

Type A286 alloy (S66286) is an iron-base superalloy useful for applications requiring high strength and corrosion resistance up to 1300°F (704°C) and for lower stress applications at higher temperatures. Type A286 alloy is a heat and corrosion resistant austenitic iron-base material which can be age hardened to a high strength level. The alloy is also used for low temperature applications requiring a ductile, non-magnetic high strength material at temperatures ranging from above room temperature down to at least -320°F (-196°C). The alloy may be used for moderate corrosion applications in aqueous solutions. Type A286 alloy can be produced by AOD refining or vacuum induction melting. Vacuum arc or electroslag remelting procedures may be used to further refine the material.

### Nominal Composition

<b>C</b>	Carbon – 0.08%
<b>Mn</b>	Manganese – 2.00%
<b>P</b>	Phosphorous – 0.025%
<b>S</b>	Sulfur – 0.025%
<b>Si</b>	Silicon – 1.00%
<b>Cr</b>	Chromium – 13.50 – 16.00%
<b>Ni</b>	Nickel – 24.00 – 27.00%
<b>Mo</b>	Molybdenum – 1.00 – 1.50%
<b>Ti</b>	Titanium – 1.90 – 2.35%
<b>V</b>	Vanadium – 0.10 – 0.50%
<b>Al</b>	Aluminum – 0.35%
<b>B</b>	Boron – 0.003 – 0.010%
<b>Fe</b>	Iron - Balance

Percent by weight, maximum unless a range is listed.

### Standard Inventory Specifications

#### A-286 sheet, coil and bar stock:

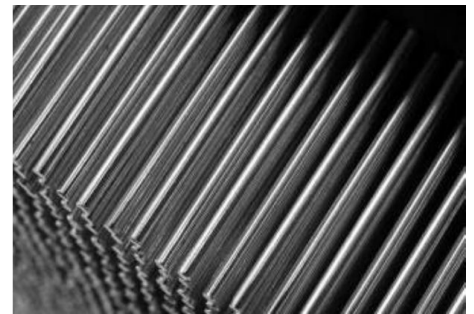
UNS S66286  
AMS: 5525, 5858, 5726, 5731, 5732, 5734, 5737, 5804, 5853  
ASTM: A453, A638

#### Other industry standards:

ASME SA 453  
EN 1.4980  
DIN EN 10204 3.1  
PWA-LCS  
GE-S400/1000  
RR SABRe Edition 2  
DFARS Compliant

### Industry Applications

- Jet engine components
- Fasteners
- Springs
- After Burner Parts
- Industrial Gas Turbines
- Moderate corrosion application in Aqueous Solutions
- Non-Magnetic Cryogenic Eq.



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### Features

- Can be produced by AOD refining or vacuum induction melting
- Iron-base superalloy
- High strength and corrosion resistance up to 1300°F (704°C)

**Resistance to Corrosion:** Type A286 alloy content is similar in chromium, nickel, and molybdenum to some of the austenitic stainless steels. Consequently, A286 alloy possesses a level of aqueous corrosion resistance comparable to that of the austenitic stainless steels. In elevated temperature service, the level of corrosion resistance to atmospheres such as those encountered in jet engine applications is excellent to at least 1300°F (704°C). Oxidation resistance is high for continuous service up to 1500°F (816°C) and intermittent service up to 1800°F (982°C).

## Physical Properties

Properties	Solution Treated	Aged
Density	0.286 lb./in <sup>3</sup> (7.92 g/cm <sup>3</sup> )	0.287 lb./in <sup>3</sup> (7.94 g/cm <sup>3</sup> )
Specific Gravity	7.92	7.94
Melting Range	2500 – 2600°F	1370 - 1430 °C
Magnetic Permeability	1.01	1.007

## Linear Coefficient of Thermal Expansion

Temperature Range		Linear Coefficients of Thermal Expansion - 10-6	
°C	°F	/°C	/°F
21 - 93	70 - 200	16.5	9.17
21 - 204	70 - 400	16.8	9.35
21 - 316	70 - 600	17	9.47
21 - 427	70 - 800	17.4	9.64
21 - 538	70 - 1000	17.6	9.78
21 - 649	70 - 1200	17.8	9.88
21 - 760	70 - 1400	18.6	10.32

## Thermal Conductivity

Temperature Range		Coefficients	
°C	°F	W/m·K	Btu/(hr/ft <sup>2</sup> /in/°F)
150	302	15.1	8.7
300	572	17.8	10.3
500	932	21.8	12.6
600	1112	23.9	13.8

## Electrical Resistivity

Temperature		
°C	°F	microhm-cm
25	77	91
540	1004	115.6
650	1202	118.8
730	1346	120.1
815	1499	122.4

## Specific Heat

Joules/kg-K - 420

Btu/lb.-°F - .10

## Magnetic Permeability

Solution Treated: 1.010

Solution Treated and Aged: 1.007

## Mechanical Properties

### Typical Short Time Tensile Properties as a Function of Temperature

Type A286 alloy is formed most easily in the solution treated condition. Typical room temperature tensile properties of material solution treated at 1800°F (982°C) are shown below.

Mechanical Properties		
Yield Strength	Ultimate Tensile Strength	Elongation
40,000 psi (275 Mpa)	90,000 psi (620MPa)	0.4