

# 316 / 316L STAINLESS STEEL TUBING



With the addition of molybdenum, grades 316 and 316L stainless steel were developed to offer improved corrosion resistance compared to alloy 304/L. The increased performance of this austenitic chromium-nickel stainless steel makes it better suited for environments rich in salt air and chlorides. Additionally, the low carbon content makes the alloy 316/L easy to weld.

## PRODUCT SPECIFICATIONS

**ASTM A269, ASTM A213/ ASME SA213 (SEAMLESS)**  
**ASTM A269, ASTM A249/ ASME SA249 (WELDED)**

Domestic tube is bright annealed. Imported tube is solution annealed and O.D. polished to a 320-grit finish.

## SIZE RANGE

Outside Diameter (OD)	Wall Thickness
.063"–4.00"	.010"–.375"

## CHEMICAL REQUIREMENTS

**T316/L (UNS S31600/UNS S31603)**  
**COMPOSITION %**

ELEMENTS	UNS S31600	UNS S31603
C Carbon	0.080 max	0.030 max
Mn Manganese	2.00 max	2.00 max
P Phosphorous	0.045 max	0.045 max
S Sulfur	0.030 max	0.030 max
Si Silicon	1.00 max	1.00 max
Cr Chromium	16.0–18.0	16.0–18.0
Ni Nickel	10.0–14.0	10.0–15.0
Mo Molybdenum	2.00–3.00	2.00–3.00

## DIMENSIONAL TOLERANCES

OD	OD Tolerance	Wall Tolerance
≤ .500"	± .005"	± 10%
.500"–1.500" excl	± .005"	± 10%
1.500"–3.500" excl	± .010"	± 10%
3.500"–5.500" excl	± .015"	± 10%

## MECHANICAL PROPERTIES

Yield Strength	30 ksi min
Tensile Strength	75 ksi min
Elongation (2" min)	35%
Hardness (Rockwell B Scale)	90 HRB max

## FABRICATION

316/L is harder to machine than 304/L and more prone to work hardening. Special tools and methods are usually required to fabricate 316/L.

OD	Wall	ID	Lbs/Ft	OD	Wall	ID	Lbs/Ft
<b>1/16"</b> <b>(.063")</b>	.010	.043	.0057		.083	.709	.7113
	.016	.031	.0081		.095	.685	.8018
	.020	.023	.0093		.120	.635	.9803
<b>1/8"</b> <b>(.125")</b>	.010	.105	.0124	<b>1"</b> <b>(1.000")</b>	.035	.930	.3654
	.020	.085	.0227		.049	.902	.5042
	.028	.069	.0294		.065	.870	.6576
	.035	.055	.0341		.083	.834	.8235
	.049	.027	.0403		.095	.810	.9302
<b>3/16"</b> <b>(.188")</b>	.020	.148	.0364		.109	.782	1.0510
	.028	.132	.0485		.120	.760	1.1430
	.035	.118	.0579		.134	.732	1.2560
	.049	.090	.0737		.156	.688	1.4250
					.188	.624	1.6520
<b>1/4"</b> <b>(.250")</b>	.020	.210	.0498	<b>1-1/8"</b> <b>(1.125")</b>	.250	.500	2.0290
	.028	.194	.0673		.035	1.055	.4128
	.035	.180	.0814		.065	.995	.7455
	.049	.152	.1066		.109	.907	1.1980
	.065	.120	.1301		.120	.885	1.3050
<b>5/16"</b> <b>(.313")</b>	.020	.273	.0634	<b>1-1/4"</b> <b>(1.250")</b>	.188	.749	1.9060
	.028	.257	.0863		.035	1.180	.4601
	.035	.243	.1053		.049	1.152	.6367
	.049	.215	.1400		.065	1.120	.8334
	.065	.183	.1744		.083	1.084	1.0480
<b>3/8"</b> <b>(.375")</b>	.083	.147	.2066	<b>1-3/8"</b> <b>(1.375")</b>	.095	1.060	1.1870
	.095	.123	.2241		.109	1.032	1.3460
					.120	1.010	1.4670
					.134	.982	1.6180
					.156	.938	1.8470
<b>7/16"</b> <b>(.438")</b>	.020	.335	.0768	<b>1-1/2"</b> <b>(1.500")</b>	.188	.874	2.1600
	.028	.319	.1051		.250	.750	2.7050
	.035	.305	.1288		.065	1.245	.9213
	.049	.277	.1728				
	.065	.245	.2180				
<b>1/2"</b> <b>(.500")</b>	.083	.209	.2622	<b>1-3/4"</b> <b>(1.750")</b>	.049	1.402	.7693
	.095	.185	.2878		.065	1.370	1.0090
	.120	.135	.3311		.083	1.334	1.2730
	.134	.107	.3494		.095	1.310	1.4440
					.109	1.282	1.6410
<b>9/16"</b> <b>(.563")</b>	.035	.368	.1526	<b>2"</b> <b>(2.000")</b>	.120	1.260	1.7920
	.049	.340	.2062		.134	1.232	1.9810
	.065	.308	.2623		.156	1.188	2.2690
					.188	1.124	2.6690
					.250	1.000	3.3810
<b>5/8"</b> <b>(.625")</b>	.020	.460	.1039	<b>1-5/8"</b> <b>(1.625")</b>	.065	1.495	1.0970
	.028	.444	.1430				
	.035	.430	.1761				
	.049	.402	.2391				
	.065	.370	.3059				
<b>3/4"</b> <b>(.750")</b>	.083	.334	.3745	<b>1-3/4"</b> <b>(1.750")</b>	.065	1.620	1.1850
	.095	.310	.4163		.120	1.510	2.1160
	.109	.282	.4611				
	.120	.260	.4934				
	.156	.188	.5806				
<b>9/8"</b> <b>(.875")</b>	.188	.124	.6347	<b>2-1/2"</b> <b>(2.500")</b>	.049	1.902	1.0340
					.065	1.870	1.3610
					.083	1.834	1.7220
					.095	1.810	1.9580
					.109	1.782	2.2300
<b>1 1/8"</b> <b>(1.125")</b>	.035	.493	.2000	<b>3"</b> <b>(3.000")</b>	.120	1.760	2.4410
	.065	.433	.3502		.134	1.732	2.7050
					.156	1.688	3.1130
					.188	1.624	3.6860
					.250	1.500	4.7340
<b>1 1/4"</b> <b>(1.250")</b>	.049	.527	.3054	<b>3-1/2"</b> <b>(3.500")</b>	.313	1.374	5.7130
	.065	.495	.3938		.375	1.250	6.5930
	.083	.459	.4867				
	.095	.435	.5448				
	.120	.385	.6557				
<b>1 1/2"</b> <b>(1.500")</b>	.035	.680	.2708	<b>4"</b> <b>(4.000")</b>	.065	3.700	2.7670
	.049	.652	.3717		.083	3.834	3.5180
	.065	.620	.4818		.120	3.760	5.0380
	.083	.584	.5990		.250	3.500	10.140
	.095	.560	.6733				
<b>1 3/4"</b> <b>(1.500")</b>	.109	.532	.7560				
	.120	.510	.8180				
	.134	.482	.8931				
	.156	.438	1.0030				
	.188	.374	1.1430				
<b>2"</b> <b>(2.000")</b>	.250	.250	1.3530				
<b>2 1/2"</b> <b>(2.500")</b>	.035	.805	.3181				
	.049	.777	.4379				
	.065	.745	.5697				