



Designation: A 518/A 518M – 99

Standard Specification for Corrosion-Resistant High-Silicon Iron Castings¹

This standard is issued under the fixed designation A 518/A 518M; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

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

1. Scope

1.1 This specification covers high-silicon cast iron castings intended for corrosion-resistant service.

1.2 This specification covers three grades as shown in Table 1. Selection of grade depends on the corrosive service to be experienced by the casting. All three grades are suited for application in severe corrosive environments. However, Grade 2 is particularly suited for application in strong chloride environments, and Grade 3 is recommended for impressed current anodes.

1.3 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

1.4 The following safety hazards caveat pertains only to the test method portion, Section 9, of 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:

A 438 Test Method for Transverse Testing of Gray Cast Iron²

E 350 Test Methods for Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron³

E 351 Test Methods for Chemical Analysis of Cast Iron—All Types³

3. Ordering Information

3.1 Orders for material under this specification shall include

¹ This specification is under the jurisdiction of ASTM Committee A04 on Iron Castings and is the direct responsibility of Subcommittee A04.01 on Grey and White Iron Castings.

Current edition approved Oct. 10, 1999. Published December 1999. Originally published as A 518 – 64. Last previous edition A 518 – 86 (1991).

² Annual Book of ASTM Standards, Vol 01.02.

³ Annual Book of ASTM Standards, Vol 03.05.

TABLE 1 Chemical Composition

Element	Composition, Weight %		
	Grade 1	Grade 2	Grade 3
Carbon	0.65–1.10	0.75–1.15	0.70–1.10
Manganese	1.50, max	1.50, max	1.50, max
Silicon	14.20–14.75	14.20–14.75	14.20–14.75
Chromium	0.50, max	3.25–5.00	3.25–5.00
Molybdenum	0.50, max	0.40–0.60	0.20, max
Copper	0.50, max	0.50, max	0.50, max

the following information:

3.1.1 ASTM designation and year of issue.

3.1.2 Grade of high-silicon cast iron (see Section 5).

3.1.3 Number of castings.

3.1.4 Approximate weight of the casting.

3.1.5 Drawing showing the size, shape, dimensions, and finishing details. The drawing should indicate any critical dimensions and should give the allowable tolerances on all dimensions and on the accumulation of dimensions. If the purchaser supplies the pattern, the dimensions of the casting shall conform to those predicted by the pattern.

3.1.6 Options in this specification, including:

3.1.6.1 The status of the heat treatment of the castings when shipped by the manufacturer (see Section 7).

3.1.6.2 If the chemical analysis and mechanical test results are to be reported to the purchaser (see Section 14).

3.1.6.3 If a transverse test is required (see 8.1).

3.1.6.4 If hydraulic testing is required, and, if required, the test pressure and the leakage permitted (see 8.2).

3.1.6.5 Any special packing, markings, etc.

4. Method of Manufacture

4.1 The alloy may be produced by any melting and casting process, or combination of processes, capable of meeting the chemical composition and mechanical properties specified.

5. Chemical Composition

5.1 High-silicon iron castings are produced in one of three grades, as given in Table 1 of this specification.

6. Chemical Analysis

6.1 *Heat Analysis*—Chemical analysis of each heat (or each tap, if from a continuous melting operation) shall be made by the manufacturer to determine the percentages of the elements specified in Table 1. The analysis shall be made from a test