

radiography is a requirement of the particular material specification.

(2) For those specifications in which no filler material is used in the welding process, the ultrasonic examination as required by item S-6 in ASTM A-376 shall be certified as having been met for service above 800 °F.

TABLE 56.60-2(A)—ADOPTED SPECIFICATIONS NOT LISTED IN THE ASME CODE

ASTM specifications	Source of allowable stress	Notes
FERROUS MATERIALS ¹		
Bar stock:		
A276 (Grades 304-A, 304L-A, 310-A, 316-A, 316L-A, 321-A, 347-A, and 348-A), A575 and A576 (Grades 1010-1030)	See footnote 4.	(⁴).
NONFERROUS MATERIALS		
Bar stock:		
B16 (soft and half hard tempers).	See footnote 5.	(^{5,7}).
B21 (alloys A, B, and C).	See footnote 8.	(⁸).
B124:		
Alloy 377	See footnotes 5 and 9.	(^{5,9}).
Alloy 464	See footnote 8.	(^{8,10}).
Alloy 655	See footnote 11.	(¹¹).
Alloy 642	See footnote 12.	(^{7,12}).
Alloy 630	See footnote 13.	(^{7,13}).
Alloy 485	See footnote 8.	(^{8,10}).
Forgings:		
B283 (forging brass) ...	See footnotes 5 and 9.	(^{5,9}).
Castings:		
B26	See footnotes 5, 14, and 15.	(^{5,14,15}).
B85	See footnotes 5, 14, and 15.	(^{5,14,15}).

¹ For limitations in use refer to § 56.60-5.
² Allowable stresses shall be the same as those listed in UCS23 of section VIII of the ASME Code for SA-675 material of equivalent tensile strength.
³ Physical testing shall be performed as for material manufactured to ASME Specification SA-675, except that the bend test shall not be required.
⁴ Allowable stresses shall be the same as those listed in UCS23 of section VIII of the ASME Code for the corresponding SA-182 material.
⁵ Limited to air and hydraulic service with a maximum design temperature of 150 °F. The material must not be used for salt water service or other fluids that may cause dezincification or stress corrosion cracking.
⁶ [Reserved]
⁷ An ammonia vapor test, in accordance with ASTM B 858M (incorporated by reference, see § 56.01-2), shall be performed on a representative model of each finished product design.
⁸ Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-171, naval brass.
⁹ An ammonia vapor test, in accordance with ASTM B 858 (incorporated by reference, see § 56.01-2), shall be performed on a representative model for each finished product design. Tension tests shall be performed to determine tensile strength, yield strength, and elongation. Minimum values shall be those listed in table 3 of ASTM B283.

¹⁰ Physical testing, including mercurous nitrate test, shall be performed as for material manufactured to ASTM B21.
¹¹ Physical testing shall be performed as for material manufactured to ASTM B96. Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-96 and shall be limited to a maximum allowable temperature of 212 °F.
¹² Physical testing shall be performed as for material manufactured to ASTM B171, alloy D. Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-171, aluminum bronze D.
¹³ Physical testing shall be performed as for material manufactured to ASTM B171, alloy E. Allowable stresses shall be the same as those listed in UNF23 of section VIII of the ASME Code for SB-171, aluminum bronze, alloy E.
¹⁴ Tension tests shall be performed to determine tensile strength, yield strength, and elongation. Minimum values shall be those listed in table X-2 of ASTM B85.
¹⁵ Those alloys with a maximum copper content of 0.6 percent or less shall be acceptable under this specification. Cast aluminum shall not be welded or brazed.

Note: This Table 56.60-2(a) is a listing of adopted bar stock and nonferrous forging and casting specifications not listed in the ASME Code. Particular attention should be given to the supplementary testing requirements and service limitations contained in the footnotes.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 72-104R, 37 FR 14233, July 18, 1972; CGD 73-248, 39 FR 30839, Aug. 26, 1974; CGD 73-254, 40 FR 40165, Sept. 2, 1975; CGD 77-140, 54 FR 40612, Oct. 2, 1989; CGD 95-012, 60 FR 48050, Sept. 18, 1995; CGD 95-027, 61 FR 26001, May 23, 1996; CGD 95-028, 62 FR 51201, Sept. 30, 1997; USCG-1998-4442, 63 FR 52190, Sept. 30, 1998; USCG-1999-5151, 64 FR 67180, Dec. 1, 1999]

§ 56.60-3 Ferrous materials.

(a) Ferrous pipe used for salt water service must be protected against corrosion by hotdip galvanizing or by the use of extra heavy schedule material.

