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## 330 STAINLESS STEEL, UNS N08330

**Strip, Coil, Foil, Wire, AMS 5592, AMS 5716, ASTM B 511, ASTM B 512, ASTM B 535, ASTM B 536, ASTM B 546, ASTM B 710, ASTM B 739**

### Applications

This alloy was designed for applications in high temperature industrial environments where good resistance to the combined effects of carburization and thermal cycling are required. Heat exchangers, furnace parts, muffles and retorts, annealing covers, food processing equipment, cryogenic structures.

### Description

Type 330 stainless 1. 330 steel is an austenitic heat and corrosion resisting alloy that offers a combination of strength and resistance to carburization, oxidation and thermal shock. Carburization and oxidation resistance to about 2100 °F are enhanced by the silicon content of the alloy. Type 330 stainless remains fully austenitic at all temperatures and is not subject to embrittlement from sigma formation.

### Chemistry Typical

Carbon: 0.08 max  
Phosphorus: 0.030 max  
Silicon: 0.75-1.50 max  
Nickel: 34.00-37.00  
Manganese: 2.00 max  
Sulfur: 0.030 max  
Chromium: 17.00-20.00  
Molybdenum: 0.75 max  
Copper: 0.50 max  
Iron: Balance

### Physical Properties

Density: 0.289 lbs/in<sup>3</sup> 8.00 g/cm<sup>3</sup>

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Electrical Resistivity: ohm-cm:

At 68 °F (20 °C): 0.000102

At 797 °F (425 °C): 0.00014

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

At 75° F (24 °C): 86.8 (12.5)

At 212 °F (100 °C): 113 (16.3)

At 797 °F (425 °C): 135 (19.4)

At 932 °F (500 °C): 150 (21.6)

At 1600 °F (870° C): 198 (28.5)

Mean Coefficient of Thermal Expansion:  $\mu\text{in/in-}^\circ\text{F}$  ( $\mu\text{m/m-}^\circ\text{C}$ )

32 - 212 °F (0 – 100 °C): 8.00 (14.4)

32 - 599 °F (0 – 315 °C): 8.89 (16.0)

32 - 1000 °F (0 – 540 °C): 9.28 (16.7)

32 - 1200 °F (0 – 650 °C): 9.61 (17.3)

32 - 1600 °F (0 – 870 °C): 10.0 (18.0)

Modulus of Elasticity: ksi (MPa)

$28.6 \times 10^3$  ( $197 \times 10^3$ ) in tension

Magnetic Permeability: H = 200: Annealed  $\leq 1.02$

Melting Range: 2550 - 2597 °F (1400 - 1425 °C)

## Forms

Coil – Strip, Foil, Ribbon

Wire – Profile, Round, Flat, Square

## Mechanical Properties at Room Temperature

### Properties: Annealed Typical

Ultimate Tensile Strength: 85 KSI min (585 MPa min)

Yield Strength: 42 KSI min (290 MPa min)

Elongation: 45% min

### Properties: Tempered

Alloy 330 can be cold worked to various tempers. Contact Ulbrich Technical Services for additional information.

## Additional Properties

### Corrosion Resistance

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

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## 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 – 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 for custom wire finishes.*

## Heat Treatment

Alloy 330 is non hardenable by heat treatment.

## Welding

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

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