

Description

305/1.4303 grade stainless steel is an austenitic alloy known for its excellent corrosion resistance, particularly in atmospheric environments. It has a similar corrosion resistance to 304 stainless steel but offers improved workability and deep drawing capabilities due to its lower strength and work hardening rate. This grade maintains its non-magnetic properties even after cold working, making it suitable for applications where magnetic interference is a concern.

Chemical Composition

The chemical composition of 305 stainless steel (UNS S30500) is as follows (percentage by mass):

- Carbon (C): $\leq 0.12\%$
- Manganese (Mn): $\leq 2.00\%$
- Phosphorus (P): $\leq 0.045\%$
- Sulfur (S): $\leq 0.03\%$
- Silicon (Si): $\leq 1.00\%$
- Chromium (Cr): 17.0 – 19.0%
- Nickel (Ni): 11.0 – 13.0%
- Nitrogen (N): $\leq 0.10\%$
- Iron (Fe): Balance

Mechanical Properties

The mechanical properties of 305 stainless steel in the solution-annealed condition are:

- Yield Strength (Rp0.2): 160 MPa (minimum)
- Tensile Strength (Rm): 500-700 MPa
- Elongation (A): 45% (minimum)
- Hardness: Typically ≤ 215 HB

Thermal & Physical Properties

- Density: 7.92 g/cm³
- Thermal Conductivity: 15 W/m·K (up to 20°C)
- Specific Heat: 0.1200 Btu/lb/°F (32 to 212°F)

- Magnetizability: Non-magnetic

Other Designations

305 stainless steel is recognized by several designations:

- AISI: 305
- UNS: S30500
- EN: 1.4303
- DIN: X4CrNi18-12
- JIS: SUS305

Fabrication and Heat Treatment

305/1.4303 stainless steel can be readily formed and deep drawn. It is suitable for various welding processes, including TIG and arc welding, though caution is advised as it is more sensitive to hot cracking compared to 304 stainless steel.

Heat Treatment:

- Solution Annealing: 1000 - 1100 °C (cooling by air or water)
- Hot Forming: 1200 - 900 °C (cooling by air)

Applications

Common applications of 305 stainless steel include:

- Kitchen appliances
- Utensils
- Tank covers
- Deep drawn parts
- Architectural applications

Supplied Form

305/1.4303 stainless steel is supplied in various forms, including:

- Coils
- Bars

Features

- Excellent corrosion resistance
- Non-magnetic properties after cold working

- Good formability and deep drawing characteristics

This datasheet provides a comprehensive overview of 305 stainless steel, highlighting its properties, applications, and processing capabilities, making it suitable for various industrial applications.

