

Data Sheet

SULPHUR COPPER - C111/CW114C

C111 / CW114C is a free machining sulphur copper with a machinability rating of approximately 80% (free machining brass= 100%). The addition of sulphur to the copper creates Cu₂S copper sulphide within the microstructure that acts a chip breaker and forms the basis of the free machining capacity.

The free cutting properties of sulphur copper combined with its high retention of electrical and thermal conductivity values (usually only associated with purer coppers) enables its use in a wide variety of applications. The C111 / CW114C can also be machined at much higher speeds with lower tool wear, giving machinists and designers a more cost effective product.

Sulphur copper is de-oxidised during its manufacture by adding phosphorus, and as a result the material offers a freedom from hydrogen embrittlement. Other benefits of C111 / CW114C are high corrosion resistance, very good formability and can be joined easily by soldering.

Key Features:	
Excellent electrical conductivity	
Free machinability	
Freedom from hydrogen embrittlement	
Very good thermal conductivity	
High corrosion resistance	
Related Specifications:	
C111	CW114C
CuSP	C147700
Chemical Composition:	
Copper	Rem
Sulphur	0.2 - 0.7%
Phosphorus	0.003 - 0.012%
Total Imps	0.1% max

Typical Uses:

Traditional uses for C111 / CW114C Sulphur Copper are electrical components that require high conductivity values combined with free machining properties including; transformer and circuit breaker terminals, electrical contacts and connectors, clamps, cable glands and fasteners.

Typical Physical Properties:	
Melting point	1079°C
Density	8.94 g/cm ³
Specific heat	385 J/Kg °K
Thermal conductivity	347 W/m°C
Thermal expansion coefficient (20 - 200°C)	17.0 x 10 ⁻⁶ per °C
Electrical conductivity	93% IACS
Electrical resistivity	0.0181 microhm/m
Modulus of elasticity	12 500 Kg/mm ²
Fabrication Properties:	
Hot working temperature range	750 - 870°C
Hot formability	Good
Cold formability	Good
Cold reduction between anneals	70% max
Machinability rating (free cutting brass=100)	80%
Joining Methods	
Soldering	Excellent
Brazing	Good
Oxy-acetylene welding	Not recommended
Gas-shielded arc welding	Not recommended
Resistance welding: Spot and seam butt	Not recommended - Fair