Pressure Rating Tables for Carbon Steel Pipe

Notes to the tables of allowable working pressures.

Notes

1. This data is intended to provide a general guide. It must not to be relied upon in the absence of competent professional advice.
2. These allowable internal pipe pressures were calculated by the formula given in ASME B31.3-2002 "Process Piping", clause 304.1.2. Other design codes may give different allowable pressures. The original specifications must be consulted for full details.
3. Pipe with Wall Thickness greater than one-sixth of Outside Diameter is not included in this table. For pressure design of this heavy wall pipe consult the standard.
4. Calculations are for Grade B seamless pipe to specifications ASTM A53M, ASTM A106M or API5L. A weld join efficiency factor (typically 85%) must be allowed for standard ERW pipe, and allowance made for corrosion or wear loss if appropriate.
5. Conversion of carbides to graphite may occur after prolonged exposure of carbon steel pipe to temperatures above 427°C.
6. Allowable working pressures are given in megapascals (MPa). Conversions to other units are:

to convert	to	multiply by
megapascals (MPa)	pounds/sq. inch (psi)	145.0
megapascals (MPa)	ksi	0.145
megapascals (MPa)	kilopascals (kPa)	1000
megapascals (MPa)	kilograms/mm² (kgf/mm²)	0.10197
megapascals (MPa)	bar	10.00

LIMITATION OF LIABILITY

CARBON STEEL GRADE B PIPES - ASTM A53M, A106M, API 5L, Seamless

Maximum Allowable Operating Pressure *(MPa)*

Nominal Size		Outside Diameter	Schedule		Wall Thickness	Temperature *(°C)*						
						-29 to +38	204	260	343	371	399	427
(DN)	*(NPS)*	*(mm)*			*(mm)*	Maximum Allowable Stress *(MPa)*						
						137.9	137.9	130.3	117.2	113.8	89.6	74.5
15	½	21.3	STD	40	2.77	34.5	34.5	32.6	29.3	28.5	22.4	18.6
20	¾	26.7	STD	40	2.87	28.1	28.1	26.5	23.8	23.1	18.2	15.1
			XS	80	3.91	39.4	39.4	37.2	33.5	32.5	25.6	21.3
25	1	33.4	STD	40	3.38	26.3	26.3	24.8	22.3	21.7	17.1	14.2
			XS	80	4.55	36.3	36.3	34.3	30.9	30.0	23.6	19.6
32	1¼	42.2	STD	40	3.56	21.6	21.6	20.4	18.4	17.8	14.1	11.7
			XS	80	4.85	30.2	30.2	28.5	25.6	24.9	19.6	16.3
				160	6.35	40.6	40.6	38.4	34.5	33.5	26.4	21.9
40	1½	48.3	STD	40	3.68	19.4	19.4	18.4	16.5	16.0	12.6	10.5
			XS	80	5.08	27.4	27.4	25.9	23.3	22.6	17.8	14.8
				160	7.14	39.8	39.8	37.6	33.8	32.8	25.9	21.5
50	2	60.3	STD	40	3.91	16.4	16.4	15.5	13.9	13.5	10.7	8.9
			XS	80	5.54	23.7	23.7	22.4	20.1	19.5	15.4	12.8
				160	8.74	38.9	38.9	36.8	33.1	32.1	25.3	21.0
65	2½	73.0	STD	40	5.16	17.9	17.9	17.0	15.3	14.8	11.7	9.7
			XS	80	7.01	24.8	24.8	23.5	21.1	20.5	16.1	13.4
				160	9.53	34.7	34.7	32.8	29.5	28.6	22.5	18.7
80	3	88.9	STD	40	5.49	15.6	15.6	14.7	13.2	12.8	10.1	8.4
			XS	80	7.62	22.0	22.0	20.8	18.7	18.2	14.3	11.9
				160	11.13	33.1	33.1	31.3	28.1	27.3	21.5	17.9
100	4	114.3	STD	40	6.02	13.2	13.2	12.5	11.2	10.9	8.6	7.1
			XS	80	8.56	19.1	19.1	18.0	16.2	15.7	12.4	10.3
				120	11.13	25.2	25.2	23.8	21.4	20.8	16.4	13.6
				160	13.49	31.0	31.0	29.3	26.4	25.6	20.2	16.8
			XXS		17.12	40.4	40.4	38.2	34.3	33.3	26.2	21.8
125	5	141.3	STD	40	6.55	11.6	11.6	10.9	9.8	9.5	7.5	6.2
			XS	80	9.53	17.1	17.1	16.1	14.5	14.1	11.1	9.2
				120	12.7	23.1	23.1	21.9	19.7	19.1	15.0	12.5
				160	15.88	29.4	29.4	27.8	25.0	24.3	19.1	15.9
			XXS		19.05	35.9	35.9	33.9	30.5	29.6	23.4	19.4
150	6	168.3	STD	40	7.11	10.5	10.5	9.9	8.9	8.7	6.8	5.7
			XS	80	10.97	16.5	16.5	15.6	14.0	13.6	10.7	8.9
				120	14.27	21.8	21.8	20.6	18.5	17.9	14.1	11.7
			XXS	160	18.26	28.3	28.3	26.8	24.1	23.4	18.4	15.3
200	8	219.1		20	6.35	7.1	7.1	6.7	6.1	5.9	4.6	3.9
				30	7.04	7.9	7.9	7.5	6.7	6.5	5.2	4.3
			STD	40	8.18	9.3	9.3	8.7	7.9	7.6	6.0	5.0
				60	10.31	11.7	11.7	11.1	10.0	9.7	7.6	6.3
			XS	80	12.7	14.6	14.6	13.8	12.4	12.0	9.5	7.9
				100	15.09	17.5	17.5	16.5	14.8	14.4	11.4	9.4
				120	18.26	21.4	21.4	20.2	18.2	17.6	13.9	11.5
				140	20.62	24.3	24.3	23.0	20.7	20.1	15.8	13.1
			XXS		22.23	26.4	26.4	24.9	22.4	21.7	17.1	14.2
				160	23.01	27.4	27.4	25.8	23.3	22.6	17.8	14.8

