Designation: A 897/A 897M – 03

Standard Specification for Austempered Ductile Iron Castings[1]

This standard is issued under the fixed designation A 897/A 897M; 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 ductile iron castings that are subsequently heat treated by an austempering process as defined in 10.1.

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 15. 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 inch-pound 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.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 247 Test Method for Evaluating the Microstructure of Graphite in Iron Castings

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products

A 732 Specification for Castings, Investment, Carbon and Low Alloy Steel for General Application, and Cobalt Alloy for High Strength at Elevated Temperatures

A 834 Specification for Common Requirements for Iron Castings for General Industrial Use

E 8 Test Methods for Tension Testing of Metallic Materials

E 10 Test Methods for Brinell Hardness of Metallic Materials

E 23 Test Methods for Notched Bar Impact Testing of Metallic Materials

2.2 *Military Standard:*

MIL-STD-129 Marking for Shipment and Storage[3]

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 and Sections 6 and 7),

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

3.1.4 Heat treated microstructure restrictions (see Section 10),

3.1.5 Test coupon criteria (see Section 12),

3.1.6 Lot size and tests per lot (see 12.6 and Section 15),

3.1.7 Special requirements, if desired, including hardness, radiographic soundness, magnetic particle inspection, pressure tightness, dimensions, or surface finish (see Section 9),

3.1.8 Certification, if required (see Section 16),

3.1.9 Special preparation for delivery, if required (see Section 17).

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.

5. Microstructure

5.1 The graphite component of the microstructure shall consist of a minimum 80 % spheroidal graphite conforming to Types I and II per Test Method A 247.

[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.

[3] Available from Standardization Documents, Order Desk, Building 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, Attn: NPODS.

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