THEORETICAL BURSTING AND COLLAPSING PRESSURES FOR PIPE

Stainless Steel (ASTM-A-312)

NOMINAL SIZE (INCHES)	SCHEDULE NUMBER	OUTSIDE DIAMETER (INCHES)	WALL THICKNESS (INCHES)	INSIDE DIAMETER (INCHES)	INTERNAL PRESSURE, PSI BURSTING	EXTERNAL PRESSURE, PSI COLLAPSING
1/8	40 80	0.405 0.405	0.068 0.095	0.269 0.215	25,185 35,185	10,761 15,441
1/4	40 80	0.540 0.540	0.088 0.119	0.384 0.302	24,444 33,055	10,415 14,445
3/8	40 80	0.678 0.678	0.091 0.126	0.493 0.423	20,192 27,876	8,397 12,021
1/2	40 80	0.840 0.840	0.109 0.147	0.622 0.548	19,464 26,250	8,084 11,260
3/4	40 80	1.050 1.050	0.113 0.154	0.824 0.742	16,142 22,000	6,529 9,271
1	40 80	1.315 1.315	0.133 0.179	1.049 0.957	15,171 20,418	6,075 8,530
1 1/4	40 80	1.660 1.660	0.140 0.191	1.380 1.278	12,650 17,259	3,895 7,052
1 1/2	40 80	1.900 1.900	0.145 0.200	1.610 1.500	11,447 15,789	4,332 6,364

NOTE: Burst Pressures for Stainless Steel in above chart were calculated using the specified minimum tensile strength, 75,000 p.s.i.

The information and data presented herein are typical or average values and are not a guarantee of maximum or minimum values. Applications specifically suggested for material described herein are made solely for the purpose of illustration to enable the reader to make his own evaluation and are not intended as warranties, either express or implied, of fitness for these or other purposes.

THEORETICAL BURSTING PRESSURES FOR TUBING (ASTM-A-632)

Corresponding to a fiber stress in wall of 10,000 pounds per square inch

OUTSIDE DIAMETER (INCHES)	WALL THICKNESS - DECIMAL INCH BWG EQUIVALENT						
	.020 25	.028 22	.035 20	.049 18	.065 16	.095 13	.120 11
1/8	3200	5200	5600	7840			
3/16	2133	2987	3933	5227			
1/4	1600	2240	2800	3920	5200	7600	
5/16	1280	1792	2240	3136	4160	6100	
3/8	1057	1493	1867	2613	3467	5067	6400
1/2	800	1120	1400	1960	2600	3800	4800

The table (S=10,000) affords easy calculations with appropriate multipliers shown below. For theoretical bursting pressures, use tensile values. For theoreticalbulging pressures, use yield values. Working pressures will vary depending upon safety factors required for environmental conditions involved as determined by your design engineer and appropriate codes.

Material	Tensile (Multiplier)	Yield (Multiplier)
6061-T6 Aluminum	42,000 psi (x 4.2)	35,000 psi (x3.5)
Annealed Low Carbon Steel	55,000 psi (x 5.5)	25,000 psi (x 2.5)
Annealed 18-8 Stainless	75,000 psi (x 7.5)	30,000 psi (x3.0)
1/8 Hard 18-8 Stainless	105,000 psi (x 10.5)	75,000 psi (x7.5)
Cold Dr. 21-6-9 Stainless	142,000 psi (x 14.2)	120,000 psi (x 12.0)

The above table is based on the best known and most widely used formula for calculating the bursting pressure of tubes, namely Barlow's: $P=\frac{2St}{D}$

P = Internal pressure in p.s.i S = Fiber stress of tube in p.s.i. t = Wall thickness in inches D = Outside diameter in inches

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