# How do you fix heat creep?

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**Abstract.** Clear the jam at 250 °C, cold pull from 220 to 100 °C, then cut the heat: hotend fan always on, door open for PLA on a 45 °C+ bed, retraction 2 mm or less.

**Keywords:** pla, petg, tpu, slicer-settings

## 1 How do you fix heat creep?

Clear the jam, then take away the heat. Bambu Lab heats the nozzle to 250 °C, pins the tip, then cold pulls: load PLA at 220 °C, pull at 100 °C. To prevent it, run the hotend fan whenever the hotend is hot, open the door for PLA on a 45 °C or hotter bed and keep retraction short.

What heat creep is, and how to tell it from other clogs, is on the heat creep page.

### 1.1 The number

**Table 1.** The number

| What to set or check | Published threshold | Source |
|---|---|---|
| Hotend (heatsink) fan | On whenever the hotend is hot, blowing into the heatsink toward the heatbreak. Prusa's heat creep guide expects 4000 to 4400 RPM while printing. Let it cool the hotend before you switch the printer off | Prusa, Polymaker, Slice Engineering |
| Bed temperature against the door and lid | Open the front door and remove the top cover when the bed is at or above the filament's softening temperature: about 45 °C for most PLA, 70 °C for PETG | Bambu Studio |
| Lid off, by filament | PLA at 45 to 60 °C bed: yes. TPU at 35 to 45 °C: yes. PETG at 60 to 80 °C: no | Bambu Lab heat creep guide |
| PLA on a Bambu P1S | Textured PEI plate at 55 °C with the door open or lid off, or the Cool Plate at 35 °C with both closed | Bambu Lab heat creep guide |
| Chamber air | At least 10 °C below the filament's glass transition: at most 50 °C for Bambu PLA Basic (60 °C), 59 °C for PETG Basic (69 °C). Chamber heater off (0 °C) for PLA, PETG and TPU | Bambu Lab |
| Room air | Under 35 °C, or 30 °C for some filaments | Prusa |
| Retraction | Direct drive: 2 mm at most on Prusa's MK2.5 and MK3 family, the nozzle diameter on a Slice Engineering Mosquito. Bowden: longer, 3.2 mm by default on Prusa's MINI | Prusa, Slice Engineering |
| Flow through the hotend | Layers of 0.15 to 0.20 mm, about 10 percent faster, bed 5 to 10 °C cooler | Prusa |
| Hotend assembly | Thermal paste on the heatbreak threads, a 0.5 mm gap between nozzle and heater block, PTFE tube flush in the heatbreak | Prusa |

The thresholds come from Bambu Lab's heat creep guide, Bambu Studio chamber temperature page and PLA Basic and PETG Basic data sheets, Prusa's heat creep and stringing articles, Polymaker's nozzle clog guide and Slice Engineering's hotend FAQ. PLA is polylactic acid, PETG glycol-modified polyethylene terephthalate, TPU thermoplastic polyurethane, PEI polyetherimide and PTFE polytetrafluoroethylene, the white liner tube.

### 1.2 How to clear a heat creep clog

1. **Heat past printing temperature.** Bambu Lab uses 250 °C for PLA, PETG, TPU and ABS (acrylonitrile butadiene styrene). Prusa goes to 260 °C after PLA or 280 °C after PETG or ABS, then waits 2 minutes for the filament to start dripping.
2. **Clear the tip.** Work the cleaning pin a short way in and out of the nozzle a few times (Bambu Lab skips this on 0.2 mm nozzles). Push it too far and you shove molten filament higher, into a harder clog. Prusa pushes a 0.3 to 0.35 mm needle 1 to 2 cm in from below. Never load filament while it's inserted.
3. **Test the flow.** Extrude by hand. The strand should come out straight, not curling.
4. **Cold pull.** Bambu Lab loads PLA at 220 °C, sets 100 °C and retracts while helping gently by hand. Prusa heats to 270 °C, keeps pushing until about 170 °C, then pulls slowly straight up at 100 °C. Repeat until the tip comes out clean. Full steps are on the cold pull page.

