



We Deliver Precision®



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

MP35N®, UNS R30035

Strip, Coil, Foil & Wire, AMS 5758, AMS 5844, AMS 5845, ASTM F562

Applications

Fasteners, springs, nonmagnetic electrical components medical instruments, medical and dental devices, seawater, oil and gas well, and chemical and food processing environments

Description

MP35N® is an age hardenable Nickel-Cobalt base alloy that has a unique combination of properties – ultra high strength, toughness, ductility and outstanding corrosion resistance. MP35N® resists corrosion in hydrogen sulfide, salt water and other chloride solutions. It also has excellent resistance to crevice and stress corrosion cracking in sea water and other hostile environments. Suitable where a high combination of strength, high modulus values and good corrosion resistance are required.

Chemistry Typical

Carbon: 0.02 max
Manganese: 0.15 max
Phosphorus: 0.015 max
Sulfur: 0.010 max
Silicon: 0.15 max
Chromium: 19.00-21.00
Nickel: 33.00-37.00
Molybdenum: 9.00-10.50
Cobalt: Balance
Titanium: 1.00 max
Boron: 0.010 max
Iron: 1.00 max

Physical Properties

Density: 0.304 lb/in³, 8.43 g/cm³

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Electrical Resistivity: ohm-cir-mil/ft (microhm-mm)

-300 °F (-184 °C): 593.0 (986.0)

-100 °F (-73 °C): 608.9 (1011.0)

70 °F (21 °C): 621.0 (1033.0)

200 °F (93 °C): 632.0 (1051.0)

400 °F (204 °C): 648.0 (1078.0)

600 °F (316 °C): 664.0 (1104.0)

800 °F (427 °C): 679.0 (1129.0)

1000 °F (538 °C): 694.0 (1154.0)

1200 °F (649 °C): 709.0 (1179.0)

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

-300 °F (-184 °C): 45 (6.5)

-100 °F (-73 °C): 63 (9.1)

70 °F (21 °C): 78 (11.2)

200 °F (93 °C): 88 (12.7)

400 °F (204 °C): 104 (15.0)

600 °F (316 °C): 118 (17.0)

800 °F (427 °C): 133 (19.2)

1000 °F (538 °C): 148 (21.3)

1200 °F (649 °C): 162 (23.4)

Mean Coefficient of Thermal Expansion: $\mu\text{in/in-}^\circ\text{F}$ ($\mu\text{m/m-}^\circ\text{C}$)

70 – 200 °F (21 - 93 °C): 7.11 (12.8)

70 – 600 °F (21 - 316 °C): 8.22 (14.8)

70 – 1000 °F (21 - 538 °C): 8.72 (15.7)

Modulus of Elasticity: ksi (MPa)33.8 x 10³ (232.8 x 10^{1/4}) in tension

Melting Range: 2400 - 2625 °F (1315 - 1440 °C)

Forms

Coil – Sheet, Strip, Foil

Wire – Profile, Round, Flat, Square

Mechanical Properties at Room Temperature**Properties: Annealed Typical**

Ultimate Tensile Strength: 135 KSI (931 MPa)

Yield Strength: 60 KSI (414 MPa)

Elongation: 70 %

Reduction in area: 70% MP35N® is a registered trademark of SPS Technologies

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TemperedCold Reduction: 15%

Ultimate Tensile Strength: 155 KSI (1069 MPa)

Yield Strength: 118 KSI (814 MPa)

Elongation: 41%

Reduction in area: 70%

Hardness: Rc 29

Cold Reduction: 25%

Ultimate Tensile Strength: 170 KSI (1172 MPa)

Yield Strength: 150 KSI (1034 MPa)

Elongation: 28%

Reduction in area: 65%

Hardness: Rc 34

Cold Reduction: 35%

Ultimate Tensile Strength: 194 KSI (1336 MPa)

Yield Strength: 154 KSI (1062 MPa)

Elongation: 22%

Reduction in area: 65%

Hardness: Rc 42

Cold Reduction: 45%

Ultimate Tensile Strength: 228 KSI (1572 MPa)

Yield Strength: 189 KSI (1303 MPa)

Elongation: 17%

Reduction in area: 62%

Hardness: Rc 47

Cold Reduction: 55%

Ultimate Tensile Strength: 265 KSI (1827 MPa)

Yield Strength: 205 KSI (1413 MPa)

Elongation: 12%

Reduction in area: 50%

Hardness: Rc 47

Cold Reduction: 65%

Ultimate Tensile Strength: 280 KSI (1931 MPa)

Yield Strength: 235 KSI (1620 MPa)

Elongation: 11%

Reduction in area: 49%

Hardness: Rc 50

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Properties: Cold Reduced + Aged @ 1000 °F (538 °C) for 4 Hrs. Air CooledCold Reduction: 15% + Aged

Ultimate Tensile Strength: 158 KSI (1089 MPa)

Yield Strength: 125 KSI (862 MPa)

Elongation: 39%

Reduction in area: 70%

Hardness: Rc 33

Cold Reduction: 25% + Aged

Ultimate Tensile Strength: 186 KSI (1282 MPa)

Yield Strength: 175 KSI (1207 MPa)

Elongation: 24%

Reduction in area: 65%

Hardness: Rc 39

Cold Reduction: 35% + Aged

Ultimate Tensile Strength: 203 KSI (1400 MPa)

Yield Strength: 195 KSI (1344 MPa)

Elongation: 21%

Reduction in area: 62%

Hardness: Rc 43

Cold Reduction: 45% + Aged

Ultimate Tensile Strength: 257 KSI (1772 MPa)

Yield Strength: 251 KSI (1731 MPa)

Elongation: 12%

Reduction in area: 52%

Hardness: Rc 46

Cold Reduction: 53% + Aged

Ultimate Tensile Strength: 300 KSI (2068 MPa)

Yield Strength: 290 KSI (1999 MPa)

Elongation: 10%

Reduction in area: 48%

Hardness: Rc 50

Additional Properties**Corrosion Resistance**

Refer to NACE (National Associate 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 for 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 finishes.*

Heat Treatment

MP35N® can be hardened by cold working and by cold working + heat treatment.

Welding

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

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