

**AISI 316L / UNS S31603 / DIN 1.4404**

Low Carbon Marine Grade Stainless Steel

Alloy 316L Data Sheet

**Introduction**

Alloy 316L is an extra low carbon version of type 316 chrome-nickel austenitic alloy. It also contains molybdenum which increases general corrosion resistance, improves resistance to pitting from chloride ion solutions, and provides increased strength at high temperatures. Type 316L offers improved weldability and also reduces the possibility of lower corrosion resistance around welded areas.

**Chemical Composition ( Typical )**

Element	Limits	
	min	max
Carbon	0.000	0.030
Manganese	0.000	2.000
Silicon	0.000	0.750
Phosphorus	0.000	0.045
Sulphur	0.000	0.030
Chromium	16.000	18.000
Nickel	10.000	14.000
Molybdenum	2.000	3.000
Nitrogen	0.000	0.100
Iron	Remainder	

**Mechanical Properties ( typical )**

Parameter	Value
Yield 0.2 % ( ksi/Mpa), Min	170
Tensile (ksi/Mpa), Min	485
Elongation ( % in 50mm ), Min	40
Reduction in Area, %	70
Hardness (HB), Max	217

**Physical Properties**

Parameter	Value
Density ( Kg/m <sup>3</sup> )	8000
Elastic Modulus ( Gpa )	200
Co-eff of Expansion ( $\mu\text{m/m}^\circ\text{C}$ )	15.9
Thermal Condc. (W/m.K)	16.3
Electric Resistivity (n $\Omega$ .m)	740

**Corrosion Data**

Types 316L possess the same desirable corrosion resistance and mechanical properties as the equivalent higher carbon Type 316, and give an extra advantage in highly corrosive applications where intergranular corrosion is a hazard. This provides resistance to intergranular attack with any thickness in the as-welded condition or with short periods of exposure in the 800-1500°F (427-826°C) temperature range.

## Equivalent Grade Designation

AISI 316L  
UNS S31603  
BS 316S11  
DIN EN 1.4404  
0Cr17Ni14Mo2  
Z3 CND 17-11-02  
SS 2348

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## Available Product Forms

Round, Square, Hexagon & Flat Bars  
Seamless / Welded Pipes  
Seamless / Welded Tubes  
Hot & Cold Rolled Plates & Sheets  
Forged Bars  
Buttweld Pipe Fittings  
Forged Fittings  
Ferrule Compression Fittings  
Forged Flanges  
Valves  
Gauges

## Common Manufacturing Specifications

AMS 5507, AMS 5584, AMS 5653, ASTM A167, ASTM A182, ASTM A213, ASTM A240, ASTM A249, ASTM A269, ASTM A270, ASTM A276, ASTM A312, ASTM A314, ASTM A336, ASTM A403, ASTM A473, ASTM A478, ASTM A479, ASTM A511, ASTM A554, ASTM A580, ASTM A632, ASTM A666, ASTM A688, ASTM A774, ASTM A778, ASTM A813, ASTM A814, ASTM F138.

## Alternate to Alloy

- 316Ti** Better resistance to temperatures of around 600-900°C.
- 316N** Higher strength than standard 316L.
- 317L** Higher resistance to chlorides with similar resistance to stress corrosion cracking.
- 904L** higher resistance to chlorides at elevated temperatures, with good formability.
- 2205** higher resistance to chlorides and higher strength than 316L.

## Applications & Industries

Food preparation equipment particularly in chloride environments.  
Petroleum - Oil & Gas Industries  
Pharmaceutical industry  
Architectural Applications  
Marine Applications  
Medical Implants  
Fasteners

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