

Description

316L/1.4404 stainless steel is an austenitic grade of stainless steel known for its excellent corrosion resistance, particularly in chloride environments. It is a low-carbon variant of 316 stainless steel, which enhances its weldability and reduces the risk of sensitization during welding.

Chemical Composition

The typical chemical composition of **316L/1.4404** stainless steel is as follows:

Element	Composition (%)
Carbon (C)	≤ 0.03
Manganese (Mn)	0.0 - 2.0
Silicon (Si)	0.0 - 1.0
Phosphorus (P)	≤ 0.045
Sulfur (S)	≤ 0.03
Chromium (Cr)	16.50 - 18.50
Nickel (Ni)	10.00 - 14.00

Molybdenum (Mo)	2.00 - 2.50
Iron (Fe)	Balance

Mechanical Properties

The mechanical properties of 316L stainless steel include:

Property	Value
Tensile Strength	520 - 670 MPa
Yield Strength	220 MPa (min)
Elongation (A50 mm)	40% min
Hardness (Brinell)	217 HB max

Thermal & Physical Properties

The thermal and physical properties of 316L stainless steel are:

Property	Value
Density	8.00 g/cm ³

Property

Value

Melting Point	1400 °C
Modulus of Elasticity	193 GPa
Thermal Conductivity	16.3 W/m·K
Thermal Expansion	$15.9 \times 10^{-6}/K$

Other Designations

316L stainless steel is also known by various designations, including:

- UNS S31603
- DIN 1.4404
- JIS SUS316L
- GB 022Cr17Ni12Mo2

Fabrication and Heat Treatment

- **Welding:** 316L stainless steel is easily weldable using standard techniques, and post-weld annealing is typically not required.
- **Machining:** It can be machined effectively, though it tends to work harden if machined too quickly. Low speeds and constant feed rates are recommended.
- **Hot Working:** Optimal hot working temperatures range from 1150 °C to 1260 °C, with post-work annealing recommended for corrosion resistance.
- **Cold Working:** Common operations include shearing, drawing, and stamping, with post-work annealing to relieve internal stresses.

Applications

316L/1.4404 stainless steel is widely used in various industries due to its excellent corrosion resistance and mechanical properties. Typical applications include:

- Marine equipment
- Chemical processing
- Pharmaceutical equipment
- Food and beverage processing
- Pulp and paper production
- Heat exchangers
- Dyeing and film processing equipment
- Construction materials in coastal areas

Supplied Form

316L stainless steel is available in various forms, including:

- Sheets and plates
- Bars and rods
- Tubes and pipes
- Wire and profiles

Features

- Superior corrosion resistance, especially in chloride environments.
- Excellent weldability and formability.
- Good mechanical properties at elevated temperatures.
- Resistance to pitting and crevice corrosion.

DIN Number

The DIN number for 316L stainless steel is 1.4404.

This datasheet provides a comprehensive overview of **316L/1.4404** stainless steel, highlighting its properties, applications, and characteristics suited for various industrial uses.