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PLA MARBLE

Mineral grains speckled through PLA for a convincing stone look — the stiffest of the effect filaments, matte and slightly rough, with a strict no-0.2-mm rule.

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PLA Marble mixes fine inorganic particles into PLA so that a print comes out flecked like polished granite or veined marble, with a matte, faintly gritty surface that reads as stone from across a room. It is the material for busts, planters, architectural models and anything that would look better carved than moulded. Among the decorative PLAs it is the most "engineering-like" on paper: the mineral filler keeps it stiff and gives it a good flat-direction bending strength, at the cost of low elongation and the weak layer bonding common to all filled grades. The particles are hard enough that the manufacturer rules out 0.2 mm nozzles outright and recommends hardened steel for regular printing.

FEELS LIKE

Matte, dry, slightly gritty

Cooler and more stone-like in the hand than smooth PLA

THE EFFECT

Speckled stone

White Marble looks like Carrara; Red Granite like polished red stone

STRENGTH

Stiff but brittle

Bending strength close to PLA Basic; elongation about half

NOZZLE

0.2 mm not compatible

Hardened steel 0.4 mm or larger recommended

COLOUR RANGE

2 colours

White Marble, Red Granite

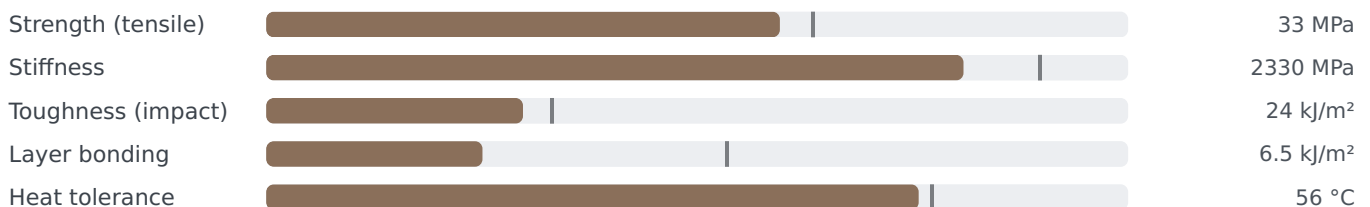
EASE OF PRINTING

Easy

Standard PLA settings, 250 mm/s limit; hides layer lines well

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 Marble ■ PLA Basic reference

Good for

- Busts, statues, columns and classical decorative pieces
- Planters, vases and bowls with a stone look
- Architectural models and tabletop terrain
- Bookends, coasters, trays and desk objects

Not the right choice for

- Structural parts, brackets and anything loaded across layers
- Fine detail through a 0.2 mm nozzle — it will clog
- Thin, tall features that may be knocked
- Food contact, heat, sun: the general PLA limits

- Lamp bases and candle holders kept away from heat

- Prints where a smooth glossy finish is wanted

Speckle, texture and the hardness that comes with them

The stone look comes from two things: visible mineral grains that show as darker flecks against the base colour, and a matte, micro-rough surface where grains sit proud of the polymer. The grains do not melt, so they pass through the nozzle intact and any orifice smaller than a few grain diameters will eventually block — hence the 0.2 mm prohibition, the strongest wording of any PLA in the range. Hard mineral grains also abrade soft nozzle metals over time. Inside the material they raise stiffness and bending strength to near PLA Basic levels while cutting elongation to 6.7 % and layer impact to less than half. Because the particles are randomly distributed, no two prints have the same pattern, and larger nozzles with thicker layers give a coarser, more natural speckle.

2 · Living with a PLA Marble print

A Marble print is as easy to live with as any PLA ornament, and its matte surface forgives fingerprints and dust.

Heat	Softens from about 56 °C. Keep out of parked cars, off radiators, and never use as a candle holder for anything but LED candles.
Sunlight	Matte filled surfaces fade less visibly than gloss; the polymer still embrittles over years of UV. Better indoors.
Water and damp	Insoluble; moderate moisture uptake (0.44 %). Works as a planter with an inner pot; not for permanently wet outdoor use.
Chemicals	As PLA; the mineral is inert.
Food	Not certified for food contact.
Handling	Robust to handling in thick sections; thin features snap along layers.
Load over time	Stiffer than most decorative PLAs but still creeps under sustained load.
End of life	General waste or 3D-print recycling.

