

LUVOCOM 3F PA^{HT}® CF 9891 BK Printing Guidelines

LUVOCOM 3F PA^{HT}® CF 9891 BK is a polyamide based formulation containing carbon fibers with the ability to be printable on non-heated chamber machines. It has excellent tensile and impact strength and allows continues use up to 150°C while retaining 50% of its mechanical properties. Its water uptake takes about 4 times longer to reach the saturation point compared to unmodified PA6, also its saturation point is 5 times lower than conventional PA6 materials. A special point of attention is the abrasive nature of the carbon fibers. In general these fibers will accelerate the nozzle-wear of brass nozzles, much faster than unfilled filaments. LEHVOSS Group recommends the use of a $\varnothing > 0.5$ mm abrasion resistant nozzle and layer thicknesses ≥ 0.2 mm.

Safety

For the safety properties of the material, please refer to our SDS. During practical operation wear personal safety protections for hand/eye/body. Prior start printing you should read the entire document.

Support Material Compatibility

LUVOCOM 3F PA^{HT}® CF 9891 BK is fully compatible with water soluble supports such as PVA, PVOH, BVOH. Also it is fully compatible with breakaway supports such as HIPS.

Startup/Shut Down

Before the production start feed it with dried material and extrude at least 50 mm of new filament through the nozzle to make sure any residue from previous prints are removed. Be sure to have a levelled build plate. Prior to applying an adhesive promotor, any surface must be free from dirt and grease. Therefore cleaning with ethanol or IPA is recommended. Remove the filament from the machine before shutting down the printer, and store the unused filament properly. Clean the build plate after each printing.

Production Breaks: If there are production interruptions exceeding a few minutes, purge the nozzle adequately.

Generic Machinery Settings

LUVOCOM 3F PA^{HT}® CF 9891 BK has been tested using various 3D printers, which has resulted in the following recommended settings. Geometrical requirements of the application or the printer used could make adjustments necessary to obtain the best result. Common fused filament fabrication (FFF) equipment should work with LUVOCOM 3F filaments, direct drive as well as bowden type extruders. Typical settings for any slicing software (e.g. Cura, Simplify3D) are listed below. These generic settings are established for a 0.6mm Nozzle Diameter and a Glass Build Plate surface with an adhesion promotor (Magigoo PA®).

Note: Different nozzle diameters and/or a different build plate surface, the settings should be changed accordingly.

- Nozzle: $\varnothing > 0.5$ mm abrasion resistant nozzle
- Print speed: 40 - 60 mm/s, layer height: Layers: ≥ 0.2 mm, brim/skirt: 02 outlines with 1 layer
- Extrusion temperatures: 260°C - 280°C, build plate temperature: < 80 °C.

Note: prior to removing the printed part from the bed, the bed temperature should be lowered to ambient to avoid deformation of the part. Build plate adhesion: The material has been tested on buildTak®, glass bed and aluminium bed. When printing on glass and aluminium bed we advise using Magigoo PA® to obtain better adhesion to the plate. Cooling fan: A 50% fan speed as default. Use less fan speed if the print geometry allows for this.

Troubleshooting

Most common issues:

- First layer not sticking / parts coming loose: Check bed levelling and first layer thickness, increase size of brim, add appropriate adhesion promotor (Magigoo PA®) to the build plate.
- Oozing/Stringing: Enable retraction, or increase the retraction length and/or speed. If that doesn't improve make sure that the material is completely dried.
- Filament grinding: Remove the damaged filament and start again, reduce printing speed, reduce retraction speed and length. Increase the extruder temperature.
- Warping: Check bed levelling and first layer thickness. Increase the Brim and/or print the part in another direction.

Filament Handling

Storage: In order to prevent moisture pick up and contamination, supplied packaging should be kept closed and undamaged. For the same reason, partially used bags should be re-sealed before storage. Allow the material that has been stored elsewhere to adapt to the temperature in the processing room while keeping the bag closed.

Packaging: LUVOCOM 3F PA^{HT}® CF 9891 BK is supplied in vacuum re-sealable aluminium moisture-proof packaging.

Moisture content as delivered: LUVOCOM 3F PA^{HT}® CF 9891 BK is packaged at a moisture level < 300 ppm.

Drying: In case the filament has become wet, it should be dried. Using a hot dry air oven at 80°C for at least 12h is recommended.

3D PRINTING MATERIALS

Experience the 3Difference

LUVOCOM® 3F FILAMENT

Additive manufacturing solutions

- Extrusion based processes
- Product: filaments
- Carbon fiber reinforced and unreinforced materials

LUVOCOM® 3F

Additive manufacturing solutions

- Extrusion based processes
- Product: pellets
- Composite materials (CF, GF), tribological, electrically and thermally conductive

LUVOSINT®

Additive manufacturing solutions

- Powder fusion processes
- Product: powder
- Nano-filled materials

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