self-lubricating iron-base PM bearings are discussed in Appendix X1.

1.5 Commercial bearing dimensional tolerance data are shown in Appendix Appendix X2, while engineering information regarding installation and operating parameters of PM bearings is included in Appendix Appendix X3. Additional useful information on self-lubricating bearings can be found in MPIF Standard 35 (Bearings), ISO 5755 and the technical literature.²

1.6 *Units*—With the exception of density values for which the use of the g/cm³ unit is the long-standing practice of the PM industry, the values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not to be regarded as standard.

1.7 *The following safety hazards caveat pertains only to the test methods described in this specification. 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.

2. Referenced Documents

2.1 ASTM Standards:³

- B243 Terminology of Powder Metallurgy
- B438 Specification for Bronze-Base Powder Metallurgy (PM) Bearings (Oil-Impregnated)
- B939 Test Method for Radial Crushing Strength, *K*, of Powder Metallurgy (PM) Bearings and Structural Materials
- B962 Test Methods for Density of Compacted or Sintered Powder Metallurgy (PM) Products Using Archimedes' Principle
- B963 Test Methods for Oil Content, Oil-Impregnation Efficiency, and Interconnected Porosity of Sintered Powder Metallurgy (PM) Products Using Archimedes' Principle
- B966 Test Method for Permeability of Powder Metallurgy (PM) Bearings Using Nitrogen Gas
- B970 Test Method for Cleanliness of Powder Metallurgy (PM) Bearings and Structural Parts
- E9 Test Methods of Compression Testing of Metallic Materials at Room Temperature
- 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:⁴

- MPIF Standard 35 Materials Standards for PM Self-Lubricating Bearings

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 B09.04 on Bearings.

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² *Machine Design Magazine*, Vol 54, No. 14, June 17, 1982, pp. 130–142.

³ 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.

⁴ Available from Metal Powder Industries Federations, 105 College Road East, Princeton, NJ 08540, <http://www.info@mpif.org>.