What does bed temperature do in 3D printing?

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Abstract. It keeps the first layers stuck and stops them shrinking off the plate. Polymaker sets it just under the glass transition: PLA at 25 to 60 °C against a 61 °C Tg.

Keywords: bed-adhesion, warping, build-plates, slicer-settings

Table 1. The number

Filament	Polymaker bed	Polymaker Tg	Bambu Lab bed	Bambu Lab Tg
PLA	25 to 60 °C	61 °C	35 to 45 °C	60 °C
PETG (glycol-modified polyethylene terephthalate)	70 to 80 °C	81 °C	65 to 75 °C	69 °C
ASA (acrylonitrile styrene acrylate)	75 to 95 °C	98 °C	80 to 100 °C	Not listed
ABS (acrylonitrile butadiene styrene)	90 to 100 °C	101 °C	80 to 100 °C	Not listed
PC (polycarbonate)	90 to 105 °C	113 °C	90 to 110 °C	145 °C
Nylon (PA, polyamide)	25 to 50 °C (PolyMide CoPA)	66 °C	80 to 100 °C (PAHT-CF)	70 °C

1 What does bed temperature do in 3D printing?

Bed temperature is how hot the build plate is held during a print. It keeps the first layers soft enough to grip the plate and warm enough not to shrink and peel. Polymaker sets it just under the plastic's glass transition (Tg): PLA (polylactic acid) at 25 to 60 °C against a 61 °C Tg.

1.1 The number

Polymaker's figures come from its PolyLite PLA, PETG, ABS and PC, Polymaker ASA and PolyMide CoPA data sheets. Bambu Lab's come from its PLA Basic, PETG Basic, ASA, ABS, PC and PAHT-CF data sheets. Every sheet measures Tg by differential scanning calorimetry (DSC) at 10 °C/min. Bambu gives no Tg for ASA or ABS; its sheets list heat deflection at 1.8 MPa instead, 92 °C for ASA and 84 °C for ABS.

On Polymaker's sheets, the top of the bed range stops 1 to 8 °C below Tg for every plastic except nylon. PETG is where the sheets disagree. Bambu's 65 to 75 °C range straddles its own 69 °C Tg, and Prusament's 80 ± 10 °C reaches 9 °C past Polymaker's 81 °C. Prusament gives 40 to 60 °C for PLA and publishes no Tg, so read the sheet for your own spool.

1.2 Glass transition temperature vs bed temperature

Glass transition is a property of the plastic; bed temperature is a setting you choose. The Polymer Science Learning Center describes a polymer below its Tg as "hard and brittle, like glass." Above it, the polymer turns soft and flexible.

The bed works in a narrow band around that point. Spörk and colleagues measured how hard PLA and ABS parts stuck to two common bed surfaces at different bed temperatures. They found "a significant increase in adhesion forces" with the bed "slightly above the glass transition temperature." Polymaker's ranges stop just short of that line. Past Tg, its elephant foot guide says, the bottom layers deform as new material is laid on top of them.

Nylon breaks the pattern. Polymaker classes it as semi-crystalline, where PETG, ABS, ASA and PC are amorphous. Its Tg says little about when a part softens: CoPA's heat deflection at 0.45 MPa is 111 °C against a 66 °C Tg. The two nylon sheets in the table put the bed on opposite sides of Tg.

1.3 Why bed temperature matters in 3D printing

The bed does three jobs at once:

- **Grip.** Bambu Lab says bed temperature "heavily influences" how filament bonds to its textured PEI (polyetherimide) plate, and that "a higher bed temperature increases adhesion."
- **Less shrinkage stress.** Plastic shrinks as it cools. Ramian, Ramian and Dziob trace ABS warping to the drop "from glass transition temperature to chamber temperature." Their thermal camera showed the bed holding the base of the part hot while the rest cooled, and that gradient "peeled off the cooler corners." Bambu Lab describes the same thing: the outer edges cool faster than the center, and shrinkage pulls the first layer's corners up.
- **First-layer squish.** Prusa notes the first layer is "squished against the heated print bed," so it ends up a bit wider than designed. Too much heat makes it worse: Polymaker says not to print PLA on a plate hotter than 60 °C, and sometimes not above 50 °C.

