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PLA METAL

A brushed-metal look with no metal in it — the effect is pigment and surface texture, which makes this the easiest effect filament to print and the most heat- tolerant PLA in the range.

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A brushed-metal look with no metal in it — the effect is pigment and surface texture, which makes this the easiest effect filament to print and the most heat-tolerant PLA in the range.

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PLA Metal is the exception among the effect filaments: it contains no hard filler at all. The manufacturer states plainly that there are no metal particles inside; the look of cast iron, cobalt, copper or oxidised bronze comes from a metallic-effect pigment system combined with a slightly textured, low-gloss surface that scatters light the way brushed or sand-cast metal does. Because nothing abrasive is in the mix, it prints like PLA Basic — any nozzle, any size including 0.2 mm, full 300 mm/s — and its datasheet shows the best layer toughness of the effect family and, by a few degrees, the highest heat resistance of any PLA in the range.

FEELS LIKE

Matte-satin, faintly textured

Like a powder-coated or cast metal part; warm to the touch, unlike metal

THE EFFECT

Metallic sheen, no glitter

Reads as iron, blued steel, copper or patinated bronze depending on colour

STRENGTH

Close to PLA Basic

Best layer toughness of the effect PLAs; good elongation

HEAT

Highest in the range

HDT 62 °C at light load; still a PLA — not for hot places

COLOUR RANGE

5 colours

Iron Gray, Cobalt Blue, Iridium Gold, Copper Brown, Oxide Green

EASE OF PRINTING

As easy as PLA Basic

Any nozzle including 0.2 mm; no hardened steel needed

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 Metal | PLA Basic reference

Good for

- Replica tools, hardware, hinges and fittings meant to pass as metal
- Model engines, steampunk props, armour pieces and weapon replicas for display

Not the right choice for

- Anything that must actually behave like metal: heat, load, wear
- Outdoor fixtures in sun
- Food contact; no certification

- Industrial-look lamps, brackets and shelf supports for light duty
 - Coins, medallions, badges and cosplay accessories
 - Fine-detail miniatures through a 0.2 mm nozzle, where other effect filaments cannot go
- Parts to be sanded or polished to a shine — the effect is a surface property and may not survive finishing

Why no filler changes everything

Every other effect PLA pays for its look with a hard additive that abrades nozzles, blocks small orifices, and breaks up the polymer so that layers bond poorly. PLA Metal's pigment is dispersed at the molecular scale like any colourant, so the polymer behaves like an unfilled PLA: melt flow is high (38.6 g/10 min), layer impact toughness is 16.8 kJ/m² — above PLA Basic's 13.8 — and elongation of 14.7 % is the best of the family. Its glass transition of 60 °C and HDT of 62 °C at 0.45 MPa are the highest published for any PLA in the range, a few degrees above Basic. The metallic appearance depends on the surface texture created as the material is extruded; the manufacturer publishes no post-processing guidance, and it is reasonable to expect that heavy sanding or polishing will change the look.

2 · Living with a PLA Metal print

A PLA Metal print lives as comfortably as a PLA Basic print, with a little more headroom on heat. It is still not metal.

Heat	Softens from about 60 °C — a few degrees better than PLA Basic, which changes nothing in practice. No cars, radiators, hot lamps or dishwashers.
Sunlight	Metallic pigments are generally UV-stable; the polymer still embrittles over years outdoors. Fine indoors.
Water and damp	Insoluble; the lowest moisture uptake of the effect family (0.40 %).
Chemicals	As PLA. Isopropyl alcohol cleans safely.
Food	Not certified for food contact.
Handling	Robust: good toughness in both directions. Tools and props survive normal handling.
Load over time	Creeps like PLA under sustained load; light-duty brackets only.
End of life	General waste or 3D-print recycling.

Looks and feel

A satin, lightly textured surface with a metallic lustre that shifts with the light — Iron Gray looks like cast iron, Cobalt Blue like blued steel, Copper Brown like aged copper. Layer lines are visible but suit the machined look; a textured plate gives a convincingly sand-cast underside.

Care

- Dust and wipe with a damp cloth
- Keep away from heat and direct sun
- Avoid sanding and polishing; test on scrap first if you must, as the finish may change
- A matte clear coat protects without killing the metallic effect; gloss coats make it look painted
- 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

PLA Metal uses the PLA Basic profile without restrictions. It is the one effect filament that works in a 0.2 mm nozzle and at 300 mm/s.

Manufacturer print window

Nozzle temperature	190–230 °C
Bed temperature	35–45 °C
Build plates	Cool Plate, High-Temperature Plate, Textured PEI (current listings add SuperTack and Smooth PEI)
Bed adhesive	Glue stick or liquid glue
Chamber	25–45 °C, no enclosure
Print speed	Up to 300 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	0.2, 0.4, 0.6 and 0.8 mm — all suitable
Nozzle material	Any; hardened steel not required
Abrasive	No
Automatic material systems	Compatible with all AMS generations
Spool identification	RFID tag

Moisture, drying and storage

Standard PLA drying; not on the manufacturer's must-dry list.

Forced-air oven or filament dryer	55 °C for 8 hours
Heated print bed method	65–75 °C for 12 hours, covered
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

- A textured plate makes the first layer look sand-cast; a smooth plate makes it look machined — choose per part
- Slightly thicker layers (0.24–0.28 mm) strengthen the brushed-metal impression
- Fuzzy skin at very low amplitude mimics a cast surface on props
- Because Z bonding is good, orientation can follow appearance rather than strength

Known problems and their fixes

None specific to this material are documented

PLA Metal shares PLA Basic's behaviour. The usual PLA fixes apply: dry the spool for stringing, clean the plate for adhesion, open the door in hot rooms.

