

Wrought copper-zinc alloy special brass **BZ 2** alloy 2175

BZ 2 is a construction and sliding material with high strength. It is resistant to atmospheric corrosion as well as to slightly aggressive water and gases. BZ 2 is well suited for medium sliding speeds and medium surface pressures. A hard counterpart material is recommended.

ZOLLERN brand	BZ 2
EN designation	CuZn37Mn3Al2PbSi
EN material no:	CW713R

EN 12420:1999 Forgings
EN 12164:2016 Bars drawn
EN 12167:2016 Profiles drawn

// National designations / ISO

DIN	CuZn40Al2
DIN	2.0550
ISO	≈ CuZn39AlFeMn
USA	≈ C 67400
GB	≈ CZ 114
F	≈ U - Z36N3

≈ (substantial coherence)

// Composition (weight by per cent in %)

Cu	Al	Fe	Mn	Ni
57.0 – 59.0	1.3 – 2.3	max. 1.0	1.5 – 3.0	max. 1.0
Pb	Si	Sn	Zn	Other
0.2 – 0.8	0.3 – 1.3	max. 0.4	Rest	max. 0.3

// Strength properties at room temperature

(minimum values)

	R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	HB
[1] EN 12420:1999 [2] EN 12164:2016 min. 200 kg [3] EN 12167:2016 min. 200 kg				
[1] Forgings and die-forged parts up to 80 mm thickness	230	510	12 ^(*)	140
[1] Forgings over 80 mm thickness	180	470	16 ^(*)	125
[2] Rods, drawn to 30 mm Ø thickness or SW	370	590	10	150- 220
[3] Profiles, drawn to 10 mm thickness	370	590	10	150- 220
[3] Profiles, drawn to 20 mm thickness	280	540	15	130- 170

(*) for long forgings, tensile test in longitudinal direction, for rings or discs however only A₅ min 10%, Not suitable for rings / bushings wall thickness > 100 mm

// Physical properties

Density at 20 °C	8.1 kg/dm ³
Melting temperature/range	875 – 910°C
Coefficient of linear expansion from 20° to 100°C	19 x 10 ⁻⁶ °C ⁻¹
Specific heat at 20°C	0.356 J/g x °C
Thermal conductivity at 20°C	0.63 W/cm x °C
Electr. conductivity at 20°C	7 - 9 MS/m 12 - 16 % IACS
Electr. resistance at 20°C	0.11 - 0.14 Ω mm ² /m
Temperature coefficient of the electrical resistance (0 - 100°C)	0.0009 °C ⁻¹
Permeability	< 1.03
Young's modulus	87 KN/mm ²
Shear modulus G	35 KN/mm ²

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

Rotational bending fatigue strength R _{bw} at 20 x 10 ⁶ load cycles	170 N/mm ²
Notched impact energy (ISO - V/KV)	20 joules

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Areas of application

Due to the improved sliding properties resulting from the addition of Si and Pb, **BZ 2** is particularly suitable for sliding stresses.

For example

- for slide and guide rails in mechanical engineering
- for bearing bushes in plain bearings with medium load
- Valve guides
- worm wheels
- Spindle nuts
- Thrust pads

BZ 2 is insensitive to oil corrosion, which is why a large number of transmission parts such as synchroniser rings, shift forks and piston rings for air compressors are also made of it.

Machinability

BZ 2 has good hot and limited cold forming properties. Machining is easily possible. The cutting index is 40 where $CuZn39Pb3 = 100$. The low Pb addition results in shorter spiral chips.

Relaxation annealing 350 – 450°C

Soft annealing 500 - 650°C

Soft soldering less suitable

Brazing less suitable

Welding Inert gas-shielded arc welding is possible. However, smoke is generated due to the evaporation of Zn (smoke extraction).

Surface treatment BZ 2 can be polished well, both mechanically and as well as chemically or electrochemically. Galvanic coatings are possible, care must be taken to ensure good pre-treatment

