

// MATERIAL · BAMBU LAB · FDM

PLA WOOD

Real wood flour in PLA for a matte, grainy, faintly scented finish — the most moisture-sensitive PLA in the range, and the one that most needs a dryer.

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PLA Wood blends finely ground wood — genuine plant fibre, not a pigment — into a PLA base. Prints come out with a dry, matte, slightly fibrous surface that hides layer lines, takes stain and looks and feels closer to timber than any other filament. There is a gentle sawdust smell while printing. Wood flour is also the most hygroscopic filler in the range, absorbing three times the moisture of plain PLA, which is why the manufacturer's advice is unusually firm: dry it before printing, print it, and seal it away with desiccant straight afterwards. It is a decorative material of modest strength, mildly abrasive, and best run through a 0.4 mm or larger nozzle.

FEELS LIKE

Dry, matte, faintly fibrous

Warmer and less plasticky in the hand than any other PLA

THE EFFECT

Wood grain look and scent

Six wood tones from birch to black walnut; colour deepens with temperature

STRENGTH

Modest

About 75 % of PLA Basic in a pull; weak across layers

MOISTURE

1.25 % uptake — highest in the range

Drying is required, not optional; store sealed

NOZZLE

0.4 mm or larger

Hardened steel recommended; no 0.2 mm

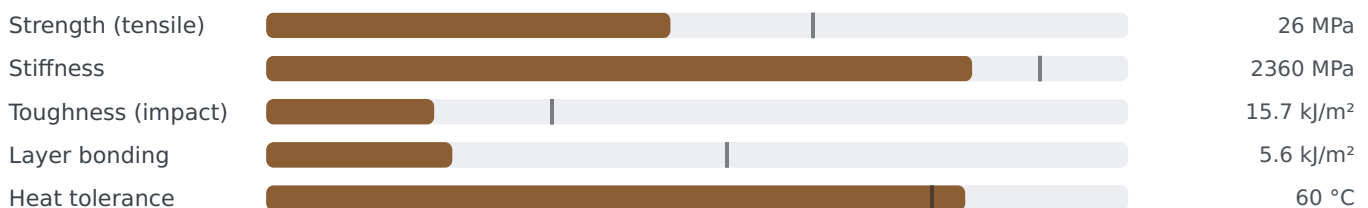
COLOUR RANGE

6 tones

Black Walnut, Rosewood, Clay Brown, Classic Birch, White Oak, Ochre Yellow

Where it sits in the range

Each bar shows this material against the strongest value found anywhere in this series of guides, PLA and PETG together (bar full = best in the series). The dark tick marks plain PLA Basic, the material most people know, so you can see at a glance where this one gives up or gains something. Values come from the manufacturer's own datasheets, measured on test bars printed flat (X-Y).



■ PLA Wood | PLA Basic reference

Good for

- Decorative boxes, bowls, trays and coasters
- Picture frames, signs, plaques and lettering
- Model furniture, dollhouse pieces and architectural details
- Terrain, tree trunks and scenery for tabletop games

Not the right choice for

- Structural parts, hinges, clips or anything loaded across layers
- Fine detail through a 0.2 mm nozzle — it clogs
- Damp rooms or outdoor use; the wood fibre swells and the polymer softens
- Food contact; no certification

- Planters and vases with a natural look (with a liner)
- Anything you would like to stain, oil or wax like wood

- Printers left loaded for days without drying — the spool will absorb moisture in the AMS

Wood flour: grain, scent, and thirst

Wood flour is cellulose and lignin ground to a fine powder. In the melt the particles stay solid and slightly rough, so the extruded line has a matte, textured surface and a natural colour variation from particle to particle that reads as grain. Heating the wood browns it, which is why a hotter nozzle produces darker prints — a property some users exploit to create ring-like tone bands by varying temperature through a print. The same cellulose is what makes wood swell in damp weather, and it does the same thing inside filament: the datasheet's 1.25 % water uptake is three times that of plain PLA, and wet PLA Wood prints with bubbles, stringing, uneven colour and weak layers. Wood particles are softer than glass or minerals but still abrasive over time, and they clog small orifices, so hardened steel and a 0.4 mm minimum are advised.

