

### Free Machining Sulphur Copper

#### Typical Applications

- Gas valve nozzles
- Cable glands & fasteners
- Circuit breaker terminals
- Electrical contacts

#### Product Description

C111 (CW114C) is a free machining sulphur copper with a machinability rating of approximately 80% (free machining brass = 100%). Commercially pure coppers are not the easiest metals to machine due to the materials softness. However, by introducing other alloying elements such as sulphur, this creates a 'free machining copper' with only slightly reduced conductivity. The addition of sulphur to the copper results in the effect of cutting the chips into short pieces - this enables a much higher machining speed than is possible with pure copper (up to 4 times). The material also promotes better tooling life expectancy.

C111 still retains high levels of electrical and thermal conductivity. It is a cost effective material since it can be machined at very high speeds without excessive tooling wear. C111 also offers a freedom from hydrogen embrittlement due to the addition of phosphorus in the deoxidisation process. Other benefits of the alloy include very good formability, it can be easily joined by soldering and offers high corrosion resistance.

#### Key features:

- Free machining alloy
- Higher machining speeds when compared with pure copper (up to 4 times quicker)
- High corrosion resistance
- Very good formability
- Very good weldability

#### Related material specifications

- BS2874 C111
- C14700
- BS EN12164 CW114C
- CuSP

#### Weldability

Can be easily joined by soldering

#### Corrosion Resistance

High corrosion resistance

#### Availability

Bar

#### Chemical Composition (weight %)

	Cu	S	Ph	Total Imps
min	Rem	0.2	0.003	
max	Rem	0.7	0.012	0.1%

#### Physical Properties

Density	8.94 g/cm <sup>3</sup>
Melting Point	1079 °C
Modulus of Elasticity	12500 Kg/mm <sup>2</sup>
Electrical Resistivity	0.0181 microhm m
Thermal Conductivity	347 W/m
Thermal Expansion (20-200°C)	17 x10 <sup>-6</sup> per °C

#### 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
Smiths Biggleswade	01767 604 704
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#### Quality & Testing:



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