

Copper-Chromium Casting Alloy **CCG** alloy 1080

CCG is a construction material with high electrical and thermal conductivity. At the same time, its strength values are considerably higher compared to cast pure copper, both at room temperature and at elevated temperatures. CCG offers similar electrical conductivity to cast pure copper, with improved strength values. The parts are delivered in a fully heat-treated state.

ZOLLERN brand	CCG
EN designation	CuCr1-C
EN material no:	CC140C

EN 1982, ASTM

// National designations / ISO

DIN	G-CuCr F35
DIN	2.1292
USA	C81500
GB	CC1-Wp
F	U – Cr0.8Zr

// Composition (mass fraction in %) EN 1982, * ASTM

Cu	Cr	Fe, Al, Sn, Zn*	Si*	Pb*	Other
Rest	0.4 – 1.2	max. 0.10	max 0.15	max 0.02	max 0.5

// Strength properties at room temperature

(minimum values)					
[1] EN 1982 [2] DIN 17665	R _m N/mm ²	R _{p0.2} N/mm ²	A ₅ %	HB	
[1] Sand casting	300	200	10	95	
[2] Sand casting	350	250	10	110	

// Physical properties (reference values)

Density at 20 °C	8.9 kg/dm ³
Melting temperature/range	1075 – 1085°C
Thermal conductivity at 20°C	3.14 W/cm °C
Electrical conductivity at 20°C	45 MS/m 77 % IACS
Electrical resistance at 20°C	0.022 Ω mm ² /m
Coefficient of linear expansion from 20°C to 200°C	17 x 10 ⁻⁶ °C ⁻¹
Shrinkage	approx. 2 %
Young's modulus	98 KN/mm ²
Permeability	< 1.01

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Areas of application

CCG is used when, in addition to high electrical conductivity, high strength values are required at the same time.

For example

- Electrode holder, welding tong arms, copper backup bars, contact parts and clamping pieces in welding machine construction and resistance welding technology
- Contact parts for transformers, generators
- Cooling elements and furnace parts manufactured for chemical and metallurgical processes

Machinability

CCG is moderately easy to machine. Due to its higher hardness compared to pure copper, the machinability index is approx. 20 ($\text{CuZn39Pb3} = 100$), while pure copper is 10.

Relaxation annealing 250 – 400 °C

Soft soldering good

Brazing suitable to a limited extent, strength degradation occurs depending on the soldering temperature and soldering time

Welding not suitable, similar filler wires of the same type are not available. For larger parts, preheating up to approx 600°C is necessary, which results in a loss of strength in the base material. The heat treatment may then have to be repeated or the welding may need to be carried out before the heat treatment

Galvanisability good

