

COPPER
ALLOYS
LTD

“Sea the difference”

Materials designed for performance in extreme environments...

The Elite Marine Alloy range of superior wrought cupro-nickel and cupro-nickel/aluminium bronze hybrid alloys possess some of the most advanced material technology available to marine engineers.

The importance of these alloys is in their excellent corrosion resistance in sea water applications, combined with the application of innovative process techniques, developed by Copper Alloys Ltd. to tailor mechanical properties to meet the exacting requirements of design engineers in extreme environments.

This range of alloys is manufactured with enhanced properties, produced by precipitation and spinodal hardening mechanisms to offer engineers extreme strength and ductility with superb resistance to corrosion.

Highly advanced material technology

These alloys are the result of decades of research and development, which is still ongoing to identify more advanced versions of these alloys. The ongoing research and development programme is conducted by Copper Alloys Ltd. on behalf of the industry, using the expertise of our highly qualified metallurgical engineers to develop ever-more progressive alloys.

The latest addition to the range CuNi30Cr2 which is a single phase alloy offers mechanical properties at least twice that of 70/30 cupro nickel whilst still retaining the excellent corrosion resistance of this family of alloys.



All of these alloys are available in a range of formats including rings, discs, blocks, bars, closed die forgings and customised shapes.

New Material Technology

- Extreme mechanical strength
- High hardness and resistance to wear
- Very high shock resistance
- Low rate of general corrosion and pitting in sea water
- Anti bio-fouling (lack of marine growth)
- Immune to hydrogen embrittlement
- Anti galling
- Low relative magnetic permeability
- Easy to machine and dimensionally stable
- No loss of properties at cryogenic temperatures
- Cost effective compared with other materials



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We are pleased to present our range of advanced wrought cupro-nickel alloys with outstanding resistance to sea water corrosion combined with a spectrum of high mechanical properties.

Overview of our Elite Wrought Marine Alloys

These materials are strengthened by both solid solution and precipitation mechanisms. Our deep metallurgical understanding and direct control of processing gives us the capability to induce material properties unavailable elsewhere.

This suite of alloys has a wide spectrum of mechanical properties ensuring a range of demanding applications can be satisfied. Extreme fracture toughness combined with high strength through to extreme tensile strength and hardness are available.

The extremely low general corrosion rate and immunity to preferential phase attack make these materials ideal for critical marine applications and by far out perform conventional materials such as nickel aluminium bronze and conventional cupro-nickel alloys.

These industry-leading alloys are the result of decades of research and our advanced manufacturing capability combined with metallurgical expertise allows us to produce a range of wrought products to 25,000Kgs piece-weight. These materials are available as raw material (proof machined bar stock, forgings, plates) or finished machined components, supplied to print.

Full traceability and full certification in accordance with EN 10204 3.1 provided as standard. Certification to 3.2 (independent witnessing) is available upon request.

Typical Properties and Attributes

Increasing strength and hardness

Increasing ductility and fracture toughness/shock resistance

	CAL T-1000		CAL T-850		CAL CNC-1 and CNC-2			
	Copper-Nickel-Manganese-Aluminium Alloy CuNi14Al2 (DIN 2.1504)		Copper-Nickel-Manganese-Aluminium Alloy CuNi14Mn4Al2 Def Stan 02-835		Cu30Cr1FeMnSiZrTi (Def Stan 02-886 / Def Stan 02-824 Part 1)			
	Extreme strength and hardness		High strength and hardness		CAL CNC-1 (Wrought) Moderate strength with high ductility		CAL CNC-2 (Wrought enhanced) High strength with moderate ductility	
	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial
Tensile Strength	820-1050 MPa	119-152 Ksi	725-825 MPa	105-120 Ksi	550-650 MPa	80-94 Ksi	700-800 MPa	45-52 Ksi
0.2% Proof Stress	600-850 MPa	87-123 Ksi	430-550 MPa	62-80 Ksi	380-480 MPa	55-70 Ksi	650-750 MPa	94-109 Ksi
Elongation	10-16%	10-16%	18-28%	18-28%	24-34%	24-34%	15-22%	15-22%
Hardness HB	250-290	250-290	210-240	210-240	160-200	160-200	195-230	195-230
	Low-moderate toughness		Moderate toughness		Extreme toughness and shock resistance			
Impact	10-16 J	7-11 ft lbf	40-65 J	29-48 ft lbf	130-150 J	96-111 ft lbf	90-120 J	66-88 ft lbf
Excellent seawater corrosion resistance								

- Extreme mechanical strength
- High hardness and resistance to wear
- Very high shock resistance
- Low rate of general corrosion and pitting in sea water
- Anti bio-fouling (lack of marine growth)
- Immune to hydrogen embrittlement
- Anti galling
- Low relative magnetic permeability
- Easy to machine and dimensionally stable
- No loss of properties at cryogenic temperatures
- Cost effective compared with other material