How should you store filament to keep it dry?

Asked 3D Content Team
Published October 17, 2026 · Last verified October 17, 2026

Abstract. Seal it in an airtight bag or box with desiccant below 20% RH, Bambu Lab's target for PLA, PETG, TPU, PC and nylon. Room air can re-wet it in 2 to 12 hours.

Keywords: pla, petg, nylon

Table 1. The number

Filament	Bambu Lab: desiccant while printing	Bambu Lab data sheet: storage RH, water uptake at 25 °C and 55% RH	Polymaker	Prusa: maximum RH in its drybox
PLA	Not required but recommended	Below 20% RH, sealed with desiccant; 0.43% (PLA Basic)	Low sensitivity, but can still take on moisture over time	Below 30% RH, up to 40% short-term
PETG	Not required but recommended	Below 20% RH; 0.45% (PETG Basic)	Highly hygroscopic; PolyLite PETG sheet: print from a dry box, store in the resealable bag	Below 20% RH
TPU	Required (TPU 85A, 90A, 95A HF, TPU for AMS)	Below 20% RH; 1.08% (TPU 95A HF)	Highly hygroscopic; often kept in a dryer while printing in humid climates	Below 20% RH, ideally below 15%
PC	Required	Below 20% RH; 0.25%	Dry box or dryer recommended while printing (PolyLite PC)	Below 20% RH
Nylon (PA)	Required (PA6-CF/GF, PAHT-CF/GF)	Below 20% RH; 0.88% (PAHT-CF), 2.35% (PA6-CF)	Store and use below 20% RH; print only from a heated dryer (PolyMide CoPA)	Not listed; keep airtight with desiccant

1 How should you store filament to keep it dry?

Keep it sealed in an airtight bag or box with desiccant, below 20 percent relative humidity (RH): the target on Bambu Lab's data sheets for PLA, PETG, TPU, PC and nylon. A hygrometer inside shows the humidity. Left out at about 55 percent RH, dried filament can be wet enough to hurt prints in 2 to 12 hours.

1.1 The number

The desiccant column is from Bambu Lab's Filament Drying Recommendations wiki. Storage RH and water uptake are from Bambu's PLA Basic, PETG Basic, TPU 95A HF, PC, PA6-CF and PAHT-CF data sheets. Polymaker's column draws on its Wet Filament page, the PolyLite PETG data sheet and the PolyLite PC and PolyMide CoPA pages. Prusa's figures are from the Prusa USS Drybox and Polyamide (Nylon) articles in the Prusa Knowledge Base.

PLA is polylactic acid, PETG is glycol-modified polyethylene terephthalate, TPU is thermoplastic polyurethane and PC is polycarbonate. Bambu contradicts itself on PLA: the PLA Basic sheet asks for sealed storage with desiccant, while the wiki calls desiccant optional during printing.

1.2 Why

Filament is hygroscopic: it keeps pulling water from the surrounding air. Bambu Lab puts ordinary indoor air at 45 to 65 percent RH, and higher in humid weather. The lower the humidity, the longer filament stays dry.

A sealed container stops fresh air from reaching the spool, and the desiccant soaks up any moisture that leaks past the seal. Once that's saturated, the box climbs back toward room humidity. Bambu counts its AMS multi-spool feeder as a sealed container while it holds working desiccant.

A sealed box won't dry a wet spool. Prusa says filament that is already moist must be dried before it goes in its drybox, and Polymaker says an airtight box with desiccant packs does little for active drying.

1.3 How fast does a dried spool get wet again?

Table 2. How fast does a dried spool get wet again?

Where the spool sits	How long it stays dry
Open room air, about 55% RH	2 to 12 h before print quality suffers
Sealed with desiccant at 20% RH	2 to 7 days
Below 20% RH	Longer the lower it goes
Nylon in open air for about 3 months	So wet that an 80 to 90 °C oven struggles to dry it
Factory vacuum bag with desiccant, seal unbroken	Ready to print without drying, for most users

All rows but the last are from Bambu Lab's drying wiki, which says the spread depends on the filament type. The

