CENTRAL WIRE INDUSTRIES

# CWI Specialty Series Alloy: MP35N® (UNS R30035)

MP35N® is a multi-phase, nickel-cobalt based alloy that has a unique combination of ultrahigh tensile strength, good toughness and excellent corrosion resistance. It maintains its toughness, ductility, and corrosion resistance in a range of environments from cryogenic temperatures up to 850°F (454°C) and is virtually immune to crevice and stress corrosion. MP35N® is highly resistant to sulfide stress corrosion cracking and provides excellent performance in the most demanding sour well environments.

*MP35N ® is a registered trademark of SPS Technologies, Inc.*

## Nominal Composition

| | C | Mn | P | S | Si | Cr | Ni | Mo | Ti | Fe | Co |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | | | | | | 19.0 | 33.0 | 9.0 | | | |
| Max | 0.025 | 0.15 | 0.015 | 0.01 | 0.15 | 21.0 | 37.0 | 10.5 | 1.0 | 1.0 | balance |

## Physical Properties

| | At 70°F | At 20°C |
|---|---|---|
| **Density** | 0.304 lb/in³ | 8.42 g/cm³ |
| **Modulus of Elasticity (E)** | 33.8 x 10³ ksi | 233 GPa |
| **Modulus of Rigidity (G)** | 12.1 x 10³ ksi | 83.4 GPa |
| **Coefficient of Expansion** | 8.2 microinches/in.-°F (70-600°F) | 14.8 x µm/m°C (20-300°C) |
| **Electrical Resistivity** | 40.6 µ ohm.in | 103 µ ohm.cm |
| **Thermal Conductivity** | 78 Btu-in./ft.²hr.-°F | 11.2 W/m-K |

## Applicable Specifications

| | |
|---|---|
| **Wire & Bar** | AMS 5844, 5845 (capable), ASTM F562, NACE MR0175 (ISO 15156-3), NACE MR0103 (ISO 17945) |

## Typical Mechanical Properties – Spring Applications

| Condition | Heat Treatment | Tensile Strength | Suggested Operating Conditions |
|---|---|---|---|
| **Solution Heat Treated** | 1900 – 1925°F (1038-1052°C) for 4 to 8 hours | 115 – 140 ksi (793 – 965 MPa) | -300°F to 800°F (-184°C to 427°C) |
| **Spring Temper** | | 220 – 280 ksi (1517 – 1931 MPa) | -300°F to 800°F (-184°C to 427°C) |
| **Spring Temper + Aged** | After spring coiling Age 1200°F (649°C) minimum for 4 hours | 240 – 300 ksi (1655 – 2068 MPa) | -300°F to 800°F (-184°C to 427°C) |

| Available Forms | Packaging Options |
|---|---|
| • Round wire (0.009” to 0.625”)<br>• Bars<br>• Shaped wire<br>• Rope/Strand | • Coils<br>• Spools<br>• Bars<br>• Custom packaging |