2 · Living with a PLA Wood print

A PLA Wood print behaves like a small wooden object with a plastic core: it likes dry indoor air and dislikes heat, damp and rough handling.

Heat	Softens from about 54-60 °C. Keep out of parked cars and away from radiators, cookers and hot lamps.
Sunlight	The wood tones can lighten or yellow with UV, as real wood does; the polymer embrittles over years. Indoors preferred.
Water and damp	Absorbs moisture into the wood fibre; in a bathroom or outdoors it may swell slightly and the surface can roughen. Keep dry. Use a liner in planters.
Chemicals	As PLA. Wood stains, oils and waxes are absorbed by the exposed fibres and change the colour as they would on timber.
Food	Not certified for food contact.
Children and pets	Non-hazardous material; small parts are a choking hazard.
Load over time	Weak and creeps; decorative only.
End of life	General waste or 3D-print recycling.

Looks and feel

Matte and fibrous with a subtle natural variation that reads as grain, especially after light sanding. Colour depends on nozzle temperature — lighter when cool, darker when hot — and on how dry the filament was. Layer lines are well concealed. Spools can differ slightly in tone, and so can regions within one print.

Care

- Dust with a brush; wipe with a barely damp cloth and dry immediately
- Keep dry and away from heat
- Sands beautifully with dry paper (unlike glossy PLA) and reveals more grain; wear a mask
- Stains, oils, waxes and wood dyes take well; test on scrap — absorption is uneven
- Wood glue does not bond it; use superglue or epoxy

Dry it, print it, seal it

The manufacturer's drying page rates PLA Wood as the one PLA for which pre-drying and desiccant storage are required rather than recommended. At typical indoor humidity a dried spool can begin to degrade print quality within hours.

What PLA actually is

PLA stands for polylactic acid. It is a polyester made by fermenting plant sugars — usually corn starch or sugarcane — into lactic acid and then linking those molecules into long chains. That plant origin is why PLA is often described as a bioplastic: the carbon in it was recently in a field, not in an oil well. It is the most widely used material in desktop 3D printing for a practical reason: it melts at a low temperature, barely shrinks as it cools, and therefore prints reliably on almost any machine without an enclosure.

Its two well-known limits follow from the same chemistry. PLA is a semi-crystalline polymer with a glass transition around 55–60 °C, so it starts to soften at temperatures a car dashboard or a sunny windowsill can reach. And although it is compostable in principle, that only happens in an industrial composting plant at around 60 °C with the right microbes; in a garden heap, in soil or in the sea it behaves like any other plastic for many years. Printed PLA should go into general waste or a dedicated 3D-print recycling stream, not the organic bin. Every variant in this series is a PLA base with something changed — a filler, a pigment system, an additive package or a foaming agent — and each guide explains what that change does to the material's behaviour.

3 · How it is printed

PLA Wood prints on the PLA profile with three habits: dry the spool first, use a 0.4 mm or larger hardened nozzle, and expect a light woody smell — ventilate if you are sensitive to it.

Manufacturer print window

Nozzle temperature	190–240 °C; hotter gives darker wood tones
Bed temperature	35–45 °C on Cool Plate; 45–65 °C on PEI per the general table
Build plates	Textured PEI or Smooth PEI (datasheet); Cool Plate also listed in the general table
Bed adhesive	Glue stick or liquid glue
Chamber	25–45 °C, no enclosure; ventilate for the wood odour
Print speed	Up to 250 mm/s
Part cooling fan	On
Retraction	0.6–1.0 mm at 20–40 mm/s
Max overhang without support	About 55°
Max unsupported bridge	About 30 mm
Support material	Support for PLA

Hardware and compatibility

Nozzle sizes	0.4, 0.6 and 0.8 mm; 0.2 mm not recommended (clogging)
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Nozzle material	Hardened steel 0.4/0.6/0.8 recommended; stainless 0.4 acceptable; brass unsuitable
Abrasive	Mildly; wear rate not published
Automatic material systems	AMS and AMS lite listed as compatible by the store; the general table hedges that rough or brittle filled filaments may not feed in AMS lite
Spool identification	RFID tag

Moisture, drying and storage

This is the PLA that must be dried. The manufacturer's drying page gives PLA Wood its own, stricter row, and the usage guide adds AMS-dryer figures.

