Tubing Data

Contents

Tubing Selection

Proper selection, handling, and installation of tubing, when combined with proper selection of Swagelok® tube fittings, are essential to reliable tubing systems.

The following variables should be considered when ordering tubing for use with Swagelok tube fittings:

- Surface finish
- Material
- Hardness
- Wall thickness.

Tubing Surface Finish

Many ASTM specifications cover the above requirements, but they often are not very detailed on surface finish. For example, ASTM A450, a general tubing specification, reads:

> 11. Straightness and Finish
>
> 11.1 Finished tubes shall be reasonably straight and have smooth ends free of burrs. They shall have a workmanlike finish. Surface imperfections (Note) may be removed by grinding, provided that a smooth curved surface is maintained, and the wall thickness is not decreased to less than that permitted by this or the product specification. The outside diameter at the point of grinding may be reduced by the amount so removed.
>
> **Note:** An imperfection is any discontinuity or irregularity found in the tube.

Tubing Material

Our suggested ordering instructions for each type of tubing are shown under the respective tables.

Tubing Outside Diameter Hardness

The key to selecting proper tubing for use with metal Swagelok tube fittings is that the tubing must be softer than the fitting material. Swagelok tube fittings are designed to work properly with the tubing that is suggested in the ordering instructions.

Swagelok stainless steel tube fittings have been repeatedly tested successfully with tubing with hardness up to 200 HV and 90 HRB.

Tubing Wall Thickness

The accompanying tables show working pressure ratings of tubing in a wide range of wall thicknesses. Except as noted, allowable pressure ratings are calculated from *S* values as specified by ASME B31.3, Process Piping.

Swagelok tube fittings have been repeatedly tested in both the minimum and maximum wall thicknesses shown.

Swagelok tube fittings are not recommended for tube wall thicknesses outside the ranges shown in the accompanying tables for each size.

Tubing Handling

Good handling practices can greatly reduce scratches on tubing and protect the good surface finish that reliable tube manufacturers supply.

- Tubing should never be dragged out of a tubing rack or across a rough surface.
- Tube cutters or hacksaws should be sharp. Do not take deep cuts with each turn of the cutter or stroke of the saw.
- Tube ends should be deburred. This helps to ensure that the tubing will go all the way through the ferrules without damaging the ferrule sealing edge.

Swagelok

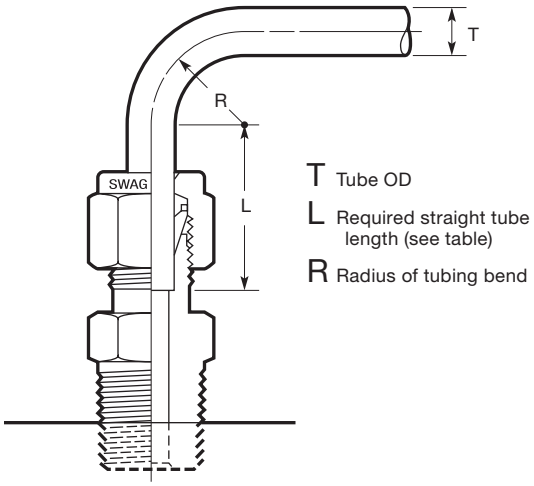
Gas Service

Gases (air, hydrogen, helium, nitrogen, etc.) have very small molecules that can escape through even the most minute leak path. Some surface defects on the tubing can provide such a leak path. As tube outside diameter (OD) increases, so does the likelihood of a scratch or other surface defect interfering with proper sealing.

The most successful connection for gas service will occur if all installation instructions are carefully followed and the heavier wall thicknesses of tubing on the accompanying tables are selected.

A heavy wall tube resists ferrule action more than a thin wall tube, allowing the ferrules to coin out minor surface imperfections. A thin wall tube offers less resistance to ferrule action during installation, reducing the chance of coining out surface defects, such as scratches. Within the applicable suggested allowable working pressure table, select a tube wall thickness whose working pressure is *outside* of the shaded areas.

