



AL SAAD CO

ENGINEERING CONSULTING



Al- Saad Co. Supply all type of stainless steel a several projects made by high quality for food – beverage – Pharmaceutical. The product we can supply is for valuable customers and clients who likes to insure that their line gives a high quality production with a long life material.

We a sure for any customer that he/she satisfied from our experience in any factory project he want to start any time and any where.



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Data sheet & specifications

Product Information for 316/316L/316H tubing and pipe

Products	Sizes			Grades	Standard Tolerances		
	OD	Wall	Lengths and/or coils		OD	Wall	Lengths
Welded Austenitic Steel Boiler, Super Heater, Heat-Exchangers & Condenser Tubes Specifications: ASTM-A249, ASME-SA249, ASTM-A688, ASME-SA688	3/16" (4.76 mm) to 4" (101.6 mm) Metric sizes available	0.020" (0.51 mm) to 0.220" (5.59 mm)	Random or cut lengths up to 90' (27.4 m) Coils to 1-1/2" OD	316/316L	Under 1" (25.4 mm) ± 0.004 " (0.10 mm) 1" (25.4 mm) to 1-1/2" (38.1 mm) ± 0.006 " (0.15 mm) >1-1/2" (38.1 mm) to 2" (50.8 mm) ± 0.008 " (0.20 mm) >2" (50.8 mm) to 2-1/2" (63.5 mm) ± 0.010 " (0.25 mm) >2-1/2" (63.5 mm) to 3" (76.2 mm) ± 0.012 " (0.30 mm) 3" (76.2 mm) to 4" (101.6 mm) ± 0.015 " (0.38 mm)	$\pm 10\%$	Randoms up to +2" (50.8 mm) Cuts +1/8" (3 mm) -0" Coils to 80,000' (24,384 m)
Pressure & Corrosion Tubing Meets or exceeds requirements for welded Specifications: ASTM-A269, ASTM-A1016, and ASTM-A632	1/16" (1.59 mm) to 4" (101.6 mm) Metric sizes available	0.010" (0.25 mm) to 0.220" (5.59 mm)	Random or cut lengths up to 90' (27.4 m) Coils to 1-1/2" OD	316/316L	<1-1/2" (38.1 mm) ± 0.005 " (0.13 mm) 1-1/2" (38.1 mm) to 3" (76.2 mm) ± 0.010 " (0.25 mm) 3-1/2" (88.9 mm) to 4" (101.6 mm) ± 0.015 " (0.38 mm)	$\pm 10\%$	Randoms up to +2" (50.8 mm) Cuts +1/8" (3 mm) -0" Coils to 80,000' (24,384 m)
Beverage Tubing	1/4" (6.35 mm) 5/16" (7.94 mm) 3/8" (9.53 mm) 1/2"	0.020" (0.51 mm) to 0.028" (0.71)	Random or cut lengths up to 40'	316L	± 0.005 " (0.13 mm)	$\pm 10\%$	Randoms up to +2" (50.8 mm)



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	(12.7 mm) Metric sizes available	mm)	(12.2 m)				Cuts +1/8" (3 mm) -0" Coils to 15,000' (4,572 m)
Instrumentation Tubing Specifications: ASTM-A269 and ASTM-A632	1/16" (1.59 mm) to 1/2" (12.7 mm) Metric sizes available	0.010" (0.25 mm) to 0.065" (1.65 mm)	Random or cut lengths up to 40' (12.2 m)	316/316L	±0.005" (0.13 mm)	±10%	Randoms up to +2" (50.8 mm) Cuts +1/8" (3 mm) -0"
Food/Dairy Tubing, Pharmaceutical/BioPharmaceutical Tubing, High Purity Tubing, Ultra High Purity Tubing	1/2" (12.7 mm) to 8" (203.2 mm)	0.049" (1.24 mm) to 0.109" (2.77 mm)	20' (6.1 m) stock lengths. Other lengths available upon request.	316/316L	1/2" (12.7 mm) ± 0.005" (0.13 mm) 3/4" (19.1 mm) ± 0.005" (0.13 mm) 1" (25.4 mm) ± 0.005" (0.13 mm) 1-1/2" (38.1 mm) ± 0.008" (0.20 mm) 2" (50.8 mm) ± 0.008" (0.20 mm) 2-1/2" (63.5 mm) ± 0.010" (0.25 mm) 3" (76.2 mm) ± 0.010" (0.25 mm) 4" (101.6 mm) ± 0.015" (0.38 mm) 6" (152.4 mm) ± 0.030" (0.76 mm) 8" (203.2 mm) +0.061" (1.55 mm), -0.031" (0.79 mm)	±10% ±10% ±10% ±10% ±10% ±10% ±10% ±10% ±10% ±10%	+1/8" (3 mm) -0" +1/8" (3 mm) -0" +1/8" (3 mm) -0" +1/8" (3 mm) -0" +1/8" (3 mm) -0" +1/8" (3 mm) -0" +1/8" (3 mm) -0" +1/8" (3 mm) -0" +1" (25.4 mm) -0" +1" (25.4 mm) -0"



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Physical Properties of 316/316L/316H Alloys in the Annealed Condition at -20°F to +100°F

Alloy	UNS Designation	Spec.	Tensile Strength			Yield Strength			Elongation in 2 inches (min.) %	Grain Size Req.	Max. Hardness	Modulus of Elasticity (x10 ⁶ psi)	Mean Coefficient of Thermal Expansion (IN./IN./°F x 10 ⁻⁶)	Thermal Conductivity(BTU-in/ft ² -h-°F)
			psi	MPa	ksi	psi	MPa	ksi						
316	S31600	A249, A312	75,000	515	75	30,000	205	30	35	—	90 Rb	28.0	9.2	116
316L	S31603	A270, A312	70,000	485	70	25,000	170	25	—	—	90 Rb	28.0	9.2	116
316H	S31609	—	—	—	—	—	—	—	—	7 or coarser	—	—	—	—

Composition of 316/316L/316H tubing and pipe

Grade	316	316L	Grade	316	316L
UNS Designation	S31600	S31603	UNS Designation	S31600	S31603
Carbon (C) Max.	0.08	0.030*	Nickel (Ni)	10.0 – 14.0	10.0 – 14.0
Manganese (Mn) Max.	2	2	Molybdenum (Mo)	2.0 – 3.0	2.0 – 3.0
Phosphorous (P) Max.	0.045	0.045	Nitrogen (N)	—	—
Sulphur (S) Max.	0.03	0.03	Iron (Fe)	Bal.	Bal.
Silicon (Si) Max.	1	1	Other Elements	—	—
Chromium (Cr)	16.0 – 18.0	16.0 – 18.0			

* Maximum carbon content of 0.04% acceptable for drawn tubes



316/316L/316H Product Range

Alloy	UNS Designation	Werkstoff NR.	Specifications*
316	S31600	1.4401	A269, A/SA249, A/SA312, A1016, A632, A/SA688
316L**	S31603	1.4404	A269, A/SA249, A/SA312, A1016, A632, A/SA688

Notes:

- We can supply pipes stainless steel under ASTM A270 / S2, 304, 304L, 304H, 317, 317L, 309S, 309H, 310S, 310 H, 321, 321H, 347, 347H.
- We can supply Duplex Aloys Duplex 2205, Nitronic 19D, Super Duplex 2507, Lean Duplex 2003, Lean Duplex 2101, Lean Duplex 2304.
- We can Supply Nickel Alloys 20, 200, 201, 400, 600, 625, 800, C-276, C-22, 686, 59.
- Others under Negotiation, Please kindly for any information Contact us .