

## 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 (138 MPa) for ASTM A269 tubing at -20 to 100°F (-28 to 37°C), as listed in ASME B31.3, except as noted.

**For Welded Tubing**

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

- for double-welded tubing, multiply working pressure by 0.85
- for single-welded tubing, multiply working pressure 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	10 200 <sup>①</sup>								400
5/16							4 000	5 800	8 000								500
3/8							3 300	4 800	6 500	7500 <sup>①②</sup>							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- and High-Pressure Fittings, Tubing, Valves, and Accessories* catalog, MS-02-472.

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**

High-quality, fully annealed (Type 304, 304/304L, 316, 316/316L, 317, 317/317L, 321, 347) (seamless or welded and drawn) stainless steel hydraulic tubing, ASTM A269 and A213, or equivalent. Hardness not to exceed 90 HRB or 200 HV. Tubing to be free of scratches, suitable for bending and flaring. OD tolerances not to exceed ± 0.003 in. for 1/16 in. OD tubing.

**Note:** Certain austenitic stainless tubing has an allowable ovality tolerance double the OD tolerance and may not fit into Swagelok precision tube fittings. Dual-certified grades such as 304/304L, 316/316L, and 317/317L meet the minimum chemistry and the mechanical properties of both alloy grades.

**Suggested Allowable Working Pressure for Stainless Steel Tubing**

**Table 4—Metric Stainless Steel Seamless Tubing**

Allowable working pressures are calculated from an S value of 138 MPa (20 000 psi) for EN ISO 1127 tubing (D4, T4 tolerance for 3 to 12 mm; D4, T3 tolerance 14 to 50 mm), at -28 to 37°C (-20 to 100°F), as listed in ASME B31.3, except as noted.

**For Welded Tubing**

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

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

Tube OD mm	Tube Wall Thickness, mm															Swagelok Fitting Series	
	0.3	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.)																
1	430 <sup>①</sup>																1M0
2	210	660 <sup>①</sup>															2M0
3		680															3M0
4		500	670														4M0
6		320	430	550	720												6M0
8			310	390	530												8M0
10			240	310	410	510	580										10M0
12			200	250	330	420	480										12M0
14			160	200	270	340	390	430									14M0
15			150	190	250	310	360	400									15M0
16				180	230	290	330	370	400 <sup>①</sup>								16M0
18				150	210	260	290	330	380								18M0
20				140	180	230	260	290	330	380							20M0
22				120	170	210	240	260	300	340							22M0
25						180	200	230	260	300	320						25M0
28							180	200	230	260	280	330					28M0
30							170	190	210	240	260	310					30M0
32							160	170	200	230	240	290	330				32M0
38								140	170	190	200	240	270	310			38M0
50											150	180	200	230	260		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**

High-quality, fully annealed (Type 304, 304/304L, 316, 316/316L, 317, 317/317L, 321, 347) stainless steel tubing, EN ISO 1127 or equivalent. Hardness not to exceed 90 HRB or 200 HV. Tubing to be free of scratches, suitable for bending or flaring. OD tolerances not to exceed ± 0.076 mm for 3 mm OD tubing.

**Note:** Dual-certified grades such as 304/304L, 316/316L, and 317/317L meet the minimum chemistry and the mechanical properties of both alloy grades.

