

## HIGH CONDUCTIVITY COPPER BERYLLIUM ALLOY

### TYPICAL APPLICATIONS

Thermal management, Metal and plastic moulding, Welding, Automotive, Marine, Chemical processing

### PRODUCT DESCRIPTION

Alloy 3 is a high conductivity copper beryllium alloy used in applications requiring a combination of high thermal conductivity with moderate strength. Alloy 3, supplied with certified mechanical properties, is fully heat treated and no additional treatment is required. Alloy 3 is nonmagnetic and provides excellent resistance to thermal fatigue.

### CORROSION RESISTANCE

Alloy 3's corrosion resistance is similar to pure copper. It resists corrosion in sea water, most organic solutions, non-oxidizing acids, and dilute alkalis. Alloy 3 is not subject to hydrogen embrittlement, and it resists stress corrosion cracking in sulfide and chloride solutions. Alloy 3 is not recommended for use with ammonium hydroxide or strongly oxidizing acids.

### HIGH TEMPERATURE STRENGTH

Temperature, °C	200	300	400	450	500
UTS, MPa	760	760	730	680	520

### MATERIAL SPECIFICATIONS

- UNS C17510
- ASTM B441
- RWMA – Class 3
- BS EN 12163:1998

### FABRICATION

Machining – very good  
 Brazing – good  
 Electro-discharge machining – good  
 Welding – fair

### AVAILABILITY

Bar, rod, plate, wire, tube, extrusions, forgings

### CHEMICAL COMPOSITION

Alloy 3 in weight %

Be	Ni	Fe	Cu
0.2-0.6	1.4-2.2	.1 max	balance

### MECHANICAL PROPERTIES

	Alloy 3 AT	Alloy 3 HT
UTS, MPa	680-900	750-970
0.2% PS, MPa	550-690	650-870
Elongation, % in 4D	10-25	5-25
Hardness, HRB	92-100	95-102
Fatigue strength at 10 <sup>8</sup> , MPa	240-350	240-350
Elastic modulus, GPa	138	138
Thermal conductivity, W/m °C	240	240
Electrical conductivity, MS/m	32	32
Thermal expansion, ppm/°C	18	18
Magnetic permeability	1.000	1.000
Density, g/cm <sup>3</sup>	8.83	8.83

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