Monel K-500 Bright Bar (UNS N05500) — Technical Data Sheet

Bright Bar supplied to ASTM B865 and ASME SB865 in UNS N05500 — the aged values below are acceptance minima; the ordered condition, section size and hardness band govern final acceptance.

Chemical Composition — ASTM B865 limits for UNS N05500

Element	Content
Nickel (Ni) plus Cobalt (Co)	63.0% min.
Copper (Cu)	27.0–33.0%
Aluminium (Al)	2.30–3.15%
Titanium (Ti)	0.35–0.85%
Iron (Fe)	2.0% max.
Manganese (Mn)	1.5% max.
Carbon (C)	0.18% max.
Silicon (Si)	0.50% max.
Sulfur (S)	0.010% max.

Minimum Age-Hardened Mechanical Properties (ASTM B865)

Condition and Section	Tensile Strength, min.	Yield Strength (0.2%), min.	Elongation, min.
Hot-worked and age-hardened, all sizes	≥140 ksi (965 MPa)	≥100 ksi (690 MPa)	20%
Cold-worked and age-hardened, rounds 6.4–25.4 mm (1/4–1 in.)	≥145 ksi (1000 MPa)	≥110 ksi (760 MPa)	15%
Cold-worked and age-hardened, rounds 25.4–76.2 mm (1–3 in.)	≥140 ksi (965 MPa)	≥100 ksi (690 MPa)	17%
Cold-worked and age-hardened, rounds 76.2–101.6 mm (3–4 in.)	≥135 ksi (930 MPa)	≥95 ksi (655 MPa)	20%
Annealed and age-hardened, rounds to 25.4 mm (1 in.)	≥130 ksi (895 MPa)	≥90 ksi (620 MPa)	20%
Annealed and age-hardened, rounds over 25.4 mm (1 in.)	≥130 ksi (895 MPa)	≥85 ksi (585 MPa)	20%

Physical Properties (Approx.)

Property	Value
Density	Approx. 8.44 g/cm³
Melting range	Approx. 1315–1350 °C
Modulus of elasticity	Approx. 179 GPa
Thermal conductivity at 20 °C	Approx. 17.5 W/m·K
Specific heat at 20 °C	Approx. 419 J/kg·K
Electrical resistivity at 20 °C	Approx. 0.615 µΩ·m
Thermal expansion, 20–100 °C	Approx. 13.7 µm/m·K
Magnetic behaviour	Essentially non-magnetic down to approx. -101 °C
Curie temperature	Approx. -101 °C (-150 °F)

Standards and Designations

Standard	Product or Application
ASTM B865	Nickel-copper-aluminium bar, rod and wire, UNS N05500
ASME SB865	ASME counterpart for pressure equipment
AMS 4676	Bars, forgings and rings of this grade

Heat Treatment (solution treatment and aging)

Condition	Typical Treatment
Solution Annealed	Held near 980 °C and rapidly quenched to hold aluminium and titanium in solution
Aged from Annealed Stock	Held at 580–595 °C (1075–1105 °F) for 8 to 10 hours, then air cooled
Aged from Spring Temper	Held at 530–540 °C (985–1005 °F) for 4 to 6 hours, then air cooled
Stress Relieved	A low-temperature relief that holds straightness without starting the precipitation

Surface Finishes (Bright Bar)

Surface Condition	Typical Use
Cold Drawn	Drawn stock giving this bright bar close diameter control and a smooth bright skin.
Centreless Ground	Ground diameter and straightness on this bright bar for shafts and spindles.
Polished	Reduced roughness on this bright bar for product-contact and visible components.

Typical Supply Dimensions — Bright Bar

Product Form	Typical Supply	Length
Bright Bar	6–150 mm dia.	Cut to length or random
Bright-Drawn Bar	6–80 mm dia.	Cut to length
Peeled Bar	20–100 mm dia.	Cut to length
Centreless-Ground Bar	3–100 mm dia.	Cut to length
Precision-Ground Bar	3–80 mm dia.	Cut to length
Polished Bar	6–100 mm dia.	Cut to length
Custom Bright Bar	To drawing	Custom

Values are for reference; the mill test certificate prevails for final acceptance. Dimensions, heat-treatment conditions, and surface finishes are confirmed at quotation.