How often should you clean a 3D printer nozzle?

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Published October 15, 2026 · Last verified October 15, 2026

Abstract. Wipe the outside before each print and cold pull the inside about monthly, Bambu Lab's minimum. Prusa's INDX guide says 200 print hours; UltiMaker 100 to 400.

Keywords: pla, tpu

1 How often should you clean a 3D printer nozzle?

Check and wipe the outside before every print, and clean the inside with a cold pull about once a month. That's Bambu Lab's minimum; Prusa's CORE One INDX guide says every 200 print hours, and UltiMaker every 100 hours for abrasive-filament cores. Do one sooner when switching materials, before TPU (thermoplastic polyurethane), or when extrusion thins.

1.1 The number

The intervals come from Bambu Lab's wiki maintenance and cold pull pages, Prusa's Knowledge Base maintenance articles, UltiMaker's print core cleaning and maintenance schedules, and three Creality blog posts. PLA is polylactic acid, PETG is glycol-modified polyethylene terephthalate and PVA is polyvinyl alcohol. Creality's three figures disagree with each other and are described as habits, not a schedule.

Table 1. The number

Maker and printer	Outside of the nozzle	Nozzle cleaning or cold pull	Replace the nozzle
Bambu Lab, all printers (clog guide)	Not stated	"At least once a month, especially when switching between different filament types"	Not stated
Bambu Lab X1 and P1	When the surface is dirty or the print under-extrudes; heat to 200 °C and wipe	"From time to time", especially when changing filament type; "regular" with carbon fiber. No hour figure	No interval
Bambu Lab A1	Heating assembly every month	"Clean the nozzle" every 5 spools of PLA or PETG; every 2 spools of carbon fiber filament	When worn and leaking, and cleaning does not restore extrusion
Bambu Lab H2D, H2S, A2L, P2S	Not stated	Built-in routine: on repeated extruder overload errors and before switching to TPU. No hour figure	No interval
Prusa CORE One and MK4/S, MK3.9/S	Check before every print; heat 3 to 5 minutes at 250 °C and brush	No interval	No interval
Prusa CORE One INDX	Same as CORE One	"As needed, or every 200 hours of printing time, whichever occurs first"	No interval
Prusa MK3 family and MINI	MINI: when coated in plastic	After a clog or print failure	MK3: consider it after 3 to 6 months of use if quality stays poor after maintenance
UltiMaker AA and AA+ print cores	Monthly cleaning (UltiMaker 3 schedule)	No scheduled cleaning; clean when switching to a material with a very different printing temperature	AA and BB cores "function well for over 2000 printing hours"
UltiMaker BB (the PVA support core)	Same	Every ~400 printing hours	Same
UltiMaker CC, CC+ and HT	Same	Every ~100 printing hours; after every print with metal filament or large-fiber composites in a CC 0.4	Limited lifespan, set by the material
UltiMaker DD	Same	After every print, or when the core will sit unused for over 24 hours	Limited lifespan, set by the material
Creality (blog posts)	Not stated	Every 50 to 100 printing hours (cold pull FAQ); the same post says "many users" do 100 to 150, and its unclog guide says "most users" clean every 200 to 300	Brass with PLA or ABS every 3 to 6 months; hardened steel with wood or carbon fill every 1 to 2 months

1.2 How often do 3D printer nozzles clog?

No maker publishes a clog rate. Bambu Lab calls clogs "a common, minor issue", and the triggers it lists are what sets your rate: low-quality or wet filament, switching between high- and low-temperature materials, a hot chamber, printing too fast, fiber-filled filament and frequent start/stop printing. UltiMaker singles out PVA and composite materials as the most prone to degrading and blocking the nozzle, and its cores for them carry the shortest intervals in the table.

If clogs come back between cleanings, fix those triggers before shortening the interval. The repeat-clog causes and their settings are on why a nozzle keeps clogging.

1.3 What is cold pull maintenance on a Bambu Lab printer?

It's a guided cold pull built into Bambu Lab's newer printers, started from the printer's menu (Settings > Maintenance > Nozzle Cold Pull Maintenance on the A2L). You pick the nozzle and a cleaning filament (PLA or PETG), then feed in at least 30 cm of it. The printer flushes at 250, 290 or 320 °C, set by the hottest filament the nozzle has run. It then refills the nozzle, cools it and pulls the filament back slowly. You finish the pull by hand.

Bambu "strongly" recommends it as routine maintenance and says to repeat it until the pulled tip shows no foreign color, carbonized deposits or granular particles. On the X1 and P1 you run the cold pull by hand, setting the nozzle temperatures yourself. Settings for each model are on the Bambu Lab cold pull page.

