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Copper-tin-zinc casting alloy **Rg 5** alloy 2950

Rg 5 is a construction material. It is easy to cast and resistant to seawater.
Because of the porous solidification in the middle of thick areas, the material should only be used for thin-walled components if dense parts are required. Rg 5 does not become brittle at low temperatures.

ZOLLERN brand	Rg 5
EN designation	CuSn5Zn5Pb5-C
EN material no:	CC491K
	EN 1982

// national designations

DIN	G-CuSn5ZnPb
DIN	2.1096
USA	≈ C83600
GB	LG2
F	≈ U – E5Pb5Z5

≈ (substantial coherence)

// Composition (mass fraction in %)

Cu	Ni	P	Sn	Pb	Zn
83.0 – 87.0	max. 2.0	max. 0.10	4.0 – 6.0	4.0 – 6.0	4.0 – 6.0

Al	Fe	S	Sb	Si
max. 0.01	max. 0.3	max. 0.10	max. 0.25	max. 0.01

// Strength properties at room temperature

	(minimum values)			
[1] EN 1982 [2] BS 1400	R_m N/mm²	$R_{p0.2}$ N/mm²	A_5 %	HB
[1] Sand casting	200	90	13	60
[1] Mask mould casting	200	90	13	60
[1] Centrifugal casting	250	110	13	65
[2] Sand casting	200	~ 100	13	-
[2] Centrifugal casting	220	~ 110	8	-

// Strength properties at elevated temperatures (reference values)

Temperature	°C	20	150	200	250	300
Tensile strength	R_m N/mm²	220	200	194	188	182
0.2% limit	$R_{p0.2}$ N/mm²	90	76	70	65	59
Elongation	A_5 %	16	13	11	10	8

// Physical properties (reference values)

Density at 20°C	8.7 kg/dm³
Melting temperature/range	860 – 1030°C
Shrinkage	approx. 1.5 %
Coefficient of linear expansion in the range from 20°C to 200°C	18 x 10^{-6} °C^{-1}
Electrical conductivity at 20°C	7 – 9 MS/m 12 – 16 % IACS
Electrical resistance at 20°C	0.11 - 0.14 Ω mm²/m
Young's modulus	89 KN/mm²
Permeability	< 1.01
Thermal conductivity	0.71 W/cm °C

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

Bending fatigue strength R_{bw} at 10^8 load cycles	75 N/mm²
Notched impact energy (ISO - V/KV)	17 joules

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Areas of application
Rg 5 is used for thin-walled castings such as
- Pump housing manifolds, flanges in the cooling water circuit of marine diesel engines
- Parts for water and steam fittings up to operating temperatures of approx. 225°C

Machinability
Rg 5 is easy to machine.
Short chips are formed.

Machinability index	approx. 80 (CuZn39Pb3 = 100)
Relaxation annealing	400 – 600 °C
Soft soldering	good
Brazing extent	only suitable to a limited
Welding	Rg 5 can only be welded to a limited extent. The material has a tendency to hot cracking. Larger parts must be preheated and cooled in the furnace. Suitable filler material e.g. CuSn8 = CF453K
Galvanisability	good, but denser casting necessary
Surface treatment	blasting, grinding and polishing are easily possible

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