

Custom 450® Stainless Steel, UNS S45000

Shaped, Flat, Square, Round, Fine Wire, Plated and Bare Wire
Specifications: AMS5763, AMS 5773, AMS 5863, ASTM A
564, ASTM A693, ASTM A 959

Custom 450® Alloy Description

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Custom 450® stainless is a age-hardenable martensitic stainless steel that has very good corrosion resistance and moderate strength. Although the alloy has a yield strength higher than 100 KSI (689 MPa) in the annealed condition, it is easily fabricated. A single-step aging treatment develops higher strength with good ductility and toughness. Because it has corrosion resistance similar to alloy 304 stainless and with much higher yield strength, Custom 450® has been used in applications where alloy 304 was not strong enough. It has also replaced alloy 410 stainless directly on a strength basis where alloy 410 had insufficient corrosion resistance. Mechanical properties will depend on the aging temperature selected. *

* Information supplied by Carpenter Technology Corp

Applications

Screens for the pulp and paper industry

Medical devices

Aircraft parts

Power generation applications

Chemical processing

Nuclear applications

Chemistry Typical

Carbon: 0.05 max

Manganese: 1.00 max

Phosphorus: 0.030 max

Sulfur: 0.030 max

Silicon: 1.00 max

Chromium: 14.00-16.00

Nickel: 5.00-7.00

Molybdenum: 0.50-1.00

Copper: 1.25-1.75

Columbium: 8 x Carbon min

Iron: Balance

Physical Properties

Density: 0.280 lb/in³, 7.75 g/cm³

Electrical Resistivity: ohm-cm

At 68°F (20°C): 0.0000992

Specific Heat: BTU/lb-°F (J/g-°C):

73-216°F (23-102°C): 0.114 (0.477)

Thermal Conductivity: BTU-in/hr-ft²-°F (W/m-K): Condition H900

At 70°F (21°C): 104(15.0)

At (200°C): 18.2 W/m-K

At (500°C): 24.4 W/m-K

Mean Coefficient of Thermal Expansion: in/in-°F

75-200°F: 5.88×10^{-6}

75-300°F: 5.62×10^{-6}

75-400°F: 5.68×10^{-6}

75-500°F: 5.80×10^{-6}

75-600°F: 5.91×10^{-6}

75-700°F: 5.98×10^{-6}

75-800°F: 6.09×10^{-6}

75-900°F: 6.13×10^{-6}

75-1100°F: 6.17×10^{-6}

Modulus of Elasticity: KSI (MPa)

28-29 x 10³ (193-200 x 10³) in tension

Mechanical Properties at Room Temperature

Properties: Annealed Typical

Ultimate Tensile Strength: 142 KSI (979 MPa)

Yield Strength: 118 KSI (814 MPa)

Elongation: 13%

Hardness: Rc 28

Properties: Tempered

Custom 450® can be cold rolled to achieve the temper properties required by specific customers and/or manufacturing requirements. Contact Ulbrich Wire for details.

Age Hardened: Typical

H900

Ultimate Tensile Strength: 196 KSI (1351 MPa)

Yield Strength: 188 KSI (1296 MPa)

Elongation: 14%

Hardness: Rc 42.5

H950

Ultimate Tensile Strength: 187 KSI (1289 MPa)

Yield Strength: 184 KSI (1269 MPa)

Elongation: 16%

Hardness: Rc 41.5

H1000

Ultimate Tensile Strength: 173 KSI (1193 MPa)

Yield Strength: 169 KSI (1165 MPa)

Elongation: 17%

Hardness: Rc 39

H1050

Ultimate Tensile Strength: 160 KSI (1103 MPa)

Yield Strength: 152 KSI (1048 MPa)

Elongation: 20%

Hardness: Rc 37

H1150

Ultimate Tensile Strength: 142 KSI (979MPa)

Yield Strength: 92 KSI (634 MPa)

Elongation: 23%

Hardness: Rc 28

Additional Properties

Corrosion Resistance

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

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

Heat Treatment

Custom 450® can be hardened by cold working and with a heat treatment.

Welding

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

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