How do you print with PVA soluble supports?

Asked 3D Content Team
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Abstract. Load dry PVA as a second filament, make it the support filament and set top Z distance to 0. It dissolves in water in a few hours to overnight.

Keywords: supports, pla

Table 1. The number

Slicer	Where you assign PVA	Gap to the part	Interface	Other values for PVA
Bambu Studio	Process, Support, Filament for Supports: "Support/raft base" and "Support/raft interface" both PVA	Top Z distance 0 mm, Bottom Z distance 0 mm	Rectilinear Interlaced, Top interface spacing 0	Normal (grid) support, not tree; Support 120 mm/s, Support interface 50 mm/s; PVA at 240 °C, at most 6 mm^3/s
OrcaSlicer	The same two fields	Top Z distance 0	Rectilinear Interlaced, Top interface spacing 0	Independent support layer height off
PrusaSlicer (MK4S or CORE One with MMU3, XL)	A "SOLUBLE FULL" or "SOLUBLE INTERFACE" print preset; PVA defaults to filament 5 on the MMU3, tool 2 on the XL	Top contact Z distance "0 (soluble)"	3 top interface layers, Interface pattern spacing 0.1 mm	Synchronize with object layers on
UltiMaker Cura (UltiMaker S5, PVA in a BB 0.4 print core)	Support Extruder defaults to the extruder loaded with a support material	Support Z Distance 0, against 0.3 mm when PLA prints its own support at 0.15 mm layers	Enable Support Interface on, Support Interface Thickness 2 layers	Support Speed 50 mm/s

1 How do you print with PVA soluble supports?

Load dry PVA (polyvinyl alcohol) into a second extruder or filament slot, make it the support filament and set top Z distance to 0. Bambu Studio and OrcaSlicer also prompt for 0 interface spacing and a Rectilinear Interlaced pattern. Pair it with a build material its maker lists, such as PLA (polylactic acid), then dissolve the PVA in water.

1.1 The number

The Bambu Studio row combines Bambu Lab's PVA Printing Guide (its X1 Carbon project) with the soluble-support prompt and X1 Carbon PVA profile in Bambu Studio v02.09.01.70. OrcaSlicer's row is its soluble-interface prompt at v2.5.0, PrusaSlicer's the 0.20 mm soluble presets bundled with version_2.9.7 (inheritance followed), and Cura's the S5 definitions and quality profiles at 5.14.0.

1.2 How does PVA support work?

PVA dissolves in water and the plastics it holds up do not, so the support can touch the part with no gap. Support in the part's own material needs a gap so you can snap it free (how big a gap). Bambu Lab says only a Top Z distance of 0 leaves the supported surface completely free of sagging, and a dedicated support filament makes 0 possible. With PVA nothing gets snapped: the part goes into water and the support dissolves.

That suits support no tool can reach, such as inside a hollow part, as long as water can get in: UltiMaker's PVA Removal Station reverses its flow so the water reaches every cavity.

Breakaway interface filaments are the other dedicated option and come off by hand (which interface material for each filament).

1.3 Do you need a dual extruder for soluble supports?

Yes, or a second filament path into one nozzle:

- **Two nozzles:** the Bambu Lab H2D, the UltiMaker S series and Factor 4 (PVA in a BB print core), the Original Prusa XL. Bambu Lab says a dual-nozzle printer switches nozzles instead of flushing out the old filament.
- **One nozzle with a filament changer:** Bambu Lab's AMS and AMS lite, the Original Prusa MMU3. Every switch between PVA and the build material flushes filament: the MMU3 default is 140 mm^3 per change, and Prusa suggests at least 200 to 240 mm^3 with soluble supports.

UltiMaker makes no PVA profiles for single-extrusion printers. Polymaker calls a single nozzle possible but not recommended for its PVA, since swapping materials raises the chance of a clog. It recommends an IDEX (independent dual extruder) or a tool changer.