Important - refer to the associated Notes on page 1.

CARBON STEEL GRADE B PIPES - ASTM A53M, A106M, API 5L, Seamless

Maximum Allowable Operating Pressure *(MPa)*												
Nominal Size		Outside Diameter	Schedule		Wall Thickness	Temperature *(°C)*						
						-29 to +38	204	260	343	371	399	427
(DN)	*(NPS)*	*(mm)*			*(mm)*	Maximum Allowable Stress *(MPa)*						
						137.9	137.9	130.3	117.2	113.8	89.6	74.5
250	10	273.1		20	6.35	5.7	5.7	5.4	4.8	4.7	3.7	3.1
				30	7.8	7.0	7.0	6.6	6.0	5.8	4.6	3.8
			STD	40	9.27	8.4	8.4	7.9	7.1	6.9	5.5	4.5
			XS	60	12.7	11.6	11.6	11.0	9.9	9.6	7.5	6.3
				80	15.09	13.9	13.9	13.1	11.8	11.4	9.0	7.5
				100	18.26	16.9	16.9	16.0	14.4	14.0	11.0	9.1
				120	21.44	20.0	20.0	18.9	17.0	16.5	13.0	10.8
			XXS	140	25.4	24.0	24.0	22.7	20.4	19.8	15.6	13.0
				160	28.58	27.3	27.3	25.8	23.2	22.5	17.7	14.7
300	12	323.9		20	6.35	4.8	4.8	4.5	4.1	4.0	3.1	2.6
				30	8.38	6.4	6.4	6.0	5.4	5.2	4.1	3.4
			STD		9.53	7.2	7.2	6.9	6.2	6.0	4.7	3.9
				40	10.31	7.9	7.9	7.4	6.7	6.5	5.1	4.2
			XS		12.7	9.7	9.7	9.2	8.3	8.0	6.3	5.3
				60	14.27	11.0	11.0	10.4	9.3	9.0	7.1	5.9
				80	17.48	13.5	13.5	12.8	11.5	11.2	8.8	7.3
				100	21.44	16.8	16.8	15.8	14.2	13.8	10.9	9.0
			XXS	120	25.4	20.0	20.0	18.9	17.0	16.5	13.0	10.8
				140	28.58	22.7	22.7	21.4	19.3	18.7	14.8	12.3
				160	33.32	26.8	26.8	25.3	22.7	22.1	17.4	14.4
350	14	355.6		10	6.35	4.4	4.4	4.1	3.7	3.6	2.8	2.4
				20	7.92	5.5	5.5	5.2	4.6	4.5	3.5	2.9
			STD	30	9.53	6.6	6.6	6.2	5.6	5.4	4.3	3.6
				40	11.13	7.7	7.7	7.3	6.6	6.4	5.0	4.2
			XS		12.7	8.8	8.8	8.4	7.5	7.3	5.7	4.8
				60	15.09	10.6	10.6	10.0	9.0	8.7	6.9	5.7
				80	19.05	13.4	13.4	12.7	11.4	11.1	8.7	7.3
				100	23.83	17.0	17.0	16.0	14.4	14.0	11.0	9.2
				120	27.79	20.0	20.0	18.9	17.0	16.5	13.0	10.8
				140	31.75	23.0	23.0	21.7	19.5	19.0	14.9	12.4
				160	35.71	26.1	26.1	24.6	22.2	21.5	16.9	14.1
400	16	406.4		10	6.35	3.8	3.8	3.6	3.2	3.1	2.5	2.1
				20	7.92	4.8	4.8	4.5	4.1	3.9	3.1	2.6
			STD	30	9.53	5.8	5.8	5.4	4.9	4.7	3.7	3.1
			XS	40	12.7	7.7	7.7	7.3	6.6	6.4	5.0	4.2
				60	16.66	10.2	10.2	9.6	8.7	8.4	6.6	5.5
				80	21.44	13.2	13.2	12.5	11.2	10.9	8.6	7.1
				100	26.19	16.3	16.3	15.4	13.8	13.4	10.6	8.8
				120	30.96	19.4	19.4	18.4	16.5	16.0	12.6	10.5
				140	36.53	23.1	23.1	21.9	19.7	19.1	15.0	12.5
				160	40.49	25.8	25.8	24.4	22.0	21.3	16.8	14.0

