

Bronze PB102

Bronzes are Copper based alloys. Major alloying elements are often, but not always, Zinc and Tin. They offer a combination of properties such as high strength, hardness, corrosion resistance and wear resistance.

Bronze alloy 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.

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

Applications

PB102 is typically used in:

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

Typical Chemical Composition

%	PB102
Cu	95
Pb	-
Sn	5
Fe	-
Al	-
Mn	-
Zn	-
Si	-
Ni	-

Typical Mechanical Properties

Half Hard Properties	PB102
Tensile Strength (MPa)	650
Proof Stress 0.2% (MPa)	560
Elongation A5 (%)	3
Hardness VPN	210-240

Typical Physical Properties

Property	Value
Density	8.85 g/cm ³
Melting Point	930°C
Modulus of Elasticity	121 GPa
Electrical Resistivity	0.096x10 ⁻⁶ Ω.m
Thermal Conductivity	63 W/m.K at 20°C

Alloy Designations

Bronze alloy PB102 corresponds to the following designations:

CEN	BS	UNS	ISO
CW451K	PB102	C51000	CuSn5

Note that CW451K is not an exact equivalent

Corrosion Resistance

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

Cold Working

Cold working response of PB102 is excellent.



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Hot Working

Hot formability of PB102 is poor.

Heat Treatment

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

Machinability

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

Welding and Joining

- ◆ Soldering, brazing and butt welding of PB102 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".

Supplied Forms

PB102 is typically supplied in the following forms:

- ◆ Drawn round rod
- ◆ Plate
- ◆ Hard sheet

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