

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: February 26, 2001

See Numeric Index for expiration  
and any reaffirmation dates.

**Case 2344**  
**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) Maximum allowable working pressure shall not exceed 50 psi.
- (b) No welding is permitted.
- (c) 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.
- (d) Maximum water temperature shall be 200°F.

(e) All other applicable parts of Section IV shall apply except HC-401 and HC-402.

(f) 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 and the design factor shall be 7 in lieu of 5.

(g) 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"
- (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.
- (h) 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).
- (i) This Case number shall be shown on the H-5 Data Report.

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
Yield strength, min., ksi	24.0
Elongation in 2 in., min., %	3.5

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Material Specification _____
Certified by _____ for _____ (Name of Manufacturer)      (Shop-Assembler)
MAWP, water _____ psi
Maximum water temperature _____ °F
_____
(Pattern number)
_____
(Casting date)

FIG. 1