PLA

PLA (Polylactic Acid) by LOTACTREE represents the most versatile and widely used version of PLA. It is easy to print with and delivers excellent performance in high-precision prints, sharp overhangs, and long bridges.

Advantages:

- Easy and stable printing
- Minimal warping
- Excellent detail quality
- Supports complex structures (such as steep overhangs and long bridges)
- Biodegradable (made from renewable sources like corn starch or sugarcane)
- Low odor
- Wide range of color options

Limitations:

- Rigid, but more brittle compared to materials like PETG or ABS
- High moisture absorption
- Limited mechanical strength and weather resistance compared to other filaments
- Low heat resistance: deforms at temperatures above 50–60 °C

Printing **Reference:**

Bambu P1P, Open, Generic PLA profile, 220 °C / 55 °C (nozzle / bed)

PLA-F (Force)

PLA-F (Force) is a next-generation filament developed by Lotactree, designed to combine the best properties of PLA and ABS. It addresses key limitations of conventional PLA, such as brittleness, moisture sensitivity, and rapid degradation. PLA-F delivers excellent performance in detailed prints, steep overhangs, and long bridges. It features good toughness, aging resistance, easy printability, and low density — 1 kg yields approximately 380 meters of filament.

Advantages:

- Combines the ease of printing of PLA with some of the strength of ABS
- Easy to print
- Improved resistance to degradation and aging compared to standard PLA
- Low density: 1 kg yields around 380 meters, allowing for higher print volume and better cost efficiency
- Higher mechanical strength than PLA — better impact and drop resistance
- Supports high-speed printing
- Compatible with textured build plates and cold removal, saving energy
- Reduced warping
- Excellent choice for 3D printing farms due to its energy efficiency
- Shelf life of approximately 3 years

Limitations:

- Slight odor; prolonged exposure may cause discomfort
- Not compatible with standard PLA for multi-color or multi-material prints — poor interlayer adhesion between PLA and PLA-F
- For best results, use a smooth or textured bed with cold removal
- Cold part removal (after cooling) is recommended

Printing **Reference:**

Bambu P1P, Open, Generic PLA profile, 220 °C / 55 °C (nozzle / bed)

PLA-LS

PLA-LS is a new material system developed by LOTACTREE that enhances performance by optimizing molecular structure and increasing interlayer adhesion strength by 200%. Easy to use and delivering industrial-grade results, it combines the printability of PLA with some of the weather resistance of PETG.

It is recommended to set the bed temperature between 0 °C and 30 °C, relying solely on the printer's ambient temperature.
Important: Do not exceed 40 °C on the heated bed, as this will make model removal extremely difficult after printing.

Advantages:

- Excellent interlayer adhesion, leading to higher print success rates
- Can be printed without a heated bed (cold printing), reducing energy consumption
- Non-toxic and odorless printing – ideal for home use and indoor environments
- The final part can withstand repeated bending and drop impacts, making it suitable for dynamic applications

Printing **Reference:**
Bambu P1P, Open, Generic PLA profile, 210 °C / 30 °C (nozzle / bed)

PLA Silk

LOTACTREE PLA Silk retains the eco-friendly properties and user-friendliness of standard PLA while employing an innovative process that gives printed objects a delicate metallic sheen. The result is a silk-like, pearlescent, or gradient gold effect under light refraction — all without the need for post-processing or polishing. This offers a sophisticated finish with minimal effort. The filament also provides excellent interlayer adhesion, strong performance even in thin-walled structures, and allows for direct printing at room temperature, without requiring a heated bed (though it is recommended) or adhesive — blending art and functionality in a single material.

Advantages:

- Shiny, visually appealing finish
- Easy to print
- Good interlayer adhesion
- Maintains the safety and sustainability of standard PLA

Limitations:

- Relatively sensitive to moisture
- Lower mechanical strength
- Potential for stringing: Due to high fluidity, may produce fine strands between model sections. Proper retraction and temperature tuning are essential
- Higher cost compared to regular PLA

Printing **Reference:**

Bambu P1P, Open, Generic PLA-Silk profile, 220 °C / 55 °C (nozzle / bed)

PLA Rainbow

LOTACTREE PLA Rainbow is a revolutionary filament developed specifically for multicolor printing without the need to swap materials. Each spool features intelligent color transitions every 8–12 meters, using a segmented dyeing process that produces smooth gradients between red, orange, yellow, green, blue, indigo, and violet. Printed models naturally display a rainbow gradient effect and are compatible with all FDM printers — no AMS system or complex slicer settings required. With just a single nozzle, you can unlock the magic of the rainbow and effortlessly create visually striking, artistic prints.

