Can you seal a 3D print with resin?

Asked 3D Content Team
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Abstract. UV printer resin brushed on hardens only where 405 nm light or sunlight lands, and no maker documents it as a sealant. Uncured, it carries H317 (skin allergy).

Keywords: waterproofing, pla, petg

1 Can you seal a 3D print with resin?

Yes, a brushed coat of UV-curing printer resin hardens into a skin under 405 nm light or sunlight, but only where the light lands: a hollow inside or a deep crevice stays liquid and tacky. No resin maker documents it as a sealant, and Hackaday's test of the method measured smoothing, not leaks.

If your resin comes as two bottles you mix, it is epoxy, a different product with its own procedure: see sealing a print with epoxy. This page covers the light-curing liquid sold for resin printers. A craft UV resin follows its own bottle's safety data sheet (SDS) and cure instructions.

1.1 UV printer resin and two-part epoxy as a print coating

Table 1. UV printer resin and two-part epoxy as a print coating

	UV-curing printer resin	Two-part epoxy (Smooth-On XTC-3D)
What starts the cure	Light: ideally 405 nm for Formlabs resin, or direct outdoor sun, since most windows block UV	Mixing Part A and Part B, 2:1 by volume
Cure time	Formlabs Form Cure: Clear V5 5 min with no heat; Clear V4 and V4.1 15 min at 60 °C (140 °F). Hackaday's brushed coat: 2 to 3 hours in winter sun	Tack free in about 2 hours at 23 °C (73 °F); a thin layer cures in 3.5 hours, or 15 minutes at 60 °C
Where it fails	Any face the light does not reach stays uncured	A mismeasured or under-mixed batch misses full cure
Sold as a print coating	No: the SDS lists one use, in Formlabs printers	Yes: Smooth-On names PLA (polylactic acid), ABS (acrylonitrile butadiene styrene) and PETG (glycol-modified PET) prints
Food contact	Formlabs: its resins are not approved for food or drink	The technical bulletin makes no food-contact statement
Skin hazard, uncured	H317, may cause an allergic skin reaction	H317 on the Part A SDS; Smooth-On calls epoxy hardeners sensitizers
Cleaning up uncured material	Isopropyl alcohol	Scrape, then acetone, alcohol or lacquer thinner

The resin column comes from Formlabs' Clear V5 Resin SDS, Form Cure V1 settings and food-safety page. Donald Papp's 2018 smoothing test on Hackaday, which brushed Formlabs Clear resin onto filament prints, supplies the 405 nm and sunlight details and the cleanup. The epoxy column comes from Smooth-On's XTC-3D technical bulletin and Part A SDS.

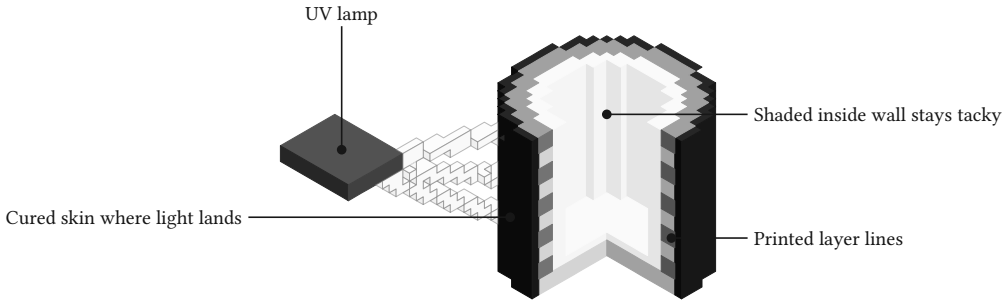


Figure 1. Light cures the resin on the outer face it reaches, while the inside wall it cannot see stays liquid and tacky.

1.2 Why the light decides where it seals

Printer resin hardens when light activates its photoinitiators (the light-sensitive ingredients), so the cure stops where the light stops. Formlabs tells users to remove supports so light reaches every surface during post-curing, and says light alone only cures the surface of a part. A brushed film is thin enough to cure by light alone, but any face the lamp cannot see stays liquid. On a cup or vase that is the inside wall, the face the water touches.

Cure a PLA part with light only. Formlabs' cure presets for Clear V4 and V4.1 run at 60 °C, and the Prusa Knowledge Base says PLA gets soft and deforms above 60 °C.

1.3 How to brush it on

1. **Gloves and glasses.** The Formlabs SDS calls for protective gloves and eye protection. If resin reaches skin, wash it off with plenty of soap and water.
2. **Pour off a small amount.** Never return it to the printer's tank afterward, and keep UV light away from the cup and brush.
3. **Brush it undiluted.** In Hackaday's test, one coat pooled in the valleys between layer lines and smoothed most areas, though not completely. A 25:75 mix of resin and isopropyl alcohol mostly evaporated and barely smoothed the surface. A second undiluted coat buried fine detail.
4. **Cure every face.** Formlabs lists sunlight, UV nail lamps, curing stations and DIY UV boxes as light sources. Turn the part and aim the light into each opening.
5. **Clean up.** Wipe brushes and spills with isopropyl alcohol.

1.4 How to check it on your own print

1. Press every surface with a gloved finger, inside walls and crevices too. Hackaday counted a coat cured once it was no longer tacky. Give any sticky spot more light.
2. Run the leak test: fill the part, stand it on a dry tissue overnight, then keep watching it for the longer soak that page sets out.
3. If it still weeps, switch to a full epoxy coat or add perimeters.
4. Whatever the result, do not use it for food or drink; Formlabs has not approved its resins for food contact.

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