

Material Information



Titanium Grade 2

Introduction

Titanium Grade 2, also known as Commercially Pure Titanium Grade 2 or UNS R50400, is an unalloyed titanium grade that offers a good balance of moderate strength, excellent corrosion resistance, and formability. Its high strength-to-weight ratio and resistance to aggressive environments make it suitable for CNC-machined components used in marine, chemical, aerospace, and medical applications.

Advantages

Excellent corrosion resistance, good formability, low density, and a high strength-to-weight ratio. Titanium Grade 2 performs well in many marine and chemical environments and maintains good corrosion resistance through the formation of a stable, protective oxide layer on its surface.

Disadvantages

Titanium Grade 2 has lower strength than higher-strength titanium alloys such as Grade 5, making it less suitable for applications requiring maximum mechanical strength. It is also more difficult and costly to machine than common metals such as aluminum because titanium has relatively low thermal conductivity and can generate significant heat at the cutting zone.

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 excellent corrosion resistance, moderate strength, low weight, and good formability makes Titanium Grade 2 suitable for CNC-machined components used in marine, chemical processing, aerospace, medical, and industrial applications. It is particularly appropriate for parts exposed to corrosive environments where low weight and reliable long-term performance are important.

Material Specifications (For reference only.)	
Tensile strength	340MPa
Fatigue strength	240MPa

Elongation at Break	28%
Hardness	200 HB
Density	4.51 g/cm ³

Attention

Titanium Grade 2 requires appropriate CNC machining conditions because the material can retain heat in the cutting zone and may react strongly with cutting tools. Proper tooling, cutting parameters, coolant, and chip evacuation are important for controlling heat generation and tool wear. Its excellent corrosion resistance should not be assumed to eliminate all corrosion risks, as crevice corrosion and attack in strongly reducing environments can still occur under certain conditions.

Applications

3DSPRO finds people using Titanium Grade 2 to make functional parts and prototypes in the following industries and applications.

Marine equipment:

Heat exchangers, condensers, piping components, fittings, brackets, and other parts exposed to seawater or marine environments.

Chemical processing:

Reaction vessels, evaporators, condensers, tubing, tube headers, and other components requiring strong resistance to corrosive chemicals.

Aerospace components:

Airframe skins, ductwork, brackets, structural fittings, and other lightweight components requiring corrosion resistance and moderate strength.

Medical and industrial equipment:

Medical components, laboratory equipment, jigs, baskets, cathodes, and other precision parts requiring corrosion resistance, low weight, and reliable dimensional performance.