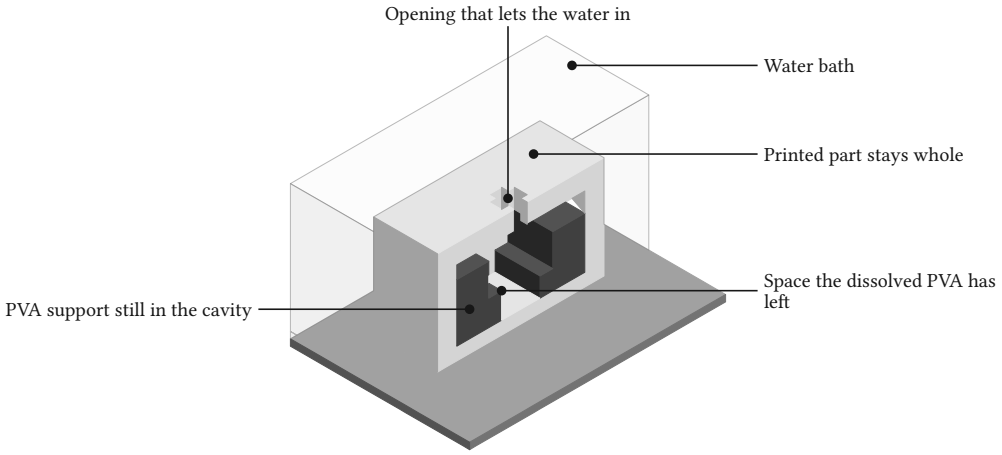


Figure 1. Water reaches the PVA through the opening and dissolves it out of the cavity while the printed part stays whole.

1.4 What filaments pair with PVA supports?

PLA: every PVA source in the table lists it. Nylon, PETG and TPU (thermoplastic polyurethane) depend on the maker. Prusa's rule is that the build material and the soluble support must print at similar temperatures.

Table 2. What filaments pair with PVA supports?

PVA	Build materials the maker lists	Listed against
Bambu Lab PVA	PLA, PLA-CF	PETG: "not compatible"
UltiMaker PVA	Supported: PLA, Tough PLA, PETG, nylon, CPE, PET CF. Experimental: ABS, CPE+, TPU 95A, PPS CF	PC (polycarbonate) and PP (polypropylene), for poor adhesion
Prusa's PVA+ guidance	PLA	PETG: use BVOH (butenediol vinyl alcohol copolymer), another water-soluble support
Polymaker PolyDissolve S1	PLA, TPU, PVB (polyvinyl butyral) and nylon-based filaments	Not stated

The makers disagree on PETG: UltiMaker supports it, Bambu Lab rules it out, and Prusa points PETG to BVOH.

1.5 Should you print the whole support in PVA or only the interface?

Interface only saves PVA; full PVA is for support inside the part or out of reach.

- **Interface only:** PVA goes only in the dense layers touching the model, which saves soluble filament that Prusa notes costs more than PLA and PETG. Prusa prefers it when a lot of support stands on the print sheet, since PVA+ and BVOH stick poorly to its smooth PEI (polyetherimide) and textured sheets.
- **Full PVA:** Prusa uses it for complex geometry with a lot of internal support. Bambu Lab's PVA guide sets PVA for base and interface on normal supports, because tree supports in PVA run tall, thin and unstable and may collapse.
- **Either way,** UltiMaker says a lower support interface density and thickness use less PVA and dissolve faster.

1.6 How do you dry and store PVA?

Dry it before printing and keep it sealed while it prints: Bambu Lab says freshly dried PVA goes damp in 1 to 3 hours at about 55% relative humidity (RH). Bambu Lab dries it at 85 °C for 8 to 12 hours in a forced-air oven (80 °C on its data sheet), UltiMaker at 50 °C for 10 to 20 hours. Other dryers are on the filament drying temperature chart.

While printing, Bambu Lab keeps PVA below 20% RH with calcium chloride desiccant, since silica gel cannot keep it dry for long. After the print, Bambu Lab and UltiMaker both put the spool straight back in a sealed bag or container with desiccant (storing filament dry).