Looks and feel

A matte, lightly textured surface with random dark flecks. White Marble resembles a pale stone with grey grains; Red Granite has darker speckles on a terracotta-red base. Layer lines are well hidden by the texture, which is one of the material's practical advantages: prints rarely need finishing.

Care

- Dust with a brush; wipe with a damp cloth
- Keep away from heat and direct sun
- Wet-sanding smooths the texture and reveals more grain, like polishing stone; use a mask — mineral dust
- Takes primer and paint well; unpainted looks best
- Superglue and epoxy bond normally

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

Marble prints on the standard PLA profile at up to 250 mm/s. The hardware rules are firm: no 0.2 mm nozzle, and hardened steel for anything beyond occasional use.

Manufacturer print window

Nozzle temperature	190–230 °C
Bed temperature	35–45 °C
Build plates	Cool Plate (or SuperTack), High-Temperature / Smooth PEI, Textured PEI
Bed adhesive	Glue stick or liquid glue
Chamber	25–45 °C, no enclosure
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

Hardware and compatibility

Nozzle sizes	0.4, 0.6 and 0.8 mm only; 0.2 mm not compatible
Nozzle material	Hardened steel recommended for 0.4/0.6/0.8; stainless 0.4 acceptable for occasional use
Abrasive	Yes, implied by the hardened-steel recommendation; wear rate not published
Automatic material systems	Compatible with AMS and AMS lite
Spool identification	RFID tag

Moisture, drying and storage

Standard PLA drying; Marble is not among the variants the manufacturer flags as requiring pre-drying.

Forced-air oven or filament dryer	55 °C for 8 hours
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Heated print bed method	Not stated for Marble; 65–75 °C for 12 hours is the figure for sibling filaments
Storage	Sealed with desiccant, below 20 % relative humidity
Annealing (optional)	50–60 °C for 6–12 hours; may warp

Tips that make a visible difference

- 0.6 mm nozzle, 0.3 mm layers: coarser speckle, more stone-like, and less nozzle wear per part
- Fuzzy skin at a low amplitude gives a rough-hewn stone surface that suits busts and terrain
- Add a wall to thin sections; the layers are the weak point
- Textured plate for a matte underside that matches the rest

Known problems and their fixes

Clog with a 0.2 mm nozzle

Not compatible. Use 0.4 mm or larger.

Nozzle wears; extrusion width drifts

Fit hardened steel.

Part breaks along a layer

Low Z toughness (6.5 kJ/m²). More walls, flat orientation, slightly slower print.

Speckle looks too fine or uniform

Increase nozzle size and layer height; the pattern scales with both.

4 · The numbers — technical datasheet

Figures are from the PLA Marble Technical Data Sheet V3.0.

Physical and thermal properties

Property	Test method	Value
Density	ISO 1183	1.22 g/cm ³
Melt flow index (210 °C, 2.16 kg)	ISO 1133	32.2 ± 4.5 g/10 min
Melting temperature	DSC, 10 °C/min	156 °C
Glass transition temperature	DSC, 10 °C/min	56 °C
Vicat softening temperature	ISO 306	57 °C
Heat deflection temperature, 0.45 MPa	ISO 75	56 °C
Heat deflection temperature, 1.8 MPa	ISO 75	53 °C
Saturated water absorption (25 °C, 55 % RH)	—	0.44 %

Mechanical properties

Property	Test method	X-Y (flat)	Z (across layers)
Young's modulus	ISO 527	2330 ± 240 MPa	1970 ± 210 MPa
Tensile strength	ISO 527	33 ± 4 MPa	30 ± 4 MPa
Elongation at break	ISO 527	6.7 ± 0.5 %	5.3 ± 0.4 %

Property	Test method	X-Y (flat)	Z (across layers)
Bending modulus	ISO 178	2920 ± 180 MPa	2560 ± 170 MPa
Bending strength	ISO 178	75 ± 5 MPa	55 ± 4 MPa
Charpy impact, unnotched	ISO 179	24.0 ± 2.5 kJ/m ²	6.5 ± 0.8 kJ/m ²
Charpy impact, notched	ISO 179	9.5 ± 2.6 kJ/m ²	not published

What the mechanical numbers mean in practice

Marble is the stiffest and strongest of the four effect filaments: bending strength of 75 MPa flat matches PLA Basic almost exactly, and Z tensile strength holds up well at 30 MPa (91 % of flat). The trade is ductility — 6.7 % elongation, about half of PLA Basic — and layer toughness of 6.5 kJ/m², less than half. In plain terms a thick Marble bust is rigid and hard to bend but will chip or crack at a corner rather than dent. The notched impact of 9.5 kJ/m² is actually a little better than PLA Basic's 7.9. Thermal behaviour is standard PLA.

