

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.

General physical properties	
Property	Value
Density	8.8g/cm ³
Melting point	1020°C
Modulus of elasticity	105,000 N/mm ²
Modulus of rigidity	39,000 N/mm ²
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 ⁻⁶ per °C

Chemical composition	
BS EN12163 CW453K	
Element	% Present
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

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

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

DISCLAIMER

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