



Designation: A942/A942M – 95 (Reapproved 2022)

Standard Specification for Centrifugally Cast White Iron/Gray Iron Dual Metal Abrasion-Resistant Roll Shells¹

This standard is issued under the fixed designation A942/A942M; 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 double pour, centrifugally cast, abrasion-resistant roll shells for general application. The outer layer is white iron and the inner layer is gray iron. There shall be no gradient of mottled iron between the white iron and the gray iron.

1.2 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 nonconformance with the standard.

1.2.1 Within the text, the SI units are shown in brackets.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

A48/A48M Specification for Gray Iron Castings

E8/E8M Test Methods for Tension Testing of Metallic Materials

E10 Test Method for Brinell Hardness of Metallic Materials

3. Classification

3.1 The white iron portion of the casting shall be classified by type based upon Brinell hardness.

3.2 The gray iron portion of the casting shall be classified by class based upon tensile strength.

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.

4. Ordering Information

4.1 Orders for material to this specification shall include the following:

- 4.1.1 Specification title, designation, and year of issue,
- 4.1.2 Quantity of castings required,
- 4.1.3 Required dimensions and thickness of white iron layer (8.1),
- 4.1.4 Surface condition—as cast or machined,
- 4.1.5 Type of white iron required for the outer layer of the casting (7.1),
- 4.1.6 Class of gray iron required for the inner layer (7.2),
- 4.1.7 Certification, if required (Section 13), and
- 4.1.8 Special position of marking information, if required (Section 14).

4.2 Additional requirements may be agreed upon between the manufacturer and the purchaser.

5. Materials and Manufacture

5.1 Both the white and the gray irons may be melted by any suitable melting process.

5.2 The white iron portion of the casting shall be produced by chemistry rather than chilling.

6. Chemical Composition

6.1 A chemical analysis shall be performed by the manufacturer on both the white and gray irons. The chemical compositions shall be controlled to obtain the required mechanical properties.

7. Mechanical Properties

7.1 The white iron shall conform to the following requirements:

Type I – 450 to 500 HB
Type II – 500 to 550 HB
Type III – 550 to 600 HB
Type IV – 600 to 650 HB

7.2 The gray iron shall conform to the following requirements:

Class	Tensile Strength	
	min, ksi	min, [MPa]
No. 20	20	[138]
No. 25	25	[172]
No. 30	30	[207]
No. 35	35	[241]