How do you unclog a 3D printer nozzle?

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Abstract. Heat the nozzle to 260 °C for PLA or 280 °C for PETG and push filament through, then use a 0.3 to 0.35 mm needle, a cold pull, and finally a nozzle swap.

Keywords: pla, petg, abs

1 How do you unclog a 3D printer nozzle?

Start gentle. Heat the nozzle to 260 °C for PLA or 280 °C for PETG, ABS or ASA and push filament through by hand. Next, run a 0.3 to 0.35 mm needle 1 to 2 cm up from below, then do a cold pull. If nothing moves, take the nozzle off hot and clean or replace it.

1.1 The number

Stop at the first step that gets clean filament flowing. PLA is polylactic acid and PETG is glycol-modified PET. In Prusa's steps, ABS (acrylonitrile butadiene styrene) and ASA (acrylonitrile styrene acrylate) take the PETG figures. TPU is thermoplastic polyurethane.

Temperatures and tools come from Prusa Research's clogged-nozzle, cold pull and nozzle-change articles, Bambu Lab's X1/P1 and A1 unclogging guides, and E3D's V6 nozzle support page. Where the makers' numbers differ, both are shown.

1.2 Why heat, then a needle, then a pull

Most partial clogs are a particle stuck at the tip. Bambu Lab names the usual sources: carbon fiber, glow-in-the-dark and sparkle filaments, plus debris and unpurged leftovers from a different plastic. Extra heat softens the plug so fresh filament can push it out. The needle dislodges a particle too big for the hole.

A cold pull works the other way. Filament fills the nozzle and cools until partly solid. Bambu Lab says it then comes out "along with burnt residue or dust."

A clogged hotend is not the same as a clogged nozzle, Prusa warns. Plastic can jam above the nozzle, in the heatbreak or the PTFE (polytetrafluoroethylene) tube, so a new nozzle is not a universal fix. That case is on the filament stuck in the heatbreak page.

1.3 How do you clear a clog without removing the nozzle?

Steps 1 to 4 in the table all leave the nozzle in place. Start by unloading the filament. If the filament breaks off, look at the top of the nozzle tube. When a stub shows there, Prusa grips it with needle-nose pliers at 280 °C and draws it up bit by bit.

If you can see nothing, push the 1.5 mm wire down from the top. How far it goes tells you where the clog starts. Then load fresh PLA so the new strand drives the rest through.

1.4 What if the nozzle is completely clogged?

Loud clicking from the extruder with nothing coming out means the gears are skipping against the blockage, Prusa

Table 1. The number

Step	Use it when	Nozzle temperature	Tool
1. Push filament through hot	Filament will not load, or comes out thin	Prusa: 260 °C after PLA, 280 °C after PETG, ABS or ASA, then wait 2 minutes. Bambu Lab: 250 °C for PLA, PETG, TPU and ABS	About 40 cm of PLA pushed by hand with the extruder idler open (Prusa), or the load button (Bambu Lab)
2. Needle from below	Flow is partial or curls to one side	The filament's printing temperature (Prusa), 250 °C (Bambu Lab)	Acupuncture needle or wire, 0.3 to 0.35 mm, 1 to 2 cm deep (Prusa); the bundled pin (Bambu Lab)
3. Cold pull	Filament loads but prints still fail	Prusa: load PLA at 270 °C, cool to room temperature, pull at 85 °C. Bambu Lab: load at 220 °C, pull at 100 °C	A length of PLA, or nylon cleaning filament
4. Push or pull from the top	Nothing passes the nozzle at all	Prusa: 260 or 280 °C to push, 280 °C to pull with pliers	1.5 mm rigid wire, 100 mm long, pushed down; or needle-nose pliers on filament visible at the top of the nozzle tube
5. Remove the nozzle	Steps 1 to 4 fail	Prusa: 280 °C, nozzle tightened to 2.5 N m. E3D V6 brass: 285 °C for about a minute, tightened to 2 N m	Spanner on the heater block, pliers or a 7 mm spanner on the nozzle

