

## Phosphor Bronze

### Specifications:

Commercial: **PB104**  
EN: **CW453K**

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 CW453K/PB104 is a high performance wrought Phosphor Bronze containing approximately 8% Tin. The addition of Tin gives exceptional bearing, wear and spring properties together with excellent fatigue properties in marine and other corrosive environments.

### Applications

CW453K/PB104 is typically used in the following:

- High strength fasteners
- Bearing bushes
- Drive shafts
- Pump and valve components
- Valve guides
- Electrical clamps
- Connectors and switchgear

### Alloy designations

CW453K/PB104 corresponds to the following designations but may not be a direct equivalent: C52100, BSB24, DTD265A, CuSn8 / CuSn8P.

### Supplied forms

CW453K/PB104 is typically supplied in the following: round bar, square bar, flat bar, hexagon bar.

### Corrosion resistance

Alloy CW453K/PB104 has very good corrosion resistance.

### Cold working

Cold working response of CW453K/PB104 is good.

### Hot working

Hot formability of CW453K/PB104 is considered poor.

## Heat treatment

Solution treatment or annealing of CW453K/PB104 can be done by rapid cooling after heating to 475-675°C. Stress relieving temperature 200-350°C.

## Machineability

The machineability rating of CW453K/PB104 is rated as poor at 20 compared to Brass CZ121/CW614N which is rated to 100.

## Weldability

CW453K/PB104 is rated as follows: Soldering excellent, brazing good, Oxyacetylene welding fair. Seam welding fair, spot welding good, butt welding excellent. Gas shielded arc welding is rated as good.

<b>General physical properties</b>	
<b>Property</b>	<b>Value</b>
Density	8.8g/cm <sup>3</sup>
Melting point	1020°C
Modulus of elasticity	105,000 N/mm <sup>2</sup>
Modulus of rigidity	39,000 N/mm <sup>2</sup>
Specific heat	377 J/Kg°C
Thermal conductivity	46 W/m °C
Electrical conductivity	12% IACS
Electrical resistivity	15 microhm cm
Thermal expansion	17 x 10 <sup>-6</sup> per °C

<b>Chemical composition</b>	
BS EN12163 CW453K	
<b>Element</b>	<b>% Present</b>
Tin (Sn)	7.50-9.0
Phosphorus (P)	0.02-0.40
Nickel (Ni)	0.30 max
Zinc (Zn)	0.30 max
Others (Total)	0.30 max
Iron (Fe)	0.10 max
Lead (Pb)	0.05 max
Copper (Cu)	balance

<b>Mechanical properties</b>	
BS EN12163 CW453K	
<b>Property</b>	<b>Value</b>
0.2% Proof stress	360 N/mm <sup>2</sup>
Tensile strength	500 N/mm <sup>2</sup>
Hardness Vickers	135-175 HV
Elongation	18%

Mechanical properties may vary widely according to condition (soft/half hard etc)

## **DISCLAIMER**

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