

Alloy 3 (C17510)

Technical Datasheet



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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.

Chemical Composition (weight %)

Weight (%)	Be	Ni	Fe	Cu
Min	0.2	1.4		
Max	0.6	2.2	0.1	Balance

Material Specifications

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

Fabrication

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

Availability

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

High Temperature Strength

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

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 ⁸ , 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 ³	8.83	8.83

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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