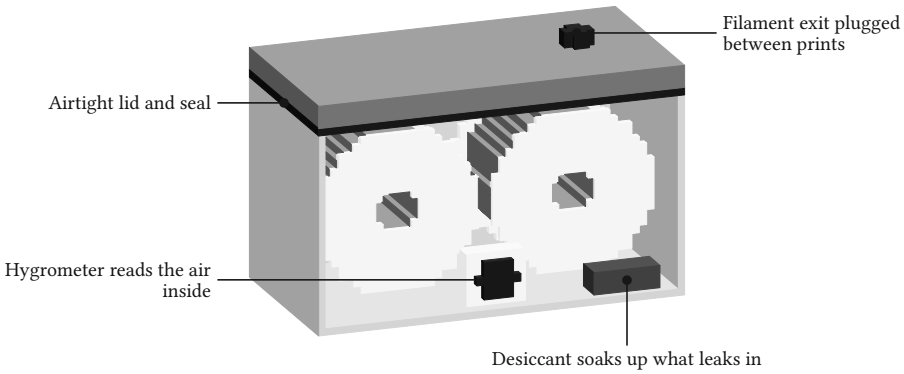


Figure 1. The sealed box stops fresh air reaching the spools, and the desiccant soaks up any moisture that leaks past the seal.

last is Polymaker's, which vacuum-seals every spool with a desiccant pack.

1.4 How do you keep PLA dry?

PLA is the most forgiving. Prusa's drybox limit for it is 30 percent RH, and Prusa says PLA "doesn't change properties too much" as it takes on moisture. If you're short on storage, Prusa says to give the sealed space to the more hygroscopic filaments first. One exception: Prusa recommends drying even PLA before printing on the multi-tool Original Prusa XL, because its idle toolheads sit at 70 °C and any moisture in the filament comes out as stringing.

1.5 How do you keep PETG dry, and does it need a dry box?

Seal it below 20 percent RH, the figure Bambu Lab and Prusa both give. For printing, the makers disagree. Bambu calls desiccant during use optional for PETG. Polymaker rates PETG highly hygroscopic and recommends a dry box while printing its PolyLite grade, with the spool kept in its resealable bag between jobs.

1.6 How do you keep nylon filament dry?

Treat it as the strictest case, and plan for more than a dry box. Polymaker says PolyMide CoPA must be stored and used below 20 percent RH, and fed from a heated filament dryer for the whole job. Bambu requires desiccant during printing for all its nylon grades.

Prusa says badly stored polyamide can soak up to 10 percent of its own weight in water. Bambu adds that nylon left in open air for about 3 months gets very hard to dry, so seal any spool you won't use soon.

1.7 When do you replace or recharge the desiccant?

Prusa's rule: when the hygrometer reads above the filament's limit, replace or regenerate the desiccant. Bambu Lab's silica gel has indicator beads that change color as they fill. Once every bead has turned, replace or dry the pack. Bambu's regeneration settings:

- **In an oven:** 80 to 90 °C and never above 100 °C, with the beads no deeper than 2 cm. Allow 1 to 2 hours if lightly damp, 2 to 3 hours if saturated.
- **On the printer bed (X1, X1C, P1S):** 80 °C for 3 to 4 hours after a 10-minute preheat, beads in an open heat-safe container.
- **Containers:** ceramic, glass or aluminum foil. Never plastic, and never cookware used for food. Ventilate the room, wear heat-resistant gloves and clean a household oven afterwards.
- **Lifespan:** 5 to 15 regenerations.

Bambu dropped calcium chloride desiccant from its newer AMS units because it can liquefy and corrode electronics.

1.8 How to check it on your own print

- **Dry a damp spool first.** A sealed box only slows moisture uptake.
- **Put a hygrometer in the box.** Prusa says the reading can take up to an hour to settle after you close the lid. Its drybox hygrometer is accurate to ±3 percent RH, so keep a few points under the limit.
- **Inspect the seal at every opening.** Prusa says a poor seal or frequent opening raises the humidity in the box. Keep any ports shut, and plug the filament exit between prints.
- **Leave new spools in the factory bag.** Polymaker says its spools print straight from an unbroken vacuum bag.
- **Print a test.** If you still get popping, bubbles or strings, the spool is wet again. The moisture symptom table shows what each maker blames on moisture.

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Cite as: Asked 3D. "How should you store filament to keep it dry?." October 17, 2026. https://asked3d.com/answers/store-filament-dry. Last verified October 17, 2026.