Tubing Installation



Tubing properly selected and handled, when combined with the quality of Swagelok fittings, will give you leak-tight systems. Properly installed on such tubing, Swagelok fittings provide reliable service under a wide variety of fluid applications.

When installing fittings near tube bends, there must be a sufficient straight length of tubing to allow the tube to be bottomed in the Swagelok fitting (see tables).

For maximum assurance of reliable performance, use Swagelok tube fittings assembled in accordance with catalog instructions, and use properly selected and handled high-quality tubing—such as provided by Swagelok.

Fractional, in.	
T Tube OD	**L**①
1/16	1/2
1/8	23/32
3/16	3/4
1/4	13/16
5/16	7/8
3/8	15/16
1/2	1 3/16
5/8	1 1/4
3/4	
7/8	1 5/16
1	1 1/2
1 1/4	2
1 1/2	2 13/32
2	3 1/4

① Required straight tube length.

Metric, mm	
T Tube OD	**L**①
3	19
6	21
8	23
10	25
12	31
14	32
15	
16	
18	
20	34
22	
25	40
28	46
30	50
32	54
38	63
50	80

Hydraulic Swaging Unit

When installing carbon steel or stainless steel Swagelok tube fittings over 1 in. (25 mm), a Swagelok hydraulic swaging unit must be used. This unit provides sufficient pre-swaging of the ferrules onto the tubing for 1 1/4, 1 1/2 and 2 in. and 28, 30, 32, 38, and 50 mm Swagelok tube fittings. Ask your authorized Swagelok sales and service representative for a demonstration.

Suggested Allowable Pressure Tables

Figure and tables are for reference only. No implication is made that these values can be used for design work. Applicable codes and practices in industry should be considered. ASME Codes are the successor to and replacement of ASA Piping Codes.

- All pressures are calculated from equations in ASME B31.3, Process Piping. See factors for calculating working pressures in accordance with ASME B31.1, Power Piping.
- Calculations are based on maximum OD and minimum wall thickness, except as noted in individual tables.

  Example: 1/2 in. OD × 0.035 in. wall stainless steel tubing purchased to ASTM A269:

  OD Tolerance ± 0.005 in. / Wall Thickness ±10 %

  Calculations are based on 0.505 in. OD × 0.0315 in. wall tubing.
- No allowance is made for corrosion or erosion.

Suggested Allowable Working Pressure for *Carbon Steel Tubing*

Table 1—Fractional Carbon Steel Tubing

Allowable working pressures are calculated from an *S* value of 15 700 psi (108 200 kPa) for ASTM A179 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3. Multiply carbon steel rating by 0.85 for working pressure in accordance with ASME B31.1.

Tube OD in.	Tube Wall Thickness, in.													Swagelok Fitting Series
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.148	0.165	0.180	0.220	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)													
1/8	8000	10 200												200
3/16	5100	6 600	9600											300
1/4	3700	4 800	7000	9600										400
5/16		3 700	5500	7500										500
3/8		3 100	4500	6200										600
1/2		2 300	3200	4500	5900									810
5/8		1 800	2600	3500	4600	5300								1010
3/4			2100	2900	3700	4300	5100							1210
7/8			1800	2400	3200	3700	4300							1410
1			1500	2100	2700	3200	3700	4100						1610
1 1/4				1600	2100	2500	2900	3200	3600	4000	4600	5000		2000
1 1/2					1800	2000	2400	2600	2900	3300	3700	4100	5100	2400
2						1500	1700	1900	2100	2400	2700	3000	3700	3200

Suggested Ordering Information

High-quality, soft annealed seamless carbon steel hydraulic tubing, ASTM A179 or equivalent. Hardness 72 HRB (130 HV) or less. Tubing to be free of scratches, suitable for bending and flaring.

Table 2—Metric Carbon Steel Tubing

Allowable working pressures are based on equations from ASME B31.3 for DIN 2391 tubing, using a stress value of 1130 bar (16 400 psi) and tensile strength of 3400 bar (49 300 psi).

