



Standard Specification for Austempered Ductile Iron Castings¹

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1. Scope

1.1 This specification covers ductile iron castings that are subsequently heat treated by an austempering process as defined in 9.1.

1.2 The application of the austempering heat treatment extends the range of properties achievable in ductile iron castings.

1.3 No precise quantitative relationship can be stated between the properties of the iron in various locations of the same casting or between the properties of castings and those of a test specimen cast from the same iron (see Appendix X1). However, austempering heat treatment will tend to diminish any differences in mechanical properties.

1.4 The production of castings, machining (if required), and the austempering heat treatments may be performed by different manufacturers, as covered in Section 13. The purchaser should establish by contract agreement, at the time of ordering, the responsibility of the various parties for meeting the specification requirements.

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

1.5.1 *Exception*—Within the text, the SI units are shown in brackets.

2. Referenced Documents

2.1 ASTM Standards:²

A247 Test Method for Evaluating the Microstructure of Graphite in Iron Castings

¹ This specification 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.

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

A732/A732M Specification for Castings, Investment, Carbon and Low Alloy Steel for General Application, and Cobalt Alloy for High Strength at Elevated Temperatures

A834 Specification for Common Requirements for Iron Castings for General Industrial Use

E8 Test Methods for Tension Testing of Metallic Materials

E10 Test Method for Brinell Hardness of Metallic Materials

E23 Test Methods for Notched Bar Impact Testing of Metallic Materials

2.2 Military Standard:

MIL-STD-129 Military Marking for Shipment and Storage³

3. Ordering Information

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

3.1.1 ASTM designation, with year of issue,

3.1.2 Grade of austempered ductile iron required (see Table 1 or Table 2 and Section 6),

3.1.3 Chemical composition requirements, if any (see Section 4),

3.1.4 Heat treated microstructure restrictions (see Section 9),

3.1.5 Test coupon criteria (see Section 11),

3.1.6 Lot size and tests per lot (see 11.6 and Section 13),

3.1.7 Special requirements, if desired, including hardness, radiographic soundness, magnetic particle inspection, pressure tightness, dimensions, or surface finish (see Section 8),

3.1.8 Certification, if required (see Section 14),

3.1.9 Special preparation for delivery, if required (see Section 15).

4. Chemical Composition

4.1 Although this specification has no specific chemical requirements, such requirements may be agreed upon between the manufacturer, heat treater, and the purchaser.

4.2 Castings that are of sufficient quality (5.1 and Appendix X1) and properly alloyed (have sufficient hardenability) for the

³ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.