

Description

Stainless Steel Grade 439 (DIN 1.4510) is a ferritic stainless steel that offers excellent resistance to corrosion, particularly in oxidizing environments. It is stabilized with titanium, which improves its weldability and resistance to intergranular corrosion. This grade is particularly used in applications where both corrosion resistance and weldability are essential. Stainless Steel 439 exhibits good formability and moderate mechanical properties, making it a preferred choice in the automotive and exhaust industries.

Chemical Composition

- Chromium (Cr): 17.0 - 19.0%
 - Nickel (Ni): $\leq 0.50\%$
 - Manganese (Mn): $\leq 1.00\%$
 - Silicon (Si): $\leq 1.00\%$
 - Titanium (Ti): 0.10 - 0.75%
 - Carbon (C): $\leq 0.030\%$
 - Phosphorus (P): $\leq 0.040\%$
 - Sulfur (S): $\leq 0.030\%$
 - Nitrogen (N): $\leq 0.030\%$
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Mechanical Properties

- Tensile Strength: 415 - 485 MPa
 - Yield Strength: ≥ 240 MPa
 - Elongation: $\geq 20\%$ in 2 inches (50.8mm)
 - Hardness: ≤ 90 HRB
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Thermal & Physical Properties

- Density: 7.7 g/cm³

- Melting Point: 1480°C - 1520°C
 - Thermal Conductivity: 25 W/m·K at 100°C
 - Specific Heat: 460 J/kg·K at 20°C
 - Electrical Resistivity: 600 $\mu\Omega\cdot\text{cm}$ at 20°C
 - Coefficient of Thermal Expansion: 10.5 $\mu\text{m}/\text{m}\cdot\text{K}$ (20-100°C)
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Other Designations

- ASTM A240
 - UNS S43035
 - EN 1.4510
 - JIS SUS439
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Fabrication and Heat Treatment

- Welding: Stainless Steel 439 has good weldability and can be welded using common welding techniques. However, pre-heating is not generally required. Post-weld annealing may be necessary to restore corrosion resistance.
- Forming: The material exhibits good formability and can be easily bent, drawn, and rolled. Care must be taken to avoid cracking in severe forming operations.
- Heat Treatment: This grade cannot be hardened by heat treatment. It is typically supplied in the annealed condition to provide optimum corrosion resistance and formability.

STAINLESS STEEL WIRES & BARS

Applications

- Automotive Industry: Exhaust systems, catalytic converters, mufflers.
 - Construction: Roofing, wall panels, and structural supports.
 - Industrial: Heat exchangers, furnace parts, and chemical processing equipment.
 - Catering Equipment: Commercial kitchen equipment, appliances, and food processing units.
 - Energy: Parts exposed to corrosive environments in the power generation sector.
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Supplied Forms

- Coils
 - Bars
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Features

- Excellent Corrosion Resistance: Particularly in oxidizing environments and against chloride-induced stress corrosion cracking.
- Good Weldability: Stabilized with titanium, reducing the risk of intergranular corrosion post-welding.
- Formability: Can be easily formed into various shapes, making it versatile for different applications.
- Thermal Stability: Retains properties at elevated temperatures, making it suitable for heat exchangers and exhaust systems.
- Cost-Effective: A more affordable option compared to austenitic stainless steels, with sufficient performance for many applications.

