

QA PROGRAMS

MIL-I-45208A / MIL-STD-45662A

ASTM A193/A194/F593/F594/F467/F468

ANSI, ASME, ASTM, SAE, FEDERAL, IFI, MIL-SPEC
DOD/QSLD CLASS 2 + 3, CAGE CODE 1T9G7
 SBA Registered Small Business Women Owned

MONEL alloy 400

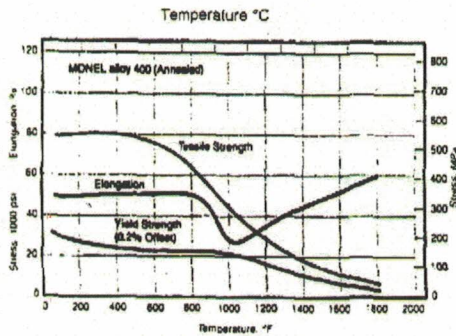
A nickel-copper alloy with high strength and excellent corrosion resistance in a range of media including seawater, hydrofluoric acid, sulfuric acid, and alkalis. Used for marine engineering, chemical and hydrocarbon processing equipment, valves, pumps, shafts, fittings, fasteners, and heat exchangers. Standard product forms are round, hexagon, flats, forging stock, pipe, tube, plate, sheet, strip, and wire.

Limiting Chemical Composition, %		
Ni ¹63.0 min.	Mn.....2.0 max.	Si.....0.5 max.
Cu.....28.0-34.0	C.....0.3 max.	
Fe.....2.5 max.	S.....0.024 max.	

¹Plus Co.

Typical Mechanical Properties (Annealed)

Tensile Strength, psi.....	80,000
MPa.....	500
Yield Strength (0.2% Offset), psi.....	35,000
Mpa.....	240
Elongation, %.....	40



Physical Constants and Thermal Properties

Density, lb/in ³	0.318
Mg/m ³	8.80
Melting Range, °F.....	2370-2460
°C.....	1300-1350
Specific Heat, Btu/lb·°F.....	0.102
J/kg·°C.....	427
Curie Temperature, °F.....	70-120
°C.....	20-50
Coefficient of Expansion, 70-200°F, 10 ⁻⁶ in/in·°F.....	7.7
21-93°C, μm/m·°C.....	13.9
Thermal Conductivity, Btu·in/ft ² ·h·°F.....	151
W/m·°C.....	21.8
Electrical Resistivity, ohm·circ mil/ft.....	329
μΩ·m.....	0.547

Specifications and Designations

UNS N04400	SAE AMS 4544, 4574, 4575
BS 3072-3076 (NA 13)	4675, 4730, 4731, 7233
ASTM B 127, B163-B165, B564	DIN 17743, 17750-17754
ASME SB-127, SB-163-SB-165, SB-564, Boiler Code	Werkstoff Nr. 2.4360, 2.4361
Sections III, IV, VIII IX	VdTUV 263
AECEMA Pr EN 2305	MIL-T-1368, MIL-T-23520,
AFNOR NU30	MIL-N-24106
	QQ-N-281 NACE MR-01-75

MONEL alloy R-405

The free-machine version of MONEL alloy 400. A controlled amount of sulfur is added to the alloy to provide sulfide inclusions that act as chip breakers during machining. Other characteristics are essentially the same as those of MONEL alloy 400. Used for meter and valve parts, fasteners, and screw-machine products. Standard product forms are round, hexagon, flats, and wire.

Limiting Chemical Composition, %		
Ni ¹63.0 min.	S.....0.025-0.060	Si.....0.5 max.
Cu.....28.0-34.0	Mn.....2.0 max.	
Fe.....2.5 max.	C.....0.3 max.	

¹Plus Co.

Typical Mechanical Properties (Annealed)

Tensile Strength, psi.....	80,000
Mpa.....	550
Yield Strength (0.2% Offset), psi.....	35,000
Mpa.....	240
Elongation, %.....	40

Physical Constants and Thermal Properties

Density, lb/in ³	0.318
Mg/m ³	8.80
Melting Range, °F.....	2370-2460
°C.....	1300-1350
Specific Heat, Btu/lb·°F.....	0.102
J/kg·°C.....	427
Curie Temperature, °F.....	70-120
°C.....	20-50
Coefficient of Expansion, 70-200°F, 10 ⁻⁶ in/in·°F.....	7.6
21-93°C, μm/m·°C.....	13.7
Thermal Conductivity, Btu·in/ft ² ·h·°F.....	151
W/m·°C.....	21.8
Electrical Resistivity, ohm·circ mil/ft.....	307
μΩ·m.....	0.510