Tube OD mm	Tube Wall Thickness, mm													Swagelok Fitting Series
	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.5	4.0	4.5	
	Working Pressure, bar **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)													
3	630	790												3M0
6	290	370	460	590										6M0
8		270	330	430										8M0
10		210	260	330										10M0
12		170	210	270	330	380	420							12M0
14		150	180	230	280	320	350							14M0
15		140	170	210	260	290	330							15M0
16		130	150	200	240	270	300	350						16M0
18			140	170	210	240	270	310						18M0
20			120	160	190	210	240	270	310					20M0
22			110	140	170	190	210	240	280					22M0
25			100	120	150	170	180	210	240	260				25M0
28						150	160	190	210	230	270			28M0
30						140	150	170	200	210	250			30M0
32						130	140	160	180	200	230	270		32M0
38							120	130	150	160	190	230	260	38M0

Suggested Ordering Information

High-quality, soft annealed carbon steel tubing, DIN 2391 or equivalent. Hardness 130 HV (72 HRB) or less. Tubing to be free of scratches, suitable for bending or flaring.

Suggested Allowable Working Pressure for *Stainless Steel Tubing*

Table 3—Fractional Stainless Steel Seamless Tubing

Allowable working pressures are calculated from an *S* value of 20 000 psi (137 800 kPa) for ASTM A269 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3, except as noted. Multiply stainless steel rating by 0.94 for working pressure in accordance with ASME B31.1.

For Welded Tubing

For welded and drawn tubing, a derating factor must be applied for weld integrity:

- for double-welded tubing, multiply pressure rating by 0.85
- for single-welded tubing, multiply pressure rating by 0.80.

Tube OD in.	Tube Wall Thickness, in.																Swagelok Fitting Series
	0.010	0.012	0.014	0.016	0.020	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)																
1/16	5600	6800	8100	9400	12 000												100
1/8						8500	10 900										200
3/16						5400	7 000	10 200									300
1/4						4000	5 100	7 500	10 200①								400
5/16							4 000	5 800	8 000								500
3/8							3 300	4 800	6 500	7500①②							600
1/2							2 600	3 700	5 100	6700							810
5/8								2 900	4 000	5200	6000						1010
3/4								2 400	3 300	4200	4900	5800					1210
7/8								2 000	2 800	3600	4200	4800					1410
1									2 400	3100	3600	4200	4700				1610
1 1/4										2400	2800	3300	3600	4100	4900		2000
1 1/2											2300	2700	3000	3400	4000	4900	2400
2												2000	2200	2500	2900	3600	3200

① For higher pressures, see the Swagelok *Medium-Pressure Fittings* catalog, MS-02-335, or the Swagelok *High-Pressure Fittings* catalog, MS-01-34.

② Rating based on repeated pressure testing of the Swagelok tube fitting with a 4:1 design factor based upon hydraulic fluid leakage.

Suggested Ordering Information

Fully annealed, high-quality (Type 304, 316, etc.) (seamless or welded and drawn) stainless steel hydraulic tubing, ASTM A269 or A213, or equivalent. Hardness 90 HRB (200 HV) or less. Tubing to be free of scratches, suitable for bending and flaring.

Note: Certain austenitic stainless tubing has an allowable ovality tolerance double the OD tolerance and may not fit into Swagelok precision tube fittings.

Table 4—Metric Stainless Steel Seamless Tubing

Allowable working pressures are based on equations from ASME B31.3 for EN ISO 1127 tubing (D4, T4 tolerance for 3 to 12 mm; D4, T3 tolerance 14 to 50 mm), using a stress value of 1370 bar (20 000 psi) and tensile strength of 5170 bar (75 000 psi), except as noted. Multiply stainless steel rating by 0.94 for working pressure in accordance with ASME B31.1.

For Welded Tubing

For welded and drawn tubing, a derating factor must be applied for weld integrity:

- for double-welded tubing, multiply pressure rating by 0.85
- for single-welded tubing, multiply pressure rating by 0.80.

