How much cooling does PETG need?

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Abstract. A moderate fan, about 20 to 60%, not PLA's 100%. Prusa's PETG profile runs 30 to 50%, Bambu's 20 to 40%; both keep it off for 3 layers, more for bridges.

Keywords: petg, part-cooling, slicer-settings

Table 1. The number

PETG profile (0.4 mm nozzle)	Normal layers	Shortest layers	Bridges and overhangs	Fan off for
PrusaSlicer 2.9.6, Prusament PETG or Generic PETG: MK3S, MINI, XL, MK4	30%	50%	50%	First 3 layers
Same profiles, MK4 Input Shaper	30%	60%	50%	First 3 layers
Same profiles, MK4S	20%	40%	40%	First 3 layers
Same profiles, CORE One	30%	60%	60%	First 3 layers
Bambu Studio 02.08.02.61, Bambu PETG Basic: X1, X1E, P1P, P1S	20%	40%	50%	First 3 layers
Bambu PETG Basic: A1 and A1 mini	30%	50%	50%	First 3 layers
Bambu PETG Basic: H2D	20%	30%	50%	First 3 layers
Bambu PETG Basic: H2S	20%	60%	50%	First 3 layers
Bambu PETG Basic: P2S	30%	60%	50%	First 3 layers
Bambu Studio, Generic PETG: every Bambu printer	40%	90%	90%	First 3 layers
OrcaSlicer 2.4.2, Generic PETG	20%	100%	100%	First 3 layers
PLA for comparison: PrusaSlicer and Bambu Studio base profiles	100%	100%	100%	First layer

1 How much cooling does PETG need?

PETG needs a moderate part cooling fan, about 20 to 60%, against 100% for PLA. PrusaSlicer's Prusament PETG profile uses 30 to 50% on the MK3S, MK4 and XL, and Bambu Studio's PETG Basic profile 20 to 40% on X1 and P1 printers. Both keep the fan off for the first 3 layers and raise it for bridges.

1.1 The number

Values come from PrusaResearch.ini in PrusaSlicer 2.9.6, the BBL filament profiles in Bambu Studio 02.08.02.61 and the filament library in OrcaSlicer 2.4.2, with each profile's `inherits` chain followed to the parent that sets the value.

A normal layer is one that takes longer than 20 s in PrusaSlicer and OrcaSlicer, or 30 s in Bambu Studio's PETG profiles. On quicker layers the fan climbs toward the shortest-layer figure.

The filament makers' data sheets agree or go lower: 50% for Prusament PETG, 0 to 60% for Bambu PETG Basic and off to 20% for Polymaker's PolyLite PETG. The exceptions are the generic profiles. Bambu Studio's Generic PETG never drops below 40%, and OrcaSlicer's reaches 100% on its shortest layers.

1.2 Why does too much fan weaken PETG?

The fan cools each fresh line before it has fully fused to the one below. Two lines bond only while the plastic where they meet stays soft, and more air drops it below PETG's glass transition (where it turns rigid) sooner: 69 °C on Bambu's PETG Basic data sheet, 81 °C on Polymaker's PolyLite PETG sheet. Prusa's layer separation guide names too much cooling, from the print fan or the room, as a main cause.

A 2021 test presented at COBEM, the Brazilian mechanical engineering congress, measured it with one PETG brand (3D Fila) on one printer (a Creality CR-10S). Bars printed upright, so the pull ran across the layers, lost strength at every step up in fan speed:

Table 2. Why does too much fan weaken PETG?

Part cooling fan	Yield strength, bars printed upright
Off	32.6 MPa
10%	28.5 MPa
25%	25.6 MPa
50%	22.3 MPa
100%	20.0 MPa

That is almost a third weaker at 50% and about 39% weaker at full fan. Bars printed flat, pulled along the lines, lost less: 47.8 MPa with the fan off, 41.9 MPa at 100%. Treat the trend as the finding, not the exact figures.

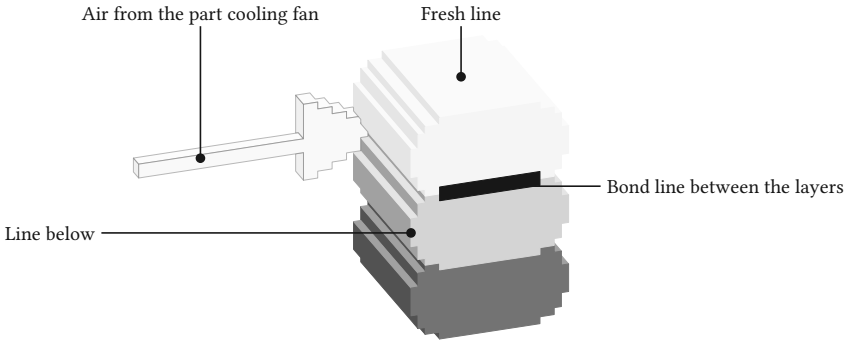


Figure 1. The fan cools each fresh line before it has fully fused with the line below it, which weakens the bond between layers.

1.3 Should the part cooling fan be on for PETG?

Yes, at a low speed from the fourth layer on, unless the part must be as tough as possible. Prusa's PETG guide says to keep the fan off for the first few layers to prevent deformation, then run it at half power. For those parts it says to turn the fan off entirely. Expect weaker bridges and overhangs if you do.

1.4 What does too little cooling look like?

Drooping overhangs, sagging bridges and soft detail. Prusa's PETG guide says cooling keeps the model detailed and that PETG bridges and overhangs worse than PLA to begin with. Bambu's data sheet puts PETG Basic's limits at about 70° of overhang and 30 mm of bridge.

Every PETG profile in the table raises the fan for bridges and overhangs, and Bambu Studio's PETG Basic switches to its overhang speed once 10% of a line's width has nothing under it. See why overhangs droop and why small prints come out melted and blobby.

1.5 What fan speed stops PETG stringing?

None on its own. Prusa's PETG guide credits cooling with helping against stringing, but neither Prusa's stringing guide nor Polymaker's lists the fan as a fix. Their fixes are more retraction, a nozzle 5 to 10 °C cooler and dry filament. Polymaker adds faster travel and coasting (stopping extrusion just before a line ends).

Leave the fan at your profile's value, since more air costs layer strength. Check whether your PETG needs drying, then work through why filament still strings after drying.

1.6 How to check it on your own print

1. **Open the cooling settings.** PrusaSlicer (Expert mode): Filament Settings > Cooling, with "Fan speed" Min and Max, "Bridges fan speed", "Disable fan for the first" and "Enable fan if layer print time is below". Bambu Studio or OrcaSlicer: edit the filament preset and open Cooling, where "Min fan speed threshold" and "Max fan speed threshold" each pair a fan speed with a layer time. The overhang setting is "Fan speed for overhang" in Bambu Studio (Advanced mode) and "Overhangs and external bridges fan speed" in OrcaSlicer.
2. **Compare with the table** for your printer and with the fan range on your spool's data sheet.
3. **Check the preview.** Slice, switch the preview to Fan speed and step through the layers. The first 3 layers should show the fan off, and bridges and overhangs a higher speed than the walls around them.
4. **If overhangs or bridges sag,** raise the bridge or overhang fan speed, not the minimum, so the rest of the part keeps its layer bond.
5. **If the part must be strong across its layers,** lower the minimum toward the bottom of your spool's range, print with the fan off as Prusa suggests, or turn it so the load runs along the lines.

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