

Approval Date: October 27, 2005

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 2497-2

**Unalloyed and Palladium or Ruthenium Corrosion
Enhanced Titanium Grades With 58 ksi Minimum
UTS, UNS R50400, R52400, R52402, and R52404
Section VIII, Division 1**

Inquiry: May unalloyed and palladium and ruthenium enhanced titanium conforming to the requirements of Grades 2, 7, 16, or 26 (UNS R50400, R52400, R52402, and R52404) except with a minimum UTS of 58 ksi be used in Section VIII, Division 1 construction with design allowable stresses adjusted for the higher minimum specified UTS?

Reply: It is the opinion of the Committee that unalloyed titanium conforming to the requirements of Grades 2, 7, 16, or 26 (UNS R50400, R52400, R52402, and R52404) except with a minimum UTS of 58 ksi may be used in Section VIII, Division 1 construction, provided the following requirements are met:

- (a) The material shall meet all other requirements of the corresponding ASME Specifications in Table 1.
- (b) The maximum allowable stress values shall be as shown in Tables 2 or 2M.
- (c) External Pressure Chart as shown in Figs. 1 and 1M and Tables 3 and 3M shall be used for the material.

**TABLE 1
PRODUCT SPECIFICATIONS**

Product	Specification	Grade
Bar, billet	SB-348	2, 7, 16, 26
Forgings	SB-381	F2, F7, F16, F26
Plate, sheet, strip	SB-265	2, 7, 16, 26
Seamless fittings	SB-363	WPT2, WPT7, WPT16, WPT26
Seamless pipe	SB-861	2, 7, 16, 26
Seamless tube	SB-338	2, 7, 16, 26
Welded fittings	SB-363	WPT2W, WPT7W, WPT16W, WPT26W
Welded pipe	SB-862	2, 7, 16, 26
Welded tube	SB-338	2, 7, 16, 26

(d) Welding Procedure Qualifications and performance qualifications shall be conducted in accordance with Section IX. Separate welding procedure qualification is required for this material and the minimum tensile strength shall be 58 ksi. For welder performance qualifications, these materials shall be considered P-No. 51.

(e) All other rules for Section VIII, Division 1, Part UNF applicable to titanium shall be met.

(f) This Case number shall be referenced in the documentation and marking of the material and shown on the Manufacturer's Data Report.

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.

CASE (continued)
2497-2

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

TABLE 2
MAXIMUM ALLOWABLE STRESS VALUES
(All Product Forms)

For Metal Temperature Not Exceeding, °F	Allowable Stress Values, ksi
100	16.6
150	15.9
200	14.4
250	13.1
300	12.0
350	11.1
400	10.2
450	9.5
500	8.8

GENERAL NOTES:

- (a) For welded pipe, tube, and fittings, a 0.85 joint efficiency shall be used.
- (b) The revised criterion of 3.5 on tensile strength was used in establishing these values.

TABLE 2M
MAXIMUM ALLOWABLE STRESS VALUES
(All Product Forms)

For Metal Temperature Not Exceeding, °C	Allowable Stress Values, MPa
40	114
65	110
100	97.2
125	89.3
150	82.5
175	76.6
200	71.5
225	66.8
250	62.5
275 (1)	58.4

GENERAL NOTES:

- (a) For welded pipe, tube, and fittings, a 0.85 joint efficiency shall be used.
- (b) The revised criterion of 3.5 on tensile strength was used in establishing these values.

NOTE:

- (1) The maximum use temperature shall be 260°C. Data for 275°C temperatures are provided for interpolation purposes.

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

TABLE 3
TABULAR VALUES FOR FIG. 1

Temp., °F	A	B, psi
100 °F	1.00 -05	7.75 +01
	1.28 -03	9.92 +03
	1.50 -03	1.10 +04
	2.00 -03	1.30 +04
	3.00 -03	1.49 +04
	5.00 -03	1.67 +04
	8.00 -03	1.78 +04
	1.00 -02	1.81 +04
	2.00 -02	1.88 +04
	6.00 -02	2.00 +04
	1.00 -01	2.00 +04
200°F	1.00 -05	7.50 +01
	1.23 -03	9.23 +03
	1.50 -03	1.02 +04
	2.00 -03	1.13 +04
	4.00 -03	1.34 +04
	7.00 -03	1.48 +04
	1.00 -02	1.55 +04
	2.00 -02	1.63 +04
	4.00 -02	1.68 +04
	1.00 -01	1.68 +04
400°F	1.00 -05	7.00 +01
	6.85 -04	4.80 +03
	1.00 -03	5.95 +03
	2.00 -03	7.20 +03
	4.00 -03	8.66 +03
	6.00 -03	9.37 +03
	9.00 -03	9.63 +03
	1.00 -02	9.74 +03
	1.30 -02	9.80 +03
	1.00 -01	9.80 +03
600°F	1.00 -05	6.30 +01
	6.41 -04	4.04 +03
	6.85 -04	4.28 +03
	8.00 -04	4.60 +03
	1.00 -03	4.80 +03
	2.00 -03	4.99 +03
	3.00 -03	5.15 +03
	5.00 -03	5.30 +03
	8.00 -03	5.40 +03
	1.00 -02	5.50 +03
	1.50 -02	5.60 +03
	1.80 -02	5.65 +03
	1.00 -01	5.70 +03

