



Coiled Tubing

ASTM A269/213 ASME B31.3



**High quality products for
industrial & construction**

DSG
VALVES & TUBE FITTINGS

Tubing Selection

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

The following variables should be considered when ordering tubing for use with DSG® 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, it is specified as below:

12. Straightness and Finish

12.1 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.

Material

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

Hardness

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

Wall Thickness

The accompanying tables show working pressure of tubing in a wide range of wall thicknesses. Allowable working pressures are calculated from S values as specified by ASME B31.3, Process Piping. DSG® tube fittings have been repeatedly tested in both the minimum and maximum wall thicknesses shown. DSG® tube fittings are not recommended for tube wall thicknesses outside the ranges shown in the accompanying tables for each size.

Tubing Handling

It is important to properly handle the tubing in order to reduce the scratches and protect the surface finish.

- 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.
- Remove burrs on the tube end which will be helpful for the tubing to go through the ferrules without damaging the ferrule sealing edge.

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 (O.D.) 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 and grip the tube more firmly. Within the applicable suggested allowable working pressure table, select a tube wall thickness whose working pressure is outside of the shaded areas.

Suggested Allowable Working Pressure for Tubing

Figures 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 O.D. and minimum wall thickness, except as noted in individual tables. Example: 1/2 in. O.D.×0.035 in. wall thickness stainless steel tubing according to ASTM A269/213
O.D. Tolerance ± 0.005 in. / Wall Thickness Tolerance $\pm 10\%$ Calculations are based on 0.505 in.O.D.×0.0315 in. wall thickness tubing.
- No allowance is made for corrosion or erosion.

Features

- Materials: 316/316L or 304/304L
- Sizes: 1/4", 3/8" and 1/2"
- Working temperature: -325°F to 1000°F (-198°C to 537°C)
- Bright annealed with mechanically polished external surface
- Marked with brand, material grade, standard, specification and heat number
- Lengths: 400 Ft, 800 Ft and 1200 Ft. (Customized shorter length available subject to confirmation from fabric).
- Wall Thickness: 0.028 in, 0.035 in, 0.049 in, 0.065 in and 0.083 in. (Depends on the Outside Diameter).

Materials

Grade	ASTM Standard	Composition %				Mechanical Properties			
		C	Cr	Ni	Mo	Yield Strength MPa	Tensile Strength MPa	Elongation %	Hardness
316/316L	A269	0.035	16-18	10-14	2.0-3.0	≥205	≥515	≥35	≤80
304/304L		0.035	18-20	8-11	-				

- The carbon content of tubing with outside diameter smaller than 1/2 " or wall thickness smaller than 0.049" is allowed up to 0.04%.

Scope of Supply

Tube O.D. in.	Wall Thickness in.	Coil Length
1/4"	0.028	400, 800 or 1200 Ft.
	0.035	
	0.049	
	0.065	
3/8"	0.035	400, 800 or 1200 Ft.
	0.049	
	0.065	
1/2"	0.035	400, 800 or 1200 Ft.
	0.049	
	0.065	
	0.083	

- Customized shorter length available subject to confirmation from fa

Table 3 — Stainless Steel Coiled Tubing (Fractional)

Nominal Diameter		Nominal Wall Thickness (in/mm)												
Tubing O.D.														
Inch.	mm	Coil Length (Ft)	WT (in)	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188
			WT (mm)	0.71	0.89	1.24	1.65	2.11	2.41	2.77	3.05	3.4	3.96	4.78
			Cal./WT	22	20	18	16	14	13	12	11	10	9	3/16
1/4"	6.35	400	WP (Psi)	4,000	5,100	7,500	10,200							
			Kg/Coil	12.07	14.61	19.12	23.34							
		800	WP (Psi)	4,000	5,100	7,500	10,200							
			Kg/Coil	24.13	29.21	38.23	46.68							
		1200	WP (Psi)	4,000	5,100	7,500	10,200							
			Kg/Coil	36.2	43.82	57.35	70.02							
3/8"	9.53	400	WP (Psi)		3,300	4,800	6,500							
			Kg/Coil		23.11	31.02	39.14							
		800	WP (Psi)		3,300	4,800	6,500							
			Kg/Coil		46.22	62.05	78.27							
		1200	WP (Psi)		3,300	4,800	6,500							
			Kg/Coil		69.33	93.07	117.41							
1/2"	12.7	400	WP (Psi)		2,600	3,700	5,100	6,700						
			Kg/Coil		31.59	42.89	54.88	67.18						
		800	WP (Psi)		2,600	3,700	5,100	6,700						
			Kg/Coil		63.18	85.79	109.77	134.36						
		1200	WP (Psi)		2,600	3,700	5,100	6,700						
			Kg/Coil		94.77	128.68	164.65	201.54						

Conversion Tables

Weight Conversion Table					
	Kilogram	Ton	Ounce	Pound	Slug
Kilogram	1	0.001	35.27	2.2	0.0685
Ton	1000	1	35274	2204.62	68.58
Ounce	0.028349	0.000028	1	0.0625	0.00194
Pound	0.45359	0.000454	16	1	0.03111
Slug	14.59	0.01459	514.82	32.136	1

Length Conversion Table					
	Meter	Kilometer	Inch	Foot	Mile
Meter	1	0.001	39.37	3.28084	0.000621
Kilometer	1000	1	39370.1	3280.84	0.62137
Inch	0.0254	0.0000254	1	0.08333	0.000015
Foot	0.3048	0.000348	12	1	0.000189
Mile	1609.34	1.609	63.346	5280	1

Formulas

Linear weight formula for smooth end pipe	
P	$(D - e) * e * 0.02466$

Where:

P	Weight in Kg/m
D	Exterior Diameter in mm
e	Wall Thickness in mm

Hydrostatic Formula (Barlow's Formula)	
P(Psi)	$(2Se)/D$

Where:

P	Pressure in Psi
D	Exterior Diameter in inch
e	Wall Thickness in inch
S	Yield strength (Ys) in Psi

Hydrostatic Formula (Barlow's Formula)	
P(MPa)	$(2Se)/D$

Where:

P	Pressure in MPa
D	Exterior Diameter in mm
e	Wall Thickness in mm
S	Yield strength (Ys) in MPa

Conventional Terms	
API	American Petroleum Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
NACE	National Association of Corrosion Engineers
AWWA	American Water Works Association
SSAW	Spiral / helical Seam Submerged Arc Welded pipe
DSAW	Double seam Submerged Arc Welded pipe
LSAW	Longitudinal seam Submerged Arc Welded pipe (one seam)
ERW-HFI	Electric Resistance Welded High Frequency Induced
EFW	Electric Fusion Welded Tube
SRL	Single Random Lengths: minimum average Lengths 17'6" - shortest length permissible is 9".
DRL	Double Random Lengths: minimum average Lengths 35" - shortest length permissible is 14".



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