

UPM Formi 3D printing recommendations



When using UPM Formi 3D for 3D printing, experimental approach is recommended in order to find the best possible print parameters.

Print bed:

Compared to pure PLA, UPM Formi 3D has extremely low tendency to warp or lose its dimensional stability during printing. Due to these features UPM Formi 3D has very good adhesion to print bed.

Tips:

- *When using glass bed, use 50-60C temperature for small surface area prints and no heating for large surface area. If print sticks too much, you can remove it with water.*
- *Do not use glue for build plate or BuildTack*

Print temperature:

UPM Formi 3D cools fast due to fine cellulose fibres. Because of this property it is recommended to print with 10 to 20 degrees higher temperature compared to PLA and adjust the print speed according to melt flow.

Note: *Like other wood filled composites, cellulose fibers are sensitive to heat. When printing small parts with low speed, print may get darker. This can be avoided by changing temperature settings to lower level.*

Heated chamber:

Not needed but heated chamber can be used in order to keep the printed part warm during printing for improving the layer adhesion. However it is important to keep the chamber temperature under 60 °C.

Cooling:

It is recommended to keep fan speed as low as possible in order to keep printed surface hot enough for the next layer.

Material flow:

Recommended material flow between 100-200% depending on used nozzle diameter, print speed and temperature settings.

Print speed:

Adjust the print speed according to your print temperature and printed model.

UPM Formi 3D printing recommendations



Retraction:

Due to shear thinning flow properties and soft surface of UPM Formi 3D keep retraction distance as low as possible and lower retraction speed compared to PLA.

Layer thickness:

Recommended layer thickness 0,2 mm-1mm depending on your nozzle size.

For large scale printing (e.g. 1,5-2mm nozzle) best adhesion between layers have been obtained by using layer width/layer thickness ratio of 1.5-2.5 where line width is 1.5x nozzle diameter.

Feeding the filament

UPM Formi 3D filaments have soft surface. it's important that the tension on the feeder is set correctly. If the tension is too high, the feeder will flatten the filament and it gets grinded. To prevent grinding of the filament it is important to set the tension on the feeder as loose as possible.

Recommended print settings based on print experiments:

2,85mm filament:

Ultimaker 2+

Nozzle	Print temperature (°C)	Fan speed	Heated bed (°C)	Print speed (mm/s)	Material flow	Retraction distance	Retraction speed
0,6	230-240	0-30	60/no heat	10-30	120-150	3 mm	10 mm/s
0,8	240	0-30	60/no heat	10-30	120-150	3 mm	10 mm/s

Nozzle	Print temp. (°C)	Fan speed	Print mode	Print speed (mm/s)	Material flow	Retraction distance	Layer height
1,5mm*	250-260	0-30	spiral	10-12	200	0 mm	0,7

*3Dsolex matchless nozzle

UPM Formi 3D does not flow as rapidly as PLA and has softer surface. When material is fed into Ultimaker 2+ printer it often hits the nozzle with high speed and wheel of the feeder starts to grind the filament. This can be prevented in the following way:

When inserting filament with Ultimaker 2+ printer:

1. Select ready. Select material
- 2) Select ready to continue. Feeder will start to feed the filament high speed. Wait for 3 seconds and insert the filament, this will prevent filament hitting the nozzle too hard, prevent grinding and have time for melting.
- 3) Confirm when the new material extrudes from the nozzle.

UPM Formi 3D printing recommendations



Ultimaker 3

Nozzle	Print temp (°C)	Fan speed	Print speed (mm/s)	Material flow	Retraction distance	Retraction speed	Standby temp (°C)	Nozzle switch retraction dist.
AA0,4	220	0-30	10-30	120	2 mm	10 mm/s	80	20 mm
AA0,8	235	0-30	10-30	120	3,5mm	10 mm/s	80	20 mm

Recommended retraction ~1-3mm/ 10 mm/s and fan speed low as possible 0-30%.

Custom Settings -> Material PLA -> Printcore AA04/AA08-> Profile UPMFormi3D AA04/AA08

Download print profiles for UM3, go to: <https://www.upmformi.com/3D>

1,75 filament:

based on print tests with different printer models:

Nozzle	Print temperature (°C)	Bed type	Heated bed (°C)	Print speed (mm/s)	Material flow
0,4	205-220	glass/kapton	60/no heat	10-30	100
0,8	230-240	glass/kapton	60/no heat	10-30	100

Post processing tips:

Sanding:

Surface of UPM Formi 3D is soft to sand. Sand paper with any coarseness can be used.

Gluing:

Prints can be joined to each other by using regular fast glues or PVAC glue (white wood glue).