How can you tell if filament is wet?

Asked 3D Content Team
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Abstract. Wet filament pops or hisses at the nozzle, bubbles, strings and prints rough. To confirm, dry it (PLA 50 °C, PETG 60 to 65 °C, 8 hours) and reprint.

Keywords: pla, petg, nylon

Table 1. The number

Symptom	Shows most in	What the source says	Source
Popping, crackling, hissing	Any damp spool	“pops or sizzling while extruding” are “water vapor escaping”	Polymaker; Siraya Tech
Steam and bubbles at the nozzle	Any damp spool	“bubbling and smoke during extrusion”	Prusa
Bubbles trapped in the walls	Translucent PETG	Undried walls flecked with small bubbles; the dried print is clear	Bambu Lab photo
More stringing	PETG and ASA; PLA only slightly	“little wisps between parts”; PLA strung “just a little bit more” after 7 days damp	Polymaker; Tom’s 3D
Rough, pitted or grainy surface	PETG and nylon	“Pinholes”, “Sandy or grainy texture”, “Small craters”	Siraya Tech
Milky instead of clear	Clear PETG	“milky translucent instead of true crystal clear”	Tom’s 3D; BioResources
Swollen small features	PETG, ASA	A Benchy chimney “all swollen up and over extruded”	Tom’s 3D
Weak, brittle layers	Nylon	“weak, brittle layers”; polyamide “affected quite significantly”	Polymaker; Prusa

1 How can you tell if filament is wet?

Wet filament pops, crackles or hisses at the nozzle, puffs steam and leaves bubbles in the strand. Prints string more and turn rough or pitted, and clear PETG goes milky. To confirm, dry the spool and reprint the same file: Bambu Lab dries PLA at 50 °C and PETG at 60 to 65 °C for 8 hours.

1.1 The number

Each row’s quote and material come from the source named beside it. The bubble row describes Bambu Lab’s PETG photo, and Tom’s 3D left Prusament PLA, PETG and ASA (acrylonitrile styrene acrylate) for 7 days in a 50 percent RH (relative humidity) room, outdoors and under water.

1.2 Why

Filament pulls water from the air. Bambu Lab says that water vaporizes in the hot nozzle, so the melt expands, extrudes erratically and forms bubbles. That shows up as stringing, holes, rough surfaces and weaker parts. Bambu says freshly dried filament at about 55 percent RH can take up enough to hurt print quality within 2 to 12 hours.

The plastic sets how loud the symptoms get. Polymaker rates nylon, PVA (polyvinyl alcohol), TPU (thermoplastic polyurethane) and PETG (glycol-modified polyethylene terephthalate) highly hygroscopic, and PLA (polylactic acid)

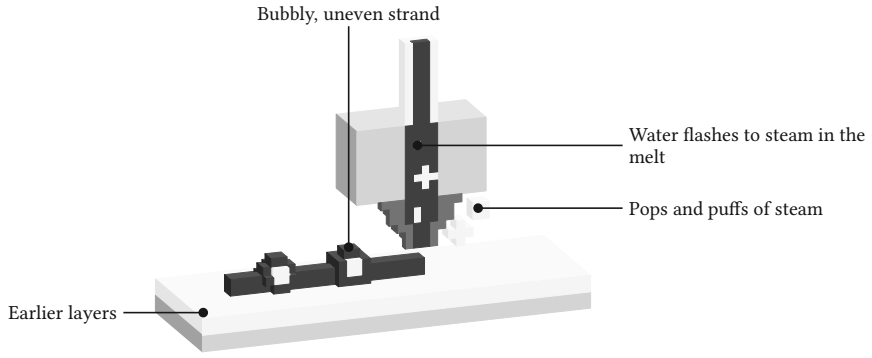


Figure 1. Water in the filament vaporizes in the hot nozzle, so the melt expands, extrudes erratically and forms bubbles.

low. Damp nylon, polycarbonate and fiber-filled grades can also clog: see can wet filament clog a nozzle.

1.3 What does wet filament sound like?

A pop or crackle, sometimes a hiss or sizzle, as filament leaves the nozzle. Listen for it during the purge line or a manual extrude, before the fans and motion noise start.

1.4 What does wet filament look like when printing?

The strand comes out bubbly and uneven, what Polymaker calls "weakened, inconsistent, or even pitted extrusion." On the part, check where the printer slows down. Tom's 3D found bubbling worst at a Benchy's chimney, where the plastic sits longest in the hotend. Polymaker's PETG photo shows hair-fine strings and pimples before drying, gone after.

1.5 What are the symptoms of wet PLA?

Mild ones. Prusa says PLA "doesn't change properties too much by uptaking humidity," and Tom's 3D saw only slightly more stringing at each wetter step. On PLA, the tell is a spool that suddenly strings on retraction settings that used to work, which Siraya Tech names as the likely moisture sign. Any popping from PLA points the same way.

1.6 What are the symptoms of wet PETG?

Obvious ones: Polymaker says PETG makes the decline "easy to spot." Tom's 3D's damp PETG strung more, swelled at the chimney and printed milky. Prusa calls PETG "prone to stringing" by nature, so trust pops and cloudy walls over strings.

In a BioResources study, a 202 g PETG roll gained 0.70 g in 12 hours at 30 °C and 90 percent humidity. Once dried, it printed parts 48 percent lower in average roughness (Ra), clearer and stronger than an undried roll did.

1.7 How do you test for wet filament?

Dry it and reprint. Print a small part with travel moves and a slow section, dry the spool, then reprint it unchanged. If the pops and strings go, it was moisture. Prusa's quicker check: print with a different spool and see whether the stringing stops.

Weighing the spool before and after drying works only on a precise scale. The BioResources roll lost its 0.70 g over 8 hours at 70 °C, then held at 202.22 g. Tom's 3D found a scale sold as reading to 10 mg resolved about 100 mg, too coarse to tell wet from dry on 50 g samples.

A hygrometer in a sealed box measures the air, not the filament. Bambu Lab uses one to keep storage below 20 percent RH, and no maker we found publishes a reading that means a spool is wet.

1.8 How to check it on your own print

- **Listen at the purge line, then look at slow sections.** Pops, bubbles or milky PETG mean water.
- **Swap spools.** If the stringing stays with one spool, the filament is the cause.
- **Dry and reprint the same file.** PLA: Bambu Lab 50 °C for 8 hours, Prusa 45 °C for 6 hours. PETG: Bambu 60 to 65 °C for 8 hours, Prusa 55 °C for 6 hours. Carbon- or glass-filled nylon (PA6-CF/GF, PAHT-CF/GF): Bambu 75 to 85 °C for 8 to 12 hours; Prusa dries PA11 Carbon Fiber at 90 °C for 6 hours. To dry on the printer, see the heated-bed drying table.
- **Use a filament dryer or forced-air oven.** Bambu rules out kitchen ovens and microwaves, which heat unevenly enough to damage the spool or filament. It also warns that some third-party spools deform.
- **Old nylon may resist drying.** Bambu says nylon (PA) left in open air for about 3 months becomes very hard to dry at 80 to 90 °C.
- **Seal it straight after drying.** Keep it with desiccant below 20 percent RH, where Bambu says filament stays dry for 2 to 7 days.
- **If drying changes nothing, look at settings.** For PETG, Prusa moderates stringing with longer retractions and a lower nozzle temperature.

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