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Technical Data Sheet:
CMG Tech-X H13 tool steel HMs metal filament for 3D printing

Description

H13 tool steel is an air hardening chromium die steel used for a range of applications such as hot forging and pressing dies. The higher vanadium content ensures increased resistance to heat checking and all-round improvement to properties at elevated temperatures. CMG Tech-X H13 HMs filament is a metal-polymer composite containing more than 90 percent by weight fine metal 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 H13 HMs filament can be used for cutting tools, dies, moulds, etc.

Fig. 1: Sintered mould cavity printed with CMG Tech-X H13 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

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

Typical printing parameters:
Nozzle temperature: 120-160 °C, typical 125-135 °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 1280 °C for 1-2 hours in N_2 atmosphere with backbone polymer removal at 600 °C.

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, ASTM E92 and RP146, respectively. All test specimens were printed flat in x-y printing direction.

Property	**As-sintered**	**Heat treated**
Yield strength, 0.2% offset (MPa)	n/a	650-700
Tensile strength (MPa)	600-660	1000-1100
Elongation (%)	2.5-5.5	2.5-5.5
Hardness, HV 10kg	536	613
Density (g/cm^3)	7.42-7.85	7.42-7.85

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.