

# Temperature Limits of Materials

## Rated Internal Working Pressures of Joints made with Copper Water Tube and Solder Type Fittings, PSI (Bar)

Solder or Brazing Alloy Used in Joints	Service Temperature ° F      (° C)		Copper Water Tube K, L and M Nominal Sizes, In Inches (mm)					Saturated Steam LB (kg) All Sizes
			Water A					
			¼" to 1"	1¼" to 2"	2½" to 4"	5" to 8"	10" to 12"	
50- 50 Tin-Lead <sup>B, G</sup>	100	(38)	200 (14)	175 (12)	150 (10)	135 (9)	100 (7)	15 <sup>D</sup> (6.8) <sup>D</sup>
	150	(66)	150 (19)	125 (8)	100 (7)	90 (6)	70 (4)	
	200	(93)	100 (9)	90 (6)	75 (5)	70 (40)	50 (3)	
	250	(121)	85 (6)	75 (5)	50 (3)	45 (3)	40 (2)	
95-5 Tin-Antimony <sup>C</sup>	100	(38)	635 (43)	560 (39)	375 (26)	340 (23)	150 (10)	15 <sup>D</sup> (6.8) <sup>D</sup>
	150	(66)	635 (43)	560 (39)	375 (26)	340 (23)	150 (10)	
	200	(93)	630 (43)	480 (33)	375 (26)	340 (23)	140 (10)	
	250	(121)	435 (30)	330 (23)	265 (18)	245 (16)	110 (7)	
Brazing Alloys, Melting at or above 1000° F (538°C)	100-150-200	(32-66-93)	H	H	H	H	H	120 <sup>E</sup> (54.4) <sup>E</sup>
	250 <sup>F</sup>	(121) <sup>F</sup>	H	H	H	H	H	
	350	(177)	H	H	H	H	H	

The values in the above table are based on data in the National Bureau of Standards publications, "Building Materials and Structures Reports" BMS 58 and BMS 83.

<sup>A</sup>Including other non-corrosive liquids and gases.

<sup>B</sup>ASTM B 32, Alloy Grade Sn50.

<sup>C</sup>ASTM B 32, Alloy Grade Sb5.

<sup>D</sup>This pressure is determined by the temperature of saturated steam at 15 lb. (6.8 kg) pressure at 250°F (121°C).

<sup>E</sup>This pressure is determined by the temperature of saturated steam at 120 lb. (54.4 kg) pressure at 350°F (177°C).

<sup>F</sup>For service temperatures lower than 250°F (121°C), the solders as above may be used.

<sup>G</sup>The Safe Drinking Water Act Amendment of 1986 prohibits the use in potable water systems of any solder having a lead content in excess of 0.2%.

<sup>H</sup>Rated internal pressure is that of the tube being joined. While solders can be used, brazing alloys are recommended.

## Pressure/Temperature Ratings for Threaded Bronze Pressure Rated Valves†

Press. Class		125 <sup>2,3</sup>	150 <sup>3</sup>	200 <sup>3</sup>	300 <sup>3</sup>
Temperature		Thd.	Thd.	Thd.	Thd.
°F	°C	ASTM B 62	ASTM B 61		
-20 to 150	-28.8 to 65.5	200	300	400	600
200	93.3	185	270	375	560
250	121.1	170	240	350	525
300	148.8	155	210	325	490
350	176.6	140	180	300	450
400	204.4	—	—	275	410
406	207.7	125	150	—	—
450	232.2	120 <sup>1</sup>	145 <sup>1</sup>	250	375
500	260.0	—	—	225	340
550	287.7	—	—	200	300

<sup>1</sup>Some codes (i.e. ASME BPVC, SECTION 1) limit the rating temperatures of the indicated material to 406° F temperatures.

<sup>2</sup>Buna-N disc valves limited to 180° F temperatures.

<sup>3</sup>PTFE disc valves limited to 450° F temperatures.

<sup>4</sup>Solder end valves are limited by temperatures which affect the strength of the solder joint.

†Tables from MSS SP-80

## Pressure/Temperature Ratings for NIBCO® Gray Iron and Ductile Iron Valves

Temperature		Gray Iron				Ductile Iron	
		Class 125 200 WOG		Class 250 500 WOG		Class 150	
°F	°C	2"-12"	14"-24"	30"-48"	2"-12"	2"-12"	
-20 to 100	-28.8 to 37.7	200	150	150	500	300	285
150	65.5	200	150	—	500	300	243
200	93.3	190	135	115	460	280	235
225	107.2	180	130	100	440	270	—
250	121.1	175	125	85	415	260	225
275	135.0	170	120	65	395	250	—
300	148.8	165	110	50	375	240	215
325	162.7	155	105	—	355	230	—
350	176.6	150	100	—	335	220	210
375	190.5	145	—	—	315	210	—
400	204.4	140	—	—	290	200	200
425	218.3	130	—	—	270	—	—
*450	232.2	125	—	—	250	—	185
500	260.0	—	—	—	—	—	170
550	287.7	—	—	—	—	—	155
600	315.5	—	—	—	—	—	140
650	343.3	—	—	—	—	—	125

The temperature shown for the corresponding rating shall be the metal temperature of the pressure retaining parts. It shall be assumed that the metal temperature will be the temperature of the contained fluid. Use of a pressure rating at a metal temperature other than that of the contained fluid shall be the responsibility of the user.

<sup>1</sup>Buna-N Disc Valves limited to 180° F or EPDM Disc Valves limited to 250° F.

\*Maximum temperature for bronze trim or PTFE

Visit our website for the most current information.