2 How long does PVA take to dissolve?

Several hours to overnight. Bambu Lab says a few hours to a dozen hours, Polymaker 6 to 12 hours and Prusa a few hours to overnight. UltiMaker says moving water can sometimes do it in under three hours. Warm water speeds it up, but the makers cap it at 35 to 50 °C for PLA parts.

2.1 How long does each maker say PVA takes?

Table 3. How long does each maker say PVA takes?

Maker and PVA	Water	Time
Bambu Lab PVA	Warm and agitated, at most 50 °C for a PLA part	A few hours to a dozen hours
UltiMaker PVA, by hand	Warm, at most 35 °C for a PLA part; never above 50 °C, a burn risk	Several hours; under three hours in some cases with moving water
UltiMaker PVA Removal Station	Cold tap water, kept flowing	1 to 8 hours for most prints
Prusa (PVA+ and BVOH)	Warm, at most 45 °C	A few hours to overnight, then 10 to 20 minutes in hot water and a brush
Polymaker PolyDissolve S1	Warm; boiling only if the part's material can take it	6 to 12 hours

Rows come from Bambu Lab's PVA Printing Guide, UltiMaker's dissolving article and Removal Station manual, the Prusa Knowledge Base and Polymaker's wiki. The caps protect the printed part; UltiMaker's 50 °C cap also protects your hands.

2.2 How do you dissolve supports faster with warm water?

Heat the water to your maker's cap in the table, then keep it moving: UltiMaker's flowing-water station clears PVA up to four times faster than still water. Stirring or running tap water over the part also works.

1. **Break off the bulk first.** UltiMaker soaks the part for about 10 minutes, then pulls most of the support off with pliers. Wear gloves: broken PVA pieces can be sharp.
2. **Change the water.** Water saturated with PVA dissolves it more slowly; UltiMaker says fresh water is quickest, and Polymaker changes it every few hours.
3. **Finish with a brush.** Prusa gives the freed part 10 to 20 minutes in hot water, then scrubs off the residue with a small, stiff toothbrush.

Then rinse and let the part dry. Bambu Lab warns that water can get into the voids inside a print during the soak (walls that keep water out).

2.3 Can PVA water go down the drain?

Usually, yes. UltiMaker says it can where your drains connect to a wastewater treatment plant: run hot tap water for about 30 seconds afterward so the PVA does not clog the pipe, and check local regulations. Prusa says that unless you dissolve several kilos of PVA or BVOH a day, you can pour it down the sewer.

2.4 How to check it on your own print

1. **Match the pair** against your PVA maker's list above.
2. **Dry the PVA, then bend it.** Bambu Lab's test: dry PVA bends stiffer than PLA Basic.
3. **Assign it** where the table says, and accept Bambu Studio's or OrcaSlicer's soluble suggestion. In PrusaSlicer, set the soluble filament under Multiple Extruders.
4. **Read the gap and the preview.** Top Z distance should read 0 ("0 (soluble)" in PrusaSlicer), with PVA on every surface that touches the part.
5. **Test the extrusion.** Bambu Lab feeds PVA by hand at 240 to 250 °C first; if the strand is irregular or does not fall straight down, do a cold pull or change the nozzle.
6. **Start the soak within 2 hours of the print ending.** Bambu Lab says PVA left out absorbs moisture and softens, which leaves residue on the part.

References

[1] PVA Printing Guide, Bambu Lab Wiki. https://wiki.bambulab.com/en/filament-acc/filament/pva-printing-guide. Accessed November 7, 2026.

[2] Support Structures (Bambu Studio), Bambu Lab Wiki. https://wiki.bambulab.com/en/software/bambu-studio/support. Accessed November 7, 2026.

[3] Introduction to Filament Grouping Strategy for Dual Nozzle Printers, Bambu Lab Wiki. https://wiki.bambulab.com/en/software/bambu-studio/manual/dual-nozzles-slicing-filament-grouping. Accessed November 7, 2026.

