

PolyLight 1.0 is active foaming PLA based 3D printer LW filament. The heat during printing activates foaming agents and the filament starts expanding the volume nearly 3 times of the original. Foaming factor can be controlled by the hotend temperature in combination with the printing speed.

This results in significant weight reduction of the printed part, which is very useful anywhere the weight matters, such as RC plane models, cosplay wearables and so on. Best results are achieved by printing in a single pass, such as spiral vase mode where available, because retractions are ineffective due to volume expansion within the nozzle.



Specifications

Material:	3D LabPrint PolyLight 1.0 LW-PLA
Diameter:	1.75 ± 0.05 mm
Foaming factor:	1-3x depending on the temperature and speed
Glass transition temp.:	55°C

Printing suggestions

Nozzle temperature:	210 - 250 °C
Heatbed:	55 - 60 °C treated as a regular PLA
Extrusion multiplier:	1 - 0.35 depending on foaming factor

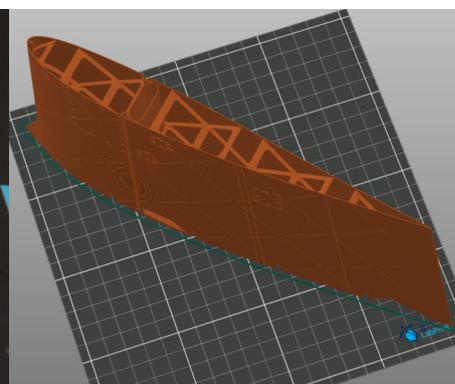
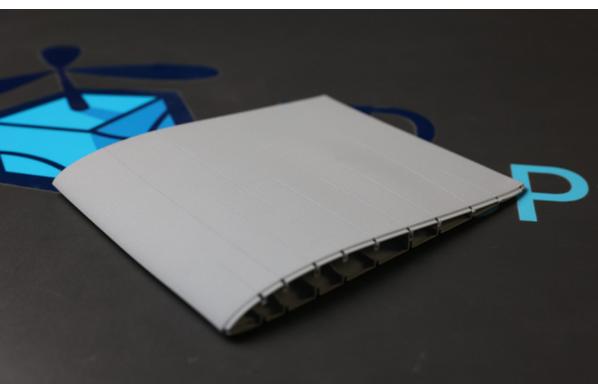
Use Spiral Vase mode where available or avoid travel moves to reduce stringing. If you can't avoid travel moves, stringing is easily removed in post-processing using a sharp knife and the surface is easily treated by sanding.

Pluses

- Reduced weight by 65%
- Increased volume by 270%
- Cost effective
- Strong inter-layer adhesion
- Heat activated foaming
- Easy to glue with CA
- Less visible layers

Minuses

- Less stiff than PLA
- Lower glass transition temperature
- Oozing during travel moves



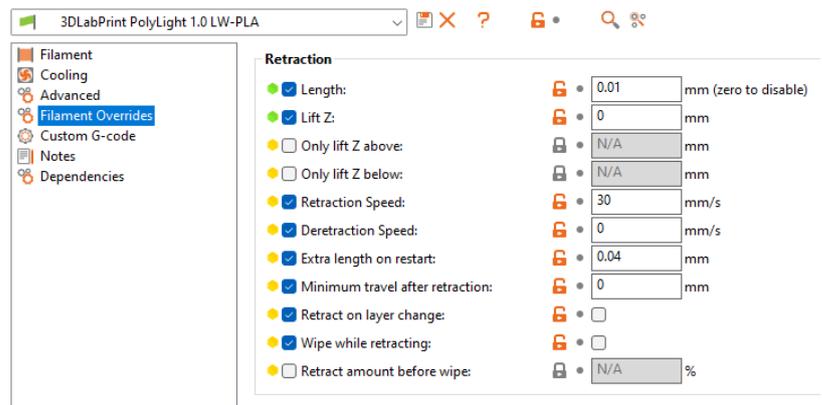
How to print with PolyLight 1.0?

With temperature activated foaming factor, the PolyLight 1.0 filament can be used for prints where the weight is concerned as well as fast speed drafting. You can easily achieve a single wall width of 1.1 mm with a 0.4 mm nozzle with 0.3 mm layer height, keeping the extrusion multiplier at 1 as well as 65% weight reduction tuning the extrusion multiplier down to 0.35.

Similar to popcorn, foaming agent needs heat to increase the volume. The amount of heat is determined by the hotend temperature and printing speed. The faster you're printing, the hotter your nozzle should be to achieve the same wall width.

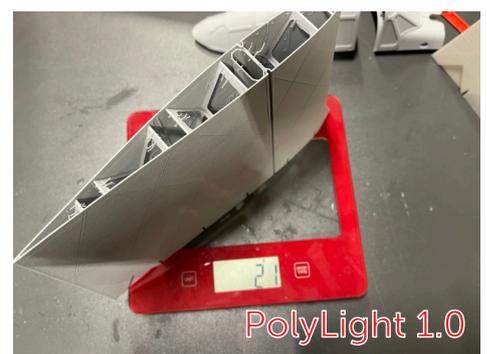
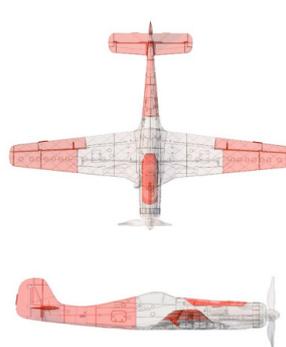
The maximum amount of foaming is achieved around 240-250°C.

Due to foaming inside the nozzle, printing with low layer height and too much extrusion multiplier can lead to clogging when printing multiple layers. Also, the material tends to ooze out from the nozzle regardless the retractions, which may also lead to clogs. Retraction engine can help with re priming the nozzle after a travel move. Set the Retraction Length to 0.01 mm and Extra length on restart as required.



Avoid unnecessary travel moves where possible to reduce unwanted stringing. Use Spiral Vase mode where possible or optimize the seam position. Any imperfections on the outside surface can be easily scuffed using a snap knife and sanded with sanding sponge.

A rule of thumb for single-wall plane parts is 0.3 mm layer height, multiplier set at 0.5, 0.42 mm extrusion width, resulting wall width between 0.5-0.6 mm. This results in strong enough parts that are half the weight of regular PLA parts. Almost every plane, even the older projects not explicitly designed for LW printing, can benefit from weight reduction when used wisely. You can use the [3D LabPrint Prusa Slicer profiles](#) to print any plane.



Foaming factor

