



17-4 PH® Stainless Steel, UNS S17400

Shaped, Flat, Square, Round, Fine Wire, Plated and Bare Wire
ASTM A564, ASTM 693, AMS 5523, AMS 5604, AMS 5643

17-4PH® Alloy Description

17-4 PH® is a martensitic, chromium-nickel-copper precipitation-hardening stainless steel that provides an outstanding combination of high strength, good corrosion resistance, good mechanical properties at temperatures up to 600°F (316°C). This alloy is typically furnished in Condition A (annealed) but can be cold rolled to various temper ranges.



Applications

Jet engine stator vanes

Surgical instruments

Aerospace components

Components for the chemical, petrochemical and food processing industries

Chemistry Typical

Carbon: 0.070 max

Manganese: 1.00 max

Silicon: 1.00 max

Chromium: 15.00-17.00

Nickel: 3.00-5.00

Copper: 3.00-5.00

Columbium +Tantalum: 5 x Carbon min – 0.45 max

Phosphorus: 0.040 max

Sulfur: 0.030 max

Iron: Balance

Physical Properties

Density: 0.280 lbs/in³, 7.80 g/cm³

Electrical Resistivity: (microhm-cm):

68°F (20°C): 98

Specific Heat: BTU/lb/°F (kJ/kg•K):

32-212°F (0-100°C): 0.11(0.46)

Thermal Conductivity: BTU/hr/ft²/in/°F (W/m•K)

At 300°F (149°C): 124 (17.9)

At 900°F (482°C): 157 (22.6)

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

70-200°F (21-93°C): 6.0×10^{-6} (10.8)

70-600°F (21-315°C): 6.2×10^{-6} (11.2)

70-800°F (21-427°C): 6.3×10^{-6} (11.3)

Modulus of Elasticity: KSI (MPa)

29.0×10^3 (200×10^3) in tension

11.2×10^3 (78×10^3) in torsion

Magnetic Permeability: Strongly ferromagnetic in all conditions

Mechanical Properties at Room Temperature

Properties: Annealed

AMS 5604 (gauges: $\geq .015$ inches)

Ultimate Tensile Strength: 185 KSI max (1255 MPa max)

Yield Strength (0.2% offset): 160 KSI max (1105 MPa max)

Elongation: 3% Min

Hardness: Rc 38 max

Properties Tempered

Alloy 17-4 PH® can be cold rolled to achieve the temper properties required by specific customers and/or manufacturing requirements. Contact Ulbrich Wire for details.

Heat Treat Capabilities (Aged)

H900

Ultimate Tensile Strength: 190 KSI min (1310 MPa min)

Yield Strength (0.2% Offset): 170 KSI min (1170 MPa min)

Elongation: 5% min

Hardness: Rc 40-48

H925

Ultimate Tensile Strength: 170 KSI min (1170 MPa min)

Yield Strength: 155 KSI min (1070 MPa min)

Elongation: 5% min

Hardness: Rc 38-46

H1025

Ultimate Tensile Strength: 155 KSI min (1070 MPa min)

Yield Strength: 145 KSI min (1000 MPa min)

Elongation: 5% Min

Hardness: Rc 35-43

H1075

Ultimate Tensile Strength: 145 KSI min (1000 MPa min)

Yield Strength: 125 KSI min (860 MPa min)

Elongation: 5% min

Hardness: Rc 35-43

H1100

Ultimate Tensile Strength: 140 KSI min (965 MPa min)

Yield Strength: 115 KSI min (790 MPa min)

Elongation: 5% min

Hardness: Rc 31-40

H1150

Ultimate Tensile Strength: 135 KSI min (930 MPa min)

Yield Strength: 105 KSI min (725 MPa min)

Elongation: 8% min

Hardness: Rc 28-38

H1400+1150

Ultimate Tensile Strength: 115 KSI min (790 MPa min)

Yield Strength: 75 KSI min (515 MPa min)

Elongation: 9% min

Hardness: Rc 26-32

Additional Properties

Corrosion Resistance

The corrosion resistance of Type 17-4PH® is comparable to that of Type 304 stainless Steel in most media and superior to that of the hardenable 400 series stainless steels. 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 application

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

Alloy 17-4® PH can be heat treated to increase mechanical properties. Contact Ulbrich Technical Service for information.

Welding

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

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