Description

Stainless Steel Grade 309S/1.4833 is an austenitic chromium-nickel stainless steel known for its high-temperature resistance and oxidation resistance. It is a lower carbon variant of 309/1.4833 stainless steel, which minimizes carbide precipitation and improves weldability. This grade is designed for use in high-temperature applications and is commonly used in environments that require resistance to heat and corrosion.

Chemical Composition

- Chromium (Cr): 22.0 - 24.0%
- Nickel (Ni): 12.0 - 15.0%
- Manganese (Mn): ≤ 2.0%
- Silicon (Si): ≤ 1.0%
- Carbon (C): ≤ 0.08%
- Phosphorus (P): ≤ 0.045%
- Sulfur (S): ≤ 0.030%

Mechanical Properties

- Tensile Strength: 515 MPa (minimum)
- Yield Strength (0.2% offset): 205 MPa (minimum)
- Elongation: 40% (minimum)
- Hardness: 95 HRB (maximum)

Thermal & Physical Properties

- Density: 8.0 g/cm³
- Melting Range: 1400 - 1455°C
- Specific Heat: 500 J/kg·K
- Thermal Conductivity: 14.2 W/m·K at 100°C
- Thermal Expansion: 15.9 µm/m·K from 20°C to 100°C

- Electrical Resistivity: 0.74 μΩ·m

Other Designations

- UNS S30908
- EN 1.4833
- JIS SUS 309S
- AFNOR Z12CN24-13
- DIN X12CrNi23-13

Fabrication and Heat Treatment

- Forming: Can be readily formed using all conventional methods.
- Welding: Can be welded using standard fusion and resistance techniques. Oxyacetylene welding is not recommended.
- Heat Treatment: Not hardenable by heat treatment. Anneal at 1038-1121°C, then rapidly quench.
- Machining: Exhibits slightly better machinability compared to 304 stainless steel, but work hardening can occur.

Applications

- Furnace Parts: Used in the construction of furnace parts due to its high-temperature resistance.
- Heat Exchangers: Suitable for heat exchangers in high-temperature environments.
- Kiln Liners: Ideal for kiln liners and other high-temperature structural applications.
- Boiler Baffles: Commonly used in boiler baffles and other components subjected to high temperatures.
- Chemical Processing Equipment: Employed in chemical processing where heat and corrosion resistance are critical.

Supplied Forms

- Bars
- Coils
- Wires

Features

- High-Temperature Resistance: Can withstand high temperatures and is resistant to scaling and oxidation.
- Corrosion Resistance: Offers good resistance to corrosion in high-temperature environments.
- Weldability: Lower carbon content improves weldability, reducing the risk of carbide precipitation.
- Strength: Maintains high strength at elevated temperatures.
- Durability: Excellent durability in high-heat applications, ensuring longevity of components.