Tube OD mm	Tube Wall Thickness, mm														Swagelok Fitting Series
	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.5	4.0	4.5	5.0	
	Working Pressure, bar **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)														
3	670														3M0
6	310	420	540	710											6M0
8		310	390	520											8M0
10		240	300	400	510	580									10M0
12		200	250	330	410	470									12M0
14		160	200	270	340	380	430								14M0
15		150	190	250	310	360	400								15M0
16			170	230	290	330	370	400①							16M0
18			150	200	260	290	320	370							18M0
20			140	180	230	260	290	330	380						20M0
22			140	160	200	230	260	300	340						22M0
25					180	200	230	260	290	320					25M0
28						180	200	230	260	280	330				28M0
30						170	180	210	240	260	310				30M0
32						160	170	200	220	240	290	330			32M0
38							140	160	190	200	240	270	310		38M0
50										150	180	210	240	270	50M0

① Rating based on repeated pressure testing of the Swagelok tube fitting with a 4:1 design factor based upon hydraulic fluid leakage.

Suggested Ordering Information

Fully annealed, high-quality (Type 304, 316, etc.) stainless steel tubing, EN ISO 1127 or equivalent. Hardness 200 HV (90 HRB) or less. Tubing to be free of scratches, suitable for bending or flaring.

Suggested Allowable Working Pressure for *Copper Tubing*

Table 5—Fractional Copper Tubing

Allowable working pressures are calculated from an *S* value of 6000 psi (41 300 kPa) for ASTM B75 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Tube OD in.	Tube Wall Thickness, in.									Swagelok Fitting Series
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)									
1/8	2700	3600								200
3/16	1800	2300	3400							300
1/4	1300	1600	2500	3500						400
5/16		1300	1900	2700						500
3/8		1000	1600	2200						600
1/2		800	1100	1600	2100					810
5/8			900	1200	1600	1900				1010
3/4			700	1000	1300	1500	1800			1210
7/8			600	800	1100	1300	1500			1410
1			500	700	900	1100	1300	1500		1610
1 1/8				600	800	1000	1100	1300	1400	1810

Suggested Ordering Information

High-quality, soft annealed seamless copper tubing, ASTM B75 or equivalent. Also soft annealed (Temper O) copper water tube, type K or type L to ASTM B88.

Suggested Allowable Working Pressure for *Aluminum Tubing*

Table 6—Fractional Aluminum Tubing

Allowable working pressures are calculated from an *S* value of 14 000 psi (96 500 kPa) for ASTM B210, Type 6061-T6 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3. Multiply aluminum rating by 0.85 for working pressure in accordance with ASME B31.1.

Tube OD in.	Tube Wall Thickness, in.					Swagelok Fitting Series
	0.035	0.049	0.065	0.083	0.095	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)					
1/8	8600					200
3/16	5600	8000				300
1/4	4000	5900				400
5/16	3100	4600				500
3/8	2600	3700				600
1/2	1900	2700	3700			810
5/8	1500	2100	2900			1010
3/4		1700	2400	3100		1210
7/8		1500	2000			1410
1		1300	1700	2300	2700	1610

Suggested Ordering Information

High-quality aluminum alloy drawn seamless tubing, ASTM B210 (Type 6061-T6) or equivalent.

Suggested Allowable Working Pressure for *Additional Alloys*

A limited amount of test data is available on Swagelok tube fittings used with special alloy tubing. For sizes not listed in the following tables, we recommend that a sample of the tubing be provided for evaluation before installation. Please include all pertinent information relating to system parameters. Give tubing sample to your authorized Swagelok representative to forward to the factory.

Table 7—Fractional Alloy 400 Tubing

Allowable working pressures are calculated from an *S* value of 18 700 psi (128 800 kPa) for ASTM B165 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Tube OD in.	Tube Wall Thickness, in.								Swagelok Fitting Series
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)								
1/8	7900	10 100							200
1/4	3700	4 800	7000	9500					400
3/8		3 100	4400	6100					600
1/2		2 300	3200	4400					810
3/4			2200	3000	4000	4600			1210
1				2200	2900	3400	3900	4300	1610

Suggested Ordering Information

Fully annealed, quality seamless alloy 400 hydraulic tubing, ASTM B165 or equivalent. Hardness 75 HRB maximum. Tubing to be free of scratches, suitable for bending and flaring.