Forced-air oven or filament dryer	55–65 °C for 8 hours (drying page); 55 °C for 8 hours (datasheet)
Heated print bed method	70–75 °C for 12 hours (drying page); 65–75 °C (datasheet); covered, turned every 6 hours
AMS 2 Pro / AMS HT	55 °C for 8 hours (usage guide)
Pre-drying	Required, even from a fresh vacuum pack
Storage	Required: sealed with desiccant, below 20 % relative humidity, immediately after use
Annealing (optional)	50–60 °C for 6–12 hours; may warp

Tips that make a visible difference

- Print a temperature tower to pick the wood tone you want; 200 °C is pale, 230 °C is dark
- For visible "rings", change the nozzle temperature by 10–15 °C every few millimetres of height
- A 0.6 mm nozzle with 0.3 mm layers gives a coarser, more timber-like texture and fewer clogs
- Dry-sand the finished print with 180–320 grit to lift the grain, then oil or wax
- Do not leave the spool in the AMS between sessions; unload and bag it with desiccant

Known problems and their fixes

Stringing, bubbles, popping, uneven colour

Moisture — by far the most common problem. Dry at 55–65 °C for 8 hours and store sealed.

Clog on a 0.2 mm nozzle

Not supported. Use 0.4 mm or larger.

Tone varies within a print or between spools

Partly natural, partly moisture-driven. Dry thoroughly and keep the nozzle temperature constant if you want uniform colour.

Nozzle wear over time

Fit hardened steel.

Part snaps along a layer

Low Z toughness (5.6 kJ/m²). More walls, orient flat, and keep it decorative.

Feeding problems in AMS lite

Possible with rough filled filaments. Feed from the external holder if it recurs.

4 · The numbers — technical datasheet

Figures are from the PLA Wood Technical Data Sheet V1.0 (specimens printed at 220 °C / 35 °C bed / 200 mm/s, 100 % infill, dried 55 °C for 8 hours).

Physical and thermal properties

Property	Test method	Value
Density	ISO 1183	1.21 g/cm ³
Melt flow index (210 °C, 2.16 kg)	ISO 1133	29.4 ± 1.7 g/10 min
Melting temperature	DSC, 10 °C/min	156 °C
Glass transition temperature	DSC, 10 °C/min	54 °C
Vicat softening temperature	ISO 306	64 °C
Heat deflection temperature, 0.45 MPa	ISO 75	60 °C
Heat deflection temperature, 1.8 MPa	ISO 75	57 °C
Saturated water absorption (25 °C, 55 % RH)	—	1.25 %

Mechanical properties

Property	Test method	X-Y (flat)	Z (across layers)
Young's modulus	ISO 527	2360 ± 190 MPa	1770 ± 150 MPa
Tensile strength	ISO 527	26 ± 5 MPa	15 ± 4 MPa
Elongation at break	ISO 527	15.3 ± 3.1 %	4.5 ± 1.7 %
Bending modulus	ISO 178	2780 ± 120 MPa	1975 ± 140 MPa
Bending strength	ISO 178	55 ± 4 MPa	28 ± 4 MPa
Charpy impact, unnotched	ISO 179	15.7 ± 3.7 kJ/m ²	5.6 ± 1.2 kJ/m ²
Charpy impact, notched	ISO 179	6.3 ± 2.2 kJ/m ²	not published

What the mechanical numbers mean in practice

PLA Wood is stiff for a filled decorative grade (bending modulus 2780 MPa, close to PLA Basic) but not strong: 26 MPa in a pull, 55 MPa in bending, and the lowest flat-direction impact of any PLA in the range at 15.7 kJ/m². Across the layers it drops to 15 MPa tensile — 58 % of flat — and 5.6 kJ/m² impact. The high flat elongation (15 %) is a little misleading; it reflects a softened matrix, not resilience. Thermally it is unremarkable except for the water absorption row, which at 1.25 % is the number that defines how to handle it.

