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Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings¹

This standard is issued under the fixed designation A 126; 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 revision. A superscript letter (a) indicates an editorial change since the last revision or reapproval.

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

1. Scope

1.1 This specification covers three classes of gray iron for castings intended for use as valve pressure retaining parts, pipe fittings, and flanges.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

Note 1.—The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (including those in tables and figures) shall not be considered as requirements of the standard.

2. Referenced Documents

- 2.1 ASTM Standards: A 48 Specification for Gray Iron Castings² A 438 Test Method for Transverse Testing of Gray Iron³ A 644 Terminology Relating to Iron Castings⁴ E 8 Test Methods for Tension Testing of Metallic Materials⁵

3. Terminology

3.1 Definitions of many terms common to gray iron castings are found in Terminology A 644.

4. Classification

4.1 Castings produced to this specification are classified based upon the minimum tensile strength of the iron (see Table 1).

5. Ordering Information

5.1 Orders for material in this specification should include the following information:

- 5.1.1 ASTM designation and year date,
5.1.2 Class of iron required,
5.1.3 Quantity,
5.1.4 Transverse test, if required (see Section 8), and
5.1.5 Certification, if required (see Section 17).

TABLE 1 Tensile Requirements

Table with 3 columns: Class, Tensile strength, min. ksi (MPa), and Yield strength, min. ksi (MPa). Rows include Class A, Class B, and Class C.

6. Workmanship, Finish, and Appearance

6.1 The castings shall be made in a workmanlike manner and the surface shall be free of adhering sand, scale, cracks, and hot tears as determined by visual examination.

7. Chemical Requirements

7.1 A chemical analysis shall be performed on each lot and shall conform to the following requirements for phosphorus and sulfur:

Table with 2 columns: Element and Maximum, %. Rows include Phosphorus and Sulfur.

7.2 The chemical analysis shall be performed on a sample obtained during the pouring of the lot.

8. Tensile Properties

8.1 One tension test shall be performed on each lot and shall conform to the mechanical properties specified in Table 1.

9. Transverse Test

9.1 When specified by the purchaser, one transverse test shall be performed on each lot and shall conform to the requirement specified in Table 2.

9.2 The test shall be performed with the bar resting on supports separated by 12 in. (305 mm) and the load applied midway between the supports. The load shall be applied at a rate that will produce 0.10 in. (2.5 mm) central deflection in 20 to 40 s.

9.3 In case the transverse test specimen varies from the specified diameter of 1.20 in. (30.5 mm), a correction factor conforming to the requirements for Test Bar B in Table 1 of Test Method A 438 shall apply.

10. Cast Test Bars

10.1 Separately cast 1½ in. (38.1 mm) diameter test bars shown in Fig. 1 shall be poured in sand molds from the same lot as the castings required.

Note 2.—The numbering on the test specimens shown in Fig. 1 and Fig. 2 shall conform to the requirements of Test Method A 438.

¹ This specification is under the jurisdiction of ASTM Committee A01 on Iron Castings and is the direct responsibility of Subcommittee A01.01 on Gray and White Iron Castings. Current edition approved Dec. 10, 1995. Published January 1996. Originally published as A 126 – 29F. Last previous edition A 126 – 95. ² Annual Book of ASTM Standards, Vol. 03.02. ³ Annual Book of ASTM Standards, Vol. 03.02.



Endorsed by Manufacturers International Society of the Iron and Steel Industry Used in USDOE-AS Standards

Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service¹

This standard is issued under the fixed designation A 182/A 182M; 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 revision. A superscript letter (a) indicates an editorial change since the last revision or reapproval.

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

1. Scope^a

1.1 This specification² covers forged low alloy and stainless steel piping components for use in pressure systems. Included are flanges, fittings, valves, and similar parts to specified dimensions or to dimensional standards, such as the ASME specifications that are referenced in Section 2.

1.2 For bars and products machined directly from bar, refer to Specifications A 479/A 479M and A 739 for the similar grades available in those specifications. Products made to this specification are limited to a maximum weight of 10 000 lb [4540 kg]. For larger products and products for other applications, refer to Specifications A 336/A 336M and A 905/A 905M for the similar ferritic and austenitic grades, respectively, available in those specifications.

1.3 Several grades of low alloy steels and ferritic, martensitic, austenitic, and ferritic-austenitic stainless steels are included in this specification. Selection will depend upon design and service requirements.

1.4 Supplementary requirements are provided for use when additional testing or inspection is desired. These shall apply only when specified individually by the purchaser in the order.

1.5 This specification is expressed in both inch-pound units and in SI units. However, unless the order specifies the applicable "M" specification designation (SI units), the material shall be furnished to inch-pound units.

