



# MP35N®, UNS R30035

Shaped, Flat, Square, Round, Fine Wire, Plated and Un-plated  
AMS 5758, AMS 5844, AMS 5845, ASTM F562

## MP35N Wire Alloy Description



This age hardenable nickel-cobalt base alloy that has a unique combination of properties: ultra- high strength, toughness, ductility and outstanding corrosion resistance. The alloy resists corrosion in hydrogen sulfide, salt water and other chloride solutions with 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.

## Applications

Medical instruments

Medical and dental devices

Fasteners

Springs

Nonmagnetic electrical components

Seawater, oil and gas well, and chemical and food processing environments.

## 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/in<sup>3</sup>, 8.43 g/cm<sup>3</sup>

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-ft<sup>2</sup>-°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 10<sup>3</sup> (232.8 x 10<sup>14</sup>) in tension

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

## 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%

### Tempered

#### **Cold 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

**Properties: Cold Reduced +Aged @ 1000 °F (538°C) for 4 Hrs. Air Cooled**

Cold 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 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 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

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"

\*MP35N® is an registered trademark of SPS Technologies

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