Product format

Diameter	1.75 mm ± 0.03 mm
Net weight	1 kg
Spool	ABS, 200 × 67 mm, rated to 70 °C; ships vacuum-sealed with desiccant
Colours	6: Black Walnut, Rosewood, Clay Brown, Classic Birch, White Oak, Ochre Yellow

Identification	RFID tag
Datasheet version	V1.0

Safety, certifications and chemical resistance

- Declared composition polylactic acid with fine wood powder; a mild, non-irritating wood odour while printing — ventilate if sensitive
- Flammable; combustion products water and carbon oxides
- RoHS and REACH compliance stated across the filament line
- No food-contact or toy certification; no emissions data published
- Sanding dust is wood-and-plastic dust; wear a mask
- Resistant to oils and greases; not to acids, alkalis or some organic solvents

5 · Compared with Polymaker and SUNLU

Both other brands sell a genuine wood-fibre PLA. Neither publishes a proper datasheet for it: Polymaker gives no figures at all, SUNLU gives approximate ones.

Polymaker

Polymaker Wood PLA

Real wood fibre in PLA, marketed on look, texture and scent and on being sandable and finishable like timber. Polymaker publishes no density, mechanical or thermal values for it, and the older PolyWood datasheet is no longer online. It is the most expensive wood filament of the three.

Mechanical data	not published
Filler	real wood fibre
Price band	highest of the three
Spool	cardboard, 1 kg

SUNLU

SUNLU PLA Wood · Real Wood Fiber PLA

SUNLU marks every figure for its wood filament as approximate: about 1.25 g/cm³, 35–42 MPa tensile, 65–75 MPa bending, 55 °C HDT. It is the only SUNLU PLA with a lower bed temperature (40–50 °C) and the only one at ±0.03 mm rather than ±0.02 mm diameter tolerance — both signs of a filled, less uniform filament. No drying guidance specific to wood is published.

Density	≈ 1.25 g/cm ³
Tensile	≈ 35–42 MPa
Bending strength	≈ 65–75 MPa
HDT	≈ 55 °C
Nozzle / bed	190–220 °C / 40–50 °C
Diameter	1.75 ± 0.03 mm
Spool	cardboard, 1 kg

Reading cross-brand numbers fairly

Manufacturer datasheets are produced by different labs on different printers, and two numbers are comparable only when the test standard, specimen orientation and impact method match. Charpy and Izod impact results are not interchangeable; notched and unnotched results differ by a factor of three or more; and Polymaker publishes Z-direction data where SUNLU publishes none. Treat cross-brand figures as an indication of class, not a ranking. Where a brand's marketing claim is not backed by its own datasheet, this guide says so.

Bottom line. Bambu's is the only wood PLA of the three with a full datasheet and explicit drying rules, which for this material matters more than the numbers themselves. SUNLU's approximate figures suggest a somewhat stronger compound at a lower price; Polymaker's is an appearance-only purchase.

