Do 3D printed planters leak?

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Abstract. Thin-walled ones do. Prusa's PLA flower pots held water; its tests needed 4 perimeters for PLA and PETG and 5+ bottom layers. Seal the inside or print a saucer.

Keywords: watertight, waterproofing, pla, petg

1 Do 3D printed planters leak?

Thin-walled ones do. Prusa Research's PLA flower pots showed no leakage over a long test, but its leak tests needed 4 perimeters for PLA and PETG, and water escaped at the seam and where the solid bottom meets the walls. Print thicker walls or seal the inside. A pot with a drainage hole needs a watertight saucer instead.

1.1 The settings that held water

Table 1. The settings that held water

Setting	Value that held water in Prusa's tests
Perimeters, PLA and PETG	4 or more
Perimeters, ABS, ASA, PP, PC, CPE	2 or more
Perimeters in vase mode (spiral vase)	1, in every material tested
Bottom solid layers	2 to 7 all held (with 8 perimeters); Prusa advises 5 or more
Layer height	0.15 mm or lower
Flow (extrusion multiplier)	raise to 105 to 110 percent if you cannot add perimeters

The figures come from Prusa Research's Watertight 3D printing part 1 post, which found most parts fine at 4 to 6 perimeters, a wall 2 to 3 mm thick. The Prusa Knowledge Base adds a nozzle 5 to 10 °C hotter than the preset. Per-material counts are on the perimeter page.

In full: PLA is polylactic acid, PETG glycol-modified PET, ABS acrylonitrile butadiene styrene, ASA acrylonitrile styrene acrylate, PP polypropylene, PC polycarbonate and CPE a co-polyester.

1.2 Why a 3D printed pot leaks

Water rarely gets through the layers. Prusa traced most leaks to the seam, where each layer starts and ends, and to the joins between solid infill and perimeters. In a planter that join runs around the base, where the floor meets the wall.

Watch PETG closely. In Prusa's closed-box test, untreated PETG "leaked really quickly through the seams and contact points between perimeters and solid infill." PLA boxes from the same test stayed dry 20 m underwater with no coating.

A vase-mode planter is not doomed by its single wall. Prusa found one vase-mode wall held water in every material it tested. If yours weeps, Prusa's fixes are more flow (105 to 110 percent) and layers of 0.15 mm or lower.

1.3 Planters with a drainage hole

Plants need the hole, so the pot does not have to hold water at all. The University of Illinois Extension calls a hole at the bottom critical, because wet soil leaves little air for the roots and favors root rot. Colorado State University Extension says every container with drainage holes needs a saucer to protect furniture and floors.

That moves the watertight job to the saucer:

- **Print a separate drip tray.** Make it a shallow tray in vase mode, or with 4 perimeters in PLA or PETG. Illinois advises a detachable saucer over a fixed one, emptied after each watering.
- **Double-pot it.** Set a plain nursery pot inside the printed planter, which Illinois calls double potting. Check that the inner pot never stands in water unless the plant is aquatic.

A printed pot with no hole works as a decorative outer pot. Colorado State notes that decorative containers often lack drainage holes and may call for double potting.

1.4 How to seal a 3D printed planter

Coat the inside, where the soil and water sit. Prusa's part 1 lists two practical methods:

1. **Acrylic lacquer spray.** Prusa's instruction is to spray the model outside and inside a few times. Spray options are compared on the waterproof spray page.
2. **Two-part epoxy.** Brush it over the inner wall and floor, wearing gloves and respiratory protection. In part 2, epoxy turned the leaking PETG box perfectly watertight and improved its mechanical properties. The mix ratio and cure times are on the epoxy page.

Prusa also tried nail polish but calls it quite expensive compared to the other methods, which rules it out for a whole pot.

1.5 Outdoor planters: PLA, PETG or ASA

Heat and sun, not water, decide what lasts outside. The Prusa Knowledge Base gives these limits:

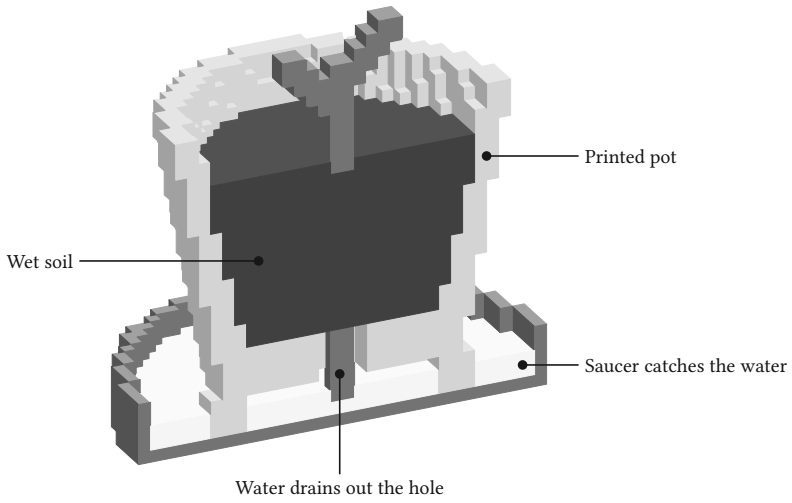


Figure 1. With a hole in the bottom the pot no longer has to hold water, so the saucer underneath does the watertight job.

Table 2. Outdoor planters: PLA, PETG or ASA

Material	Heat limit	Sun and outdoor use
PLA	soft and deforms over 60 °C	degrades under UV light; not suitable for outdoor use
PETG	below 80 °C	water and humidity resistant; most exterior use
ASA	up to 93 °C	UV resistant; suitable for outdoor use

A PLA planter is fine on an indoor shelf and a poor bet in a hot, sunny spot. PETG still needs 4 perimeters. ASA seals with 2 but warps significantly, and Prusa wants a heated bed of at least 100 °C and an enclosure. The full comparison is on the filament page.

1.6 How to check it on your own print

1. Print the planter or saucer with the settings above and let it cool.
2. Stand it on a dry paper towel and fill it to the brim with water.
3. After a few minutes, check the towel and the base, starting with the seam and the floor-to-wall joint.
4. If it is dry, leave it filled overnight and check again.
5. If the seam or base is wet, raise flow to 105 to 110 percent and reprint. If damp patches show across the wall, add perimeters. If it still weeps, seal the inside.

The timed version is on how to test a print for leaks.

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