Product format

Diameter	1.75 mm ± 0.03 mm
Net weight	1 kg
Spool	ABS, 200 × 67 mm, rated to 70 °C
Colours	2: White Marble, Red Granite
Identification	RFID tag
Datasheet version	V3.0

Safety, certifications and chemical resistance

- Declared composition polylactic acid with inorganic particles; odourless, no skin hazard listed
- 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 produces mineral dust — wet-sand and wear a mask
- Resistant to oils and greases; not to acids, alkalis or some organic solvents

5 · Compared with Polymaker and SUNLU

Marble PLA is a staple of every decorative range. Polymaker now sells it as Panchroma Marble; SUNLU sells Marble PLA and a High Speed Marble PLA.

Polymaker

Panchroma Marble PLA

No marble-specific data is published; the Panchroma "Others" column applies, which describes a denser, stiffer, stronger-in-a-pull material than Bambu's Marble with a lower notched impact. Speed is capped at 200 mm/s. Priced at the low end of the Panchroma range on a cardboard spool.

Density (Others)	1.32 g/cm ³
Tensile X-Y / Z (Others)	40.4 / 27.2 MPa
Young's modulus X-Y (Others)	3071 MPa
Charpy notched X-Y (Others)	6.76 ± 0.44 kJ/m ²
Max speed	up to 200 mm/s
Spool	cardboard, 1 kg

SUNLU

SUNLU Marble PLA · High Speed Marble PLA

SUNLU publishes a dedicated row for its high-speed marble: 35 MPa tensile, 65 MPa bending, 56 °C HDT at 1.25 g/cm³ — close to Bambu's figures in tension, weaker in bending. No impact, modulus or Z data, and no nozzle guidance. Unusually, SUNLU's list price for marble is above Polymaker's, though street prices are lower.

Density	1.25 g/cm ³
Tensile	35 ± 5 MPa
Bending strength	65 ± 6 MPa
HDT	56 ± 3 °C
Nozzle / bed	210–230 °C / 50–60 °C
Diameter	1.75 ± 0.02 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 Marble has the best published bending strength and the clearest nozzle guidance of the three, and keeps a respectable Z tensile figure. All three are decorative materials that need a hardened nozzle and a 0.4 mm minimum; choose by colour and price.

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, T_g (°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 T _g 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, T_m (°C)	Where the crystalline regions melt, measured by DSC (a calorimeter). Printing happens well above T _m 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 T _g 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

- Build plates: the datasheet lists Cool / High-Temperature / Textured PEI; the current store page lists Cool Plate SuperTack, Smooth PEI and Textured PEI. The datasheet predates the SuperTack plate.
- The store page uses the wording "0.2 mm nozzle not compatible" — stronger than the "not recommended" used for Galaxy and Sparkle.
- No refill (spool-free) format was found for this product.

Sources

- Bambu Lab, PLA Marble Technical Data Sheet V3.0 — https://store.bblcdn.eu/s8/default/96837d68ea4144b58983e52fd470d48e/Bambu_PLA_Marble_Technical_Data_Sheet.pdf
- Bambu Lab US Store, PLA Marble — <https://us.store.bambulab.com/products/pla-marble>
- Bambu Lab Wiki, PLA Usage Guide (nozzle compatibility table) — <https://wiki.bambulab.com/en/filament/pla>

- Polymaker, Panchroma product data sheet V2.1 — https://cdn.shopify.com/s/files/1/0548/7299/7945/files/TDS_PANCHROMA_V2.pdf
- Polymaker, Panchroma family page — <https://shop.polymaker.com/pages/panchroma>
- SUNLU, filament parameter table — <https://www.sunlu.com/wiki/43>

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