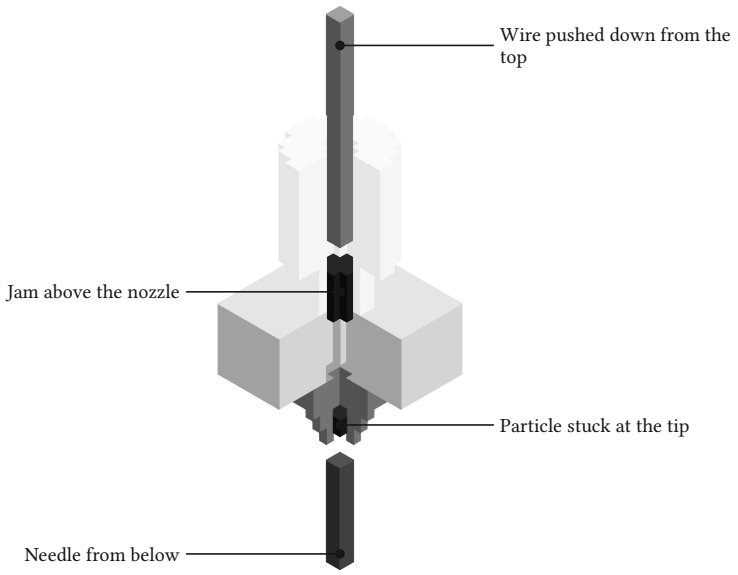


Figure 1. The needle knocks a particle at the tip loose from below, while the wire pushed down from the top stops where a jam higher up starts.

says. Go straight to step 1 at the higher temperature, then step 4.

Prusa adds that if pushing new filament through will not restore flow, a cold pull is unlikely to work either. Most likely the blockage sits above the nozzle tip and the nozzle needs replacing. Bambu Lab says its pin, extrude and cold pull methods "tend to clear out 99% of clogs," and a damaged nozzle may still need swapping.

Once the nozzle is out, heat it with a heat gun or hairdryer and pick out the plug with pliers or tweezers. For a chemical soak, Prusa uses acetone for ABS, and tetrahydrofuran or ethyl acetate for PLA. Leave it a couple of hours to overnight. Prusa names no solvent for PETG, and it would rather replace an old, worn nozzle than clean it.

1.5 How do you unclog a PLA or PETG nozzle?

The only difference in Prusa's steps is heat: 260 °C after PLA, 280 °C after PETG. Use PLA for the cold pull even if the clog is PETG. In Prusa's testing PLA "works best for a cold pull," while other filaments tear or melt too much. Per-material figures are on the cold pull temperature page, and a PETG-to-PLA switch has its own purge routine.

1.6 How do you unclog a nozzle without a needle?

Push hot filament through, do a cold pull or run cleaning filament, and use the wire from the top. Prusa's smallest bundled Allen key can stand in for the wire. Some nozzles must skip the needle anyway:

- **E3D** lists a needle as a non-recommended cleaning method for its V6 nozzles. It suggests nylon cleaning filament, a warm pull or a cold pull.
- **Prusa High Flow** nozzles skip the needle step because of their internal geometry.
- **Bambu Lab** skips the pin on 0.2 mm nozzles in its X1/P1 guide, and its A1 guide says the pin "does not work with nozzles smaller than 0.4mm."
- **Coated nozzles** such as E3D's Nozzle X and Prusa's Nozzle X take cleaning filament only, with no cold pull.

The right gauge per nozzle size is on the needle size page.

1.7 How to check it on your own print

- **Wear heat-resistant gloves and keep your face back.** Bambu Lab warns that pressure behind a clog can spray molten filament without warning.
- **Never push the needle in too far.** Bambu Lab warns that going too deep pushes molten plastic higher, into a harder clog. Never feed it from the top, and never load filament with it inserted (Prusa).
- **Watch the extrusion.** Clean flow comes out straight and does not curl (Bambu Lab). Bambu Lab loads a second color of the same material and extrudes until the strand runs fully in the new color.
- **Finish with a cold pull.** Bambu Lab strongly recommends one after every cleaning, repeated until the pulled tip comes out clean. The full method is on the cold pull page, and Bambu Lab hotends have their own page.
- **Clean the drive gears.** Ground filament collects in the grooves after a clog. Prusa clears each groove with a toothpick or the needle.
- **Recalibrate after a nozzle swap.** Prusa says to redo at least the first layer calibration with a new nozzle.
- **If it clogs again soon,** look at the cause, not the nozzle: wet filament, heat creep or bad diameter. Bambu Lab wants 1.75 ± 0.03 mm, checked with calipers. Start with why a nozzle keeps clogging.

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