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PLA GLOW

Phosphorescent powder in PLA that charges in light and glows in the dark — surprisingly tough, distinctly abrasive, and not for the AMS lite.

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Phosphorescent powder in PLA that charges in light and glows in the dark — surprisingly tough, distinctly abrasive, and not for the AMS lite.

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PLA Glow carries a load of luminous phosphor powder — a ceramic pigment that soaks up light energy and releases it slowly as a soft green, blue, yellow, pink or orange glow once the lights go out. Charge it under a lamp or in sunlight for a couple of hours and it glows for a while; the effect fades over months and years of use as the phosphor ages. The powder is hard and the filament surface is rough, which has two practical consequences: it wears ordinary nozzles quickly, so hardened steel is the norm, and it drags in the feed path enough that the manufacturer advises against using it in the lighter-duty AMS lite. Mechanically it is a pleasant surprise — the best layer toughness of any filled PLA in the range.

FEELS LIKE

Slightly rough, matte-satin

A little grittier than plain PLA; the powder is felt more than seen in daylight

THE EFFECT

Glowes after charging

About 2 hours of sun or UV recharges it; brightness declines with age

STRENGTH

Tough for a filled PLA

Z impact 19.8 kJ/m² — better than PLA Basic

NOZZLE

Hardened steel

Phosphor is abrasive; no 0.2 mm

MATERIAL SYSTEM

AMS yes, AMS lite no

Feed resistance too high for AMS lite

COLOUR RANGE

5 glow colours

Green, Blue, Yellow, Pink, Orange — pale pastels in daylight

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 Glow ■ PLA Basic reference

Good for

- Light-switch surrounds, door signs and stair markers that need to be found in the dark
- Night-light housings, glow stars and children's room décor
- Halloween props, glow dice, keychains and fishing lures

Not the right choice for

- AMS lite units
- Brass or stainless nozzles you care about, or any 0.2 mm nozzle
- Places without a light source to charge it — it does not glow on its own
- Food contact; no certification

- Emergency-exit style signage in homes and workshops (not certified for regulatory use)
- Any print where an afterglow is the point

- Heat, sun-baked locations: the general PLA limits, plus the phosphor ages faster with intense UV

How the glow works, and why the powder is a problem for hardware

Phosphorescent pigments absorb photons and re-emit them slowly over minutes to hours; the strongest modern ones are strontium-aluminate ceramics, though the manufacturer does not name the compound it uses. The powder must be present in quantity for a visible glow, and it is hard — hard enough to abrade brass and stainless nozzles and to leave the filament surface rough. That roughness is what makes it drag in the PTFE tubes and feeder of an AMS lite. The manufacturer publishes no afterglow duration, brightness or wavelength; the practical experience is a bright glow for the first few minutes fading to a faint one over an hour or so, with a pale daytime colour that hints at the glow colour. Thicker walls glow more brightly, and the effect is stronger on a white or pale base than on a dark one. Intense or frequent UV exposure ages the phosphor, so the glow gradually weakens over the print's life.

2 · Living with a PLA Glow print

A Glow print needs light to work and dark to show. Otherwise it lives like any filled PLA.

Heat	Softens from about 55 °C. Keep out of parked cars and away from radiators and hot lamps — a glow-charged part left on a hot windowsill will warp.
Charging	About 2 hours in sunlight or under a UV lamp for a full charge; ordinary room light gives a weaker charge. Brightness fades over months and years and frequent strong UV accelerates that.
Sunlight	Charges it, but also ages the phosphor and embrittles the polymer. Charge it, then bring it in.
Water and damp	Insoluble; moderate moisture uptake (0.46 %).
Chemicals	As PLA; isopropyl alcohol is safe.
Food	Not certified for food contact.
Children	The safety data sheet classifies it as not hazardous; small parts remain a choking hazard. Glow stars stuck high on a ceiling are the classic safe use.
End of life	General waste or 3D-print recycling.

Looks and feel

In daylight a pale pastel with a slightly grainy, satin surface and visible layer lines. In darkness a soft, even glow in the labelled colour, brightest in the first minutes after charging. Thin walls glow dimly; 2 mm or more of wall glows well.

