

Material Information



Stainless Steel 316

Introduction

Stainless Steel 316, also known as AISI 316 or UNS S31600, is a molybdenum-bearing austenitic stainless steel containing chromium, nickel, and approximately 2–3% molybdenum. It offers excellent corrosion resistance, good toughness, and good weldability, making it suitable for CNC-machined components used in demanding industrial and corrosive environments.

Advantages

Excellent corrosion resistance, particularly in chloride-containing environments, together with good weldability, formability, and toughness. Stainless Steel 316 also maintains useful mechanical properties at elevated temperatures and is suitable for a wide range of demanding industrial applications.

Disadvantages

Stainless Steel 316 is more difficult to machine than free-machining stainless steels such as 303 and can work harden during machining. Its higher alloy content and lower machinability can also result in greater tooling wear and more demanding CNC machining conditions.

Tolerance

3DSPRO can manufacture and inspect to tight tolerances, including sub +/- 0.001" tolerances, per your drawing specifications and GD&T callouts.

Recommendation

The combination of corrosion resistance, toughness, weldability, and machinability makes Stainless Steel 316 suitable for CNC-machined components used in marine, chemical processing, food and beverage, medical, and industrial applications. It is particularly appropriate for parts exposed to moisture, chlorides, or other corrosive environments where 304 stainless steel may provide less resistance.

Material Specifications (For reference only.)	
Tensile strength	205MPa
Shear modulus	74GPa
Elongation at Break	40%

Hardness	187 HB
Density	8.03 g/cm ³

Attention

Stainless Steel 316 readily work hardens during machining, so proper tooling, cutting parameters, and chip control are important for consistent CNC machining results. For applications involving welding, 316L is often selected because its lower carbon content reduces carbide precipitation associated with welding and improves resistance to intergranular corrosion.

Applications

3DSPRO finds people using Stainless Steel 316 to make functional parts and prototypes in the following industries and applications.

Marine equipment:

Marine fittings, valves, pumps, fasteners, brackets, and other components exposed to seawater or chloride-containing environments.

Chemical and industrial equipment:

Heat exchangers, valves, flanges, pumps, process equipment, and other components requiring strong corrosion resistance.

Food and pharmaceutical equipment:

Processing equipment, tanks, fittings, sanitary components, and other parts requiring corrosion resistance and hygienic surfaces.

Medical and general engineering:

Medical equipment components, surgical instruments, precision fittings, shafts, housings, and other CNC machined parts requiring durability and corrosion resistance.