

## Monel® alloy 400

**UNS N04400**  
**W.Nr 2.4360/2.4361**

Monel® 400 is a Nickel-Copper alloy with high strength and toughness and remains ductile even at subzero temperatures. Age-hardening treatments are not required to obtain the high strength properties of Monel® 400 because it is a solid-solution alloy that is hardened only through cold working. Monel® 400 is resistant to corrosion in many reducing environments, offering excellent corrosion resistance in seawater, hydrofluoric acid, sulfuric acid, and hydrochloric acid. Monel® 400 also shows resistance to stress corrosion cracking and pitting in fresh water, is resistant to oxidation and can operate from cryogenic temperatures to 500°F (260°C).

Applications include valves, pumps, seals, springs, and heat exchangers.

Industries supplied include: Oil & Gas Extraction, Marine, Chemical and Petrochemical Processing,

### Nominal Composition

	Ni	Cu	Fe	Mn	Si	C	S
min	63	28					
max	70	34	2.5	2	0.5	0.3	0.024

### Physical Properties

	At 70°F	At 20°C
<b>Density</b>	0.318 lb/in <sup>3</sup>	8.8 g/cm <sup>3</sup>
<b>Modulus of Elasticity (E)</b>	26.0 x 10 <sup>3</sup> ksi	179 GPa
<b>Modulus of Rigidity (G)</b>	9.5 x 10 <sup>3</sup> ksi	65.5 GPa
<b>Coefficient of Expansion</b>	8.8 microinches/in.-°F (70-600°F)	15.7 x μm/m-°C (20-300°C)
<b>Electrical Resistivity</b>	20.1 μ ohm.in	51.1 μ ohm.cm
<b>Thermal Conductivity</b>	151 Btu-in./ft. <sup>2</sup> hr.-°F	21.8 W/m-K

### Applicable Specifications

Wire & Bar | AMS 4730, AMS 4675, ASTM B164, BS 3075 NA 13, DOD QQ-N-281, NACE MR0175 (ISO 1516-3).

### Typical Mechanical Properties – Spring Applications

Condition	Heat Treatment	Tensile Strength	Suggested Operating Conditions
Annealed	1650°F (900°C)	70-95 ksi (480-655 MPa)	-300°F to 500°F (-184°C to 260°C)
Spring Temper		145-180 ksi (1000-1240 MPa)	-300°F to 500°F (-184°C to 260°C)

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**Phone: 1 847 695 1900**

Elgiloy Specialty Metals - Wire Products  
356 N.Cross Street  
Sycamore, IL 60178 USA

[WWW.ELGILOY.COM](http://WWW.ELGILOY.COM)

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