

Description

Stainless Steel Grade 316Ti/1.4571 is an austenitic chromium-nickel stainless steel with added titanium. The titanium addition improves high-temperature strength and resistance to sensitization during prolonged exposure to high temperatures. It offers superior corrosion resistance, especially against chlorides and other industrial solvents. The alloy is ideal for applications requiring high strength and excellent corrosion resistance in aggressive environments.

Chemical Composition

- Chromium (Cr): 16.0 - 18.0%
 - Nickel (Ni): 10.0 - 14.0%
 - Molybdenum (Mo): 2.0 - 3.0%
 - Titanium (Ti): 0.4 - 0.7%
 - Manganese (Mn): $\leq 2.0\%$
 - Silicon (Si): $\leq 0.75\%$
 - Carbon (C): $\leq 0.08\%$
 - Phosphorus (P): $\leq 0.045\%$
 - Sulfur (S): $\leq 0.030\%$
 - Nitrogen (N): $\leq 0.10\%$
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Mechanical Properties

- Tensile Strength: 515 - 740 MPa
 - Yield Strength: 205 MPa
 - Elongation at Break: $\geq 40\%$
 - Hardness (Brinell): ≤ 217 HB
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Thermal & Physical Properties

- Density: 8.0 g/cm³

- Melting Point: 1375 - 1400 °C
 - Thermal Conductivity: 16.3 W/m·K (at 100°C)
 - Specific Heat Capacity: 500 J/kg·K (at 0-100°C)
 - Electrical Resistivity: $0.074 \times 10^{-6} \Omega \cdot m$ (at 20°C)
 - Modulus of Elasticity: 193 GPa
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Other Designations

- UNS: S31635
 - EN: 1.4571
 - AISI: 316Ti
 - DIN: X6CrNiMoTi17-12-2
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Fabrication and Heat Treatment

- Cold Working: 316Ti/1.4571 can be readily cold worked by various methods, including bending, swaging, cold heading, drawing, and stamping.
 - Welding: Suitable for welding with or without filler metals. Use low heat input and interpass temperature to avoid sensitization.
 - Hot Working: Hot working should be performed between 900-1200°C.
 - Annealing: Anneal at temperatures between 1010-1120°C followed by rapid cooling.
 - Machinability: Similar to 316 stainless steel, but with added strength due to titanium stabilization.
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Applications

- Chemical Processing: Equipment and piping systems resistant to corrosive chemicals.
- Oil & Gas: Components exposed to seawater and aggressive chemical environments.
- Heat Exchangers: Tubing and components exposed to high temperatures and corrosive conditions.
- Pharmaceuticals: Equipment requiring high cleanliness and corrosion resistance.

- Food Processing: Containers and machinery that maintain hygienic standards.
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Supplied Forms

- Bars
 - Wires
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Features

- Enhanced High-Temperature Performance: Titanium addition improves stability at elevated temperatures.
- Excellent Corrosion Resistance: Resistant to pitting and crevice corrosion in chloride environments.
- High Strength: Improved mechanical properties at high temperatures.
- Good Weldability: Suitable for welding with minimal risk of sensitization.
- Versatile Fabrication: Can be easily fabricated into complex shapes and structures.

