



440A Stainless Steel, UNS S44002

Shaped, Flat, Square, Round, Fine Wire, Plated and Bare Wire
ASTM A 276

440A Alloy Description

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Alloy 440A is a high carbon straight chromium martensitic stainless steel. It combines the superior wear resistance of high carbon alloys with the excellent corrosion resistance of chromium stainless steels. It is magnetic in both the annealed and hardened conditions. Maximum corrosion resistance is attained only in the fully hardened condition.

Applications

Medical and dental instruments
Turbine components
Cutlery and scissors

Chemistry Typical

Carbon: 0.60-0.75
Manganese: 1.00 max
Phosphorus: 0.04 max
Sulfur: 0.03 max
Silicon: 1.00 max
Chromium: 16.00-18.00
Molybdenum: 0.75 max
Iron: Balance

Physical Properties

Density, 0.280 lbs/in³, 7.74 g/cm³

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

68°F (20°C): 23.7 (60.0)

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): 14.0 (24.2)

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

32-212°F (0-100°C): 5.7×10^{-6} (10.2)

32-1200°F (0-649°C): 6.8×10^{-6} (12.1)

Modulus of Elasticity, KSI (MPa)

29.0×10^3 (200×10^3) in tension

Magnetic Permeability: Magnetic

Mechanical Properties at Room Temperature

Properties: Annealed Typical

Ultimate Tensile Strength: 100 KSI max (690 MPa max)

Yield Strength (0.2% offset): 65 KSI max (448) MPa max)

Elongation: 15% min

Hardness:

HV 256 max: gauges < 0.010 inches

Rb 100 max: gauges > 0.010 inches

Properties: Tempered

Alloy 440A 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

Alloy 440A provides full corrosion resistance only in the hardened or hardened and stress-relieved conditions. Type 440A has good corrosion resistance to atmosphere, fresh water, foods, alkalies and mild acids.

Standard Wire Finishes

Extra Clean: 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

Cold Forming

Alloy 440A has limited formability in the annealed condition

Heat Treatment

Hardening: Alloy 440A can be hardened cold working and by heat treatment. Contact Ulbrich Technical Service for additional information

Welding

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

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