

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

Wire wire supplied to ASTM B865, QQ-N-286, DIN 17753 and ISO 9724 — figures are typical published Alloy Wire International ranges for the ordered diameter and temper, because B865 covers cold-worked wire only.

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.

Typical Strength Ranges by Temper (wire as delivered)

Temper	Typical Tensile Strength	Typical Yield Strength (0.2%)	Typical Elongation
Annealed (soft)	Under 850 MPa (123 ksi)	200–415 MPa (30–60 ksi)	15–30%
Annealed and aged	Over 950 MPa (138 ksi)	620 MPa (90 ksi) min.	15% min.
Spring temper	1000–1300 MPa (145–189 ksi)	690–900 MPa (100–130 ksi)	5–15%
Spring temper and aged	1200–1500 MPa (174–218 ksi)	900–965 MPa (130–140 ksi)	3–10%

Delivery Conditions

Delivery State	Typical Diameter	Notes
Annealed (soft)	0.025–21 mm	Softest state, formed and coiled before the aging cycle
Annealed and aged	0.025–21 mm	Aged after forming, delivered at full aged strength
Spring temper	0.10–8.0 mm	Heavily reduced, holds a set before aging runs
Spring temper and aged	0.10–8.0 mm	Strongest wire state, for loaded springs and clips

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	Cold-worked wire of UNS N05500
QQ-N-286	Legacy defence document for wire
DIN 17753 / ISO 9724	European and ISO wire documents

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 (Wire)

Surface Condition	Typical Use
Spring Temper	Heavily reduced wire that holds a set before any aging cycle runs.
Spring Temper + Aged	Drawn to spring temper and then aged, the strongest state for this wire.
Spool Wound	Layer-wound wire so the GMAW feeder runs without tangling.

Typical Supply Dimensions — Wire

Product Form	Typical Supply	Length
Wire (Coil or Spool)	0.025–21 mm dia., typical	Coil, spool or custom
Fine Wire	0.025–0.80 mm dia.	Spool
Spring-Temper Wire	0.10–8.0 mm dia.	Coil or spool
Spring-Temper and Aged Wire	0.10–8.0 mm dia.	Coil or spool
Straightened and Cut Wire	1.0–10 mm dia.	Straight lengths
Custom Wire	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.
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