How to read the datasheet

X-Y vs Z	A 3D print is a stack of layers. X-Y describes a test bar printed lying flat, where the load runs along the extruded lines. Z describes a bar printed standing up, where the load tries to pull the layers apart. Z values are always lower, and the ratio between them tells you how well the layers have fused. Real parts fail along layer lines far more often than through them.
Tensile strength (MPa)	The stress at which a bar pulled from both ends breaks. Megapascals are newtons per square millimetre: a 10 mm × 10 mm cross-section of a 35 MPa material holds roughly 3.5 kN, about 350 kg, before it snaps in a slow pull.
Young's modulus (MPa)	Stiffness — how much force it takes to stretch the material by a given amount. Higher means more rigid. It says nothing about strength: a stiff material can still be brittle.
Elongation at break (%)	How far the bar stretched before it broke, as a percentage of its original length. Low values (under 5 %) mean the material snaps with little warning; higher values mean it yields and bends first.
Bending (flexural) strength and modulus	The same two ideas measured by pressing down on the middle of a bar supported at both ends — closer to how brackets, clips and shelves are actually loaded.
Charpy impact (kJ/m²)	A pendulum hammer strikes the bar; the energy it absorbs before breaking is divided by the fracture area. This is the best single indicator of toughness — resistance to drops and knocks. Unnotched bars measure the bulk material; notched bars have a small cut that concentrates stress and give much lower numbers. Never compare a notched figure with an unnotched one, or a Charpy figure with an Izod one (a different test geometry).
Glass transition, Tg (°C)	The temperature at which the polymer's chains gain enough mobility for it to change from glassy and rigid to leathery and soft. Above Tg a loaded part will slowly creep and deform. For PLA and PETG this is the single most important thermal number.
Heat deflection temperature, HDT (°C)	The temperature at which a bar under a fixed bending load sags by a set amount. Quoted at 0.45 MPa (light load) and 1.8 MPa (heavy load); the light-load figure is always the higher of the two. Practical rule: keep loaded parts well below the 0.45 MPa figure.
Vicat softening point (°C)	The temperature at which a needle under load penetrates 1 mm into the material. Another measure of when the surface stops being hard.
Melting temperature, Tm (°C)	Where the crystalline regions melt, measured by DSC (a calorimeter). Printing happens well above Tm so the polymer flows freely.
Melt flow index, MFI (g/10 min)	How much molten material flows through a standard die in ten minutes under a fixed weight (210 °C for PLA; PETG sheets use 210–250 °C, so compare only at equal temperature). Higher means runnier and easier to push at speed; lower means more viscous, which is why some variants have lower speed limits.
Water absorption (%)	How much moisture the filament takes up from air at 55 % relative humidity. Absorbed water boils in the nozzle, causing pops, bubbles, stringing and rough surfaces — hence the drying recommendations.

Density (g/cm³)	Mass per volume. A 1 kg spool of a 1.31 g/cm ³ material contains about 5 % less printable length than a 1 kg spool at 1.24 g/cm ³ — heavier fillers cost you metres.
Annealing	Baking a finished print at a temperature just above Tg to let it crystallise further. It can raise heat resistance and stiffness but usually shrinks and sometimes warps the part.

Data notes and sources

Where sources disagree

- Drying: the datasheet says 55 °C / 8 h; the manufacturer's drying-recommendations page gives PLA Wood a stricter, material-specific row (55–65 °C / 8 h oven, 70–75 °C / 12 h bed, drying and desiccant required). The stricter figures are used.
- Build plates: the datasheet lists Textured and Smooth PEI; the general filament table also lists the Cool Plate at 35–45 °C.
- AMS lite: the store lists it as compatible; the general table cautions that rough or brittle filled filaments may not feed in AMS lite.
- No refill (spool-free) format was found for this product.

Sources

- Bambu Lab, PLA Wood Technical Data Sheet V1.0 — https://store.bblcdn.com/s4/default/6fda0ae88e5a4e66bb5d58f2968eeee42/Bambus_PLA_Wood_Technical_Data_Sheet.pdf
- Bambu Lab US Store, PLA Wood — <https://us.store.bambulab.com/products/pla-wood>
- Bambu Lab Wiki, Filament drying recommendations — <https://wiki.bambulab.com/en/filament-acc/filament/dry-filament>
- Bambu Lab Wiki, PLA Usage Guide (PLA Wood section, drying table) — <https://wiki.bambulab.com/en/filament/pla>
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- Polymaker, Polymaker Wood PLA — <https://shop.polymaker.com/products/polymaker-wood-pla>
- SUNLU, filament parameter table — <https://www.sunlu.com/wiki/43>
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