



Standard Specification for High-Silicon Molybdenum Ferritic Iron Castings¹

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1. Scope

1.1 This specification covers castings made of high-silicon molybdenum ferritic iron, commonly known as SiMo. This specification includes castings with microstructures of spheroidal graphite (SG) SiMo iron, compacted graphite (CG) SiMo iron, and mixed graphite or medium-nodularity graphite (MG) SiMo iron. MG iron microstructure comprises a mixture of spheroidal and compacted graphite shapes. This standard specifies the condition, chemical composition, microstructure, and other technical requirements of three grades of ferritic cast irons, specified as SG SiMo, MG SiMo, and CG SiMo.

1.2 No precise quantitative relationship can be stated between the properties of iron in the various locations of the same casting or between the properties of castings and those of a test specimen cast from the same iron.

1.3 The values stated in SI units are to be regarded as standard. All chemical compositions are in mass percentage. No other units of measurement are included in this standard.

1.4 *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:²

- A247 Test Method for Evaluating the Microstructure of Graphite in Iron Castings
- A395 Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures
- A476/A476M Specification for Ductile Iron Castings for Paper Mill Dryer Rolls
- A536 Specification for Ductile Iron Castings

¹ This test method is under the jurisdiction of ASTM Committee A04 on Iron Castings and is the direct responsibility of Subcommittee A04.02 on Malleable and Ductile Iron Castings.

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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.

- A834 Specification for Common Requirements for Iron Castings for General Industrial Use
- A842 Specification for Compacted Graphite Iron Castings
- A897/A897M Specification for Austempered Ductile Iron Castings
- D1976 Test Method for Elements in Water by Inductively-Coupled Argon Plasma Atomic Emission Spectroscopy
- D5381 Guide for X-Ray Fluorescence (XRF) Spectroscopy of Pigments and Extenders
- E8/E8M Test Methods for Tension Testing of Metallic Materials
- E10 Test Method for Brinell Hardness of Metallic Materials
- E21 Test Methods for Elevated Temperature Tension Tests of Metallic Materials
- E228 Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer
- E351 Test Methods for Chemical Analysis of Cast Iron—All Types
- E1184 Practice for Determination of Elements by Graphite Furnace Atomic Absorption Spectrometry
- E1999 Test Method for Analysis of Cast Iron by Spark Atomic Emission Spectrometry

2.2 SAE (Society of Automotive Engineers) International Standards:

- J434 Automotive Ductile (Nodular) Iron Castings
- J1887 Automotive Compacted Graphite Iron Castings
- J2582 Automotive Ductile Iron Castings for High Temperature Applications

2.3 Federal Standard:

- FED-STD-123 Marking for Shipment (Civil Agencies)

2.4 American National Standard:

- MIL-STD-129 Military Marking for Shipment and Storage

2.5 Other Publications:

- AFS (American Foundry Society), Foundrymen's Guide to Ductile Iron Microstructures, 1984
- AFS, Iron Castings Engineering Handbook, 2004
- ASM Specialty Handbook, Cast Irons, 1999
- ASM Specialty Handbook, Heat-Resistant Materials, 1999
- ASM Handbook, Casting, Volume 15, 1998

3. Ordering Information

3.1 Orders for materials to this specification shall include the following information:

- 3.1.1 ASTM designation and year of issue,