

Description

A286/1.4980 is an iron-based superalloy, also known as UNS S66286, designed for high strength and good corrosion resistance at elevated temperatures, specifically up to 1300°F (704°C). It is an austenitic alloy that can be precipitation hardened, making it suitable for various high-temperature applications, including jet engines and gas turbines.

Chemical Composition

The typical chemical composition of A286 is as follows:

- Carbon (C): 0.04 - 0.08%
- Manganese (Mn): 0.20 - 2.00%
- Silicon (Si): 0.20%
- Phosphorus (P): 0.015%
- Sulfur (S): 0.002%
- Chromium (Cr): 14.5 - 15.5%
- Nickel (Ni): 24.0 - 26.0%
- Molybdenum (Mo): 1.0 - 1.5%
- Titanium (Ti): 2.0 - 2.5%
- Aluminum (Al): 0.15%
- Iron (Fe): Balance

Mechanical Properties

The mechanical properties of A286 vary based on heat treatment but typically include:

- Yield Strength: 40,000 psi (275 MPa)
- Ultimate Tensile Strength: 90,000 psi (620 MPa)
- Elongation: 40%

Thermal & Physical Properties

- Density: 0.2860 lb/in³
- Thermal Conductivity: 104.2 BTU-in/hr/ft²/°F at 302°F
- Mean Specific Heat: 0.1100 Btu/lb/°F (from 104°F to 1299°F)
- Mean Coefficient of Thermal Expansion:
 - 200°F: 9.17×10^{-6} in/in/°F

- 600°F: 9.47×10^{-6} in/in/°F

Other Designations

- AISI Number: No. 660
- DIN Number: 1.4980

Fabrication and Heat Treatment

A286 can be processed through various methods, including:

- Hot Working: Typically performed between 1900°F to 2050°F (1038°C to 1121°C). It should not be forged below 1700°F (927°C).
- Cold Working: Can be satisfactorily cold drawn and formed in the solution-treated condition.
- Heat Treatment: Solution annealing at 1800°F (982°C) followed by aging at 1325°F (719°C) for optimal mechanical properties.

Applications

A286 is widely used in:

- Jet engines and gas turbines (e.g., turbine wheels and blades)
- Supercharger components
- High-temperature fasteners
- Automotive exhaust systems (e.g., exhaust valves and manifold fasteners)

Supplied Form

A286 is available in various forms, including:

- Round bars (AMS 5731, AMS 5732, AMS 5737)
- Coils (AMS 5525, AMS 5858)

Features

- Excellent oxidation resistance up to 1500°F (816°C) and intermittent service up to 1800°F (982°C).
- High ductility and strength retention at elevated temperatures.
- Good machinability compared to other nickel-based alloys, although it is more challenging than standard stainless steels.

This datasheet provides a comprehensive overview of the A286 grade bar, highlighting its properties, applications, and specifications relevant for engineering and manufacturing contexts.

