Why is PETG so stringy?

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Abstract. Shipped profiles run PETG 20 to 35 °C hotter than PLA, and its melt draws out into threads. Dry it, drop the nozzle 5 to 10 °C, and expect a few fine hairs.

Keywords: stringing, petg, retraction

Table 1. The number

Slicer and printers (0.4 mm nozzle)	PLA	PETG	PETG runs hotter by
Bambu Studio 02.08.02.61, Bambu PLA Basic and Bambu PETG Basic: X1 Carbon, X1, X1E, P1S, P1P	220 °C	255 °C	35 °C
Same profiles: H2D, H2D Pro, H2C, P2S, X2D	220 °C	250 °C	30 °C
Same profiles: A1, A1 mini, H2S	220 °C	245 °C	25 °C
PrusaSlicer 2.9.6, Prusament PLA and Prusament PETG: MK3S	215 °C	250 °C	35 °C
Same profiles: MK4S, CORE One	225 °C	250 °C	25 °C
PrusaSlicer 2.9.6, Generic PLA and Generic PETG: MK3S	210 °C	240 °C	30 °C
Same profiles: MK4S, CORE One	220 °C	240 °C	20 °C
OrcaSlicer 2.4.2, Generic PLA and Generic PETG	220 °C	255 °C	35 °C

1 Why is PETG so stringy?

PETG prints hotter than PLA, and its melt stays joined to the line just printed, so each travel move can draw out a thread. Shipped slicer profiles run PETG 20 to 35 °C hotter than PLA, and damp PETG strings worse. Makers expect a few strings anyway: Polymaker calls avoiding them all in PETG "just about impossible."

1.1 The number

Each value is the nozzle temperature for layers after the first, the field all three slicers label Other layers. They come from the BBL filament profiles in Bambu Studio v02.08.02.61, PrusaResearch.ini in PrusaSlicer 2.9.6 and the filament library in OrcaSlicer 2.4.2, with each `inherits` chain followed to the file that sets the value.

PETG needs that heat to flow like PLA. Bambu's data sheets list nearly the same melt flow index (grams of melt through a test die per 10 minutes) for both: 22.9 g for PETG Basic at 245 °C and 23.2 g for PLA Basic at 210 °C.

1.2 Why does PETG string more than PLA?

Heat is the first reason. Bambu Lab says an excessively hot nozzle thins the melt (lowers its viscosity) and causes abnormal extrusion, and Prusa says a lower temperature means fewer strings. PETG (glycol-modified polyethylene terephthalate) crosses every travel move 20 to 35 °C hotter than PLA (polylactic acid). Prusa's PETG guide calls it "prone to stringing."

The second is the melt itself. Polymaker's material science notes say a string forms when the line just printed stays joined to the melt inside the nozzle, and the nozzle drags it out as it moves away. Polymers with "high molecular interaction" or absorbed moisture are prone to it. Polymaker calls PETG "more likely to cause stringing issues than PLA," and Prusa adds that a long run of PETG can leave a thin film in the nozzle that makes strands stick to the print's surface.

Water makes it worse. Polymaker rates PETG highly hygroscopic (quick to absorb water from the air), along with nylon, PVA (polyvinyl alcohol) and TPU (thermoplastic polyurethane). It rates PLA low. Bambu Lab says the water vaporizes in the nozzle and makes the melt burst and flow abnormally.

So a few strings are normal. Polymaker says tuning can make PLA print clean but not PETG, and plans on a razor blade or heat gun for the leftovers. Grades differ: Bambu says its reformulated PETG Basic strings less.

