

Tubing Information

The proper selection of tubing is essential to assure maximum fitting reliability and performance. When choosing tubing material, size and wall thickness, consider system's pressure, flow rate, temperature, environment and compatibility with great care.

Maximum Allowable Working Pressure

Stainless Steel Tubing

Fully annealed and seamless stainless steel tubing to comply with ASTM A269 or equivalent.

Hardness should not exceed Rb 80.

Tubing should be free from scratched and suitable for bending and flaring.

Fractional(Inch) Tubing											
Tube O.D. (inch)	Tube Wall Thickness (inch)										
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188
1/8	8550	10950									
3/16	5500	7100	10300								
1/4	4100	5200	7600	10300					Working pressure in psig		
5/16		4100	5900	8100							
3/8		3350	4850	6550							
1/2		2650	3750	5150	6750						
5/8			2950	4050	5250	6050					
3/4			2450	3350	4250	4950	5850				
7/8			2050	2850	3650	4250	4850				
1				2400	3100	3600	4200	4700			
1-1/4					2400	2800	3300	3600	4100	4900	
1-1/2						2300	2700	3000	3400	4000	4900
2							2000	2200	2500	2900	3600

Metric Tubing											
Tube O.D. (mm)	Tube Wall Thickness (mm)										
	0.8	1.0	1.2	1.5	2.0	2.2	2.5	3.0	3.5	4.0	4.5
3	9700										
4	7900	11500									
6	4500	6100	7850	10300					Working pressure in psig		
8		4500	5650	7550							
10		3500	4350	5800	8400						
12		2900	3600	4800	6800						
14		2300	2900	4000	5500	6250					
15		2200	2750	3650	5200	5800					
16			2450	3350	4800	5350	5800				
18			2150	2950	4200	4650	5350				
20			2030	2600	3750	4200	4800				
22			1750	2300	3350	3750	4350				
25					2900	3350	3750	4650			
38						2030	2300	2900	3500	3900	4500

For gas service application, use only tubing with wall thickness on outside of gray areas.

Allowable stress of 20000 psig between -30°C(-22°F) and 40°C(104°F) based on ultimate tensile strength to be 74000 psig.

Copper Tubing

Fully annealed and seamless stainless steel tubing to comply with ASTM B75 or equivalent.

Hardness should not exceed Rb 60.

Fractional(Inch) Tubing								
Tube O.D. (inch)	Tube Wall Thickness (inch)							
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120
1/4	1300	1600	2500	3500				
3/8		1000	1600	2200				
1/2		800	1100	1600	2200			
5/8			900	1200	1600	1900		
3/4			700	1000	1300	1500	1800	
1			500	700	900	1100	1300	1500

Working
pressure in psig

Metric Tubing					
Tube O.D. (mm)	Tube Wall Thickness (mm)				
	1.0	1.5	2.0	2.5	3.0
6	2350	3670			
8	1710	2680			
10	1350	2090			
12	1100	1710	2350		
20		990	1350	1710	
25		780	1060	1350	1640

Working
pressure in psig

For gas service application, use only tubing with wall thickness on outside of gray areas.

Allowable stress of 6000 psig between -30°C(-22°F) and 37°C(100°F) based on ultimate tensile strength to be 30000 psig.

Monel Tubing

Fully annealed and seamless stainless steel tubing to comply with ASTM B165 or equivalent.

Hardness should not exceed Rockwell Rb 75.

Fractional(Inch) Tubing							
Tube O.D. (inch)	Tube Wall Thickness (inch)						
	0.035	0.049	0.065	0.083	0.095	0.109	0.120
1/4	4800	7000	9500				
3/8	3100	4400	6100				
1/2	2300	3200	4400				
3/4		2200	3000	4000	4600		
1			2200	2900	3400	3900	4300

For gas service application, use only tubing with wall thickness on outside of gray areas.

Allowable stress of 18700 psig between -30°C(-22°F) and 37°C(100°F) based on ultimate tensile strength to be 70000 psig.

