

SOUTHERLY ALLOY

Monel 400 | UNS N04400 | Werkstoff Nr. 2.4360 / NiCu30Fe

ASTM B127 / B164 / B165 / B163 — Grade Data for Bar, Tubular and Flat Product

Product Description

Monel 400 is a nickel-copper alloy that carries about two-thirds nickel with copper in solid solution. It resists flowing seawater, hydrofluoric acid, and strong alkalis, while nitric acid and wet chlorine fall outside its envelope. Nickel plus cobalt runs at 63.0% minimum, and copper sits between 28.0% and 34.0%. The grade holds no precipitation-hardening route, so cold work alone raises strength.

Chemical Composition (ASTM B127 / B164 / B165 / B163)

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

Minimum Room-Temperature Mechanical Properties

Product Form	Std.	Condition	Tensile Strength	Yield Strength, 0.2% Offset	Elongation
Bar and rod	B164	Hot-worked, annealed, all sizes	≥ 70 ksi (480 MPa)	≥ 25 ksi (170 MPa)	35%
Bar and rod	B164	Cold-drawn, as-worked, rounds < 12.7 mm	≥ 110 ksi (760 MPa)	≥ 85 ksi (585 MPa)	8%
Seamless pipe and tube	B165	Annealed, OD to 127 mm	≥ 70 ksi (483 MPa)	≥ 28 ksi (193 MPa)	35%
Seamless pipe and tube	B165	Annealed, OD above 127 mm	≥ 70 ksi (483 MPa)	≥ 25 ksi (172 MPa)	35%
Seamless pipe and tube	B165	Stress-relieved, all sizes	≥ 85 ksi (586 MPa)	≥ 55 ksi (379 MPa)	15%
Heat-exchanger tube	B163	Annealed	≥ 70 ksi (483 MPa)	≥ 28 ksi (193 MPa)	35%
Plate, sheet, and strip	B127	Hot-rolled, annealed	≥ 70 ksi (485 MPa)	≥ 28 ksi (195 MPa)	35%
Plate, sheet, and strip	B127	Cold-rolled, hard	≥ 100 ksi (690 MPa)	≥ 90 ksi (620 MPa)	2%

B725 and B730 carry their own acceptance tables for welded pipe and tube; those figures follow the edition named on the order. Cold-drawn yield values apply to rounds under 12.7 mm.

Physical Properties (typical values)

Property	Value	Property	Value
Density	Approx. 8.80 g/cm ³	Electrical resistivity, 20 °C	Approx. 0.51 μΩ·m
Melting range	Approx. 1300–1350 °C	Thermal expansion, 20–100 °C	Approx. 13.9 μm/m·K
Modulus of elasticity	Approx. 179 GPa	Curie temperature	Approx. 21–49 °C
Thermal conductivity, 20 °C	Approx. 21.8 W/m·K	Magnetic behaviour	Slightly ferromagnetic at ambient
Specific heat, 20 °C	Approx. 427 J/kg·K	Service ceiling	Approx. 480 °C continuous

Applicable Standards

Standard / Designation	Product / Application
ASTM B127 / ASME SB127	Plate, sheet, and strip, hot-rolled and cold-rolled
ASTM B164 / ASME SB164	Rod, bar, and wire
ASTM B165 / ASME SB165	Seamless pipe and tube
ASTM B163 / ASME SB163	Seamless heat-exchanger and condenser tube
ASTM B725 / B730	Welded pipe and welded tube, annealed
ASTM B564 / F467 / F468	Forgings, nuts, and bolts in the same grade
SAE AMS 4675 / 4544 / 4574	Bars and forgings; plate, sheet, and strip; seamless tubing
DIN 17743 / 17750 / 17751 / 17752	Wrought nickel-copper alloys, flat product, tube, and bar
ISO 6207 / 6208 / 9723 / 9724	Nickel alloy tube, flat product, bar, and wire
NACE MR0175 / ISO 15156	Sour service in oil and gas production
UNS N04400 · W.Nr. 2.4360 · NiCu30Fe · BS NA 13 · JIS NW 4400	Designations

Typical Supply Dimensions

Product Form	Typical Supply Range
Bar and rod	6–500 mm dia., by section and condition
Seamless pipe and tube	OD 6–219 mm, wall 0.5–12.7 mm
Heat-exchanger tube	OD 6.35–76.2 mm, wall 0.7–6 mm
Welded pipe and tube	OD 21.3–610 mm, wall 0.5–12.7 mm
Plate and sheet	0.46–100 mm thick, cut to length and width
Strip and coil	0.13–6.4 mm thick, slit to width

Solution annealing runs at 705–980 °C (1300–1800 °F), most often 1600–1800 °F. Filler metal for welding: ERNiCu-7 / ENiCu-7.

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.

Document Control · Monel 400 Material Data Sheet · Rev. 1.0 · Issued 16 September 2026