Designation: A 126 – 04

Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings[1]

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 reapproval. A superscript epsilon (ε) 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 (excluding those in tables and figures) shall not be considered as requirements of the standard.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 48 Specification for Gray Iron Castings

A 644 Terminology Relating to Iron Castings

E 8 Test Methods for Tension Testing of Metallic Materials

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, and

5.1.4 Certification, if required (see Section 17).

TABLE 1 Tensile Requirements

	Class A	Class B	Class C
Tensile strength, min, ksi (MPa)	21 (145)	31 (214)	41 (283)

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:

Phosphorus, max, %	0.75
Sulfur, max, %	0.15

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. Cast Test Bars

9.1 Separately cast 1⅛ in. (28.6 mm) diameter test bars shown in Fig. 1 shall be poured in sand molds from the same lot as the castings represented.

NOTE 2—The numbering on the test specimens shown in Fig. 1 and Fig. 2 is intended simply to illustrate a method of designation. In the particular method shown[12] refers to December 8, B 1 is the cupola number, and the numeral 1 which follows shows the hour cast (1 p.m.).

9.2 Test bars that are intended to represent castings which are cooled in the mold to less than 900°F (480°C) before shakeout, shall be cooled in their molds to a temperature less than 900°F, and then may be cooled in still air to room temperature.

9.3 Test bars that are intended to represent castings which are hotter than 900°F when shaken out of their molds, shall be

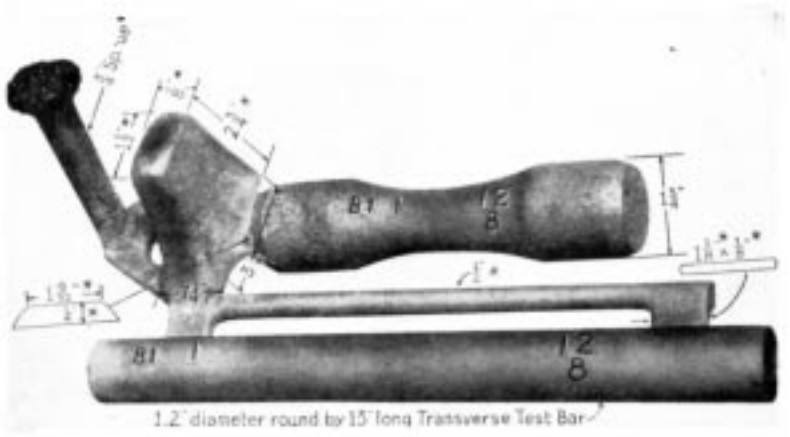
[1] This specification is under the jurisdiction of ASTM Committee A04 on Iron Castings and is the direct responsibility of Subcommittee A04.01 on Gray and White Iron Castings.

Current edition approved May 1, 2004. Published May 2004. Originally approved in 1929. Last previous edition approved in 2001 as A 126 – 95 (2001).

[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.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.

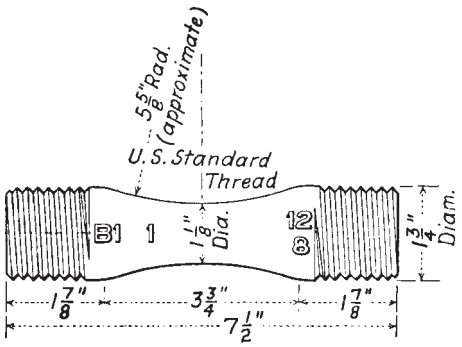
Copyright ASTM International
Reproduced by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale



Metric Equivalents												
in.	1/8	1/4	1/2	3/4	7/8	1 1/8	1.2	1 9/32	1 1/2	1 3/4	2 3/4	13
mm	3.2	6.4	12.7	19.0	22.2	28.6	30.5	32.5	38.1	44.4	69.8	1330

NOTE—These dimensions are suggested as satisfactory for average conditions, but may be varied to best suit individual pouring.

