

## Description

Stainless Steel Grade 410L/1.4003 is a low carbon martensitic stainless steel that offers a combination of corrosion resistance, weldability, and machinability. The low carbon content in 410L enhances its weldability and reduces the risk of hardening due to welding, making it a suitable choice for applications requiring moderate corrosion resistance and good mechanical properties.

---

## Chemical Composition

- Chromium (Cr): 11.5 - 13.5%
  - Nickel (Ni):  $\leq 0.75\%$
  - Manganese (Mn):  $\leq 1.0\%$
  - Silicon (Si):  $\leq 1.0\%$
  - Carbon (C):  $\leq 0.03\%$
  - Phosphorus (P):  $\leq 0.040\%$
  - Sulfur (S):  $\leq 0.030\%$
  - Iron (Fe): Balance
- 

## Mechanical Properties

- Tensile Strength: 415 - 585 MPa
  - Yield Strength: 205 MPa min
  - Elongation: 20% min
  - Hardness: 86 HRB max
- 

## Thermal & Physical Properties

- Density: 7.75 g/cm<sup>3</sup>
- Melting Point: 1480 - 1530°C
- Thermal Conductivity: 24.9 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
  - Modulus of Elasticity: 200 GPa
- 

## Other Designations

- UNS: S41003
  - EN: 1.4003
  - JIS: SUS410L
  - ASTM: A240, A276
- 

## Fabrication and Heat Treatment

- Welding: Excellent weldability due to low carbon content. Preheating and post-weld heat treatment are usually not required.
  - Machining: Machinable with standard techniques. Lower carbon content provides better machinability than higher carbon martensitic grades.
  - Forming: Can be formed using standard methods.
  - Heat Treatment: Can be hardened by heat treatment. Typical treatment involves heating to 700-800°C, followed by air cooling.
- 

## Applications

- Automotive: Exhaust systems, manifolds, and other components.
  - Construction: Structural components, particularly in environments where moderate corrosion resistance is required.
  - Petrochemical: Storage tanks and processing equipment.
  - Industrial: Pumps, valves, and other components requiring moderate corrosion resistance and good mechanical properties.
- 

## Supplied Forms

- Bars
- Strips

- Coils
  - Pipes
  - Wires
- 

## Features

- Corrosion Resistance: Moderate resistance to corrosion in mildly corrosive environments.
- Weldability: Enhanced weldability due to low carbon content, reducing the risk of hardening.
- Machinability: Easier to machine than higher carbon martensitic grades.
- Mechanical Strength: Good mechanical properties, suitable for structural and industrial applications.
- Versatility: Can be used in a variety of applications, offering a good balance of corrosion resistance, mechanical properties, and fabricability.

