SPECIFICATIONS

Commercial	PB102
EN	CW451K

Bronzes are Copper-based alloys with the major alloying elementbeing 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/cm³
Melting Point	930 °C
Modulus of Elasticity	121 GPa
Thermal Conductivity	63 W/m.K
Electrical Resistivity	0.096 x10^{-6} 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.

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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:	www.aalco.co.uk

REVISION HISTORY

Datasheet Updated	18 July 2019

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