FIG. 1 Mold of Tension and Transverse Test Specimens



Metric Equivalents			
in.	mm	in.	mm
1 1/8	28.6	3 3/4	95.2
1 3/4	44.4	5 5/8	142.9
1 7/8	47.6	7 1/2	290.5

NOTE—Modification may be made to the grip-ends of the tension test specimen to allow alternative means of gripping as required by testing procedures and equipment. Should alternative grip-ends be disputed, the threaded grip-ends shall be used.

FIG. 2 Tension Test Specimen

cooled as described in 9.2 or (by agreement between the manufacturer and the purchaser) may be shaken out of their molds at approximately the same temperature as the castings they represent.

10. Tension Test Apparatus

10.1 Ball and socket specimen holders or spherical-seated bearings or other device which will ensure that the specimen, when under load, will be as nearly as possible in pure axial tension without transverse stress shall be used in making the tension test.

NOTE 3—Suitable socket specimens holders and spherical-seated bearing device are shown in Fig. 4 and described in 5.2.3 of Test Methods E 8.

10.2 After reaching a stress of 15 000 psi (103 MPa), the speed of the crosshead of the testing machine shall not exceed ⅛ in. (3.2 mm)/min.

11. Sampling

11.1 A lot shall consist of one of the following:

11.1.1 All the metal poured from a single heating in a batch type melting furnace,

11.1.2 All the metal from two or more batch type melting furnaces poured into a single ladle or single casting, or

11.1.3 All the metal poured from a continuous melting furnace for a given period of time between changes in charge, processing conditions, or aim-for chemistry or 4 h, whichever is the shorter period.

Copyright ASTM International
Reproduced by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale

11.1.3.1 The purchaser may agree to extend the 4-h time period to 8 h if the manufacturer can demonstrate sufficient process control to warrant such an extension.

12. Test Specimens

12.1 Tension test specimens shall have threaded ends and conform to the dimensions shown in Fig. 2. The cross-sectional area of the reduced section shall be 1 in.^{2}(645 mm^2) ±5 %. The actual cross-sectional area shall be used in calculating the tensile strength.

13. Alternate Test Bars

13.1 Alternate test bars poured in accordance with Specification A 48 to the equivalent classes shown in Table 2 may be substituted for the Specification A 126 test bars. When the alternate bars are used, they shall be machined and tested in accordance with Specification A 48 and shall meet the requirements of Specification A 48.

14. Inspection

14.1 All tests and inspections required by this specification shall be performed by the manufacturer or other reliable sources whose services have been contracted for by the manufacturer. Complete records of all tests and inspections shall be maintained by the manufacturer and shall be available for review by the purchaser.

TABLE 2 Equivalent Classes (Specification A 48)

Specification A 126 Class	Under 0.50 in. (12.7 mm)	0.51 to 1.00 in. (13.0 to 25.4 mm)	Over 1 in. (25.4 mm)
A	25 A	20 B	20 C
B	35 A	30 B	30 C
C	45 A	40 B	40 C

15. Rejection and Rehearing

15.1 Castings which fail to conform to the requirements specified when inspected or tested by the purchaser or his agent may be rejected. Rejection shall be reported to the manufacturer or supplier promptly and in writing. In case of dissatisfaction with the test results, the manufacturer or supplier may make claim for a rehearing.

16. Certification

16.1 When requested by the purchaser, the manufacturer shall furnish the certification stating that the material was manufactured, sampled, tested, and inspected in accordance with Specification A 126, including the year date. The certification shall also include the results of all tests performed including chemical analysis.

16.2 A signature is not required on the certification. However, the document shall clearly identify the organization submitting the certification and the authorized agent of the manufacturer who certified the test results. Notwithstanding the absence of a signature, the organization submitting the certification is responsible for its content.

17. Keywords

17.1 gray iron castings; pressure retaining parts

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).

Copyright ASTM International
Reproduced by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale