

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: May 16, 1991

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

Case 1876-2

Design of Safety Valve Connections

Section I

Inquiry: For Section I construction, what design criteria may be used for boiler proper safety valve inlet connections?

Reply: It is the opinion of the Committee that, for Section I construction, the following design criteria may be used for safety valve inlet connections to the boiler proper.

(a) For the condition with the safety valve closed, the wall thickness of the connection shall be no less than required by the rules of PG-27 for the internal pressure using the maximum allowable stress from Table 1A of Section II, Part D; and

(b) For the condition of safety valve operation (blowing steam), the combined pressure stress and bending stress from internal pressure plus valve reaction forces may exceed the allowable stresses in Table 1A of Section II, Part D, but shall not exceed the values shown in Table 1.

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

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TABLE 1
MAXIMUM ALLOWABLE COMBINED STRESS IN
SAFETY VALVE INLET CONNECTION WHEN VALVE IS BLOWING^{1,2}

Temperature, °F	Carbon Steel, ksi [Notes (3) and (4)]	1 $\frac{1}{4}$ Cr– $\frac{1}{2}$ Mo–Si, ksi [Note (5)]	2 $\frac{1}{4}$ Cr– 1Mo, ksi [Note (6)]
–20 to 400	27.0	23.6	24.2
500	25.5	23.2	24.2
600	23.3	22.5	24.2
650	22.8	21.9	24.2
700	22.7	21.1	24.2
750	22.0	20.5	24.2
800	17.5	20.2	24.0
850	12.7	19.5	23.6
900	...	19.0	23.1
950	...	18.4	19.0
1000	...	17.8	14.3
1050	...	12.4	12.3
1100	9.1

NOTES:

- (1) The stress values in this table may be interpolated to determine values for intermediate temperatures.
 (2) The stress values in this table do not exceed either 90% of the yield strength at temperature or 67% of the average stress to produce rupture in 1000 hr.
 (3) Upon prolonged exposure to temperatures above about 800°F, the carbide phase of carbon steel may be converted to graphite.
 (4) Material shall conform to one of the following Specifications and Grades:

Specification No.	Grade or Class
SA-105	
SA-106	B,C
SA-181	60,70
SA-210	C,A1
SA-216	WCA,WCB,WCC
SA-266	1,2,3,4

- (5) Material shall conform to one of the following Specifications and Grades:

SA-182	F11, Class 2
SA-213	T11
SA-217	WC6
SA-335	P11

- (6) Material shall conform to one of the following Specifications and Grades:

SA-182	F22, Class 3
SA-213	T22
SA-217	WC9
SA-335	P22
SA-336	F22, F22A