ZOLLERN

Solid metals. Fine solutions.

Copper-aluminium casting alloy **VBG** alloy 1670

VBG is a construction material with high strength properties. It is corrosion resistant in hot and cold seawater. VBG has good abrasion and wear resistance. With good lubrication and a hardened shaft, high bearing loads are permissible. In the case of low sliding speeds, e.g. swivel movements or dynamic loads, load peaks of up to approx. 25 KN/cm² are permissible.

ZOLLERN brand	VBG
EN designation	CuAl11Fe6Ni6-C
EN material no:	CC334G
	EN 1982

// National designations / ISO

DIN	G-CuAl11Ni
DIN	2.0980
USA	≈ C 95500

≈ (substantial coherence)

// Composition (mass fraction in %) EN 1982

Cu	Al	Fe	Ni	Mn
72.0 – 82.5	10.0 – 12.0	4.0 – 7.0	4.0 – 7.5	max. 2.5
Pb	**Si**	**Sn**	**Zn**	**Mg**
max. 0.05	max. 0.1	max. 0.2	max. 0.50	max. 0.05

// Strength properties at room temperature

	(minimum values)			
[1] EN 1982	R_m N/mm²	$R_{p0.2}$ N/mm²	A_5 %	HB
[1] Sand casting	680	320	5	170
[1] Mask mould casting	680	320	5	170
[1] Centrifugal casting	750	380	5	185

// Strength properties at elevated temperatures (reference values)

Temperature	°C	20	150	200	250	300
Tensile strength	R_m N/mm²	680	600	570	545	520
0.2% limit	$R_{p0.2}$ N/mm²	320	315	313	312	310
Elongation	A_5 %	5	2	1	-	-

// Physical properties

Density at 20 °C	7.6 kg/dm³
Melting temperature/range	1030 – 1050°C
Specific heat capacity at 20°C	0.435 J/g x °C
Thermal conductivity at 20°C	0.34 W/cm °C
Electrical conductivity at 20°C	2 – 4 MS/m 3 – 7 % IACS
Electrical resistance at 20°C	0.14 – 0.33 Ω mm²/m
Coefficient of linear expansion in the range 20 – 200°C	17 x 10^{-6} °C^{-1}
Shrinkage	approx. 1.5 – 2 %
Young's modulus	125 KN/mm²
Permeability	< 1.9

// Dynamic strength values at room temperature (reference values)

Bending fatigue strength R_{bw} at 10^8 load cycles	205 N/mm²
Notched impact energy (ISO - V/KV)	12 joules

ZOLLERN

Solid metals. Fine solutions.

Copper-aluminium casting alloy **VBG** alloy 1670

VBG is a construction material with high strength properties. It is corrosion resistant in hot and cold seawater. VBG has good abrasion and wear resistance. With good lubrication and a hardened shaft, high bearing loads are permissible. In the case of low sliding speeds, e.g. swivel movements or dynamic loads, load peaks of up to approx. 25 KN/cm² are permissible.

Areas of application

VBG is used for

- Internal parts of high-pressure fittings and hydraulics
- Worm and screw wheels for high loads and low sliding speeds
- Articulated jaws and pressure nuts in mechanical engineering
- Plain bearings, swivel bearings, crank bearings and knee lever bearings with high impact load
- Also suitable for Francis wheels, Kaplan blades and pump impellers

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	approx. 600 – 700°C
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 manual electrode welding is possible. Suitable filler material CuAl9Ni4Fe2Mn2 = CF310G or S-CuAl8Ni2
Galvanisability	possible, good cleaning and pretreatment necessary

ZOLLERN GmbH & Co. KG

Hitzkofer Straße 1
72517 Sigmaringendorf-Laucherthal
Germany
T +49 7571 70-984
F +49 7571 70-82984
zgm@zollern.com
www.zollern.com