

Copper-tin casting alloy **GBz 12 Ni** alloy 3280

GBz 12 Ni belongs to the group of copper-tin alloys. Due to the addition of nickel and reduced lead content, the material has very good wear resistance for sliding elements such as worm wheels and does not tend to form pits. With worm wheels, surface pressures of up to 12 KN/cm² are possible during continuous running, depending on the sliding speed.

ZOLLERN brand	GBz 12 Ni
EN designation	CuSn12Ni-C
EN material no:	CC484K

EN 1982, ASTM B 427, BS 1400

// National designations / ISO

DIN	G-CuSn12Ni
DIN	2.1060
USA	C91700
GB	CT 2
F	U - E12P

// Composition (weight by percent in %) EN1982 / C91700

Cu	Sn	Ni	P	Pb	Zn
84.5 - 87.5	11.0 - 13.0	1.5 - 2.5	0.05 - 0.40	max. 0.3	max. 0.4
85.4 - 86.9	11.3 - 12.5	1.2 - 2.0	max. 0.3	max. 0.25	max. 0.25

// Strength properties at room temperature

	(minimum values)			
	R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	HB
[1] EN 1982 / BS1400* [2] ASTM B427, Rp0.5**				
[1] Sand casting	160	280	12	85
[1] Mask mould casting	160	280	12	85
[1] Centrifugal casting	180	300	8 (10*)	95
[2] Sand casting	117**	241	10	65
[2] Centrifugal casting	193**	345	12	95

// Strength properties at elevated temperatures (reference values)

Temperature	°C	20	150	200	250	300
0.2% limit	R _{p0.2} N/mm ²	160	148	145	140	136
Tensile strength	R _m N/mm ²	280	267	247	215	200
Elongation at break	A ₅ %	14	14	15	9	7

// Physical properties

Density at 20 °C	8.60 kg/dm ³
Melting temperature/range	830 – 1,010°C
Shrinkage	approx. 1.5 %
Coefficient of linear expansion in the range 20° to 200°C	17,5 x 10 ⁻⁶ °C ⁻¹
Electr. conductivity at 20°C	5 - 7 MS/m approx. 10 % IACS
Electr. resistance at 20°C	0.166 Ω mm ² /m
E-module	90 - 110 KN/mm ²
Permeability	< 1.01
Shear strength	approx. (0.75 - 0.80) x Rm
Surface pressure	during continuous running up to 12 KN/cm ² short-term up to 45 KN/cm ²

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Areas of application

Particularly suitable

- for low-noise worm gears, even at high sliding speeds
- Highly loaded dome and die stones
- Spindle nuts
- Valve and pump parts such as housing and guide/impeller wheels

Machinability

GBz 12 Ni is easy to machine.

Turning, milling, drilling etc. is possible without problems. Relatively short rolling chips are formed.

Relaxation annealing 400 – 600°C

Soft soldering good

Brazing good

Welding TIG, MIG and manual electrode welding is possible. However, there is danger of heat cracks in some cases.

Suitable filler material
CuSn8 = CF453 K or
CuSn12 = CF461 K

Galvanisability good, but denser casting necessary

