

Product Description

Monel 400 is a nickel-copper alloy combining strong seawater resistance with useful strength in the annealed and cold-worked conditions. Southerly Alloy supplies UNS N04400 bar and rod to ASTM B164 in hot-worked, annealed, stress-relieved and cold-drawn conditions, with custom sizes, surface finishes and mill test documentation.

Chemical Composition (ASTM B164)

Element	Content
Nickel (Ni) plus Cobalt (Co), min.	63.0%
Copper (Cu)	28.0–34.0%
Iron (Fe), max.	2.5%
Manganese (Mn), max.	2.0%
Carbon (C), max.	0.30%
Silicon (Si), max.	0.50%
Sulfur (S), max.	0.024%

Nickel is the balance of the melt; the purchase specification and mill test certificate decide final acceptance.

Mechanical Properties (minimum values, per ASTM B164)

Condition	Section	Tensile Strength, min.	Yield Strength (0.2%), min.	Elongation, min.
Hot-worked	Rounds to 305 mm (12 in.)	≥80 ksi (552 MPa)	≥40 ksi (276 MPa)	30%
Hot-worked, annealed	All sizes	≥70 ksi (480 MPa)	≥25 ksi (170 MPa)	35%
Cold-worked, stress-relieved	Rounds 12.7–88.9 mm (1/2–3-1/2 in.)	≥87 ksi (600 MPa)	≥60 ksi (415 MPa)	20%
Cold-worked, as-worked	Rounds under 12.7 mm (1/2 in.)	≥110 ksi (760 MPa)	≥85 ksi (585 MPa)	8%

Minimums follow the ASTM B164 mechanical tables; the applicable edition and the ordered condition decide final acceptance.

Physical Properties (typical room-temperature values)

Property	Value
Density	Approx. 8.80 g/cm³
Melting range	Approx. 1300–1350 °C
Modulus of elasticity	Approx. 179 GPa
Thermal conductivity at 20 °C	Approx. 21.8 W/m-K
Specific heat at 20 °C	Approx. 427 J/kg-K
Electrical resistivity at 20 °C	Approx. 0.51 μΩ-m
Thermal expansion, 20–100 °C	Approx. 13.9 μm/m-K
Curie temperature	Approx. 21–49 °C

Values support design calculations rather than acceptance testing; slightly ferromagnetic at ambient temperature.

Applicable Standards

Standard / Designation	Scope
ASTM B164	Nickel-copper alloy rod, bar and wire — UNS N04400
ASME SB164	ASME edition for rod, bar and wire
SAE AMS 4675	Nickel-copper alloy bars, forgings and rings
UNS N04400	Material designation for Monel 400
W.Nr. 2.4360 / NiCu30Fe	European designation for Monel 400
JIS NW 4400	Japanese designation
BS 3076 NA13	British nickel-copper bar standard
DIN 17743 / DIN 17752	Nickel-copper wrought alloys — chemistry and bar

Available Dimensions & Forms

Product Form	Typical Supply	Length
Round Bar	6–500 mm dia.	Cut to length or random
Round Rod	3–50 mm dia.	Cut to length
Bright Bar	6–150 mm dia.	Cut to length or random
Square Bar	10–150 mm	Cut to length or random
Hex Bar	10–150 mm A/F	Cut to length or random
Flat Bar	3–100 mm thick × 10–300 mm wide	Cut to length
Forged Bar	100–500 mm dia. or forged section	Cut to length
Precision-Ground Rod	3–100 mm dia., tight tolerance	Cut to length

Availability depends on delivery condition, surface finish and order quantity; tolerances follow ASTM B164 for the ordered condition.

Surface Finishes

Surface Condition	Typical Use
Hot-worked (as-rolled or forged)	Parts that will be machined to size
Annealed and pickled	Scale-free surface for fabrication
Cold drawn	Close diameter control with a bright surface
Stress relieved	Straightness and dimensional stability for drawn bar
Peeled	Uniform diameter with machined skin for further turning
Centreless ground	Tight diameter and straightness for shafting
Polished	Reduced roughness for product-contact and visible parts
Rough turned	Controlled machining allowance on large or forged bar

Southerly Alloy — nickel alloy bar, rod, pipe, tube, plate and fittings · www.southerly-alloy.com · Values are for reference; the mill test certificate prevails for final acceptance.