TABLE 3M
TABULAR VALUES FOR FIG. 1M

Temp., °C	A	B, MPa
40°C	1.00 -05	5.34 -01
	1.28 -03	6.84 +01
	1.50 -03	7.61 +01
	2.00 -03	8.94 +01
	3.00 -03	1.03 +02
	5.00 -03	1.15 +02
	8.00 -03	1.23 +02
	1.00 -02	1.25 +02
	2.00 -02	1.30 +02
	6.00 -02	1.38 +02
	1.00 -01	1.38 +02
95°C	1.00 -05	5.17 -01
	1.23 -03	6.36 +01
	1.50 -03	7.03 +01
	2.00 -03	7.79 +01
	4.00 -03	9.24 +01
	7.00 -03	1.02 +02
	1.00 -02	1.07 +02
	2.00 -02	1.12 +01
	4.00 -02	1.16 +02
	1.00 -01	1.16 +02
205°C	1.00 -05	4.83 -01
	6.85 -04	3.31 +01
	1.00 -03	4.10 +01
	2.00 -03	4.96 +01
	4.00 -03	5.97 +01
	6.00 -03	6.46 +01
	9.00 -03	6.64 +01
	1.00 -02	6.72 +01
	1.30 -02	6.76 +01
	1.00 -01	6.76 +01
315°C	1.00 -05	4.34 -01
	6.41 -04	2.79 +01
	6.85 -04	2.95 +01
	8.00 -04	3.17 +01
	1.00 -03	3.31 +01
	2.00 -03	3.44 +01
	3.00 -03	3.55 +01
	5.00 -03	3.65 +01
	8.00 -03	3.72 +01
	1.00 -02	3.79 +01
	1.50 -02	3.86 +01
	1.80 -02	3.90 +01
	1.00 -01	3.93 +01

