Why did my print warp on only one corner?

Asked 3D Content Team
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Abstract. One lifted corner has less grip or more cooling than the other three. Five causes to check: bed height, a draft, a cool bed zone, skin oil and a sharp corner.

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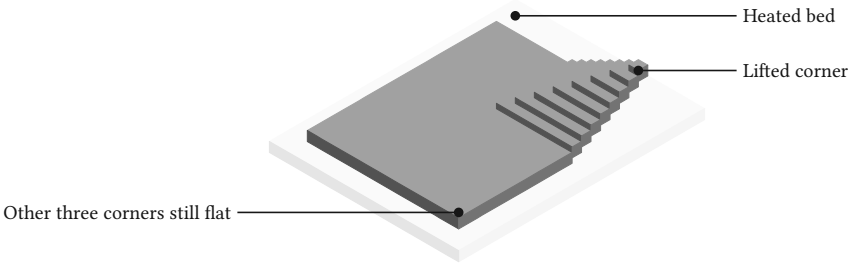


Figure 1. Every corner pulls up as the part shrinks. The one that lifts is the one with the least grip or the most cooling.

1 Why did my print warp on only one corner?

One lifted corner had less grip or more cooling than the other three. As a print cools it shrinks and pulls up at every edge, and the weakest corner gives first. Check five things at that corner: bed height, a draft from a window or fan, a cooler patch of bed, skin oil and a sharp corner.

1.1 The causes

Each row is one reason a single corner lets go, with the clue, the check and the source's fix. When two rows fit, the rotation test in the last section separates the bed causes from the part itself.

The fixes come from Bambu Lab's warping guide, Prusa's Knowledge Base, Simplify3D's print quality guide and a Prusa Forum thread on bed temperature. None says how often each cause turns up, so the rows aren't ranked.

1.2 Why one corner and not four

Simplify3D puts a number on the shrinkage: an ABS (acrylonitrile butadiene styrene) part printed at 230 °C shrinks "by almost 1.5%" on its way to room temperature. The bed keeps the bottom layer warm while the layers above contract. Bambu Lab's guide says the outer edges "cool faster than the centre, creating tension that pulls corners up".

Table 1. The causes

Cause	Clue on the print	Check	Fix
Bed too low or out of level at that corner	That corner's first-layer lines look round and sparse, not squished flat	Print a single-layer square in each corner of the bed and compare them	Re-run automatic bed leveling or the bed mesh, then set the Z offset so the first layer is squished (Bambu Lab, Simplify3D)
A draft on one side	The lifted corner faces a window, door, air conditioning vent or fan	Move the printer or block the air source and reprint	Block the airflow, and on an enclosed printer close the front door and top cover (Bambu Lab)
A cooler zone of the bed	The part sits near the edge of the bed, and the corner nearest the bed edge lifts	Reprint the same part in the middle of the bed	Let the bed heat soak before printing, or raise the bed 5 to 10 °C (Prusa Forum, Bambu Lab)
Grease on the plate	The corner sits where you hold or touch the plate	Clean the plate and reprint	Wash with warm water and dish soap and let it dry (Bambu Lab), or wipe with 90%+ isopropyl alcohol (Prusa)
Part geometry	The lifted corner is the sharpest one, or the part is large and flat	Rotate the part and reprint: the lift follows the part	Paint brim ears on that corner, and for large flat parts use Gyroid infill at 25 % or less (Bambu Lab)

Ramian, Ramian and Dziob saw this with a thermal camera on ABS: “Temperatures at the edges were lower than in the middle of the sample.” That gradient “peeled off the cooler corners”.

All four corners feel the pull. The one that lets go has something extra working against it:

- **Less grip.** A nozzle sitting too high at that corner lays lines on the plate instead of pressing them in. Simplify3D notes that on an unlevel bed “one side of your bed may be too close to the nozzle, while the other side is too far away.” A fingerprint does similar harm: for prints that come loose, Bambu Lab calls skin oils “the #1 cause”.
- **More cooling.** Bambu Lab warns that “even a nearby open window, air conditioning vent, or desk fan can cool one side of a print faster than the other, causing uneven warping.” On the P2S and X2D, air pulled into the chamber by a cooling mode can blow “directly onto the print”. A cold room adds to it: below 20 °C, Bambu Lab says, “warping can occur even with PLA and PETG”.
- **A cooler patch of bed.** If the bed edge runs cooler than the middle, a part parked there loses heat from below too. As one reply in a Prusa Forum thread put it, “a temperature difference is normal. It is with nearly every 3d printer on the market too.”
- **More pull.** Larger prints, higher infill and shrink-prone materials warp more, per Bambu Lab. Its risk order runs PC (polycarbonate), PA-CF (carbon-filled nylon), PA (nylon), ABS, ASA (acrylonitrile styrene acrylate), PETG (glycol-modified PET), then PLA (polylactic acid). For “sharp corners popping up”, the guide suggests brim ears and says to “target only the corners that lift”.

1.3 How to check it on your own print

1. **Mark where it lifted.** Note which corner lifted and where on the bed the part sat.
2. **Rotate the part half a turn and reprint it in the same spot.** If the lift follows the part, the geometry is the cause: add brim ears to that corner. If the lift stays put on the bed, look at the bed or the air around it.
3. **Clean the plate.** Wash it with warm water and dish soap, dry it, and handle it by the edges from then on. Bambu Lab’s guide says cleaning, bed leveling and a correctly fitted nozzle together resolve about 80 % of warping and adhesion failures.
4. **Re-run bed leveling and check the first layer at that spot.** The lines should be squished flat and touching. Round, separate lines mean the nozzle sits too high.
5. **Look for moving air.** Block any window, vent or fan on the side that lifted. On an enclosed printer, close the door and the top cover.
6. **Move the part toward the middle of the bed.** If the lift stops, the corner sat on a cooler zone. Let the bed heat soak before the next print, or raise the bed 5 to 10 °C.

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