

PRESSURE-TEMPERATURE RATINGS USED IN POWER PLANT PIPING SYSTEMS

Prepared by
Pipe Fabrication Institute Engineering Committee



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METRIC CONVERSIONS

The conversion of quantities between systems of units involves a determination of the number of significant digits to be retained. All conversions depend upon the intended precision of the original quantity and are rounded to the appropriate accuracy.

Pipe sizes together with applicable wall thicknesses are not shown with metric equivalents.

The SI (metric) values were included with the customary U.S. values in this Standard are the rounded equivalents of the U.S. values and are for reference only.

Metric units were derived utilizing the following conversion factor:

<u>Conversion</u>	<u>Factor</u>
inches to millimeter	25.4

The worksheets in TB-1 present both Imperial and SI calculation

1. Scope

- 1.1 This bulletin provides pressure ratings, in Imperial and SI units, for each pipe size and applicable schedule, 1/8 NPS through 48 NPS. Selection of a suitable material must consider such items as service, temperature, safety, thermal shock, corrosion allowance, exposure to fire, system life and economy, using sound engineering judgment, and is not within the scope of this bulletin.
- 1.2 Referencing the applicable fabrication code will provide allowable stress values, "S", for a given

material and temperature, weld joint efficiency "E", and temperature coefficient "y". TB-1 will also provide a minimum design thickness, when a design pressure is provided.

- 1.3 The following formula and nomenclature are in accordance with ASME B31.1, Power Piping code, 2004 edition. The pressure ratings provided in this technical bulletin may be used for other codes that utilize the same pressure formula as shown below, however, the nomenclature may be different. It is the user's responsibility to determine if this bulletin is applicable.

2. Formulas

- 2.1 The following formula, as given in Paragraph 104.1.2 formula (4) of ASME B31.1, is used to calculate the pressure ratings (PSIG/kPa) provided in columns "C" through "R" of the TB-1 "Imperial Units" worksheet, (sheet 1), and "SI Units" worksheet, (sheet 2).

$$P = \frac{2SE(t_m - A)}{D_o - 2y(t_m - A)}$$

- 2.2 The following formula, as given in Paragraph 104.1.2 formula (3) of ASME B31.1 is used to calculate the minimum wall thickness required, as provided in column "S" of the TB-1 "Imperial Units" worksheet, (sheet 1), and "SI Units" worksheet, (sheet 2):

$$t_m = \frac{P D_o}{2(SE + Py)} + A$$