

### Precipitation Hardenable Nickel-Copper Alloy

#### Typical Applications

- Pump shafts
- Oil well tools and instruments
- Springs
- Valve trim
- Fasteners/bolting
- Marine propeller shafts
- Electronic components
- Cryogenic equipment

#### Product Description

Alloy K-500 is a precipitation/age hardenable nickel-copper alloy providing high mechanical strength combined with excellent corrosion resistance. Tensile strength is typically twice and yield strength three times that of alloy 400 nickel-copper. The alloy exhibits outstanding properties at sub-zero (including cryogenic) temperatures at which ductility and toughness are virtually unimpaired. It also possesses low permeability and is non-magnetic to temperatures as low as minus 101°C.

#### Availability

Bar, wire, pipe, tube, sheet, plate, strip.

#### Material Specifications

- UNS N05500
- BS 3072 (NA18)
- ASTM B865
- AMS 4676
- 2.4375
- NACE MR01-75 / ISO 15156

#### Corrosion Resistance

Alloy K-500 provides excellent resistance to corrosion in seawater, oil & gas environments and a wide variety of industrial media. The corrosion resistance of alloy K-500 is substantially equivalent to that of alloy 400 (non-hardenable nickel-copper alloy) except that, when in the age-hardened condition, alloy K-500 has a greater tendency toward stress corrosion cracking in some media.

#### Fabrication

Heavy machining of alloy K-500 is best achieved when the material is in the annealed or hot-worked and quenched condition. It is common practise to machine slightly oversize, age-harden, then finish to size. However, age-hardened material can be finish machined to close tolerances and fine finishes. The alloy can be joined by industry-standard welding, brazing and soft soldering processes.

#### Chemical Composition (weight %)

Weight (%)	C	S	Si	Mn	Cu	Fe	Al	Ti	Ni+Co
Min					27.0		2.3	0.35	63.0
Max	0.25	0.01	0.5	1.5	33.0	2.0	3.15	0.85	

#### Mechanical Properties (Precipitation Hardened)

UTS, MPa	1100 min
0.2% PS, MPa	790 min
Elongation %	20 min

#### Technical Assistance

Our knowledgeable staff backed up by our resident team of qualified metallurgists and engineers, will be pleased to assist further on any technical topic.

#### UK Service Centres:

Smiths Belfast **02895 908 897**  
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#### Quality & Testing:



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