

Printing Process Guide For Funmat HT

I Attention

Build plate leveling is very important. After completed leveling, user may now proceed with the first-layer printing. In the event that the filament does not extrude or the extrudate does not adhere to the glass plate, user can adjust the three screws under the build plate until the filament extrusion is smooth and achieved good adhesion on the glass plate.

	PLA	FLEX	ABS	NYLON	PC	NYLON /CF	PEEK	ULTEM 1010	ULTEM 9085	PPSU
Nozzle used	Normal temp nozzle						High temp nozzle			
Nozzle Temp.(°C)	210	240	240	265	255	270	400	370	360	390
Build plate Temp. (°C)	40	60	90	75	100	80	145	160	140	160
Chamber Temp.(°C)	0	0	40	0	60	60	90	90	90	90
Four sides enclosed	Up and front doors open		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Build plate	The smooth side of glass plate + PVP glue		The smooth side of glass plate + PVP glue, Apply no less than 4 layers of glue when glass plate is cold				The frosted side of glass plate + PVP glue,Apply no less than 4 layers of glue when glass plate is cold			
Fan speed	100%	100%	50%	0	50%	0	50%	0	0	0
Layer thickness (mm)	0.05-0.3	0.1-0.3	0.05-0.3	0.05-0.3	0.05-0.3	0.1-0.3	0.1-0.3	0.1-0.3	0.1-0.3	0.1-0.3
Print speed(mm/s)	30-80	10-25	25-60	25-60	25-60	25-60	20-50	20-50	20-50	20-50
Filament dry condition	50 C /10h	60 C /10h	80 C /4h	80 C /10h	80 C /10h	80 C /12h	150 C /5h	150 C /6h	130 C /6h	160 C /6h
Annealing	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Others	Please refer to Annex 1									
Build plate leveling	Preheat the printer before build plate leveling for more than 30min at will-printing chamber temp . Then do build plate leveling at this high temp and be careful of high temperature. Because the build plate will go up when chamber temperature increase. After that start to print. The enhanced Funmat ht printer can automatically do preheating.									

I Remark

- 1) All filaments are highly sensitive to moisture. It is strongly recommended that filaments should be stored in a sealed container and with desiccant. A convection oven can be used to dry filaments if residual moisture level is high.
- 2) Thread the filament into the small holes in the side of the spool after removing from the printer to avoid twisting. And ensure the filament is not twisted before printing.
- 3) Please don't forget to adjust the chamber temp on the printer itself when you use Simplify3D or other software.
- 4) Glove is needed when you move the glass.
- 5) **Once your 3D print is completed,it must be removed from the build plate when its temperature is still high. Removing a print after it is cooled may cause the glass plate to break.**
- 6) All guides above are only applicable for 3D printing with INTAMSYS filaments.

Annex 1

High Temperature Materials (PEEK, PEI and PPSU) Print Guide

I 1.Filament Drying

PEEK, PEI and PPSU are moisture-sensitive materials. It is vital to keep the filaments away from moisture before and during printing. PEI and PPSU are More Sensitive to Moisture than PEEK.

Prior to printing, it is necessary to keep residual moisture of filaments to below 0.02% to prevent foamy extrudate due to high vapor pressure caused by trace of moisture at high printing temperature. If the filament is sufficiently dry, the extrudate should be transparent and without bubbles. Otherwise, it would result in foamy extrudate.

An air circulating oven can be used to dry filaments before printing. PEEK, 150 °C /3-5h; Ultem1010, 150 °C /4-6h; Ultem9085, 130 °C /4-6h; PPSU, 160 °C /4-6h. These IMTAMSYS filament spools can withstand high temperature.

Please ensure several bags of desiccant are placed inside the filament chamber when printing. Store filaments in sealed bag with desiccant after printing.

I 2.Build Plate Treatment

For PEEK, PEI and PPSU printings, use the frosted side of the glass plate. PVP glue is desired for glass plate gluing. Correct way of gluing is important to ensure good adhesion of your print to the glass plate. The following steps are recommended for gluing:

- (1) Cleaning. Clean the glass surface with water, and wipe to dry;
- (2) Gluing. Evenly apply no less than 4 layers of glue on the glass.
- (3) The treated glass plate is now ready for printing;
- (4) After printing, remove the print and clean the glass plate with water.

I 3.Preheating Before Bed Leveling And Printing

I For optimal results, it is recommended that you always preheat the chamber to the temperature for printing for at least 30 minutes before bed leveling or printing. The enhanced Funmat ht printer can automatically do preheating. And then do bed leveling at this high temperature.

I 4.Removing A Print After Completion

Once your 3D print is completed, it must be removed from the build plate when its temperature is still high. Removing a print after it is cooled may cause the glass plate to break because the print may shrink more rapidly than the glass plate.

I 5.Annealing After Completion

- (1) Set the oven temperature (PEEK/150 °C, Ultem1010/150 °C, Ultem9085/130 °C, PPSU/160 °C) and place the print in the oven immediately for an hour.
- (2) Increase the temperature (PEEK/200 °C, Ultem1010/200 °C, Ultem9085/160 °C, PPSU/200 °C) and leave it for 2 hours.
- (3) Lower the temperature (PEEK/150 °C, Ultem1010/150 °C, Ultem9085/130 °C, PPSU/160 °C) and leave it for 30 minutes.
- (4) Finally, turn off the oven and leave it to cool down to room temperature before removing the print.