Finish looks painted rather than metallic

Too glossy a clear coat or too fine a layer height. Use a matte coat and 0.2 mm or thicker layers.

Effect lost after sanding

Expected — the look depends on the as-printed surface.

4 · The numbers — technical datasheet

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

Physical and thermal properties

Property	Test method	Value
Density	ISO 1183	1.25 g/cm ³
Melt flow index (210 °C, 2.16 kg)	ISO 1133	38.6 ± 3.7 g/10 min
Melting temperature	DSC, 10 °C/min	160 °C
Glass transition temperature	DSC, 10 °C/min	60 °C
Vicat softening temperature	ISO 306	62 °C
Heat deflection temperature, 0.45 MPa	ISO 75	62 °C
Heat deflection temperature, 1.8 MPa	ISO 75	58 °C
Saturated water absorption (25 °C, 55 % RH)	—	0.40 %

Mechanical properties

Property	Test method	X-Y (flat)	Z (across layers)
Young's modulus	ISO 527	2010 ± 220 MPa	1710 ± 150 MPa

Property	Test method	X-Y (flat)	Z (across layers)
Tensile strength	ISO 527	34 ± 4 MPa	31 ± 3 MPa
Elongation at break	ISO 527	14.7 ± 1.5 %	4.5 ± 1.3 %
Bending modulus	ISO 178	2290 ± 210 MPa	2150 ± 180 MPa
Bending strength	ISO 178	66 ± 3 MPa	51 ± 5 MPa
Charpy impact, unnotched	ISO 179	58.9 ± 3.4 kJ/m ²	16.8 ± 1.2 kJ/m ²
Charpy impact, notched	ISO 179	22.3 ± 0.9 kJ/m ²	not published

What the mechanical numbers mean in practice

PLA Metal's numbers are those of a slightly toughened plain PLA: tensile strength equal to Basic (34 MPa) with Z at 91 % of flat, stiffness about 20 % lower, and impact toughness far higher — 58.9 kJ/m² unnotched and 22.3 notched flat, 16.8 kJ/m² across layers. That layer figure beats PLA Basic and every other effect filament. The one soft spot is Z elongation (4.5 %), so a Z-loaded thin section still snaps rather than bends. Thermally it leads the range with an HDT of 62 °C at light load and 58 °C at heavy load, and a Vicat of 62 °C — useful margin, not a new category.

Product format

Diameter	1.75 mm ± 0.03 mm
Net weight	1 kg
Spool	ABS, 200 × 67 mm, rated to 70 °C; ships with desiccant
Colours	5: Iron Gray Metallic, Cobalt Blue Metallic, Iridium Gold Metallic, Copper Brown Metallic, Oxide Green Metallic
Identification	RFID tag
Datasheet version	V3.0

Safety, certifications and chemical resistance

- Declared composition polylactic acid; the manufacturer states there is no metal particle infill; pigment chemistry not disclosed
- 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
- Resistant to oils and greases; not to acids, alkalis or some organic solvents

5 · Compared with Polymaker and SUNLU

A metallic-effect PLA without metal filler is less common than it sounds. Polymaker offers Panchroma Metallic; SUNLU has no metallic-effect PLA in its published parameter table.

Polymaker

Panchroma Metallic PLA · metallic colours within Polymaker PLA Pro

Polymaker's Panchroma Metallic sits at the top of the Panchroma price range and publishes no metallic-specific data; the "Others" column applies, which describes a denser and stiffer material than PLA Metal with much lower notched impact. Polymaker also offers metallic shades within its unfilled PLA Pro range, which — like PLA Metal — needs no hardened nozzle.

Density (Others)	1.32 g/cm ³
Tensile X-Y / Z (Others)	40.4 / 27.2 MPa
Charpy notched X-Y (Others)	6.76 ± 0.44 kJ/m ²
Max speed	up to 200 mm/s
Nozzle / bed	190–230 °C / 25–60 °C
Spool	cardboard, 1 kg

SUNLU

No equivalent in the published range

SUNLU's parameter table lists no metallic-effect PLA. Its silk grades in gold, silver and copper are the nearest visual substitute, but they deliver a chrome-like gloss rather than a brushed or cast look, and carry silk's layer weakness.

Nearest substitute	Silk PLA+ (gold / silver / copper)
Tensile (Silk PLA+)	50 ± 4 MPa
HDT (Silk PLA+)	57 ± 3 °C
Nozzle / bed	210–230 °C / 50–60 °C

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. PLA Metal is the standout of the effect family: the look of a filled filament with the manners of PLA Basic. Polymaker's Metallic is the only like-for-like alternative and is documented more thinly; SUNLU has nothing comparable.

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

- One reseller lists the cooling fan as "not required" for PLA Metal; the datasheet says on. The datasheet is followed.
- Build plates: the datasheet predates the Cool Plate SuperTack; current listings include it.
- No refill (spool-free) format was found for this product.

Sources

- Bambu Lab, PLA Metal Technical Data Sheet V3.0 — https://store.bblcdn.eu/s8/default/5f4a92a8e8df4512830af91f30a8e330/Bambu_PLA_Metal_Technical_Data_Sheet.pdf
- Bambu Lab US Store, PLA Metal — <https://us.store.bambulab.com/products/pla-metal>
- filament2print, PLA Metal Bambu Lab (no metallic particles statement) — <https://filament2print.com/en/filaments/3479-pla-metal-bambu-lab.html>

- 3D Universe, Bambu Lab PLA Metal (hotend: all size / material) — <https://shop3duniverse.com/collections/bambu-lab-filaments>
- 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>
- Polymaker, Polymaker PLA Pro — <https://shop.polymaker.com/products/polymaker-pla-pro>
- SUNLU, filament parameter table — <https://www.sunlu.com/wiki/43>

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