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Date: 24/03/2023

Version No. 1.1

Tips to print CMG Tech-X HMs metal filaments on BCN3D Epsilon 3D printers

Filament loading & feeding

CMG Tech-X HMs metal filaments are available in **316L stainless steel, 17-4PH stainless steel, H13 tool steel, Inconel 625 superalloy, Inconel 718 superalloy, copper and 100Cr6 hardening steel**. Due to the rigid & fragile nature while remaining bendy & flexible of CMG Tech-X HMs metal filaments, it is highly recommended to place the spool behind the printer for loading (Fig. 1).



Fig. 1: CMG Tech-X HMs metal filament spool on holder behind BCN3D Epsilon 3D printer

The screw attached to the dual gear drive must be loosened (Fig. 2) to reduce pressure and grinding on the filament while still driving the filament for effective feeding through the printing nozzle. The BCN3D screw supplied could be replaced with a longer screw to allow more leverage to reduce the dual gear pressure on filament. A softer spring could also be used to achieve the same effect.

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Fig. 2: Screw on dual gear drive loosened to reduce pressure and grinding on filament while still driving the filament for effective feeding through the printing nozzle

Bed Adhesion

Blue painter's tape (Fig. 3) or similar is recommended as bed adhesion material for printing CMG Tech-X HMs metal filaments. The print bed temperature should be set to 20 °C. The adhesion type should be brim or skirt. After printing, gently lift the blue tape from the sides to pop-up the part without breaking it. Alternatively, a clean and sharp-edged wide metal spatula could be used to remove part by gently pushing underneath to pop-up part.



Fig. 3: Blue painter's tape for use as bed adhesion material when printing CMG Tech-X HMs metal filament on BCN3D Epsilon 3D printers. The bed temperature should be set to 20 °C.

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Filament treatment for printing

Should the filament get brittle after exposure to the surroundings, it is recommended to warm the spool with filament in an oven at 30-40 °C for about 1-2 hours to bring up the flexibility. Please don't go above 40 °C.

Printing mode & nozzle

It is highly recommended to turn on "Alternate Wall Direction" & "Alternate Infill Direction" modes in the BCN3D Stratos software when printing CMG Tech-X HMs metal filaments. These modes prevent torsion warping during debinding and sintering of printed parts.

Hardened steel nozzle hotends supplied by BCN3D must be used to print CMG Tech-X HMs metal filaments. 0.6 mm nozzle diameter is the most suitable for printing CMG Tech-X HMs metal filaments on BCN3D Epsilon printers to achieve a balance between fast printing and quality parts. 0.4 mm nozzle diameter can also be used for printing. However, bear in mind that the smaller nozzle will put more pressure on the filament during feeding, leading to grinding of the filament. In fact, most parts or a lot of parts can be printed with 0.6 mm nozzle diameter with decent quality and detail.

To reduce metal filament consumption, save costs and benefit from lightweightness, it is highly recommended to print parts with infill % e.g. 35-80 % if it suits the application requirements. An infill % below 35 % can also be printed with CMG Tech-X HMs metal filaments.

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.