1.3 How do you stop PETG from stringing?

You can get it down to a few fine hairs. Bambu Lab lists damp filament first, so start there, and change one thing per test print:

1. **Dry the spool.** Bambu Lab dries PETG Basic at 65 °C for 8 hours and stores it sealed below 20% relative humidity. When it needs it: do you need to dry PETG.
2. **Lower the nozzle 5 to 10 °C,** Prusa's step, but stay inside the spool's range: 230 to 260 °C for Bambu PETG Basic.
3. **Retract a little more.** Prusa says more retraction moderates PETG stringing, and Bambu Lab keeps length at 2 mm or less. Per-printer values: PETG retraction settings.

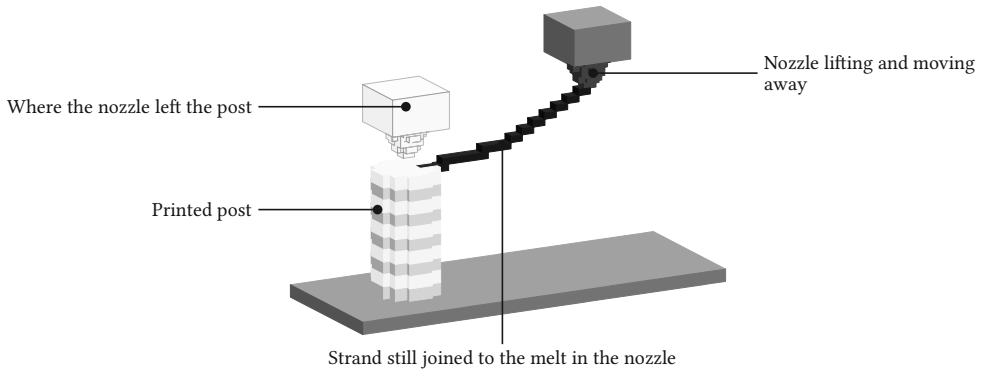


Figure 1. As the nozzle lifts away from a PETG post, the melt still joining them stretches into a long strand.

4. **Keep the part cooling fan on** after the first layers. Prusa's PETG guide says cooling prevents stringing and oozing, and Bambu's sheet allows 0 to 60%. How much: PETG cooling fan speed.
5. **Cut travel.** Move parts closer and turn on Avoid crossing wall (Bambu Lab). Travel at 200 mm/s or more if the frame allows (Polymaker). Prusa says a lower Lift Z, the nozzle's hop before travel, improves stringing (can Z hop cause stringing).

If a dried spool still strings after all five, work through why filament still strings after drying. Clean off what is left with the methods in removing stringing from a print.

1.4 Is thick stringing on PETG a different problem?

Usually, yes. Polymaker treats a few fine hairs as unavoidable with PETG, while Creality ties thick strands to a separate set of causes.

Table 2. Is thick stringing on PETG a different problem?

What you see	What it points to	Source
Fine, hair-like wisps, with smooth extrusion	Mild oozing, a slightly hot nozzle or short retraction; also travel or cooling	Creality; Flashforge
Thick strands or blobs between features	A nozzle that is too hot, retraction turned off, wet filament or slow travel	Creality
Much heavier strings with bubbles and rough or cloudy walls, on a spool that used to print clean	Moisture picked up in humid air	Flashforge

Creality says an over-hot nozzle is likely to cause thick stringing, especially with PETG and TPU. So for thick strands, confirm retraction is on and listen for popping before you tune anything else.

1.5 How to check it on your own print

1. **Read your profile's temperature.** Bambu Studio and OrcaSlicer: Filament > Print temperature > Nozzle (Other layers). PrusaSlicer: Filament Settings > Filament > Temperature > Nozzle (Other layers). Compare it with the table and your spool's range.
2. **Listen at the purge line.** Pops or sizzling mean water, per Polymaker, so dry the spool before changing settings.
3. **Print a small two-post test** at that temperature, then 5 °C and 10 °C lower. Keep the setting with the fewest strings whose walls still look solid. Fine hairs that brush off are normal PETG; thick strands send you back to the table above.
4. **Clean the nozzle** after long PETG runs, as Prusa advises, so a film in the nozzle stops dragging strands onto the print.

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