Specifications and Designations

UNS N04405	ASTM B 164	ASME SB-164, Boiler Code Sections III, VIII
SAE AMS 4674, 7234	QQ-N-281	NACE MR-01-75

MONEL WAS INVENTED IN 1905 WITH APPROXIMATELY TWO THIRDS NICKEL AND ONE THIRD COPPER. MONEL ALLOYS RESIST CORROSION IN A WIDE VARIETY OF ENVIRONMENTS AND ARE USED IN SULFURIC ACID AND HYDROFLUORIC ACID, AND IN VARIOUS MARINE/NAVAL APPLICATIONS INVOLVING CONTACT WITH SEA AND FRESH WATER. MONEL ALLOYS ARE FREQUENTLY UTILIZED IN HEAT EXCHANGERS DUE TO GOOD THERMAL CONDUCTIVITY AND CORROSION RESISTANCE.

MONEL APPLICATIONS INCLUDE: MARINE, VALVES, PUMPS, SHIPBUILDING, CHEMICAL AND OIL PROCESSING, HEAT EXCHANGERS, ELECTRICAL.

MONEL alloy K-500

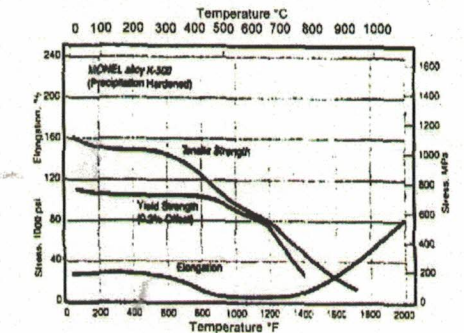
A precipitation-hardenable nickel-copper alloy that combines the corrosion resistance of MONEL alloy 400 with greater strength and hardness. It also has low permeability and is nonmagnetic to under -150°F(-101°C). Used for pump shafts, oil-well tools and instruments, doctor blades and scrapers, springs, valve trim, fasteners, and marine propeller shafts. Standard product forms are round, hexagon, flats, forging stock, pipe, tube, plate, sheet, strip, and wire.

Limiting Chemical Composition, %		
Ni ¹63.0 min.	Ti.....0.35-0.85	Mn.....1.5 max.
Cu.....27.0-33.0	Fe.....2.0 max.	S.....0.01 max.
Al.....2.30-3.15	C.....0.25 max.	Si.....0.5 max.

¹Plus Co.

Typical Mechanical Properties (Precipitation Hardened)

Tensile Strength, psi.....	160,000
Mpa.....	1100
Yield Strength (0.2% Offset), psi.....	115,000
Mpa.....	790
Elongation, %.....	20



Physical Constants and Thermal Properties

Density, lb/in ³	0.305
Mg/m ³	8.44
Melting Range, °F.....	2400-2460
°C.....	1315-1350
Specific Heat, Btu/lb·°F.....	0.100
J/kg·°C.....	419
Curie Temperature, °F.....	150
°C.....	-65
Permeability at 200 oersteds (15.9 kA/m).....	1.002
Coefficient of Expansion, 70-200°F, 10 ⁻⁶ in/in·°F.....	7.6
21-93°C, μm/m·°C.....	13.7
Thermal Conductivity, Btu·in/ft ² ·h·°F.....	121
W/m·°C.....	17.5
Electrical Resistivity, ohm·circ mil/ft.....	370
μΩ·m.....	0.615

Specifications and Designations

UNS N05500	DIN 17743, 17752, 17754
BS 3072-3076 (NA18)	Werkstoff Nr. 2.4375
ASME Boiler Code Section VIII	QQ-N-288
SAE AMS 4676	NACE MR-01-75
MIL-N-24549	

ASTM B98/B127
 ASTM B164/B473
 ASTM A193/A194
 ASTM F467/F468
 ASTM F593/F594

FF-W-82
 FF-W-84
 FF-S-86E4
 FF-S-92B
 FF-W-92

QQ-B-637
 QQ-C-591E
 QQ-S-763E
 QQ-N-281D2
 QQ-N-286F+G

MIL-S-1222G3
 MIL-S-1222H3
 MIL-DTL-1222J
 MS17828/MS17830
 MS35311/MS35307