

Monel® alloy 400

UNS N04400
W. Nr 2.4360/2.4361

Applicable Specifications

Strip and Foil AMS 4544, ASME SB-127, ASTM B127, QQ-N-281

Description: 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. The alloy 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 oxidization and can operate from cryogenic temperatures to 500°F (260°C).

Applications include: Valves, pumps, seals, springs, 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
Density	0.318 lb/in ³	8.8 g/cm ³
Modulus of Elasticity (E)	26.0 x 10 ³ ksi	179 GPa
Modulus of Rigidity (G)	9.5 x 10 ³ ksi	65.5 GPa
Coefficient of Expansion	8.8 microinches/in-°F (70-600°F)	15.7 x μm/m-°C (20-300°C)
Electrical Resistivity	20.1 μohm-in	51.1 μohm-cm
Thermal Conductivity	151 Btu-in/ft ² hr-°F	21.8 W/m-K

Typical Mechanical Properties

Condition	Heat Treatment	Tensile Strength	Suggested Operating Conditions
Annealed	1600-1800 °F (870-980°C)	70-85 ksi (480-585 MPa)	-300°F to 500°F (-184°C to 260°C)
Spring Temper	(Stress relieve as needed)	120 ksi min	-300°F to 500°F (-184°C to 260°C)

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