



# ALL STAINLESS LIMITED

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## INFORMATION SHEET

## STAINLESS STEEL TYPE 316

### TYPE 316 STAINLESS STEEL

Type 316 is a molybdenum-bearing grade. This addition gives the better overall corrosion resistance properties than type 304 and higher creep strength at elevated temperatures. Type 316 gives useful service at room temperature in sulphuric acid of concentration of lower than 15% and higher than 85%. It also resists chloride attack and is often selected for use in marine atmospheres.

Type 316L with its .03 maximum carbon content is used in applications where it is not possible to anneal after welding and where maximum corrosion resistance is required.

**Corrosion Resistance:** Good resistance to a wider range of chemicals than type 304. Highly resistant to the complex sulphur compounds used in pulp and paper processing. Also resists attack of marine and corrosive industrial atmospheres.

**Heat Resistance:** Good oxidation resistance in intermittent service to 1600°F and in continuous service to 1700°F. Continuous use of 316 in 800 – 1575°F range not recommended but often performs well in temperatures fluctuating above and below this range. Type 316L is more resistant to carbide precipitation and can be used in the above temperature range.

**Heat Treatment:** Annealing – heat to 1850 - 2050°F and cool rapidly. These grades cannot be hardened by thermal treatment.

**Welding:** Good characteristics suited to all standard methods. Use Type 316, 316L filler rods or electrodes depending on application. Welded sections in Type 316 require post-weld annealing for maximum corrosion resistance. This is not required if Type 316L is used.

**TYPICAL APPLICATIONS:** The list of applications for this general-purpose grade is very extensive and includes:

Pulp & Paper Equipment      Dairy & Brewery      Heat Exchangers      Fittings  
Food Applications      Pharmaceutical Equipment      Photographic Developing Equipment  
Exterior Architectural Components in marine coastal areas      Dyeing equipment

	C	Mn	P	S	Si	Cr	Ni
A.I.S.I. ANALYSIS	316 - .08 Max 316L - .03 Max	2.0 Max	.045 Max	.030 Max	1.0 Max	16.0 to 18.0	2.0 to 3.0

TYPICAL MECHANICAL PROPERTIES - ANNEALED	Yield Strength .2% Offset psi	Ultimate Strength psi	Elongation % in 2"	Hardness		Impact Izod Ft. - lbs	Modulus of Elasticity in Tension - psi
				Rb	BHN		
	42,000	84,000	50	80	149	110	28.0 x 10 <sup>6</sup>

OTHER PROPERTIES	Creep Strength 1% Flow in 10,000 hrs at 1000° F psi	Magnetic Permeability at 200 H-annealed	Electrical Resistivity – Microhm – CM at 68°F	Coefficient of Thermal Expansion (In/In/°F x 10 ) 32°F - 212°F	Thermal Conductivity BTU/Ft. <sup>2</sup> /Hr/°F/Ft	
					At 212°F	At 932°F
	24,500	1.02	74	8.9	9.4	12.4

**NOTE:** The above information is published as a general guide only and mechanical and physical properties should only be applied from mill certificates issued.