

Approval Date: January 3, 2006

The ASME Boiler and Pressure Vessel Standards Committee took action to eliminate Code Case expiration dates effective March 11, 2005. This means that all Code Cases listed in this Supplement and beyond will remain available for use until annulled by the ASME Boiler and Pressure Vessel Standards Committee.

Case 2344-1

Use of Sand Cast Aluminum Alloy A356.0, T6 Temper, for the Manufacture of Hot Water Heating Boilers Under Part HC Section IV

Inquiry: May aluminum alloy A356.0 sand castings in the T6 temper meeting the chemical composition and mechanical properties given in Tables 1 and 2 and other requirements of ASTM B 26/B 26M-97 be used in Section IV, Part HC, construction of heating boilers?

Reply: It is the opinion of the committee that aluminum alloy A356.0 sand castings in the T6 temper meeting the chemical composition and mechanical properties given in Tables 1 and 2 and other requirements of ASTM B 26/B 26M-97 may be used in Section IV, Part HC, construction of heating boilers, under the following conditions:

- (a) No welding is permitted.
- (b) In lieu of Section IV, HC-200 through HC-213, all applicable requirements of ASTM B 26/B 26M-97 and Tables 1 and 2 of this Case shall apply. The footnotes applicable to Tables 1 and 2 of ASTM B 26/B 26M-97 apply to Tables 1 and 2 of this Case.
- (c) Maximum water temperature shall be 200°F (95°C).
- (d) All other applicable parts of Section IV shall apply except except HC-401 and HC-402. In lieu of procedures of HC-410, the assembled boiler may be hydrostatically tested at $2\frac{1}{2}$ times the maximum allowable working pressure, provided the test pressure does not exceed $1\frac{1}{2}$ times the design pressure of the next limiting part. If $2\frac{1}{2}$ times hydro exceeds $1\frac{1}{2}$ times the design pressure of any part of the completed vessel, then the $2\frac{1}{2}$ times test is only performed on the casting, and the assembled boiler must be tested at $1\frac{1}{2}$.

**TABLE 1
CHEMICAL REQUIREMENTS**

Element	Composition, % (by weight)
Silicon	6.5–7.5
Iron	0.20 max.
Copper	0.20 max.
Manganese	0.10 max.
Magnesium	0.25–0.40
Zinc	0.10 max.
Titanium	0.20 max.
Others	0.05 max. each
Others total	0.15 max.
Aluminum	remainder

**TABLE 2
MECHANICAL PROPERTIES**

Tensile strength, min., ksi	34.0 (235 MPa)
Yield strength, min., ksi	24.0 (165 MPa)
Elongation in 2 in. (50 mm), min., %	3.5

(e) Proof testing to establish design pressure is required and shall comply with HG-501 and HG-502.3, except that in the equation in HG-502.3, the specified minimum tensile strength at room temperature shall be 34,000 psi (235 MPa) and the design factor shall be 7 in lieu of 5.

(f) All boiler parts or sections shall be built according to the Material Specification requirements. Each boiler section, including end and intermediate cored sections, shall show the following data cast in letters or numerals at least $\frac{5}{16}$ in. (8 mm) high:

- (1) the Material Specification identification number
- (2) the boiler or parts manufacturer's name or acceptable abbreviation, preceded by the words "Certified by" or "Cert. by"

The Committee's function is to establish rules of safety, relating only to pressure integrity, governing the construction of boilers, pressure vessels, transport tanks and nuclear components, and inservice inspection for pressure integrity of nuclear components and transport tanks, and to interpret these rules when questions arise regarding their intent. This Code does not address other safety issues relating to the construction of boilers, pressure vessels, transport tanks and nuclear components, and the inservice inspection of nuclear components and transport tanks. The user of the Code should refer to other pertinent codes, standards, laws, regulations or other relevant documents.

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- (3) maximum allowable working pressure
- (4) maximum water temperature
- (5) pattern number
- (6) casting date
- (7) the name of the shop-assembler in possession of a Code Symbol Stamp and a valid Certificate of Authorization. Arrangement of the data shall be substantially as shown in Fig. 1. Other data may be cast on the sections.
- (g) When the boiler size and number of sections has been decided, the completed boiler shall be marked with the Code Symbol shown in Fig. HG-530.1 and with the data specified in HG-530.2(b).
- (h) This Case number shall be shown on the H-5 Data Report.

FIG. 1

Material Specification _____

Certified by _____ for _____
(Name of Manufacturer) (Shop-Assembler)

MAWP, water _____ psi

Maximum water temperature _____ °F

(Pattern number)

(Casting date)