

**AISI 316H / UNS S31609 / BS 316S51**

High Carbon Marine Grade Stainless Steel

Alloy 316H Data Sheet

**Introduction**

Alloy 316H is an high carbon version of type 316 chrome-nickel austenitic alloy. The high carbon content give a better tensile and yield strength. This grade gives excellent toughness, even at cryogenic temperatures. Grade 316H has higher strength at elevated temperatures and is also used for structural and pressure containing applications at temperatures above about 500°C.

**Chemical Composition ( Typical )**

Element	Limits	
	min	max
Carbon	0.040	0.100
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
Molybdenum	2.000	3.000
Nickel	10.000	14.000
Nitrogen	-	-
Iron	Remainder	

**Mechanical Properties ( typical )**

Parameter	Value
Yield 0.2 % ( ksi/Mpa), Min	205
Tensile (ksi/Mpa), Min	515
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 ( $\mu\text{m}/\text{m}/^\circ\text{C}$ )	15.9
Thermal Condc. (W/m.K)	16.3
Electric Resistivity (n $\Omega$ .m)	740

**Corrosion Data**

The Cr-Ni-Mo standard stainless steels have a adaptable corrosion resistance and are suitable for a wide range of applications. Generally, the Type 316H grade is considered to perform equally well for a given environment. A remarkable exception is in environments sufficiently corrosive to cause intergranular corrosion of welds and heat-affected zones on exposed alloys.

## Equivalent Grade Designation

AISI 316H  
UNS S31609  
BS 316S51  
JIS SUS F316H  
UNI X 8 CrNiMo 1712  
UNE X 5 CrNiMo 17-12

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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 316H.
- 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 316H.

## Applications & Industries

Food Processing Industry  
Petroleum - Oil & Gas Industries  
Pharmaceutical industry  
Heat Exchangers  
Chemical Industries  
Fabrication Industry  
Water Treatment

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