



We Deliver Precision®



Ulbrich Stainless Steels & Special Metals, Inc. • 153 Washington Avenue • North Haven, CT 06473 USA • 800-243-1676 • ULBRICH.com

440A STAINLESS STEEL, UNS S44002

Strip, Coil, Foil, Wire, ASTM A 276

Applications

Cutlery and scissors

Description

Type 440A is a straight chromium martensitic stainless steel which combine 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.

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: 0.28 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)

Limitation of Liability and Disclaimer of Warranty: In no event will Ulbrich Stainless Steels & Special Metals, Inc., be liable for any damages arising from the use of the information included in this document or that it is suitable for the 'applications' noted. We believe the information and data provided to be accurate to the best of our knowledge but, all data is considered typical values only. It is intended for reference and general information and not recommended for specification, design or engineering purposes. Ulbrich assumes no implied or express warranty in regard to the creation or accuracy of the data provided in this document.

Copyright January 2014 Revision 06.01.2015. Ulbrich Stainless Steels & Special Metals, Inc. All rights reserved.

We Deliver Precision®

ULBRICH.COM

Mean Coefficient of Thermal Expansion: in/in/°F ($\mu\text{m}/\text{m}\cdot\text{K}$)

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)

29×10^3 (200×10^3) in tension

Magnetic Permeability: Magnetic

Forms

Coil – Strip, Foil, Ribbon

Wire – Profile, Round, Flat, Square

Mechanical Properties at Room Temperature

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

Tempered

Type 440A can be cold rolled to various tempers. Contact Ulbrich Technical Services for additional information.

Additional Properties

Corrosion Resistance

Type 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.

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

Limitation of Liability and Disclaimer of Warranty: In no event will Ulbrich Stainless Steels & Special Metals, Inc., be liable for any damages arising from the use of the information included in this document or that it is suitable for the 'applications' noted. We believe the information and data provided to be accurate to the best of our knowledge but, all data is considered typical values only. It is intended for reference and general information and not recommended for specification, design or engineering purposes. Ulbrich assumes no implied or express warranty in regard to the creation or accuracy of the data provided in this document.

Copyright January 2014 Revision 06.01.2015. Ulbrich Stainless Steels & Special Metals, Inc. All rights reserved.

We Deliver Precision®

ULBRICH.COM

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 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.*

Cold Forming

Type 440A has limited formability in the annealed condition.

Heat Treatment

Hardening: Type 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".

Limitation of Liability and Disclaimer of Warranty: In no event will Ulbrich Stainless Steels & Special Metals, Inc., be liable for any damages arising from the use of the information included in this document or that it is suitable for the 'applications' noted. We believe the information and data provided to be accurate to the best of our knowledge but, all data is considered typical values only. It is intended for reference and general information and not recommended for specification, design or engineering purposes. Ulbrich assumes no implied or express warranty in regard to the creation or accuracy of the data provided in this document.

Copyright January 2014 Revision 06.01.2015. Ulbrich Stainless Steels & Special Metals, Inc. All rights reserved.

We Deliver Precision®

ULBRICH.COM