Advantages:

- Visually unique, vibrant models with no post-processing required
- Enables multicolor prints from a single spool — no filament swaps necessary
- Available in both PLA-F and Silk variants

Limitations:

- Unpredictable color transitions: Small prints may not show noticeable variation; full rainbow effect appears only in larger prints or high-volume projects
- Not suitable for mechanical or functional parts, as the filament is optimized for aesthetics rather than strength
- Higher cost

Printing **Reference:**

SILK: Bambu P1P, Open, Generic PLA-Silk profile, 220 °C / 55 °C (nozzle / bed)
PLA-F: Bambu P1P, Open, Generic PLA profile, 220 °C / 55 °C (nozzle / bed)

PETG

LOTACTREE PETG (Polyethylene Terephthalate Glycol) is an enhanced formulation developed to address the brittleness commonly found in standard PETG. By incorporating 10% special elastomers, this modified PETG offers over 50% greater impact resistance compared to pure PETG, allowing parts to withstand repeated bending and drops without cracking. It is particularly well-suited for dynamic applications such as tool handles and removable joints. At the same time, it retains the core properties of PETG — including weather and chemical resistance. The material has a naturally glossy, enamel-like surface, combining industrial-grade durability with visual appeal.

Advantages:

- High impact and break resistance
- Resistant to mechanical stress, chemicals, and heat
- Greater resistance to humidity, sunlight, and environmental changes
- Strong interlayer adhesion
- Excellent balance between functionality and aesthetics

Limitations:

- Moisture-sensitive: Can cause bubbling, popping, and print defects if not properly dried. Store in a dry environment or use a filament dryer
- More challenging to print than PLA, requiring higher nozzle and bed temperatures
- Strong adhesion to the print bed — removal may require care
- Prone to stringing: Fine strands may form between parts of the model, especially if retraction settings are not well-tuned

Printing **Reference:**

Bambu P1P, Open, Generic PETG profile, 255 °C / 70 °C (nozzle / bed)

ABS

LOTACTREE ABS is engineered to balance high performance with ease of use. Featuring a proprietary modified formula, it produces low odor and reduces the emission of volatile organic compounds (VOCs) by over 70% compared to traditional ABS. Warping and shrinkage rates have also been significantly improved, reduced to just 0.3%–0.5% (versus 1.5%–2% in standard ABS). Despite these optimizations, it retains the core properties of ABS — high mechanical strength and excellent heat resistance — making it a safer and more stable solution for industrial design and functional parts.

Advantages:

- High mechanical strength and durability
- Good heat resistance
- Good chemical resistance
- Lightweight and rigid
- Cost-effective for engineering-grade applications

Limitations:

- Requires an enclosed printing chamber
- Needs high nozzle and bed temperatures
- Still prone to warping and shrinkage, though reduced
- Emits odors and potentially harmful fumes — proper ventilation or filtration is essential
- UV-sensitive: may degrade and lose properties with prolonged sunlight exposure

Printing **Reference:**

Bambu P1S, Closed, Generic ABS profile, 245 °C / 95 °C (nozzle / bed)

ASA

LOTACTREE ASA (Acrylonitrile Styrene Acrylate) is a high-performance engineering-grade filament developed specifically for demanding outdoor applications. Known as the "outdoor ABS," ASA retains the impact resistance and mechanical strength of ABS while replacing butadiene with acrylate — significantly increasing its resistance to UV radiation and weathering. It can withstand prolonged exposure to sunlight and rain without yellowing or becoming brittle, making it ideal for exterior automotive parts, outdoor equipment, and architectural models.

Advantages:

- Excellent UV and weather resistance – does not yellow, fade, or become brittle over time
- Strong mechanical and impact resistance
- High thermal stability – tolerates temperatures above 90 °C without deformation
- Good chemical resistance – withstands cleaning agents, mild solvents, and corrosive substances
- Antistatic properties
- Ideal for professional and industrial applications

Limitations:

- Requires an enclosed printing chamber
- Emits fumes and odors – proper ventilation or air filtration is recommended
- Significant thermal shrinkage, which may cause warping in large parts without adequate thermal control

Printing **Reference:**

Bambu P1S, Closed, Generic ASA profile, 245 °C / 100 °C (nozzle / bed)

ABS Lite

LOTACTREE ABS LITE (ABS/ASA) is an innovative material developed by LOTACTREE through the scientific combination of ABS and ASA. It retains the impact resistance of ABS while incorporating the aging and UV resistance of ASA. The formulation also improves density and interlayer adhesion, allowing for stable printing without an enclosed chamber. This filament solves the traditional warping issues of ABS while achieving an ideal balance of strength and low weight (density of just 1.00 g/cm³).

