

### SPECIFICATIONS

Commercial	PB102
EN	CW451K

Bronzes are Copper-based alloys with the major alloying element being Tin. They offer a combination of properties such as high strength, hardness, corrosion resistance and wear resistance.

Bronze alloy CW451K/PB102 is a Phosphor Bronze. Phosphor Bronzes are alloys of Copper and Tin. PB102 has good corrosion resistance and is known for its high fatigue strength. It also shows a good combination of strength and ductility.

#### Applications

CW451K/PB102 is typically used in:

- ~ Gears
- ~ Worm Gears
- ~ Bushes
- ~ Marine applications
- ~ Aircraft applications
- ~ Chemical applications
- ~ Springs

CW451K/PB102 is the most widely used of the wrought phosphor bronzes.

### CHEMICAL COMPOSITION

EN 1652:1998 CW451K	
Element	% Present
Tin (Sn)	4.50 - 5.50
Phosphorous (P)	0.01 - 0.40
Nickel (Ni)	0.0 - 0.20
Zinc (Zn)	0.0 - 0.20
Others (Total)	0.0 - 0.20
Iron (Fe)	0.0 - 0.10
Lead (Pb)	0.0 - 0.02
Copper (Cu)	Balance

### ALLOY DESIGNATIONS

CW451K/PB102 Bronze corresponds to the following designations **but may not be a direct equivalent:**  
 UNS C51000  
 ISO CuSn5

### SUPPLIED FORMS

CW451K/PB102 is typically supplied as Drawn round rod, Plate and Hard sheet

- Bar
- Plate
- Sheet

### GENERIC PHYSICAL PROPERTIES

Property	Value
Density	8.85 g/cm <sup>3</sup>
Melting Point	930 °C
Modulus of Elasticity	121 GPa
Thermal Conductivity	63 W/m.K
Electrical Resistivity	0.096 x10 <sup>-6</sup> Ω .m

### MECHANICAL PROPERTIES

EN 1652:1998 Sheet 0.1mm to 5.00mm	
Property	Value
Proof Stress	240-670 MPa
Tensile Strength	400-720 MPa
Elongation A50 mm	2-45 %
Hardness Vickers	75 to 230 HV

*Mechanical values are variable depending on the condition of the material i.e. 1/2 hard, 1/4 hard etc.*

*Mechanical values for bar are a typical average.*

### CORROSION RESISTANCE

Alloy CW451K/PB102 has good corrosion resistance, almost equivalent to that displayed by the Aluminium Bronzes.

### COLD WORKING

Cold working response of CW451K/PB102 is excellent.

### HOT WORKING

Hot formability of CW451K/PB102 is poor.

### HEAT TREATMENT

Solution treatment or annealing of CW451K/PB102 can be done by rapid cooling after heating to 500-700°C.

## MACHINABILITY

The machinability rating of CW451K/PB102 is rated as poor at 20 compared to Brass CZ121/CW614N which is rated as 100.

## WELDABILITY

Soldering, brazing and butt welding of CW451KPB102 are rated as excellent.

Oxyacetylene welding, seam welding and coated metal arc welding are rated as fair.

Spot welding and gas shielded arc welding are rated as good.

## CONTACT

Address:	Please make contact directly with your local service centre, which can be found via the Locations page of our web site.
Web:	<a href="http://www.amari-ireland.com">www.amari-ireland.com</a>

## REVISION HISTORY

Datasheet Updated	18 July 2019
-------------------	--------------

## DISCLAIMER

This Data is indicative only and as such is not to be relied upon in place of the full specification. In particular, mechanical property requirements vary widely with temper, product and product dimensions. All information is based on our present knowledge and is given in good faith. No liability will be accepted by the Company in respect of any action taken by any third party in reliance thereon.

Please note that the 'Datasheet Update' date shown above is no guarantee of accuracy or whether the datasheet is up to date.

The information provided in this datasheet has been drawn from various recognised sources, including EN Standards, recognised industry references (printed & online) and manufacturers' data. No guarantee is given that the information is from the latest issue of those sources or about the accuracy of those sources.

Material supplied by the Company may vary significantly from this data, but will conform to all relevant and applicable standards.

As the products detailed may be used for a wide variety of purposes and as the Company has no control over their use; the Company specifically excludes all conditions or warranties expressed or implied by statute or otherwise as to dimensions, properties and/or fitness for any particular purpose, whether expressed or implied.

Advice given by the Company to any third party is given for that party's assistance only and without liability on the part of the Company. All transactions are subject to the Company's current Conditions of Sale. The extent of the Company's liabilities to any customer is clearly set out in those Conditions; a copy of which is available on request.