1.4 When does a nozzle need replacing instead of cleaning?

When cleaning stops restoring extrusion. Bambu Lab's A1 guide says to swap the hotend when the nozzle is "obviously worn causing material leakage" and cleaning does not help. Prusa's i3 guide calls the nozzle a late suspect for extrusion problems, worth replacing after 3 to 6 months of use if print quality stays poor.

Abrasive filament shortens that a lot. E3D printed 250 g of a carbon fiber filament through a new 0.40 mm brass nozzle and called the result "wrecked", while a hardened steel nozzle that had run 2.5 kg of carbon- and glass-filled filament still held its shape. Prusa warns that abrasive filament ruins a stock brass nozzle quickly.

1.5 Why nozzles need cleaning on a schedule

Plastic left inside the nozzle degrades. UltiMaker says material "can sometimes get stuck inside the nozzle and degrade". The result is poor extrusion or a fully blocked core. Fiber and particle fills leave residue that builds up into partial blockages, according to Bambu Lab. A cold pull strips that residue. Bambu Lab holds the filament 20 to 30 °C above its glass transition, where its viscoelasticity lets it peel contaminants off the nozzle wall as it comes out.

The outside matters for a different reason. Prusa notes that plastic coating the nozzle can affect its thermal properties, and old residue can drop onto the part mid-print.

1.6 How to check it on your own print

- **Know your print hours.** Prusa and UltiMaker schedules count hours, not months. Prusa printers show them under LCD menu > Statistics; UltiMaker printers under About this printer, where Digital Factory can also log each print core cleaning.
- **Look at the nozzle before each print.** If plastic coats it, Prusa heats the nozzle 3 to 5 minutes at 250 °C and brushes it with a brass brush, keeping the brush off the hotend cables. Bambu Lab removes the silicone sock, heats to 200 °C and wipes with a cloth or tweezers in heat-resistant gloves.
- **Cold pull on a trigger, not just a date.** Thin or inconsistent lines, extruder overload errors, a switch from a high-temperature material or to a contrasting color, and a TPU print next all call for one. Temperatures by filament are on the cold pull temperature page.

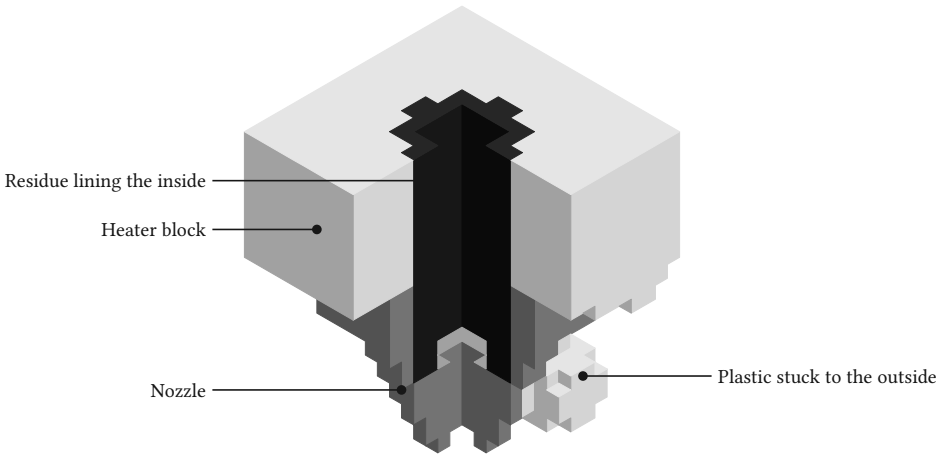


Figure 1. Plastic coating the outside can drop onto the part mid-print, while residue left inside degrades and builds up into a blockage.

- **Shorten the interval for filled filament.** Carbon fiber cuts Bambu Lab's A1 interval from 5 spools to 2.
- **Judge the pulled tip.** Repeat until it comes out as a clean cone with no dark specks or burnt residue. If the first pull is heavily carbonized, UltiMaker repeats the hot pull before the cold one.
- **Test for a full clog first.** Bambu Lab heats the nozzle to 250 °C and feeds PLA or PETG. If nothing comes out, or far less than normal, the nozzle is fully clogged; clear it first, then cold pull.

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Cite as: Asked 3D. "How often should you clean a 3D printer nozzle?." October 15, 2026. https://asked3d.com/answers/how-often-clean-nozzle. Last verified October 15, 2026.