CASE (continued)
2497-2

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

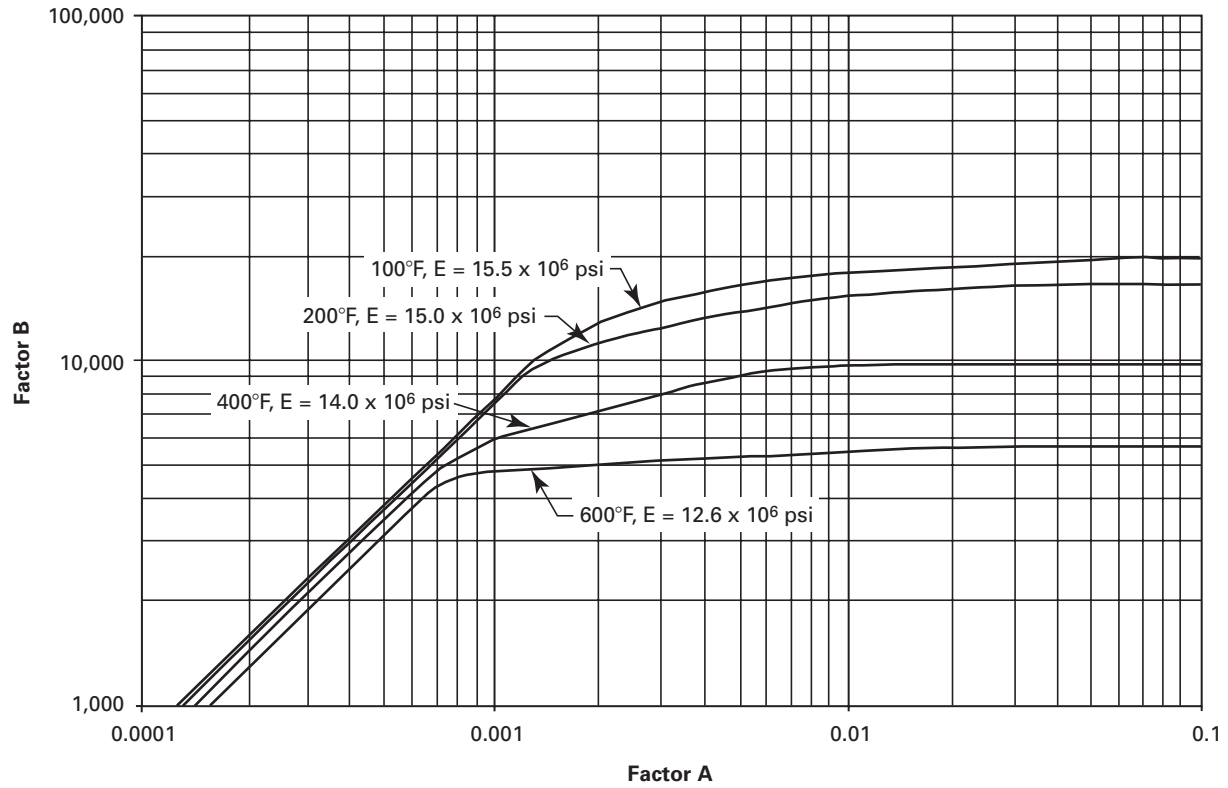


FIG. 1 EXTERNAL PRESSURE CHART

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

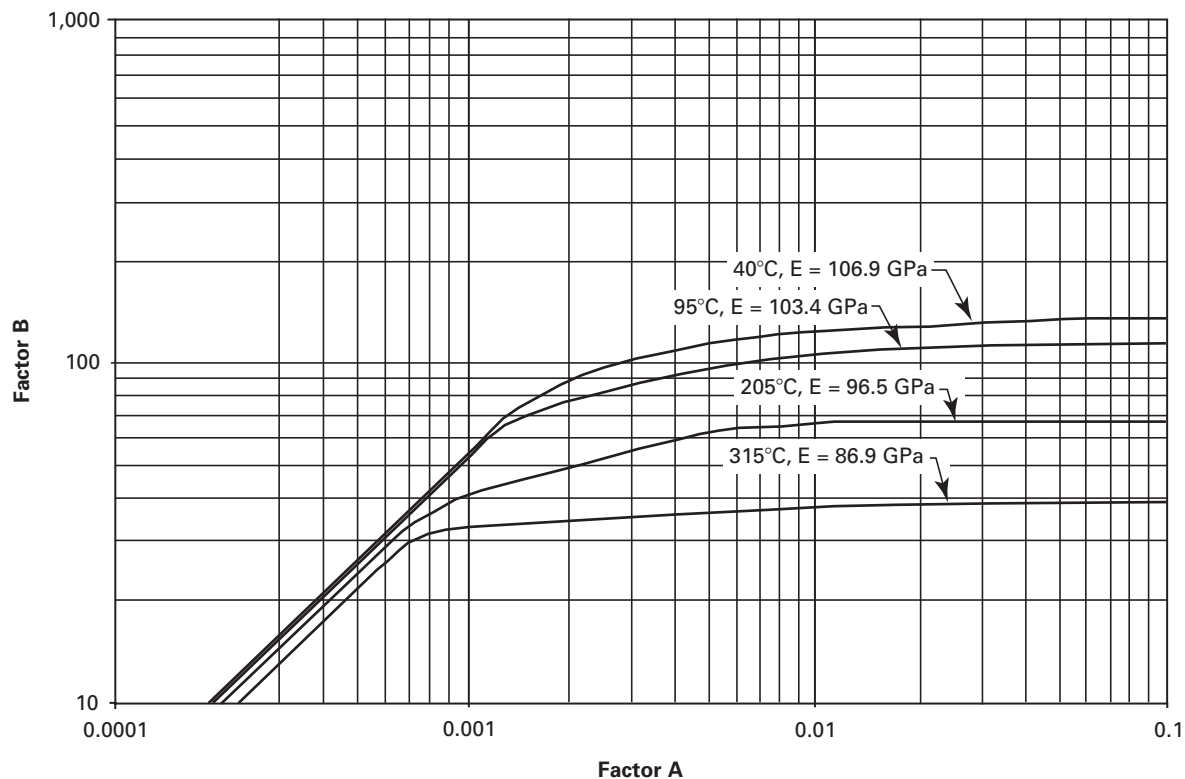


FIG. 1M EXTERNAL PRESSURE CHART