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410 STAINLESS STEEL, UNS S41000

Strip, Foil, Wire, AMS 5504, AMS 5505, ASTM A-240

Applications

Cutlery, hardware, micrometer parts, compressor parts, valve parts for oil fields, fasteners, springs, pins, gauge parts, gun clips

Description

Type 410 is a martensitic stainless steel that provides good corrosion resistance plus high strength and hardness. It is magnetic in both the annealed and hardened conditions. A wide of properties can be achieved with different heat treatments. Applications requiring moderate corrosion resistance and high mechanical properties are ideal for this alloy.

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/in³ 7.74 g/cm³

Electrical Resistivity: microhm-in (microhm-cm): 68 °F (20 °C): 22.5 (57.0)

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Specific Heat: BTU/lb/°F (kJ/kg•K):
32 - 212 °F (0 - 100 °C): 0.11 (0.46)

Thermal Conductivity: BTU/hr/ft²/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): 5.5×10^{-6} (9.9)
32 - 1200 °F (0 - 649 °C): 6.5×10^{-6} (11.6)

Modulus of Elasticity: ksi (MPa)
 29×10^3 (200×10^3) in tension

Magnetic Permeability: Magnetic

Melting Range: 2723 °F (1495 °C)

Forms

Coil – Strip, Foil, Ribbon
Wire – Profile, Round, Flat, Square

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

Type 410 can be provided in the tempered condition. Please contact our Technical Services Department for detailed 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 in alloy 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

Type 410 can be hardened by cold working and by heat treating. Please refer to Ulbrich Technical Services Department for more information.

Welding

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

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