[4] Bambu Filament Technical Data Sheet V1.0, PVA. https://store.bblcdn.com/s7/default/868930e5a44944258586caa250cc8143/Bambu_PVA_Technical_Data_Sheet.pdf. Accessed November 7, 2026.

[5] src/slic3r/GUI/SupportComboAdvisor.cpp at v02.09.01.70, Bambu Studio on GitHub. https://github.com/bambulab/BambuStudio/blob/v02.09.01.70/src/slic3r/GUI/SupportComboAdvisor.cpp. Accessed November 7, 2026.

[6] resources/profiles/BBL/filament/Bambu PVA @BBL X1C.json at v02.09.01.70, Bambu Studio on GitHub. https://github.com/bambulab/BambuStudio/blob/v02.09.01.70/resources/profiles/BBL/filament/Bambu%20PVA%20%40BBL%20X1C.json. Accessed November 7, 2026.

[7] src/slic3r/GUI/Tab.cpp at v2.5.0, OrcaSlicer on GitHub. https://github.com/OrcaSlicer/OrcaSlicer/blob/v2.5.0/src/slic3r/GUI/Tab.cpp. Accessed November 7, 2026.

[8] resources/profiles/PrusaResearch.ini at version_2.9.7, PrusaSlicer on GitHub. https://github.com/prusa3d/PrusaSlicer/blob/version_2.9.7/resources/profiles/PrusaResearch.ini. Accessed November 7, 2026.

[9] src/libslic3r/PrintConfig.cpp at version_2.9.7, PrusaSlicer on GitHub. https://github.com/prusa3d/PrusaSlicer/blob/version_2.9.7/src/libslic3r/PrintConfig.cpp. Accessed November 7, 2026.

[10] Water-soluble materials (PVA/BVOH), Prusa Knowledge Base. https://help.prusa3d.com/article/water-soluble-materials-pva-bvoh_162860. Accessed November 7, 2026.

[11] resources/definitions/fdmprinter.def.json at 5.14.0, UltiMaker Cura on GitHub. https://github.com/Ultimaker/Cura/blob/5.14.0/resources/definitions/fdmprinter.def.json. Accessed November 7, 2026.

[12] resources/definitions/ultimaker.def.json at 5.14.0, UltiMaker Cura on GitHub. https://github.com/Ultimaker/Cura/blob/5.14.0/resources/definitions/ultimaker.def.json. Accessed November 7, 2026.

[13] resources/quality/ultimaker_s5/um_s5_bb0.4_pva_0.15mm.inst.cfg at 5.14.0, UltiMaker Cura on GitHub. https://github.com/Ultimaker/Cura/blob/5.14.0/

resources/quality/ultimaker_s5/um_s5_bb0.4_pva_0.15mm.inst.cfg. Accessed November 7, 2026.
[14] resources/quality/ultimaker_s5/um_s5_aa0.4_pla_0.15mm.inst.cfg at 5.14.0, UltiMaker Cura on GitHub. https://github.com/Ultimaker/Cura/blob/5.14.0/resources/quality/ultimaker_s5/um_s5_aa0.4_pla_0.15mm.inst.cfg. Accessed November 7, 2026.
[15] How to print with UltiMaker PVA, UltiMaker Support. https://support.ultimaker.com/articles/Knowledge/1667337600656. Accessed November 7, 2026.
[16] How to dissolve Ultimaker PVA, UltiMaker Support. https://support.ultimaker.com/articles/Knowledge/1667410781980. Accessed November 7, 2026.
[17] Ultimaker PVA Removal Station, Installation and user manual v1.4, UltiMaker. https://um-support-files.ultimaker.com/manuals/user-manual/PVAR/PVA%20Removal%20Station%20-%20User%20manual%20-%20ENv1.4.pdf. Accessed November 7, 2026.
[18] PolyDissolve S1, Polymaker Wiki. https://wiki.polymaker.com/polymaker-products/polymaker-filaments/specialty-filament/polydissolve-tm-s1. Accessed November 7, 2026.

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