How do you know if your 3D printer nozzle is clogged?

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Abstract. No filament comes out, lines print thin with gaps, the extruder clicks, or a purged strand curls back onto the nozzle. Prusa tests it at 260 °C for PLA.

Keywords: pla, petg

Table 1. The number

Symptom	Full clog	Partial clog	Heat creep	Other likely cause
No filament comes out	Yes, and new filament will not load	No, some still gets through	Yes, but only after the print has run for a while	Nozzle temperature set too low
Thin, gappy lines or missing layers	No	Yes: thin lines that may not stick to the plate	Severe under-extrusion once the plug forms	Wet filament; a nozzle worn by abrasive filament
Extruder clicking	Loud clicking, with ground filament	Yes	Yes, with grinding	Light clicking points at the gears; a first layer too close to the bed
Strand curls up at the tip when purged	No strand at all	Yes, an early sign	Not listed	None listed
Fine at the start, drops mid-print	No	Yes, partial clogs often show mid-print	Yes, the classic pattern, with no error shown	Printing too fast for the hotend to melt the filament

1 How do you know if your 3D printer nozzle is clogged?

Four signs, from Prusa's and Bambu Lab's guides: nothing comes out while the printer keeps moving, lines print thin with gaps, the extruder clicks, or a purged strand curls up and sticks to the nozzle. To confirm, Prusa heats the hotend to 260 °C for PLA (polylactic acid), waits 2 minutes and pushes filament in by hand.

1.1 The number

The clog and heat creep columns come from Prusa's clogged-nozzle and heat creep articles and Bambu Lab's clog, X1/P1 and heat creep pages. The last column adds Polymaker's wet filament and clicking pages and E3D's nozzle wear test.

1.2 What does a clogged 3D printer nozzle look like?

When you purge, a clear nozzle drops a strand straight down. Bambu Lab's check is to heat to 220 °C, extrude PLA and look for a long, smooth strand that falls vertically. A short, rough strand means the channel has narrowed or the drive gear is faulty.

Debris at the tip bends the strand sideways so it curls back, often onto the nozzle. Bambu Lab blames particles from carbon fiber, glow-in-the-dark and sparkle filaments. On a

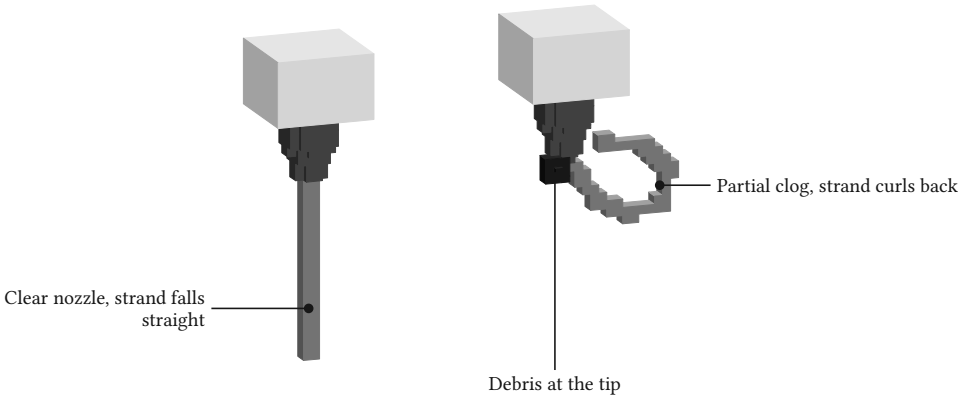


Figure 1. A clear nozzle drops the purged strand straight down, while debris at the tip bends it sideways so it curls back toward the nozzle.

full clog nothing comes out, and the gears chew a flat groove into the filament.

1.3 Signs of a partial nozzle clog

Prusa's early signs are uneven extrusion that curls when purged, printed lines much thinner than normal that sometimes fail to stick to the plate, then gaps and missing layers. The extruder may click or tick as its motor skips steps.

A partial clog can pass a load and unload test and still fail mid-print, so a clean load proves nothing.

1.4 Heat creep vs partial clog: what's the difference?

Location and timing. A partial clog sits at the tip, where debris or burnt residue narrows the opening, so a manual purge often curls. Heat creep happens higher up. Heat climbs the heat break, the filament softens and swells inside the heat sink, and it plugs the path above the melt zone.

So heat creep has a pattern. Bambu Lab's example printed normally, then clogged partway through. Prusa describes extrusion that stops while the printer carries on with no error, and lists these causes:

- a room above 35 °C (30 °C for some filaments), or an enclosure
- PLA, which has the lowest melting temperature of the common filaments
- slow printing with thin layers, so too little filament flows through
- a weak hotend fan or a dusty heat sink
- a hot bed warming the extruder parts

Bambu Lab's rule is to keep the air in an enclosure at least 10 degrees below the filament's glass transition temperature.

The fixes differ. Polymaker warns that a hotter nozzle makes heat creep worse, while Bambu Lab clears a tip clog with heat and a needle. Prusa adds that heat creep is often not the most likely explanation, so rule out a plain clog first. Cures are on the heat creep page.

1.5 Why a clog clicks

Once the resistance in the hotend or nozzle beats what the gears can push, Prusa explains, they skip. That causes the click, and usually the grinding. A partial clog lets some plastic past, but less than the slicer asked for, so lines thin out.

Two look-alikes need no unclogging. Water in wet filament turns to steam in the hotend. A worn nozzle opens up rather than clogging.

1.6 How to check it on your own print

- **Listen first.** On Prusa's Nextruder printers, a loud click most likely means a clogged or deformed nozzle, and a light click points at the gearing.
- **Purge and watch the strand.** Heat to printing temperature and extrude with the printer's load or extrude button. A straight, steady strand means the nozzle is clear. A curling strand points at a partial clog, and no strand at a full one.
- **Split the nozzle from the gear.** Bambu Lab's test: at 220 °C, push PLA into the hotend by hand. If it flows smoothly, the nozzle is clear and the extruder gear needs checking for wear or debris.
- **Push by hand on a Prusa.** Open the extruder idler and set 260 °C if you were printing PLA, or 280 °C for PETG (glycol-modified polyethylene terephthalate) or ASA (acrylonitrile styrene acrylate). Wait 2 minutes and push fresh PLA in. No flow means the blockage sits further up, and Prusa says the nozzle most likely needs replacing.
- **Measure the feed on Klipper.** Mark the filament about 70 mm above the extruder intake, send `G91` then `G1 E50 F60`, and measure what moved. Klipper treats a miss of more than about 2 mm as a reason to recalibrate. A large shortfall with clicking on a hot nozzle means something downstream is resisting.
- **Check the hotend fan.** UltiMaker says to heat the nozzle to 60 °C or higher and confirm the print head fan spins. Without it, filament can swell in the print head and stick.
- **Check the filament.** Polymaker lists popping, hissing, bubbles and pitted extrusion as signs of wet filament (wet filament clogs). Cut off flattened, chewed sections before reloading.
- **Count the abrasive filament.** E3D ran 250 g of carbon-fiber filament through a new 0.40 mm brass nozzle, found the bore "significantly opened up" and called it wrecked. A worn bore needs a new nozzle, not a cold pull.

When the checks point to a clog, the step-by-step fix is on the unclogging page.

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