

Description

Stainless Steel Grade **304/1.4301** is a widely used austenitic stainless steel known for its excellent corrosion resistance, high tensile strength, and good formability. It is the most common stainless steel used in a variety of industries, offering a balance of properties that make it suitable for both structural and decorative applications. It contains a higher percentage of chromium and nickel compared to other stainless steel grades, contributing to its robustness and durability.

Chemical Composition

- **Chromium (Cr):** 18.0 - 20.0%
 - **Nickel (Ni):** 8.0 - 10.5%
 - **Manganese (Mn):** ≤ 2.00%
 - **Silicon (Si):** ≤ 1.00%
 - **Carbon (C):** ≤ 0.08%
 - **Phosphorus (P):** ≤ 0.045%
 - **Sulfur (S):** ≤ 0.030%
 - **Nitrogen (N):** ≤ 0.10%
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Mechanical Properties

- **Tensile Strength:** 505 - 750 MPa (73,000 - 109,000 psi)
 - **Yield Strength:** 215 MPa (31,000 psi)
 - **Elongation:** 40% (in 50 mm)
 - **Hardness (Rockwell B):** 70 HRB
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Thermal & Physical Properties

- **Density:** 8.0 g/cm³ (0.29 lb/in³)
- **Melting Point:** 1400 - 1450°C (2550 - 2650°F)
- **Thermal Conductivity:** 16.3 W/m·K (112 BTU/hr·ft·°F)

- **Thermal Expansion:** 16.0 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ (8.9 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$)
 - **Specific Heat Capacity:** 500 J/kg·K (0.12 BTU/lb·°F)
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Other Designations

- **UNS Number:** S30400
 - **EN Number:** 1.4301
 - **DIN Number:** X5CrNi18-10
 - **JIS Number:** SUS304
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Fabrication and Heat Treatment

- **Welding:** Stainless Steel **304/1.4301** can be welded using all common welding techniques, including TIG, MIG, and spot welding. It does not require preheating before welding.
 - **Machining:** It has good machinability and can be processed using standard tools.
 - **Heat Treatment:** Annealing is typically done at 1010 - 1120°C (1850 - 2050°F) followed by rapid cooling. It is not hardenable by heat treatment.
 - **Forming:** Excellent formability allows it to be easily shaped, bent, and rolled.
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Applications

- **Food Processing:** Equipment such as tanks, pipes, and kitchen utensils.
 - **Chemical Industry:** Storage tanks, mixing vessels, and piping.
 - **Architectural:** Building facades, handrails, and elevator doors.
 - **Medical Devices:** Surgical instruments, implants, and laboratory equipment.
 - **Automotive:** Exhaust systems, trim components, and structural elements.
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Supplied Forms

- **Bars**
- **Coils**
- **Wires**

Features

- **Corrosion Resistance:** Offers excellent resistance to oxidation and corrosion in a range of environments.
- **Strength:** Provides high tensile strength and good durability.
- **Formability:** Highly versatile and can be easily shaped into various forms.
- **Aesthetic Appeal:** Polished surface with a clean, shiny appearance.
- **Maintenance:** Easy to clean and maintain, making it ideal for hygienic applications.