Care

- Dust and wipe with a damp cloth
- Charge in sun or under UV for about 2 hours when the glow weakens
- Do not sand — it removes the glowing surface layer and produces phosphor dust
- Avoid clear coats containing UV blockers, which reduce charging
- Superglue and epoxy bond normally

More wall, more glow

The glow comes from the volume of phosphor near the surface. Two or three walls at 0.6 mm nozzle width glow noticeably brighter than a single thin wall, and white PLA behind a thin Glow shell reflects light back through it.

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 Glow uses the PLA profile at up to 250 mm/s. The hardware rules are the point: hardened steel, 0.4 mm or larger, and no AMS lite.

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; Engineering Plate not recommended
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; 0.2 mm not recommended
Nozzle material	Hardened steel recommended for regular use (US store); the EU store also permits stainless at 0.4–0.8 mm but excludes 0.2 mm stainless

Abrasive	Yes — phosphor powder; wear rate not published; community reports of AMS feeder-funnel wear after about half a spool
Automatic material systems	AMS compatible; AMS lite NOT recommended — high feed resistance causes loading failures
Spool	PC + ABS, rated to 90 °C — a higher-spec spool than most PLA in the range
Spool identification	RFID tag

Moisture, drying and storage

Standard PLA drying; Glow is not on the manufacturer's must-dry list and has no AMS-dryer figures of its own.

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

- Print glow parts first in a multi-material job, or alone: the rough filament can interrupt feeding, and the manufacturer suggests printing the bed of glow objects first
- Use a 0.6 mm hardened nozzle and three walls for the brightest glow and the least wear per part
- A white PLA core with a Glow outer shell (via a multi-material print) saves glow filament and reflects light outward
- Feed from the external spool holder if the AMS shows loading errors

AMS lite

The manufacturer states that glow-in-the-dark filaments, being hard and rough, can cause feeding failures in the AMS lite through excessive resistance, and does not recommend the combination. Use the external spool holder on A-series printers.

Known problems and their fixes

Loading or retraction failure in AMS lite

Expected. Use the full AMS or the external spool holder.

Print interrupted mid-way

Rough filament surface dragging in the feed path. Check the PTFE tubes for wear, reduce sharp bends, and print glow objects early in a job.

Nozzle opens up; extrusion gets wide and blobby

Abrasion. Fit hardened steel and expect it to wear faster than with plain PLA.

Glow is faint

Too little charge or too thin a wall. Charge under sun or UV for 2 hours; print with thicker walls; use a pale colour.

Glow has weakened over time

Phosphor ageing — accelerated by frequent strong UV. Not reversible.

4 · The numbers — technical datasheet

Figures are from the PLA Glow Technical Data Sheet V1.0; the safety data sheet is dated December 2023.

Physical and thermal properties

Property	Test method	Value
Density	ISO 1183	1.26 g/cm ³
Melt flow index (210 °C, 2.16 kg)	ISO 1133	23.3 ± 2.4 g/10 min
Melting temperature	DSC, 10 °C/min	155 °C
Glass transition temperature	DSC, 10 °C/min	55 °C
Vicat softening temperature	ISO 306	56 °C
Heat deflection temperature, 0.45 MPa	ISO 75	55 °C
Heat deflection temperature, 1.8 MPa	ISO 75	52 °C
Saturated water absorption (25 °C, 55 % RH)	—	0.46 %

Mechanical properties

Property	Test method	X-Y (flat)	Z (across layers)
Young's modulus	ISO 527	2030 ± 210 MPa	1750 ± 180 MPa
Tensile strength	ISO 527	32 ± 3 MPa	26 ± 3 MPa
Elongation at break	ISO 527	8.6 ± 1.2 %	6.5 ± 0.8 %
Bending modulus	ISO 178	2640 ± 130 MPa	2230 ± 110 MPa
Bending strength	ISO 178	76 ± 4 MPa	55 ± 3 MPa
Charpy impact, unnotched	ISO 179	27.3 ± 2.2 kJ/m ²	19.8 ± 1.8 kJ/m ²
Charpy impact, notched	ISO 179	8.8 ± 1.7 kJ/m ²	not published

What the mechanical numbers mean in practice

PLA Glow is mechanically close to PLA Basic and in one respect better: its layer impact toughness of 19.8 kJ/m² is the highest of any filled PLA here and above Basic's 13.8, and Z tensile holds 81 % of flat. Bending strength of 76 MPa equals Basic. Flat impact (27.3 unnotched, 8.8 notched) is also on par. Elongation is a little lower. The one soft figure is thermal: glass transition 55 °C and HDT 52 °C at heavy load, a few degrees under Basic. The phosphor, in other words, costs hardware rather than strength.

