

## Copper-aluminium casting alloy **EBG** alloy 1610

**EBG** has high corrosion resistance to water containing Cl, hot and cold seawater, neutral and acidic aqueous media, as well as to non-oxidising acids and sulphide/bleaching lye. The material has relatively high strength values, high resistance to erosion and cavitation, good abrasion resistance and good fatigue behaviour. Good pressure tightness and excellent weldability mean it is predominantly used for castings exposed to corrosion in shipbuilding, the food and chemical industry as well as in pump and valve construction.

ZOLLERN brand	EBG
EN designation	CuAl10Fe5Ni5-C
EN material no:	CC333G

EN 1982, BS 1400

### // National designations

DIN	G-CuAl10Ni
DIN	2.0975
USA	≈ C95500 ≈ C95800
GB	AB 2 ≈ DEF STAN 747
F	U - E12P

≈ (substantial coherence)

### // Composition (mass fraction in %) EN 1982, BS1400-AB2\*

Cu	Al	Fe	Ni	Mn
76.0 – 83.0	8.5 – 10.5 8.8 – 10.0*	4.0 – 5.5	4.0 – 6.0 4.0 – 5.5*	max. 3.0
Pb	Si	Sn	Zn	
max. 0.03	max. 0.1	max. 0.1	max. 0.50	

Also possible according to Def Stan 747 (Z-1568), C95500 (Z-1820), C95800 (Z-1890).  
The requirements Ni => 5 %, Ni > Fe and Al <= 8.2 + Ni/2 are fulfilled by the Zollern core material Z-1650 – EBG-Navy.

### // Strength properties at room temperature

	(minimum values)			
[1] EN 1982 [2] BS 1400 [3] Def Stan 747	R <sub>m</sub> N/mm <sup>2</sup>	R <sub>p0.2</sub> N/mm <sup>2</sup>	A <sub>5</sub> %	HB
[1] Sand casting	600	250	13	140
[1] Mask mould casting	600	250	13	140
[1] Centrifugal casting	650	280	13	150
[2] Sand casting	640	250	13	-
[3] Sand casting	620	250	15	-

### // Strength properties

at elevated temperatures (reference values)

Temperature	°C	20	150	200	250	300
Tensile strength	R <sub>m</sub> N/mm <sup>2</sup>	600	485	430	395	350
0.2% limit	R <sub>p0.2</sub> N/mm <sup>2</sup>	270	265	260	258	254
Elongation at break	A <sub>5</sub> %	12	7	5	-	-

### // Physical properties

Density at 20°C	7.6 kg/dm <sup>3</sup>
Specific heat capacity at 20°C	0.42 J/g x °C
Thermal conductivity at 20°C	0.51 W/cm °C
Electrical conductivity at 20°C	4.6 MS/m approx. 8 % IACS
Electrical resistance at 20°C	0.215 Ω mm <sup>2</sup> /m
Temperature coefficient of the electrical resistance at -100 to 200°C	0.0001 °C <sup>-1</sup>
Young's modulus	110 – 128 KN/mm <sup>2</sup>
Permeability	< 1.9

### // Dynamic strength values

at room temperature (reference values)

Bending fatigue strength R <sub>bw</sub> at 10 <sup>8</sup> load cycles	185 N/mm <sup>2</sup>
Notched impact energy (ISO - V/KV)	20 joules

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### Areas of application

- Wings and hubs, Kaplan blades for ship drives, made from EBG
- Underbodies, covers and other castings in condenser and heat exchanger construction
- Valve housings and parts for shipbuilding, also for submarines, hydraulic parts, pump housings, impellers in contact with seawater and other chlorinated liquids
- Engine parts such as cylinder heads, cooled exhaust pipes, manifolds and connectors
- Pickling hooks

### Machinability

Carbide tools are needed for turning and milling and sharp drill bits are needed for drilling and thread cutting. This results in machinability that is better than that of austenitic steel. Shorter rolling and flowing chips are formed.

**Relaxation annealing** 650 – 700 °C  
(improves corrosion resistance)

**Soft soldering** not recommendable

**Brazing** poor, fluxes containing fluoride and chloride (type F – SH 1) silver solders are advantageous

**Welding** good, both TIG, MIG and also electrode manual welding are possible. Suitable filler material CuAl8 = CF309G, CuAl9Ni4Fe2Mn2 = CF310G or S-CuAl8Ni2

**Galvanisability** possible, good cleaning and pretreatment necessary