On an enclosed printer, a hot bed also heats the air around the extruder. Bambu Lab warns that PLA, TPU (thermoplastic polyurethane) and PETG can then soften inside the extruder and clog it.

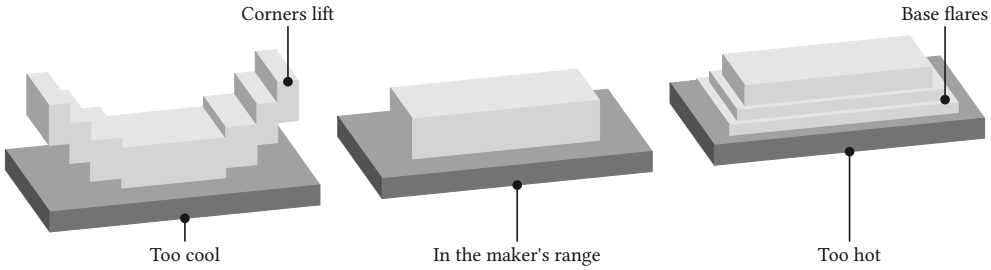


Figure 1. Too cool and the corners lift as the part shrinks; too hot, near or past the glass transition, and the bottom layers flare out.

1.4 How bed temperature affects a print

Table 2. How bed temperature affects a print

Bed setting	What the print shows	Next answer
Too low	First layer won't stick; corners lift as the part cools	Does a higher bed temperature help adhesion? and warping
In the maker's range	The setting the data sheet gives for that plastic and plate	Bed temperature chart
Too high, near or past Tg	Bottom layers flare out (elephant foot); in an enclosure, PLA, TPU and PETG can clog	What happens if the bed temperature is too high?

1.5 How to check it on your own print

- **Read two numbers off your spool's data sheet:** the bed range and the Tg. If the top of the range sits above Tg, watch the bottom edge for elephant foot.
- **Match the plate in the slicer.** Bambu Lab sets a different bed temperature for each plate type, and picking the wrong plate can leave the bed too cold and cause warping.
- **If the first layer won't stick, add heat in small steps.** Prusa suggests 5 to 10 °C more for materials that don't adhere well. Stay inside the maker's range.
- **If the bottom edge flares, go the other way.** Drop toward the low end of the range, then set elephant foot compensation; Prusa finds about 0.2 mm works with a 0.4 mm nozzle.
- **Vent the enclosure for low-temperature plastics.** For PLA and TPU above a 45 °C bed, or PETG above 60 °C, open the door or lift the top glass.

References

[1] PolyLite PLA Technical Data Sheet, Polymaker Wiki. https://wiki.polymaker.com/polymaker-products/more-about-our-products/documents/technical-data-sheets/pla/polylite-tm-pla. Accessed October 15, 2026.

[2] PolyLite PETG Technical Data Sheet, Polymaker Wiki. https://wiki.polymaker.com/polymaker-products/more-about-our-products/documents/technical-data-sheets/petg-pet/polylite-tm-petg. Accessed October 15, 2026.

[3] Polymaker ASA Technical Data Sheet, Polymaker Wiki. https://wiki.polymaker.com/polymaker-products/more-about-our-products/documents/technical-data-sheets/abs-asa/polymaker-tm-asa. Accessed October 15, 2026.

[4] PolyLite ABS Technical Data Sheet, Polymaker Wiki. https://wiki.polymaker.com/polymaker-products/more-about-our-products/documents/technical-data-sheets/abs-asa/polylite-tm-abs. Accessed October 15, 2026.

[5] PolyLite PC Technical Data Sheet, Polymaker Wiki. https://wiki.polymaker.com/polymaker-products/more-about-our-products/documents/technical-data-sheets/polycarbonate/polylite-tm-pc. Accessed October 15, 2026.

[6] PolyMide CoPA Technical Data Sheet, Polymaker Wiki. https://wiki.polymaker.com/polymaker-products/more-about-our-products/documents/technical-data-sheets/nylon/polymide-tm-copa. Accessed October 15, 2026.

[7] Bambu Filament Technical Data Sheet V3.0, PLA Basic (Bambu Lab). https://wiki.bambulab.com/filament-acc/abs-asa-pc/bambu_pla_basic_technical_data_sheet.pdf. Accessed October 15, 2026.

