

Description

Stainless Steel Grade 314/1.4841 is an austenitic stainless steel known for its high-temperature resistance and excellent oxidation resistance. It is designed for use in environments where prolonged exposure to elevated temperatures is required. The high chromium and nickel content provides superior performance in high-heat applications, making it suitable for industrial heating equipment and other demanding environments.

Chemical Composition

- Chromium (Cr): 23.0 - 26.0%
 - Nickel (Ni): 19.0 - 22.0%
 - Manganese (Mn): $\leq 2.00\%$
 - Silicon (Si): 1.50 - 3.00%
 - Carbon (C): $\leq 0.25\%$
 - Phosphorus (P): $\leq 0.045\%$
 - Sulfur (S): $\leq 0.030\%$
 - Iron (Fe): Balance
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Mechanical Properties

- Tensile Strength: 550 - 700 MPa
 - Yield Strength: ≥ 240 MPa
 - Elongation: $\geq 40\%$
 - Hardness: ≤ 95 HRB
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Thermal & Physical Properties

- Melting Point: 1398 - 1425°C
- Density: 7.9 g/cm³
- Specific Heat (0-100°C): 500 J/kg·K
- Thermal Conductivity (100°C): 14.4 W/m·K

- Coefficient of Thermal Expansion (0-100°C): 17.0 $\mu\text{m}/\text{m}\cdot\text{K}$
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Other Designations

- DIN: 1.4841
 - AFNOR: Z 12 CNS 25.20
 - UNI: X 16 CrNiSi 25 20, X 22 CrNi 25 20
 - JIS: SUS 310
 - BS: 310 S 24
 - AMS: 5522, 5652
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Fabrication and Heat Treatment

- Fabrication: 314 stainless steel can be easily fabricated using standard techniques. It can be welded using most common welding methods.
 - Heat Treatment: This grade cannot be hardened by heat treatment but can be annealed by heating to 1050-1150°C followed by rapid cooling.
 - Cold Working: 314 can be readily cold worked for increased strength and hardness.
 - Hot Working: Should be performed in the range of 982-1260°C.
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Applications

- Industrial Heating Equipment: Components such as furnace parts, heat exchangers, and radiant tubes.
 - Petrochemical Industry: Refining equipment and chemical processing.
 - Power Generation: Boiler and superheater tubes.
 - Automotive: Exhaust systems and catalytic converters.
 - Other High-Temperature Applications: Kilns and incinerators.
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Supplied Forms

- Bars

- Coils
 - Wires
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Features

- High-Temperature Resistance: Excellent performance at elevated temperatures.
- Oxidation Resistance: Superior resistance to oxidation in high-heat environments.
- Corrosion Resistance: Good resistance to corrosive environments.
- Durability: High strength and durability under extreme conditions.
- Fabricability: Easy to fabricate and weld using standard techniques.
- Low Maintenance: Long service life with minimal maintenance requirements.

