

# Ultrahigh-Purity Stainless Steel Tubing

## Imperial Sizes

### Features

- 316L stainless steel
- Available in sizes from 1/4 to 4 in. outside diameter; metric sizes available upon request
- Coaxial tubing available in sizes from 1/4 to 1 in. outside diameter
- Electropolished internal surface finish of 10  $\mu\text{in. } R_a$  (0.25  $\mu\text{m}$ ) max
- Ends prepared for orbital welding
- Rinsed with 18 M $\Omega$ ·cm DI water
- Purged with filtered nitrogen
- Cleaned and sealed in an ISO Class 4/Federal Class 10 cleanroom
- Marked to indicate size, material type, and heat code



### Material Standards

Grade	UNS	ASTM	ASME
316L	S31603	A269 <sup>①</sup>	SA213 <sup>①</sup>

<sup>①</sup> Nominal wall thickness, not minimum wall thickness.

### Pressure Ratings

See Swagelok® *Tubing Data*, MS-01-107, for complete pressure ratings.

### Chemical Composition

Element	Composition wt. %
Chromium	16.0 to 18.0
Nickel	10.0 to 15.0
Molybdenum	2.00 to 3.00
Manganese	2.00 max
Silicon	0.75 max
Carbon	0.035 max <sup>①</sup>
Sulfur	0.005 to 0.012 (seamless) 0.005 to 0.017 (welded)

<sup>①</sup> Tubing sizes smaller than 1/2 in. outside diameter contain up to 0.040 wt. % carbon.

## Ordering Information and Dimensions

To order, add a process designator from the table below to a back ordering number.

Example: 6L-T4-S-035-6M-E3

### Tubing

Tube OD in.	Nominal Wall Thickness in.	Basic Ordering Number	Nominal Length m (ft)	Weight kg/m
<b>316L Seamless</b>				
1/4	0.035	6L-T4-S-035-6M-	6 (19.7)	0.12
3/8	0.035	6L-T6-S-035-6M-		0.19
1/2	0.049	6L-T8-S-049-6M-		0.35
3/4	0.065	6L-T12-S-065-6M-		0.71
1	0.065	6L-T16-S-065-6M-		1.2
1 1/2	0.065	6L-T24-S-065-6M-		1.5
2	0.065	6L-T32-S-065-6M-		2.0
<b>316L Welded</b>				
1 1/2	0.065	6L-T24-W-065-6M-	6 (19.7)	1.5
2	0.065	6L-T32-W-065-6M-		2.0
3	0.065	6L-T48-W-065-6M-		3.0
4	0.083	6L-T64-W-083-6M-		5.2

### Cleaning and Packaging

Packaging	Individual Certificates	Process Designator
Ends are faced and protected with polyamide nylon film and polyethylene caps; packed in double polyethylene bags	Mill Test Reports Certificate of Conformance <sup>①</sup>	E2
	Mill Test Reports Surface Roughness Dimensional Tolerances	E3

Process specifications are available upon request. Contact your authorized Swagelok sales and service representative.

① Certificate of Conformance for:

- Surface roughness
- Dimensional tolerances
- Helium leak test for welded fittings
- Purity test for moisture and particulates
- SEM pits, inclusions, or other raw material defects
- XPS minimum chromium-to-iron and chromium oxide-to-iron oxide ratios
- DI water cleaning for effluent resistivity.

### Coaxial Tubing

Process tube is 316L seamless. Containment tube is 316L welded.

Process Tube OD in.	Containment Tube OD in.	Process Tube Nominal Wall Thickness, in.	Containment Tube Nominal Wall Thickness, in.	Basic Ordering Number	Nominal Length m (ft)	Weight kg/m
1/4	1/2	0.035	0.049	6L-CXT4-S-035-6M-	6 (19.7)	0.48
3/8	5/8	0.035	0.049	6L-CXT6-S-035-6M-		0.73
1/2	3/4	0.049	0.065	6L-CXT8-S-049-6M-		1.1
3/4	1	0.065	0.065	6L-CXT12-S-065-6M-		1.9
1	1 1/4	0.065	0.065	6L-CXT16-S-065-6M-		2.3

### Chemically Cleaned and Passivated and Thermocouple-Cleaned Tubing

See the Swagelok *Stainless Steel Tubing, Fractional Sizes* catalog, MS-01-159-SCS, for more information.

### Swagelok Orbital Welding System

See the Swagelok *Orbital Welding System Quick Reference Guide*, MS-02-143, for more information.



### Tube Fittings

See the Swagelok *Gaugeable Tube Fittings and Adapter Fittings* catalog, MS-01-140, for information.

### Tools and Accessories

See the Swagelok *Tools and Accessories* catalog, MS-01-169, for more information.



### 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.**

### Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](http://swagelok.com) or contact your authorized Swagelok representative.