

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: July 10, 2000

*See Numeric Index for expiration
and any reaffirmation dates.*

Case 2192-3
Modified 9Cr-1Mo-V Cast Material
Section I

Inquiry: May normalized and tempered modified 9Cr-1Mo-V castings, and with the chemical analysis shown in Table 1, the mechanical properties shown in Table 2, and otherwise conforming to applicable requirements in the following specifications, be used for Section I construction?

- (a) Castings, SA-217
- (b) Pipe, SA-426

Reply: It is the opinion of the Committee that modified 9Cr-1Mo-V castings having the chemical requirements shown in Table 1 and room temperature mechanical property requirements shown in Table 2, may be used in Section I construction provided the following requirements are met.

(a) The material shall meet the chemical analysis and minimum tensile requirements described in the Inquiry, and shall otherwise meet the requirements of SA-217 or SA-426 as applicable.

(b) The material shall be normalized within the range of 1,900–2,000°F, and tempered at 1,350°F, minimum.

(c) The maximum allowable stress values for the material shall be those given in Table 3.

(d) Separate welding procedures and performance qualifications shall be required for this material. The welding procedure qualification and performance qualification shall be conducted as prescribed in Section IX.

(e) The material shall be considered P-No. 5B, Group No. 2 for the purposes of postweld heat treatment.

TABLE 1
CHEMICAL REQUIREMENTS

| Element | Composition, % |
|------------------|----------------|
| Carbon | 0.08–0.12 |
| Manganese | 0.30–0.60 |
| Phosphorus, max. | 0.020 |
| Sulfur, max. | 0.010 |
| Silicon | 0.20–0.50 |
| Chromium | 8.00–9.50 |
| Molybdenum | 0.85–1.05 |
| Nickel, max. | 0.40 |
| Vanadium | 0.18–0.25 |
| Columbium | 0.06–0.10 |
| Nitrogen | 0.03–0.07 |
| Aluminum, max. | 0.02 |
| Titanium, max. | 0.005 |

TABLE 2
MECHANICAL PROPERTY REQUIREMENTS
(Room Temperature)

| | |
|--------------------------------------|----------|
| Tensile strength, min., ksi (MPa) | 85 (585) |
| Yield strength, min., ksi (MPa) | 60 (415) |
| Elongation in 2 in. (50 mm), min., % | 18 |

The requirements for postweld heat treatment shall satisfy the rules in PW-39.

(f) A manufacturer's test report meeting certification requirements of SA-703 shall be provided.

(g) This Case number shall be shown in the material certification and marking of the material.

(h) This Case number shall be shown on the Manufacturer's Data Report.

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TABLE 3
MAXIMUM ALLOWABLE STRESS VALUES

| For Metal Temperature Not Exceeding, °F | Allowable Stress Values, Max., ksi [Note (1)] |
|--|--|
| -20 to 100 | 24.3 |
| 200 | 24.3 |
| 300 | 23.6 |
| 400 | 22.7 |
| 500 | 22.0 |
| 600 | 21.4 |
| 650 | 21.0 |
| 700 | 20.6 |
| 750 | 20.2 |
| 800 | 19.7 |
| 850 | 19.1 |
| 900 | 18.5 |
| 950 | 17.7 |
| 1,000 | 14.3 |
| 1,050 | 11.4 |
| 1,100 | 8.8 |
| 1,150 | 6.5 |
| 1,200 | 4.2 |

NOTE:

- (1) The allowable stress values are based on the revised criterion of tensile strength at temperature divided by 3.5, where applicable.