

Description

Stainless Steel Grade 309LMO/1.4828 is an austenitic stainless steel that offers enhanced corrosion resistance and high-temperature strength. This grade is specifically designed to resist oxidation and carburization at elevated temperatures. The addition of molybdenum (Mo) improves its pitting and crevice corrosion resistance, making it suitable for severe environments. It is used in applications requiring high strength and resistance to corrosion and oxidation.

Chemical Composition

- Chromium (Cr): 22.0 - 24.0%
 - Nickel (Ni): 12.0 - 15.0%
 - Molybdenum (Mo): 2.0 - 3.0%
 - Manganese (Mn): $\leq 2.0\%$
 - Silicon (Si): $\leq 1.0\%$
 - Nitrogen (N): $\leq 0.10\%$
 - Carbon (C): $\leq 0.03\%$
 - Phosphorus (P): $\leq 0.045\%$
 - Sulfur (S): $\leq 0.030\%$
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Mechanical Properties

- Tensile Strength: 620 MPa (min)
 - Yield Strength (0.2% offset): 310 MPa (min)
 - Elongation: 40% (in 50mm)
 - Hardness: 150 HB (Brinell Hardness)
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Thermal and Physical Properties

- Density: 7.90 g/cm³
- Melting Point: 1400 - 1450°C

- Thermal Conductivity: 15 W/m·K at 100°C
 - Specific Heat: 500 J/kg·K
 - Electrical Resistivity: 0.85 $\mu\Omega\cdot\text{m}$ at 20°C
 - Coefficient of Thermal Expansion: 16.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ (20-100°C)
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Other Designations

- UNS: S30983
 - EN: 1.4828
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Fabrication and Heat Treatment

- Cold Working: 309LMO can be cold worked to enhance its strength and hardness. Cold working should be followed by an annealing process to restore ductility.
 - Hot Working: Recommended temperature range is 900-1200°C. Hot working should be followed by rapid cooling to maintain the corrosion resistance.
 - Welding: Excellent weldability using all standard welding techniques. Post-weld annealing is recommended to maintain corrosion resistance.
 - Heat Treatment: Annealing should be performed at 1038-1121°C followed by rapid cooling. This process helps to achieve maximum corrosion resistance and ductility.
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Applications

- Chemical Processing: Equipment exposed to severe environments.
 - Petrochemical: Components exposed to high temperatures and corrosive environments.
 - Power Generation: Boilers, heat exchangers, and superheater tubes.
 - Furnace Parts: Parts exposed to high temperatures, such as burner nozzles, retorts, and conveyor belts.
 - Marine: Components exposed to seawater and harsh marine environments.
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Supplied Forms

- Bars
 - Wires
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Features

- High-Temperature Strength: Retains strength and resists oxidation at high temperatures.
- Corrosion Resistance: Excellent resistance to pitting and crevice corrosion due to molybdenum content.
- Oxidation Resistance: Resists oxidation and carburization at elevated temperatures.
- Good Ductility: Maintains good ductility and toughness even at cryogenic temperatures.
- Versatile Fabrication: Easy to fabricate and weld using standard techniques.

