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# **A286 STAINLESS STEEL, UNS S66286**

**Strip, Coil, Foil, Wire, AMS 5525, AMS 5858**

## **Applications**

Jet engine applications, low temperature applications

## **Description**

Type A286 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. 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).

## **Chemistry Typical**

Carbon: 0.080 max  
Manganese: 2.00 max  
Silicon: 1.00 max  
Chromium: 13.50-16.00  
Nickel: 24.00-27.00  
Titanium: 1.90-2.35  
Molybdenum: 1.00-1.50  
Vanadium: 0.10-0.50  
Boron: 0.003-0.010  
Cobalt: 1.00 max  
Aluminum: 0.35 max  
Phosphorus: 0.02 max  
Sulfur: 0.025 max.  
Iron: Balance

## **Physical Properties**

Density: 0.286 lbs/in<sup>3</sup> 7.92 g/cm<sup>3</sup>

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Thermal Conductivity: BTU/hr/ft<sup>2</sup>/ft/°F (W/m•K):

At 302 °F (150 °C): 8.7 (15.1)

At 572 °F (300 °C): 10.3 (17.8)

At 932 °F (500 °C): 12.6 (21.8)

At 1112 °F (600 °C): 13.8 (23.9)

Mean Coefficient of Thermal Expansion: in/in/°F (µm/m•K)

70 - 200 °F (21 - 93 °C):  $9.17 \times 10^{-6}$  (16.5)

70 - 600 °F (21 - 315 °C):  $9.47 \times 10^{-6}$  (17.0)

70 - 800 °F (21 - 427 °C):  $9.64 \times 10^{-6}$  (17.4)

70 - 1000 °F (21 - 538 °C):  $9.78 \times 10^{-6}$  (17.6)

Modulus of Elasticity: ksi (MPa)

$29.1 \times 10^3$  ( $201 \times 10^3$ ) in tension

## Forms

Coil – Strip, Foil, Ribbon

Wire – Profile, Round, Flat, Square

## Mechanical Properties at Room Temperature

### Properties: Annealed

Ultimate Tensile Strength: 105 KSI max (724 MPa max)

Elongation:

10% min: Gauge: .001 - .0015

12% min: Gauge .0015 - .002

20% min: Gauge .002 - .004

25% min: Gauge > .004

Hardness: Rb 90 max

### Properties: Tempered

Consult Ulbrich Technical Services if temper rolled properties are needed.

### Properties: Stress Rupture (Typical)

A stress of 67.5 KSI min for no less than 23 hours.

### Heat Treat Capabilities: Typical

Ultimate Tensile Strength:

125 KSI min (862 MPA min): Gauge: .001 - .0015

130 KSI min (896 MPA min): Gauge .0015 - .002

135 KSI min (931 MPA min): Gauge .002 - .004

140 KSI min (965 MPA min): Gauge > .004

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**Elongation:**

4% min: Gauge: .001 - .0015

8% min: Gauge .0015 - .002

10% min: Gauge .002 - .004

15% min: Gauge &gt; .004

**Additional Properties****Corrosion Resistance**

Refer to NACE (National Association of Corrosion Engineers) for recommendations.

**Finishes**

# 1 – Hot rolled annealed and descaled. It is available in strip, foil and ribbon. It is used for applications where a smooth decorative finish is not required.

# 2D – Dull finish produced by cold rolling, annealing and descaling. Used for deep drawn parts and those parts that need to retain lubricants in the forming process.

# 2B – Smooth finish produced by cold rolling, annealing and descaling. A light cold rolling pass is added after anneal with polished rolls giving it a brighter finish than 2D.

#BA – Bright annealed cold rolled and bright annealed

#CBA – Course bright annealed cold rolled matte finish and bright anneal

#2 – Cold Rolled

# 2BA – Smooth finish produced by cold rolling and bright annealing. A light pass using highly polished rolls produces a glossy finish. A 2BA finish may be used for lightly formed applications where a glossy finish is desired in the formed part.

Polished – Various grit finish for specific polish finished requirements.

*\* Not all finishes are available for all alloys – Please contact Ulbrich sales for more information.*

**Wire Finishes**

XC – Extra clean bright annealed or bright annealed and cold rolled

Grease – Ultra-bright finish (for decorative applications)

Soap – Soap is not removed from tempered wire to act as a lubricant.

*\* Contact Ulbrich Wire with special wire finishes.*

**Welding**

For best results refer to: SSINA's "Welding of Stainless Steels and Other Joining Methods".

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