Table 8—Fractional Alloy C-276 Tubing

Allowable working pressures are based on equations from ASME B31.3 and ASME B31.1 for a maximum *S* value of 20 000 psi (137 800 kPa).

Tube OD in.	Tube Wall Thickness, in.				Swagelok Fitting Series
	0.028	0.035	0.049	0.065	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)				
1/4	4000	5100	7500	10 200	400
3/8		3300	4800	6 500	600
1/2		2600	3700	5 100	810

Suggested Ordering Information

Fully annealed quality alloy C-276 tubing, ASTM B622 or equivalent. Hardness 100 HRB maximum. Tubing to be free of scratches, suitable for bending and flaring. OD tolerances not to exceed ± 0.005 in.

Table 9—Fractional Alloy 20 Tubing

Allowable working pressures are based on equations from ASME B31.3 and ASME B31.1 for a maximum *S* value of 20 000 psi (137 800 kPa).

Tube OD in.	Tube Wall Thickness, in.				Swagelok Fitting Series
	0.028	0.035	0.049	0.065	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)				
1/4	4000	5100	7500	10 200	400
3/8		3300	4800	6 500	600
1/2		2600	3700	5 100	810

Suggested Ordering Information

Fully annealed, seamless or welded and drawn alloy 20 tubing, ASTM B729, B468 or equivalent. Hardness 95 HRB or less. Tubing to be free of scratches, suitable for bending and flaring. OD tolerances not to exceed ± 0.005 in.

Table 10—Fractional Alloy 600 Tubing

Allowable working pressures are based on equations from ASME B31.3 and ASME B31.1 for a maximum *S* value of 20 000 psi (137 800 kPa).

Tube OD in.	Tube Wall Thickness, in.				Swagelok Fitting Series
	0.028	0.035	0.049	0.065	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)				
1/4	4000	5100	7500	10 200	400
3/8		3300	4800	6 500	600
1/2		2600	3700	5 100	810

Suggested Ordering Information

Cold drawn, fully annealed, #1 temper alloy 600 seamless alloy tubing, ASTM B167 or equivalent. Hardness 92 HRB or less. Tubing to be free of scratches, suitable for bending and flaring. Order to outside diameter and wall thickness only, not to inside diameter, average wall specification. OD tolerances not to exceed ± 0.005 in.

Table 11—Fractional Grade 2 Titanium Tubing

Allowable working pressures are calculated from an *S* value of 16 700 psi (115 000 kPa) for ASTM B338 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3. Multiply grade 2 titanium rating by 0.85 for working pressure in accordance with ASME B31.1.

Tube OD in.	Tube Wall Thickness, in.				Swagelok Fitting Series
	0.028	0.035	0.049	0.065	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)				
1/4	3500	4500	6700	9100	400
3/8		2900	4200	5800	600
1/2		2100	3100	4200	810

Suggested Ordering Information

Fully annealed seamless or welded and drawn grade 2 titanium tubing, ASTM B338 or equivalent. Tubing to be free of scratches, suitable for bending. OD tolerances not to exceed ± 0.005 in.

Table 12—Fractional SAF 2507 Super Duplex Tubing

Allowable working pressures are calculated from an *S* value of 38 700 psi (266 000 kPa) for ASTM A789 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3. For tubing suitable for SAF 2507 super duplex weld fittings with working pressures calculated based on ASME B31.3 Chapter IX, see the Swagelok *SAF 2507 Super Duplex Weld Fittings* catalog, MS-01-173.

Tube OD in.	Tube Wall Thickness, in.						Swagelok Fitting Series
	0.028	0.035	0.049	0.065	0.083	0.095	
	Working Pressure, psig **Note:** For gas service, select a tube wall thickness outside of the shaded area. (See **Gas Service,** page 2.)						
1/4	7800	10 000	15 000①				400
3/8		6 500	10 100①	12 700			600
1/2		5 000	7 200	10 100①	12 900		810
5/8			5 800	7 600	10 100		1010
3/4			4 700	6 300	8 500①	10 000①	1210

① Pressure ratings based on special wall thickness tolerance for Swagelok SAF 2507 tubing.

