

## BRASS FOR CASTING CB751S-G

The alloy CB751S-G has very good dezincification resistance and is suitable for use in sanitary water fittings.

### Composition

CB751S-G	Cu	Zn	Pb	Si	Fe	Sb
Limits	63.0-64.0%	Rem	0.8-2.2%	0.65-0.95%	0.25-0.50%	<0.05%

Al	Sn	Ni	Mn
<0.10%	<0.80%	<0.80%	<0.1%

### Standardization

Closest equivalent EN-standard:

CB751S	SS-EN 1982:2008
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### Dezincification resistance

The alloy is dezincification resistance, according to ISO 6509 and AS 2345-2006, appendix C.

### Physical properties

Property	Value	Unit
Density	8500	kg/m <sup>3</sup>
Melting temperature	900-920	°C
Heat capacity at 20°C	0.38	kJ/(kg°C)
Resistivity at 20°C <sup>1)</sup>	66	nΩm
Temperature coefficient for resistance at 20°C, 0-100°C	0.0017	°C
Conductivity at 20°C, 26% IACS <sup>1)</sup>	15	MS/m
Thermal conductivity at 20°C	120	W/m°C
Thermal expansivity, 20-300°C	21*10 <sup>-6</sup>	°C
Modulus of elasticity <sup>1)</sup>	109	GPa
Modulus of shearing <sup>1)</sup>	39	GPa

1) IACS = International Annealed Copper Standard. 100% IACS is equivalent to a resistivity of 17.241 nΩm and a conductivity 58 MS/m.

### Heat treatment

**Stress-relief annealing** Temperature 330-350°C. Time 2-4 hours. Stress-relieve annealing can be justified after machining. Heat treatment decreases the risk of stress corrosion cracking caused by internal stress. The reason is that iron arsenides, nickel arsenides and manganese arsenides have low solubility at lower temperatures which causes them to stay in the grain boundaries.

By keeping the temperature at 400°C solubility is increased and the arsenic spreads better in the  $\alpha$ -phase. This provides better corrosion resistance.

### Corrosion resistance

Copper is a relatively noble metal. Copper and its alloys therefore show little tendency to react with the environment.

As a result of this, the copper materials generally have good corrosion resistance. However, corrosion may occur under disadvantageous unfavorable conditions. The type of corrosion which may occur depends on both the environment and the composition of the alloy.

The corrosion resistance of cast alloys is:

Corrosion types	Corrosion resistance	Comment
Stress Corrosion Cracking, SCC	Satisfactory	This type of corrosion only occurs in the simultaneous presence of high stresses in the material, and a corrosive medium containing ammonia and moisture. See Heat treatment
Dezincification, DZR	Very good	
Erosion corrosion	Quite good	

### Castability

Castability is good. Suitable temperature is 980-1040°C. Slow cooling from the casting temperature must be applied so that no continuous strings of  $\beta$ -phase, which decreases the corrosion resistance, are left after cooling.

### Machinability

High surface quality is easy to achieve. The chips are short. The alloy is suitable for machining in automatic machines.

Material: Tungsten carbide or high speed steel according to ISO-group K 10

Cutting data	Tungsten carbide	High speed steel
Rake angle	2-6°	0-3°
Back rake angle	0°	0°
Clearance angle	4-6°	0-6°
Cutting speed	Approx. 300 m/min or faster	Approx. 150 m/min or faster
Cutting fluid	Dry or cutting oil	Emulsion or cutting oil

### Welding and brazing

The high lead content means that in welding, the material becomes hot brittle and the weld is porous. The following applies to the different welding methods:

Welding method	Suitability	Comment
Fuse welding and resistance welding	Poor	Cannot be carried out with good results.
Braze welding	Poor	Cannot be carried out with good results because of the minimal difference between the melting temperature of the base metal and the working temperature of the solder.
Brazing (hard soldering)	Satisfactory, can be carried out with a silver solder and silver-phosphorus-copper solder	Difficult to carry out with a phosphorus-copper solder and cannot be carried out with satisfactory results with a brass solder (see Braze welding).
Soldering	Excellent	Very easy to carry out.

### Surface treatment

**Mechanical surface treatment** such as grinding, brushing, blasting and polishing is carried out by conventional methods.

**Pickling** (non-oxidizing pickling) is suitably carried out with diluted sulphuric acid at room temperature.

**Pickling** to a metallurgically clean surface (oxidizing pickling) is suitably carried out in a pickling bath containing oxidants such as peroxide, nitric acid or dichromate. For pickling to a high gloss, baths containing nitric acid are mainly used.

**Chemical and electrolytic polishing** is easy to carry out with mixtures of concentrated acids, e.g. phosphoric acid, nitric acid and acetic acid.

**Polishing** is suitably carried out with commercial cleaning products for copper.

**Dark dyeing** is easy to carry out by wet chemical methods, dark sulphide or oxide layers being obtained.

**Varnishing** with clear varnish means that the appearance obtained after cleaning or dyeing, for example, is retained for a long time. Clear varnishes containing a discoloring inhibitor are available for demanding applications.

**Metallization** (metallic surface coating) is easy to carry out.