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Technical Data Sheet:
CMG Tech-X Copper HMs metal filament for 3D printing

Description

Copper is a malleable pure metal with high thermal and electrical conductivity. CMG Tech-X Copper HMs filament is a metal-polymer composite containing more than 90 percent by weight fine high-conductivity copper powder, allowing printing of parts with high quality surface. Filaments are available in 1.75 mm and 2.85 mm diameters. Parts printed with CMG Tech-X Copper HMs filament can be used in applications such as complex heat sinks and induction coils.

Fig. 1: Sintered heat sink printed with CMG Tech-X Copper HMs filament.

Scaling factor

Typical values:
x-y: 119%
z: 118%

Range: 116-121% depending on printing parameters, build direction, part size, part geometry and sintering conditions

Shelf life

6-12 months if properly stored. Keep away from moisture. Store in a dry and clean place at room temperature.

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Typical printing parameters:
Nozzle temperature: 120-160 °C, typical 140-160 °C (direct drive printers) & 150-160 °C (Bowden tube printers)
Print bed temperature: 20-30 °C

Debinding & Sintering
Debinding:
At CMG Technologies or with appropriate debinding station. Debinding is carried out in acetone at 42 °C with weight loss of 5-6 %. Typical debinding time is 24-72 hours depending on size of part, wall thickness and infill %.

Sintering:
At CMG Technologies or with appropriate sintering furnace. Sintering is carried out at 1000-1060 °C for 1-2 hours in H_2 atmosphere with backbone polymer removal at 600 °C. Backbone polymer removal should be carried out under overpressure or vacuum for bright sintered parts.

Typical properties:
All measurements were carried out by external analytical labs. Mechanical property, hardness and density measurements are in accordance with BS EN ISO 6892-1 - 2019, ASTM E92 and RP146, respectively. All test specimens were printed flat in x-y printing direction.

Property	**As-sintered**
Yield strength, 0.2% offset (MPa)	34-38
Tensile strength (MPa)	150-154
Elongation (%)	31-35
Hardness, HV 1kg	40
Density (g/cm^3)	> 8.3
Electrical conductivity (MS/m)	TBC
Thermal conductivity (W/mK)	TBC

Any information supplied above are general recommendations and shall be used for informational and guidance purposes only. No information shall be used for other purposes without agreement with customer.