[8] Bambu Filament Technical Data Sheet V3.0, PETG Basic. https://store.bblcdn.com/s1/default/cb94589bf7994fdcbfa833badefae9cd/Bambu_PETG_Basic_Technical_Data_Sheet.pdf. Accessed October 15, 2026.

[9] Bambu Filament Technical Data Sheet V3.0, ASA, Bambu Lab. https://wiki.bambulab.com/filament-acc/abs-asa-pc/6eaf4c432d1d4014a1975e55a55ed00b.pdf. Accessed October 15, 2026.

[10] Bambu ABS Technical Data Sheet V3.0, Bambu Lab. https://store.bblcdn.com/s7/default/23b4cf2b83d5470bb96d19970b5f3ae8/Bambu_ABS_Technical_Data_Sheet_V3.pdf. Accessed October 15, 2026.

[11] Bambu Filament Technical Data Sheet V2.0, PC, Bambu Lab. https://wiki.bambulab.com/filament-acc/abs-asa-pc/a52afdccddfd448583d119587122c8c5.pdf. Accessed October 15, 2026.

[12] Bambu Filament Technical Data Sheet V3.0, PAHT-CF, Bambu Lab. https://store.bblcdn.eu/s8/default/91dea87af3414d878a0696d2c51b98f7/Bambu_PAHT-CF_Technical_Data_Sheet_V2.pdf. Accessed October 15, 2026.

[13] Prusament PLA Technical Datasheet, Version 1.1 (Prusa Polymers). https://prusament.com/wp-content/uploads/2022/10/PLA_Prusament_TDS_2021_10_EN.pdf. Accessed October 15, 2026.

[14] Prusament PETG Technical Datasheet, Version 1.1 (Prusa Polymers). https://prusament.com/wp-content/uploads/2022/10/PETG_Prusament_TDS_2021_10_EN.pdf. Accessed October 15, 2026.

[15] Glass Transition, Polymer Science Learning Center. https://pslc.ws/macrog/tg.htm. Accessed October 15, 2026.

[16] Annealing, Polymaker Wiki. https://wiki.polymaker.com/printing-tips/post-processing/annealing. Accessed October 15, 2026.

[17] Effect of the printing bed temperature on the adhesion of parts produced by fused filament fabrication, Spörk, Gonzalez-Gutierrez, Sapkota, Schuschnigg and Holzer, Plastics, Rubber and Composites (2017). https://pure.unileoben.ac.at/en/publications/effect-of-the-printing-bed-temperature-on-the-adhesion-of-parts-p/. Accessed October 15, 2026.
[18] Bambu Lab Textured PEI Plate Troubleshooting Guide, Bambu Lab Wiki. https://wiki.bambulab.com/en/general/textured-PEI-plate-not-working-as-expected. Accessed October 15, 2026.
[19] Thermal Deformations of Thermoplast during 3D Printing: Warping in the Case of ABS, Ramian, Ramian and Dziob, Materials (2021). https://pmc.ncbi.nlm.nih.gov/articles/PMC8620654/. Accessed October 15, 2026.
[20] P2S/X2D Model Warping Troubleshooting, Bambu Lab Wiki. https://wiki.bambulab.com/en/x2d/troubleshooting/preventing-warping-p2s-x2d. Accessed October 15, 2026.
[21] Elephant foot compensation, Prusa Knowledge Base. https://help.prusa3d.com/article/elephant-foot-compensation_114487. Accessed October 15, 2026.
[22] Elephant Foot (Smooshed First Layer), Polymaker Wiki. https://wiki.polymaker.com/printing-tips/common-printing-issues/elephant-foot-smooshed-first-layer. Accessed October 15, 2026.
[23] First layer issues, Prusa Knowledge Base. https://help.prusa3d.com/article/first-layer-issues_1804. Accessed October 15, 2026.
[24] Filament guide: Printer, Nozzle, AMS, Build Plate, Glue Compatibility and Required Parameters, Bambu Lab Wiki. https://wiki.bambulab.com/en/general/filament-guide-material-table. Accessed October 15, 2026.

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