



Standard Specification for Statically Cast Permanent Mold Gray Iron Castings¹

This standard is issued under the fixed designation A823; 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 gray iron castings that are statically cast in permanent molds.

1.2 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 a casting and those of a test specimen cast from the same iron (see [Appendix X1](#)).

1.3 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 considered standard.

2. Referenced Documents

2.1 *ASTM Standards*:²

[A247 Test Method for Evaluating the Microstructure of Graphite in Iron Castings](#)

[A644 Terminology Relating to Iron Castings](#)

[E8 Test Methods for Tension Testing of Metallic Materials](#)

[E10 Test Method for Brinell Hardness of Metallic Materials](#)

2.2 *Federal Standard*:

[Fed. Std. No. 123 Marking for Shipment](#)³

2.3 *Military Standard*:

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

3. Terminology

3.1 Definitions for many terms common to iron castings are found in Terminology [A644](#). A classification of graphite structure is found in Test Method [A247](#).

4. Classification

4.1 Castings ordered and produced under this specification are classified into a number of grades based on the properties

of separately cast test bars. The test bar shall be selected on the basis of the controlling section size of the casting (see [9.1](#) and [9.2](#) and [Table 1](#)).

4.2 Castings may be produced in the as cast state provided the requirements of this standard in [Table 1](#) are met. However, annealing or normalizing heat treatments are usual and customary and are a basis for classification.

4.3 The grades are designated A for annealed or N for normalized. This is followed by an S or a C to designate a solid or a cored casting, followed by an A, B, C, or S to designate the test bar to be poured with the castings. Examples of proper designations are as follows:

Permanent Mold Castings, ASTM Specification A823,
Grade N-SB

Permanent Mold Castings, ASTM Specification A823,
Grade A-CC

5. Ordering Information

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

5.1.1 ASTM designation number and year of issue.

5.1.2 Grade of iron required (see Section [4](#) and [Table 1](#)).

5.1.3 The size of the separately cast test bar (letter classification A, B, C, or S) which best represents the thickness of the controlling section of the casting (see [4.1](#) and [Table 2](#)).

5.1.4 Location for Brinell Hardness determination (see [10.1.1](#)).

5.1.5 Lot size (see Section [16](#)).

5.1.6 Special requirements (see Section [17](#)).

5.1.7 Special preparation for delivery (see Section [22](#)).

5.1.8 Saving tested specimens or unbroken test bars (see [19.1.1](#)).

6. Chemical Composition

6.1 The chemical composition shall be such as to produce the mechanical properties required by this specification. As a reference, typical compositions covering all grades are shown in [Table X1.1](#) in [Appendix X1](#).

6.2 By agreement between the manufacturer and purchaser, chemical composition requirements may be specified.

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.

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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, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>.