(b) (Reproduces 123.2.3(c)). Carbon or alloy steel having a carbon content of more than 0.35 percent may not be used in welded construction or be shaped by oxygen cutting process or other thermal cutting process.

[CGD 73-254, 40 FR 40165, Sept. 2, 1975]

§ 56.60-5 Steel (High temperature applications).

(a) (Reproduces 123.2.3(a).) Upon prolonged exposure to temperatures above 775 °F., the carbide phase of plain carbon steel, plain nickel alloy steel, carbon-manganese alloy steel, manganese-vanadium alloy steel, and carbon-silicon steel may be converted to graphite.

(b) (Reproduces 123.2.3(b).) Upon prolonged exposure to temperatures above 875 °F., the carbide phase of alloy steels, such as carbon-molybdenum, manganese-molybdenum-vanadium, and manganese-chromium-vanadium and

chromium-vanadium, may be converted to graphite.

(c) [Reserved]

(d) The design temperature of a piping system employing one or more of the materials listed in paragraphs (a), (b), and (c) of this section shall not exceed the lowest graphitization temperature specified for materials used.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970; CGD 72–104R, 37 FR 14233, July 18, 1972; CGD 73–248, 39 FR 30839, Aug. 26, 1974; CGD 73–254, 40 FR 40165, Sept. 2, 1975]

§ 56.60–10 Cast iron and malleable iron.

(a) The low ductility of cast iron and malleable iron should be recognized and the use of these metals where shock loading may occur should be avoided. Cast iron and malleable iron components shall not be used at temperatures above 450 °F. Cast iron and malleable iron fittings conforming to the specifications of Table 56.60–1(a) of this part may be used at pressures not exceeding the limits of the applicable standards of Table 56.60–1(b) of this part at temperatures not exceeding 450 °F. Valves of either of these materials may be used if they conform to the standards for class 125 and class 250 flanges and flanged fittings in ANSI B16.1 and if their service does not exceed the rating as marked on the valve.

(b) Cast iron and malleable iron shall not be used for valves or fittings in lines carrying flammable or combustible fluids¹ which are directly connected to, or in the proximity of, equipment or other lines having open flame, or any parts operating at temperatures above 500 °F. Cast iron shall not be used for hull fittings, or in systems conducting lethal products.

(c) Malleable iron and cast iron valves and fittings, designed and marked for Class 300 refrigeration service, may be used for such service provided the pressure limitation of 300 pounds per square inch is not exceeded. Malleable iron flanges of this class

¹For definitions of flammable or combustible fluids, see §§ 30.10–15 and 30.10–22 of subchapter D (Tank Vessels) of this chapter.

may also be used in sizes 4 inches and smaller (oval and square design).

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970; CGD 73–254, 40 FR 40165, Sept. 2, 1975; CGD 77–140, 54 FR 40612, Oct. 2, 1989; CGD 95–027, 61 FR 26001, May 23, 1996]

§ 56.60–15 Ductile iron.

(a) Ductile cast iron components made of material conforming to ASTM A 395 (incorporated by reference, see § 56.01–2) may be used within the service restrictions and pressure-temperature limitations of UCD–3 of section VIII of the ASME Code.

(b) Ductile iron castings conforming to ASTM A 395 (incorporated by reference, see § 56.01–2) may be used in hydraulic systems at pressures in excess of 7500 kilopascals (1000 pounds per square inch) gage, provided the following:

(1) The castings receive a ferritizing anneal when the as-cast thickness does not exceed one inch;

(2) Large castings for components, such as hydraulic cylinders, are examined as specified for a casting quality factor of 90 percent in accordance with UG–24 of section VIII of the ASME Code; and

(3) The castings are not welded, brazed, plugged, or otherwise repaired.

(c) After machining, ductile iron castings must be hydrostatically tested to twice their maximum allowable working pressure and must show no leaks.

(d) Ductile iron castings exhibiting less than 12 percent elongation in 50 millimeters (2 inches) when subjected to a tensile test must meet the requirements for cast iron in this part.

[CGD 77–140, 54 FR 40612, Oct. 2, 1989, as amended by CGD 95–027, 61 FR 26001, May 23, 1996; USCG–2000–7790, 65 FR 58460, Sept. 29, 2000]

§ 56.60–20 Nonferrous materials.

Nonferrous materials listed in this subpart may be used in piping systems under the following conditions (see also § 56.10–5(c)):

(a) The low melting points of many nonferrous metals and alloys, such as aluminum and aluminum alloys, must be recognized. These types of heat sensitive materials must not be used to