Is cleaning filament better than a cold pull?

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Abstract. Neither: they do different jobs. Cleaning filament such as eSUN eClean flushes old material at 160 to 300 °C; a cold pull drags debris out at 80 to 160 °C.

Keywords: pla, polycarbonate, nylon

1 Is cleaning filament better than a cold pull?

Neither: they do different jobs. Purging cleaning filament, such as eSUN eClean at 160 to 300 °C, pushes old material out before the next color or type. A cold pull drags stuck debris out, and Creality calls it more thorough. UltiMaker's cleaning filament does both: heat to 240 to 260 °C, pull at 140 to 160 °C.

1.1 The number

Rows come from eSUN's eClean product page, UltiMaker's cleaning filament, print core and UltiMaker 2+ articles, the Prusa Knowledge Base, Bambu Lab's H2D cold pull guide and E3D's Revo cleaning guidelines. The makers split on materials. Prusa found PLA works best for pulls, and Bambu's tests favored PLA and PETG. UltiMaker calls its polycarbonate cleaning filament "the most effective material" for the hot and cold pull.

1.2 Can you cold pull with cleaning filament?

Yes, if its maker gives a pull procedure. UltiMaker's sticks are made for exactly that. On an UltiMaker 2+, heat to 240 to 260 °C, push some through, cool to 140 to 160 °C, then pull with "a quick, firm pull." UltiMaker says one stick cleans one severely blocked print core, or several with minor blockages.

Purging filament is another matter. eSUN describes eClean as something to run through the nozzle between materials and publishes no pull temperature. Bambu Lab's advice for any third-party cleaning filament is to read its instructions and use it only under the conditions they give. UltiMaker limits pulls to "non-flexible" materials. If the pack only says to feed it through, use it as a purge.

1.3 When the hardware decides for you

- **Prusa Nozzle X:** never cold pull it. Prusa says to use only cleaning filament.
- **UltiMaker S6 and S8:** the guided print core cleaning accepts only cleaning filament. On other S series printers UltiMaker "strongly" recommends it, since PLA "may not always give optimal results."
- **E3D Revo nozzles:** nylon cleaning filament, warm pulls and cold pulls are all recommended internal methods. A needle is not.

Table 1. The number

Method and source	Temperatures	What it removes	When the source uses it	Limits
Purge with cleaning filament, eSUN eClean	160 to 300 °C extruder	Old color or material, pushed out ahead of the next filament	"After printing", before a different color or type, such as moving between PLA (polylactic acid) and carbon-fiber nylon	No pull procedure published; listed with 580 percent elongation at break
Hot pull with cleaning filament, UltiMaker (clear polycarbonate)	240 to 260 °C; 260 °C on printers without a guided procedure	"The biggest parts of carbonized material"	A clogged print core; repeat until the tip comes out clean	2.85 mm sticks only; not for Method, Sketch or Replicator printers
Cold pull with cleaning filament, UltiMaker	Heat 240 to 260 °C, pull at 140 to 160 °C	"The remaining small particles"	After the hot pulls; preventive maintenance by print hours; before a big color or temperature change	Same as above
Cold pull with PLA, Prusa (MK4 manual method)	Heat 270 °C, pull at 100 °C	Material "stuck or burnt inside"	A partial clog with some filament still coming out; routine maintenance	Not for a full clog; never on Nozzle X
Cold pull with PLA or PETG (glycol-modified PET), Bambu Lab H2D	Flush at 250, 290 or 320 °C; pull 20 to 30 °C above glass transition	Flush clears residual filament; the pull strips "internal impurities"	Extruder overload errors; before switching to TPU (thermoplastic polyurethane)	Not for a full clog; other filaments "prone to tearing"
Nylon cleaning filament, E3D (Revo nozzles)	Not given	Listed as an "internal cleaning method"	Alongside warm and cold pulls on every Revo nozzle type	No temperatures on the page

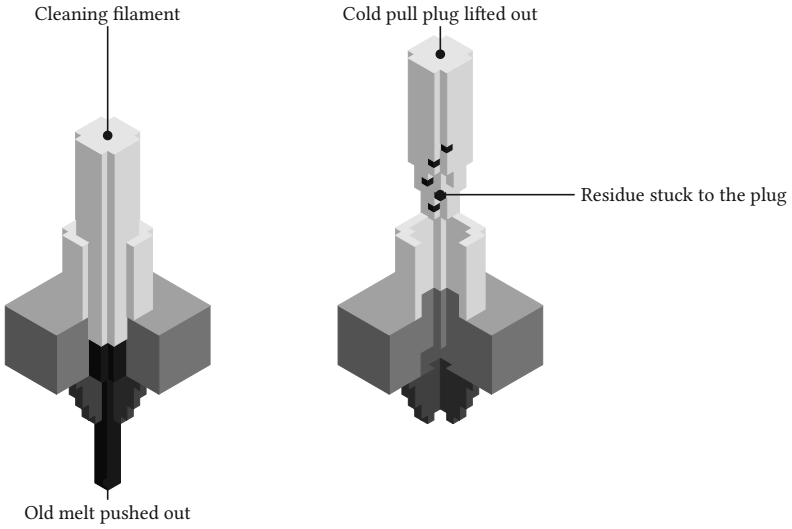


Figure 1. A purge pushes the old melt out of the nozzle tip ahead of fresh plastic, while a cold pull grips the residue and brings it out the top with the plug.

1.4 Why

A purge works by displacement: fresh plastic pushes the old melt out of the nozzle tip. That suits a color or material change, and eSUN pitches eClean for moves between low- and high-temperature materials.

A cold pull works by grip. The filament fills the nozzle and cools to a semi-solid plug. Pulled out the top, it brings the residue with it. Bambu Lab sets the pull 20 to 30 °C above the material's glass transition and relies on the plastic's viscoelasticity to strip contaminants off the nozzle wall. UltiMaker splits the work: hot pulls lift the big carbonized pieces, the cold pull the small particles left behind. Creality ranks hot pulls and cleaning filament as "lighter-touch tools to use before escalation."

Neither method clears a nozzle that passes nothing. Prusa limits the cold pull to partial clogs, and Bambu sends a fully clogged nozzle to its unclogging procedure first. The unclogging page covers that.

1.5 How to check it on your own print

- **Changing color or material:** purge. Heat to the hotter of the two materials, inside the cleaning filament's own range (160 to 300 °C for eClean). Feed it until the extrusion runs clear, then load the next filament.
- **Extrusion problems or extruder overload errors:** cold pull. Use PLA pulled at 80 to 100 °C on UltiMaker's figures, or the cleaning filament's own pull temperature. The cold pull steps and pull temperatures by material have the details.
- **Heavy carbon on the first tip:** hot pull before the cold pull. UltiMaker repeats hot pulls until the tip is clean, then does one or more cold pulls.
- **Read the tip.** A clean pull is a single-color cone in the nozzle's shape. Dark specks or old color mean another pull.
- **Before TPU:** Bambu Lab recommends a cold pull, because TPU is sensitive to nozzle resistance. See cold pull before printing TPU.

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