

NICKEL-COPPER ALLOY

TYPICAL APPLICATIONS

Pump shafts
 Chemical and hydrocarbon processing equipment
 Springs
 Valve trim
 Marine fixtures and fasteners
 Heat exchangers
 Electrical and electronic components
 Process vessels and piping

PRODUCT DESCRIPTION

Alloy 400 (nickel-copper) is a solid-solution alloy providing good mechanical strength and toughness over a wide temperature range combined with excellent corrosion resistance.

The alloy exhibits outstanding properties at sub-zero (including cryogenic) temperatures. Strength and hardness increase with only slight impairment of ductility or toughness. Alloy 400 does not undergo a ductile to brittle transition even when cooled to the temperature of liquid hydrogen.

The density of alloy 400 is 8.80 g/cc.

CORROSION RESISTANCE

Alloy 400 provides excellent resistance to corrosion in a range of media including seawater, hydrofluoric acid, sulphuric acid and alkalis and is widely employed in marine engineering and chemical processing. It is more resistant than nickel to corrosion under reducing conditions and more resistant than copper under oxidising conditions. This nickel-copper alloy is therefore in general more resistant to corrosion than either of its two principal constituents. Resistance to stress corrosion cracking in chloride containing media is extremely good.

CHEMICAL COMPOSITION

Weight%	C	S	Si	Mn	Cu	Fe	Ni+Co
Min.					28.0		63.0
Max.	0.3	0.024	0.5	2.0	34.0	2.5	

TYPICAL MECHANICAL PROPERTIES (annealed)

UTS, MPa	550
0.2% PS, MPa	240
Elongation, %	40

TECHNICAL SALES ASSISTANCE

Our resident team of qualified metallurgists and engineers will be pleased to assist further on any technical topic.

MATERIAL SPECIFICATIONS

- UNS N04400
- BS 3072-76 (NA13)
- AECMA Pr EN 2305
- SAE AMS 4544, 4574, 4575, 4730, 4731, 7233
- Wr.N 2.4360, 2.4361
- NACE MR01-75 / ISO 15156

AVAILABILITY

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

MACHINING AND JOINING

Alloy 400 may readily be fabricated, machined and joined using standard processes.

In general, cold-drawn or cold-drawn and stress relieved material provides the best machinability and produces the smoothest finish.

All standard welding techniques may be applied to alloy 400. The alloy may also be joined to dissimilar alloys employing appropriate consumables. In addition joining is possible by brazing or soldering.

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