Determination Factors of MAWP at High Temperature Application

To determine allowable working pressure at elevated temperature, multiply allowable working pressure and factors which are shown in the table.

Example :

316SS Tubing, 1/2" ODx0.049" WT at 310°C

AWP : $3750 \times 0.85 = 3187$ psig.

* MAWP : Maximum Allowable Working Pressure

* AWP : Allowable Working Pressure

Temperature		Materials		
°C	°F	316SS	Copper	Monel
90	194	1.00	0.80	0.88
200	392	0.96	0.50	0.79
310	590	0.85	-	0.79
480	802	0.79	-	0.75
536	996	0.76	-	-
644	1227	0.37	-	-

Pipe End Thread Information

The end connections with the lower pressure rating is the determining factor of pressure rating for the fittings with both Uni-Lok tube ends and pipe thread ends .

Pressure Rating for Pipe End Thread

Tapered Pipe Threads - NPT or ISO 7/1(BSPT)

Allowable pressure ratings for male and female threads are based on ASME B31.3 at ambient temperature.

Pipe Size	316SS				Brass			Uni-Lok Desig - nator
	Male		Female		Male	Female		
inch	bar	psig	bar	psig	psig	bar	psig	
1/16	760	11000	460	6700	5500	230	3300	-01N/R
1/8	690	10000	440	6500	5000	220	3200	-02N/R
1/4	550	8000	450	6600	4000	220	3300	-04N/R
3/8	540	7800	360	5300	3900	180	2600	-06N/R
1/2	530	7700	330	4900	3800	160	2400	-08N/R
3/4	500	7300	320	4600	3600	160	2300	-12N/R
1	370	5300	300	4400	2600	150	2200	-16N/R
1-1/4	410	6000	350	5000	3000	170	2500	-20N/R
1-1/2	340	5000	310	4600	2500	150	2300	-24N/R
2	270	3900	270	3900	1900	130	1900	-32N/R

Designator for NPT pipe thread is N, ISO/7 is R.

ISO 228/1 Parallel Thread (BSPP)

The pressure ratings are at ambient temperature.

Male Pipe Size	316SS		Uni-Lok Designator
	bar	psig	
1/8	316	4568	-02G
1/4	315	4568	-04G
3/8	315	4568	-06G
1/2	160	2320	-08G

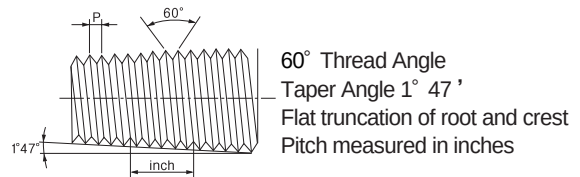
O-Seal Fittings

Rated to 206 bar (3000 psig) for 316SS fittings up to 1 inch and 25mm

Kinds of Pipe End Thread

NPT Pipe Thread

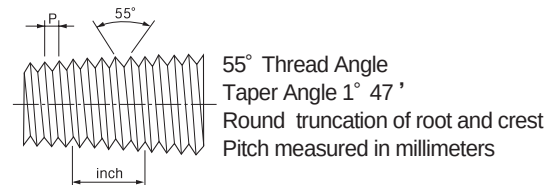
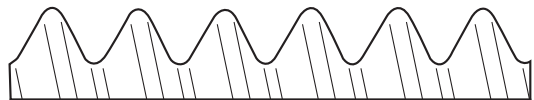
NPT (National Pipe Thread) is based on ANSI B1.2.



ISO 7/1 Tapered Pipe Thread

International Organization for Standard (ISO 7/1) Tapered (PT)

Equivalent to BSPT (British Standard Pipe Taper Thread), DIN 2999, JIS B0203



ISO 228/1 Parallel Pipe Thread

International Organization for Standard (ISO 228/1) Parallel(PF)

Equivalent to BSPP (British Standard Pipe Parallel Thread), DIN ISO228/1, JIS B0202

Gasket or O-ring is normally used to seal into the parallel female threaded components.