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

2. Referenced Documents

2.1 In addition to the referenced documents listed in Specification A 901/A 901M, the following list of standards apply to this specification:

- 2.2 ASTM Standards:³ A 234/A 234M Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service A 262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels A 275/A 275M Test Method for Magnetic Particle Examination of Steel Forgings A 336/A 336M Specification for Alloy Steel Forgings for Pressure and High-Temperature Parts A 370 Test Methods and Definitions for Mechanical Testing of Steel Products A 403/A 403M Specification for Wrought Austenitic Stainless Steel Pipe Fittings A 479/A 479M Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels A 484/A 484M Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings A 739 Specification for Steel Bars, Alloy, Hot-Wrought, for Elevated Temperature or Pressure-Containing Parts, or Both A 763 Practices for Detecting Susceptibility to Intergranular Attack in Ferritic Stainless Steels A 788 Specification for Steel Forgings, General Requirements A 901/A 901M Specification for Common Requirements for Steel Flanges, Forged Fittings, Valves, and Parts for Piping Applications A 965/A 965M Specification for Steel Forgings, Austenitic, for Pressure and High Temperature Parts E 112 Test Methods for Determining Average Grain Size

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.22 on Steel Flanges and Wrought Fittings for Piping Applications and Bolting Materials for Piping and Special Purpose Applications. Current edition approved June 1, 2005. Published September 2005. Originally approved in 1933. Last previous edition approved in 2005 as A 182/A 182M – 05. ² For ASME Boiler and Pressure Vessel Code applications see related Specification A 182 in Section II of that Code.

³ 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.

ASTM A193

Scope

Originally approved in 1936, this specification is heavily utilized in petroleum and chemical construction applications. The ASTM standard covers alloy steel and stainless steel bolting materials for high temperature or high pressure service. This specification includes fasteners intended for use in pressure vessels, valves, flanges, and fittings. Although, this material is often available in national coarse (UNC) thread pitches, if being used in traditional applications, threads are specified 8 threads per inch (tpi) for diameters above one inch.

Below is a basic summary of a few of the common grades. ASTM A193 covers a number of other standard specifications not covered in this description including B5, B6, and B16.

Grades

Table with 2 columns: Grade and Description. Rows include B7 Alloy steel, B8 Class 1 Stainless steel, B8M Class 1 Stainless steel, B8 Class 2 Stainless steel, and B8M Class 2 Stainless steel.

Mechanical Properties

Table with 6 columns: Grade, Size, Tensile ksi, min, Yield, ksi, min, Elong., %, min, and RA % min. Rows include B7, B8 Class 1, B8M Class 1, B8 Class 2, and B8M Class 2.

ASTM A 123 for Structural Steel Products



Figure 1 Single Fabrication with Multiple Material Categories

The ASTM A 123/A 123M specification covers single-fabricated steel products as well as manufactured steel products fabricated by the hot-charge gas-fabricating processes. The A 123/A 123M specification applies to steel products fabricated by the hot-charge gas-fabricating processes. The A 123/A 123M specification covers steel products fabricated by the hot-charge gas-fabricating processes. The A 123/A 123M specification covers steel products fabricated by the hot-charge gas-fabricating processes.

It is the responsibility of the designer and fabricator to ensure the product has been properly designed and built to meet the hot-charge gas-fabricating processes. The gas-fabricator should be made aware of any supplementary special test requirements or inspection requirements or other information that may be required for the gas-fabricating process. These requirements should be stated on the purchase order for the hot-charge gas-fabricating process.

It is the responsibility of the gas-fabricator to ensure the product is built to the specified heat treatment and the product has been properly designed and built to meet the hot-charge gas-fabricating processes. The gas-fabricator should be made aware of any supplementary special test requirements or inspection requirements or other information that may be required for the hot-charge gas-fabricating process. These requirements should be stated on the purchase order for the hot-charge gas-fabricating process.

Any material supplied by the manufacturer that contains carbon shall conform to the specified requirements, and shall conform to the requirements of the A 123/A 123M specification. The A 123/A 123M specification applies to steel products fabricated by the hot-charge gas-fabricating processes. The A 123/A 123M specification covers steel products fabricated by the hot-charge gas-fabricating processes. The A 123/A 123M specification covers steel products fabricated by the hot-charge gas-fabricating processes.

ASTM A 123/A 123M Requirements

- Chemical Requirements: Requirements apply to the chemical composition and shall conform to the requirements of the A 123/A 123M specification.
• Mechanical Properties: Requirements apply to the mechanical properties and shall conform to the requirements of the A 123/A 123M specification.
• Fabrication: Requirements apply to the fabrication process and shall conform to the requirements of the A 123/A 123M specification.
• Inspection: Requirements apply to the inspection process and shall conform to the requirements of the A 123/A 123M specification.

