

Monel® alloy K-500

UNS N05500
W.Nr 2.4375

Monel® 500 is an age-hardenable Nickel-Copper alloy with Aluminum and Titanium added to the base. The addition of Aluminum and Titanium provides high strength and hardness. Monel® 500 remains ductile, tough, and is nonmagnetic even at lower temperatures. Monel® 500 is corrosion resistant and can operate from cryogenic temperatures to 450°F (232°C). Applications include springs, pumps, valves, and fasteners. Industries supplied include: Oil & Gas Extraction, Marine, Chemical Processing, and Medical.

Nominal Composition

	Ni	Al	Fe	Mn	Cu	Ti	Si	C	S
min	63	2.3				0.35			
max	70	3.15	2	1.5	balance	0.85	0.5	0.25	0.01

Physical Properties

	At 70°F	At 20°C
Density	0.305 lb/in ³	8.44 g/cm ³
Modulus of Elasticity (E)	26 x 10 ³ ksi	179 GPa
Modulus of Rigidity (G)	9.5 x 10 ³ ksi	65.5 GPa
Coefficient of Expansion	8.3 microinches/in.-°F (70-600°F)	14.9 x μm/m-°C (20-300°C)
Electrical Resistivity	25.2 μ ohm.in	64 μ ohm.cm
Thermal Conductivity	121 Btu-in./ft. ² hr.-°F	17.5 W/m-K

Applicable Specifications

Wire & Bar | AMS 4676, ASTM B164, BS 3075 NA 18, DOD QQ-N-286, NACE MR0175 (ISO 15156-3).

Typical Mechanical Properties – Spring Applications

Condition	Heat Treatment	Tensile Strength	Suggested Operating Conditions
Annealed	1600°F (870°C)	80 – 110 ksi (550 – 760 MPa)	-300°F to 450°F (-184°C to 232°C)
Spring Temper		145 – 190 ksi (1000 – 1310 MPa)	-300°F to 450°F (-184°C to 232°C)
Spring Temper + Aged	After spring coiling. Age: 1000°F (540°C) for 10 hours.	160 – 200 ksi (1100 – 1380 MPa)	-300°F to 450°F (-184°C to 232°C)

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