



# 410 Stainless Steel, UNS S41000

Shaped, Flat, Square, Round, Fine Wire, Plated and Un-plated  
ASTM A240, ASTM A276, ASTM 479, ASTM 580, AMS 5504,  
AMS 5613

## 410 Alloy Description

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Alloy 410 is a martensitic stainless steel that provides moderate corrosion resistance plus high strength and hardness. This alloy can be hardened by cold working and by heat treating and is magnetic in both conditions. A wide of properties can be achieved with different heat treatments..

## Applications

Compressor parts  
Chain applications  
Surgical parts  
Spring pins  
Cutlery and other food processing applications

## Chemistry Typical

Carbon: 0.15 max  
Manganese: 1.00 max  
Silicon: 1.00 max  
Chromium: 11.50-13.50  
Nickel: 0.75 max  
Molybdenum: 0.50 max  
Phosphorus: 0.040 max

Sulfur: 0.030 max

Copper: 0.50 max

Aluminum: 0.050 max

Tin: 0.050 max

Nitrogen: 0.080 max

Iron: Balance

## Physical Properties

Density: 0.28 lbs/in<sup>3</sup>, 7.74 g/cm<sup>3</sup>

Electrical Resistivity: microhm-in (microhm-cm):

68°F (20°C): 22.5 (57.0)

Specific Heat: BTU/lb/°F (kJ/kg•K):

32-212°F (0-100°C): 0.11 (0.46)

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

At 212°F (100°C): 14.4 (24.9)

At 932°F (500°C): 16.6 (28.7)

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

32-212°F (0-100°C):  $5.5 \times 10^{-6}$  (9.9)

32-1200°F (0-649°C):  $6.5 \times 10^{-6}$  (11.6)

Modulus of Elasticity: KSI (MPa)

$29.0 \times 10^3$  ( $200 \times 10^3$ ) in tension

Magnetic Permeability: Magnetic

Melting Range: °F (°C): 2723 (1495)

## Mechanical Properties at Room Temperature

### **Properties: Annealed**

Ultimate Tensile Strength: 65 KSI min (450 MPa min)

Yield Strength (0.2% offset): 30 KSI min (205 MPa min)

Elongation: 20% min

Hardness: Rb 88 max

### **Properties Tempered**

Alloy 410 can be cold rolled to achieve the temper properties required by specific customers and/or manufacturing requirements. Contact Ulbrich Wire for details.

### **Additional Properties**

Corrosion Resistance

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

### **Standard Wire Finishes**

Extra Clean: (XC) Extra clean is also referred to as “bright annealed” or “bright annealed and cold rolled”

Grease (round wire only): Drawn in a heavy grease produces an “Ultra bright” finish for decorative applications

Soap (round wire only): Soap is used as a lubricant in the drawing process and is not removed. It acts as a lubricant during customer part forming operation. A soap finish is available in tempered products.

Plated: Many plating options are available.

\*Special finishes are available: Contact Ulbrich Wire Sales with special finish and plating requests

### **Forms**

Continuous Coils

Cut to lengths

Precision cutting

### **Heat Treatment**

410 can be hardened by cold working and by heat treating. Contact Ulbrich Wire Sales for more information.

### **Welding**

For best results refer to: SSINA’s “Welding of Stainless Steels and Other Joining Methods

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