



Description and use of Wayless PLA from Fil X

Fil X Wayless PLA is a 3D filament that is used where light weight 3D printing material is required for structural applications within the limitations of PLA polymer.

Typical application would be hobbieist airplane, race car, wind turbine and boat parts.

This filament has been made with PLA polymer, colour pigment and special foaming additive.

The environmental impact of using this filament is smaller than most petroleum based polymers due to the biodegradability of our PLA grade, and the harmless inert gas generated by the foaming process.

Guidelines on how to 3D print with Wayless PLA from Fil X

Fil X PLA Wayless Foaming results under Fil X test condition

Test condition: Ender 2_0,8Nozzle_60°CBed

<i>Flow (%)</i>	<i>Nozzle temp (°C)</i>	<i>Print Speed (mm/s)</i>	<i>Wall thickness (mm)</i>	<i>Foam bubble observation</i>	<i>Sample Weight (g)</i>	<i>Weight Difference from non foaming sample (g)</i>
100%	195	40	0,8	Almost none	3,2	0
80	215	40	0,81	Fine and evenly spread	2,6	0,6
76	230	40	0,79	Medium and evenly spread	2,4	0,8
74	240	40	0,81	Medium and evenly spread	2,2	1

Foaming density of this filament is a result of 2 variables:

- 1) The time the polymer spend in the print head (PRINT SPEED)
- 2) The temperature of the print nozzle.

The best practice for determining your maximum achievable foaming would be done by experimentation with the two variables. For example slow 40mm/min print speed at 220°C can give the same result as 50mm/min at 250°C.

It is important to adjust the printer material flowrate down in the same percentage that wall thickness increases, as foaming increases if you want weight loss of your model.

You can use the formula to adjust Flow Rate:

Thickness of IDEAL foamed sample 'Wayless' X Flow rate of UNFOAMED sample 'Wayless'

Thickness of UNFOAMED sample 'Wayless'