Suggested Ordering Information

Fully annealed SAF 2507 super duplex tubing, ASTM A789 or equivalent. Hardness 32 HRC or less. Tubing to be free of scratches, suitable for bending and flaring.

Table 13—Fractional and Metric Alloy 825 Tubing

Allowable working pressures are based on equations from ASME BPV Section 2 Part D.

Tube OD in.	Tube Wall Thickness, in.			Swagelok Fitting Series
	0.035	0.049	0.065	
	Working Pressure, psig			
1/4	6400	9300	11 600①	400
3/8	4100	5900	8 200	600
1/2	3000	4300	5 900	800

Tube OD mm	Tube Wall Thickness, mm					Swagelok Fitting Series
	0.8	1.0	1.2	1.5	1.8	
	Working Pressure, bar					
6	410	530	660			6M0
10		300	370	480		10M0
12		250	300	390	480	12M0

① Based on repeated pressure testing of the Swagelok tube fitting with 4:1 design factor based upon hydraulic fluid leakage.

Suggested Ordering Information

Fully annealed seamless alloy 825 tubing, ASTM B163 or equivalent. Fully annealed welded alloy 825 tubing, ASTM B704, class 1 or equivalent. Hardness Rockwell 90 (201 HV) maximum on the 15T scale. Tubing to be free scratches, suitable for bending and flaring.

Table 14—Fractional and Metric Alloy 625 Tubing

Allowable working pressures are calculated from an *S* value of 26 700 psi (183 900 kPa) for ASTM B444 Grade 2 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME BPV 2001 Section II, Part D, Table 1B; tubing outside diameter and wall thickness tolerances from ASTM B444 for small-diameter tube.

Tube OD in.	Tube Wall Thickness, in.			Swagelok Fitting Series
	0.035	0.049	0.065	
	Working Pressure, psig			
1/4	7300	10 700	14 600	400
3/8	4700	6 800	9 400	600
1/2	3500	5 000	6 800	800

Tube OD mm	Tube Wall Thickness, mm					Swagelok Fitting Series
	0.8	1.0	1.2	1.5	1.8	
	Working Pressure, bar					
6	470	610	750			6M0
10		350	430	550		10M0
12		290	350	450	550	12M0

Suggested Ordering Information

Fully annealed seamless alloy 625 tubing, ASTM B444, Grade 1 or equivalent. Hardness 25 HRC (266 HV) maximum. Tubing to be free scratches, suitable for bending and flaring.

Pressure Ratings at Elevated Temperatures

Table 15—Elevated Temperature Factors

Temperature		Tubing Materials												
°F	°C	Al	Copper	Carbon Steel①	304 SS	316 SS	Alloy 400	Alloy 20②	Alloy C-276②	Alloy 600②	Ti	SAF 2507	Alloy 825	Alloy 625
200	93	1.00	0.80	0.95	1.00	1.00	0.87	1.00	1.00	1.00	0.86	0.90	1.00	0.93
400	204	0.40	0.50	0.87①	0.93	0.96	0.79	0.96	0.96	0.96	0.61	0.82	0.90	0.85
600	315				0.82	0.85	0.79	0.85	0.85	0.85	0.45	0.80	0.84	0.79
800	426				0.76	0.79	0.75	0.79	0.79	0.79			0.81	0.75
1000	537				0.69	0.76			0.76	0.35				0.73

① Based on 375°F (190°C) max.

② Based on the lower derating factor for stainless steel, in accordance with ASME B31.3.

To determine allowable working pressure at elevated temperatures, multiply allowable working pressures from Tables 1 through 14 by a factor shown in Table 15.

Example: Type 316 stainless steel 1/2 in. OD × 0.035 in. wall at 1000°F

1. The allowable working pressure at –20 to 100°F (–28 to 37°C) is 2600 psig (Table 3, page 4).
2. The elevated temperature factor for 1000°F (537°C) is 0.76 (Table 15, above):
   2600 psig × 0.76 = 1976 psig

The allowable working pressure for 316 SS 1/2 in. OD × 0.035 in. wall tubing at 1000°F (537°C) is 1976 psig.

Safe Product Selection
When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

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