Product format

Diameter	1.75 mm
Net weight	1 kg
Spool	PC + ABS, 200 × 67 mm, rated to 90 °C
Colours	5: Glow Green, Glow Blue, Glow Yellow, Glow Pink, Glow Orange
Identification	RFID tag
Datasheet version	V1.0

Safety, certifications and chemical resistance

- Safety data sheet (Dec 2023): polylactic acid 80–98 %, additives 2–20 %; the phosphor is not identified. Classified as not hazardous under EC 1272/2008
- No protective equipment required under normal use per the SDS; sanding dust should nonetheless not be inhaled
- Not listed under REACH SVHC, PBT/vPvB or ozone-depleting regulations
- Flammable; combustion products water and carbon oxides
- No food-contact or toy certification; no photometric (brightness, duration, wavelength) data published
- Resistant to oils and greases; not to acids, alkalis or some organic solvents

5 · Compared with Polymaker and SUNLU

Both other brands sell a glow-in-the-dark PLA. Polymaker's Panchroma Luminous publishes useful handling notes but no properties; SUNLU's Glow In The Dark publishes properties but no handling notes.

Polymaker Panchroma Luminous PLA (formerly PolyLite Luminous) Polymaker is more restrictive than Bambu: it states a hardened nozzle is required and that the filament is not compatible with automatic material systems at all because of the abrasive additive. It also notes that the glow colour tracks the daylight colour, that 0.4 mm walls glow greenish, and that about 40 mm of thickness shows the full colour. Speed limited to 200 mm/s and 16 mm³/s. No mechanical or thermal values are published.	
Mechanical data	not published
Nozzle	hardened required
Material system	not compatible
Max speed	up to 200 mm/s
Max volumetric flow	16 mm³/s
Spool	cardboard, 1 kg

SUNLU SUNLU PLA Glow In The Dark SUNLU publishes 40 MPa tensile, 65 MPa bending, 55 °C HDT and a notched Izod of 5 kJ/m² at 1.23 g/cm³, but no abrasion or material-system warning, though the phosphor loading implies both. Cheapest of the three.	
Density	1.23 g/cm³
Tensile	40 ± 6 MPa
Bending strength	65 ± 6 MPa
Izod notched	5 ± 3 kJ/m²
HDT	55 ± 5 °C
Nozzle / bed	200–240 °C / 50–60 °C
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 Glow is the only one of the three that is both fully characterised and cleared for a (full-size) material system. Polymaker's is stricter on hardware and silent on properties; SUNLU's is the value option and should be treated with the same nozzle caution regardless of what its listing omits.

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/cm³ material contains about 5 % less printable length than a 1 kg spool at 1.24 g/cm³ — 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

- Nozzle material: the US store recommends hardened steel only; the EU store also lists stainless 0.4–0.8 mm as acceptable. Both exclude 0.2 mm stainless. Hardened steel is the safe reading.
- Diameter tolerance is not printed on the Glow datasheet; ± 0.03 mm is the manufacturer's standard for the PLA line.
- Afterglow duration, brightness and emission wavelength are not published by the manufacturer; the SDS does not name the phosphor.
- The report of AMS feeder-funnel wear at about 500 g is a third-party community observation, not a manufacturer statement.
- No refill (spool-free) format was found for this product.

Sources

- Bambu Lab, PLA Glow Technical Data Sheet V1.0 — <https://store.bblcdn.com/cd34cf072d14484bbf027290d16abe9b.pdf>
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- Bambu Lab EU Store, PLA Glow (AMS lite statement, charging) — <https://eu.store.bambulab.com/products/pla-glow>
- Bambu Lab Wiki, PLA Usage Guide (PLA Glow section) — <https://wiki.bambulab.com/en/filament/pla>
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- Filamino, Bambu Lab filament guide (AMS notes) — <https://filamino.com/blog/bambu-lab-filament-guide-best-spools-refills-and-settings-by-material>
- Polymaker Wiki, Panchroma Luminous PLA — <https://wiki.polymaker.com/polymaker-products/polymaker-filaments/panchroma-tm/panchroma-tm-luminous-pla>
- SUNLU, filament parameter table — <https://www.sunlu.com/wiki/43>

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