Wear heat-resistant gloves and keep your face clear: Bambu Lab warns that pressure behind a clog can spray molten filament. If the filament won't move at all or snaps off above the nozzle, see filament stuck in the heatbreak.

### 1.3 What retraction settings avoid heat creep?

Short ones. Prusa caps its direct-drive MK2.5 and MK3 family at 2 mm. Slice Engineering sets a direct-drive Mosquito to the nozzle diameter, 0.4 mm on a 0.4 mm nozzle. Bowden printers run longer because the tube soaks up part of the move: Prusa's MINI defaults to 3.2 mm. After fitting a Mosquito to a Bowden printer, Slice Engineering halves the old setting and tunes from there.

Polymaker's first fix is a shorter distance on direct drives. It also warns against very fast retractions and against slow ones with long dwell times, which leave filament softening in the transition zone.

### 1.4 Why these settings work

Every row in the table either pulls heat out of the hotend's cold side or keeps soft filament away from it.

The fan and thermal paste move heat out of the heatsink. An open door, a cooler bed and a cooler room stop heat soaking in. Long retractions undo both by dragging molten filament up into the cooler zone, where Polymaker says it sets.

Flow is the less obvious lever. Prusa notes that moving filament carries heat away, so thin layers and slow printing let the heatbreak warm up. Don't overcorrect: Bambu Lab warns that printing too fast, such as in Ludicrous mode, under-melts the filament and causes partial clogs.

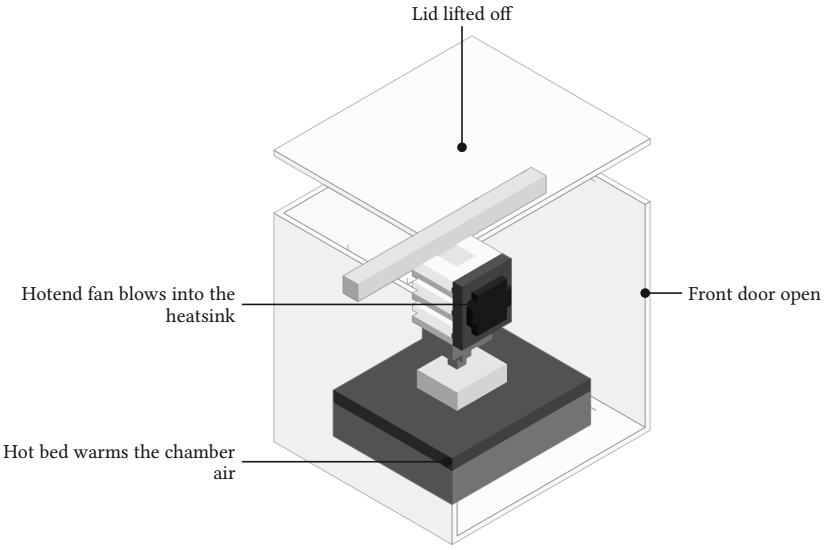



**Figure 1.** The hotend fan pulls heat out of the heatsink, while an open door and a lifted lid stop heat from the bed soaking into the chamber.

### 1.5 How to check it on your own print

- **Watch the heatsink fan.** It should spin whenever the nozzle is hot, even before the print starts, and blow into the fins rather than draw air out. Clear dust from the fins with canned air.
- **Compare the bed to the softening point.** PLA with the bed at 45 °C or more in an enclosed printer: open the door or lift the lid before the next print.
- **Measure the chamber.** Hang a thermometer clear of the bed and read it mid-print. For Bambu PLA Basic, anything above 50 °C breaks Bambu Lab's 10 °C margin.
- **Read your retraction.** Over 2 mm on a direct-drive printer is above Prusa's cap. Bring it down, then reprint the section that failed.
- **Note when it clogs.** A normal start, then a clog partway through a long print, points to heat building up in the heatsink.
- **If it keeps coming back,** check the hotend itself: thermal paste on the heatbreak threads, the 0.5 mm nozzle gap and a PTFE tube seated flush.

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