Important - refer to the associated Notes on page 1.

CARBON STEEL GRADE B PIPES - ASTM A53M, A106M, API 5L, Seamless

Maximum Allowable Operating Pressure *(MPa)*												
Nominal Size		Outside Diameter	Schedule		Wall Thickness	Temperature *(°C)*						
						-29 to +38	204	260	343	371	399	427
(DN)	*(NPS)*	*(mm)*			*(mm)*	Maximum Allowable Stress *(MPa)*						
						137.9	137.9	130.3	117.2	113.8	89.6	74.5
450	18	457		10	6.35	3.4	3.4	3.2	2.9	2.8	2.2	1.8
				20	7.92	4.2	4.2	4.0	3.6	3.5	2.8	2.3
			STD		9.53	5.1	5.1	4.8	4.3	4.2	3.3	2.8
			XS	30	11.13	6.0	6.0	5.7	5.1	4.9	3.9	3.2
					12.7	6.8	6.8	6.5	5.8	5.6	4.4	3.7
				40	14.27	7.7	7.7	7.3	6.5	6.4	5.0	4.2
				60	19.05	10.4	10.4	9.8	8.8	8.5	6.7	5.6
				80	23.83	13.1	13.1	12.3	11.1	10.8	8.5	7.1
				100	29.36	16.2	16.2	15.3	13.8	13.4	10.6	8.8
				120	34.93	19.5	19.5	18.4	16.6	16.1	12.7	10.5
				140	39.67	22.3	22.3	21.1	19.0	18.4	14.5	12.0
				160	45.24	25.7	25.7	24.3	21.8	21.2	16.7	13.9
500	20	508		10	6.35	3.0	3.0	2.9	2.6	2.5	2.0	1.6
			STD	20	9.53	4.6	4.6	4.3	3.9	3.8	3.0	2.5
			XS	30	12.7	6.1	6.1	5.8	5.2	5.1	4.0	3.3
				40	15.09	7.3	7.3	6.9	6.2	6.0	4.8	4.0
				60	20.62	10.1	10.1	9.5	8.6	8.3	6.6	5.4
				80	26.19	12.9	12.9	12.2	11.0	10.6	8.4	7.0
				100	32.54	16.2	16.2	15.3	13.8	13.4	10.5	8.7
				120	38.1	19.1	19.1	18.1	16.2	15.8	12.4	10.3
				140	44.45	22.5	22.5	21.3	19.1	18.6	14.6	12.1
				160	50.01	25.5	25.5	24.1	21.7	21.0	16.6	13.8
600	24	610		10	6.35	2.5	2.5	2.4	2.2	2.1	1.6	1.4
			STD	20	9.53	3.8	3.8	3.6	3.2	3.1	2.5	2.1
			XS		12.7	5.1	5.1	4.8	4.3	4.2	3.3	2.8
				30	14.27	5.7	5.7	5.4	4.9	4.7	3.7	3.1
				40	17.48	7.1	7.1	6.7	6.0	5.8	4.6	3.8
				60	24.61	10.0	10.0	9.5	8.5	8.3	6.5	5.4
				80	30.96	12.7	12.7	12.0	10.8	10.5	8.3	6.9
				100	38.89	16.1	16.1	15.2	13.7	13.3	10.5	8.7
				120	46.02	19.2	19.2	18.2	16.3	15.9	12.5	10.4
				140	52.37	22.0	22.0	20.8	18.7	18.2	14.3	11.9
				160	59.54	25.3	25.3	23.9	21.5	20.9	16.4	13.7

Important - refer to the associated Notes on page 1.