Advantages:

- Maintains the durability and toughness typical of ABS
- Offers improved resistance to aging, UV radiation, and outdoor conditions
- Enhanced dimensional stability — significantly reduces warping common in ABS
- Does not require an enclosed chamber
- Lightweight — optimized density (approx. 1.00 g/cm³), ideal for large models
- Good interlayer adhesion

Limitations:

- May still emit odors, though typically less than standard ABS — good ventilation is recommended
- Thermal shrinkage — some warping may still occur in large prints, requiring careful printer setup
- Lower UV resistance compared to pure ASA

Printing **Reference:**

Bambu P1P, Open:

- Generic PLA Profile: 225 °C / 40 °C (nozzle / bed)
- Generic ABS Profile: 250 °C / 100 °C (nozzle / bed)

TPU 95A

LOTACTREE TPU (Thermoplastic Polyurethane) is a functional material engineered to deliver high elasticity, excellent wear resistance, and strong resistance to oils and chemicals.

TPU 95A stands out for its exceptional flexibility, abrasion resistance, and chemical durability, making it widely used in industries such as footwear, industrial seals, and flexible connectors.

This material redefines the performance standard for flexible filaments.

Advantages:

- Good interlayer adhesion
- Excellent flexibility and elasticity
- High wear resistance
- Resistant to oils and chemicals
- Easier to print than softer TPUs (e.g., 85A)

Limitations:

- Less elastic compared to softer TPUs
- Not recommended for Bowden (remote drive) extruders
- More challenging to print than rigid filaments (e.g., PLA, PETG)
- TPU is hygroscopic and must be dried before printing to avoid bubbling and poor surface quality
- Higher cost per kilogram compared to rigid plastics

Printing **Reference:**

Bambu P1P, Open, Generic TPU profile: 220 °C / 35 °C (nozzle / bed), retraction: 1.2 mm

PC

LOTACTREE PC (Polycarbonate) is an advanced engineering filament designed for applications that demand high mechanical strength and excellent heat resistance.

It stands out for its exceptional impact resistance and thermal stability. With impact strength up to five times higher than PLA, it is ideal for producing automotive components, electronic equipment housings, and industrial brackets — setting a new benchmark in functional 3D printing performance.

Advantages:

- One of the strongest materials available for 3D printing
- Withstands temperatures above 110 °C — ideal for technical parts exposed to heat
- Excellent mechanical strength
- Low deformation during use, maintaining dimensional accuracy
- Resistant to chemicals and harsh weather conditions

Limitations:

- Requires high printing temperatures
- Hygroscopic — must be thoroughly dried before printing
- Prone to warping
- More difficult to print than common filaments — requires a robust printer and technical expertise
- Higher cost compared to standard materials
- Bed adhesion can be challenging

Printing **Reference:**

Bambu P1S, Closed, Generic PC profile, 270 °C / 100 °C (nozzle / bed)

PA6 Ease

PA6 Ease developed by **LOTACTREE** intelligently combines the wear and chemical resistance of standard PA6 (Nylon) with the processing ease of ABS. The result is a material that delivers the toughness and mechanical strength of PA6 along with improved printability and dimensional stability, making it highly suitable for functional and structural components.

Advantages:

- Improved printability over conventional PA6 – the Ease variant is modified for 3D printing, featuring reduced warping, lower moisture absorption, and better bed adhesion
- Excellent toughness, rigidity, and impact resistance, ideal for structural and mechanical parts
- Good resistance to wear and friction
- Resistant to oils, solvents, fuels, and industrial cleaners
- Enhanced dimensional stability – the modified Ease version minimizes deformation during and after printing
- Strong strength-to-weight ratio – lightweight while capable of handling high mechanical loads

Limitations:

- Still moisture-sensitive (though reduced in the Ease version); drying before printing is recommended
- High printing temperatures required; ideally printed in an enclosed chamber
- Bed adhesion may require special preparation – surfaces such as PEI, special adhesives, or Kapton tape may be necessary
- Higher cost compared to standard filaments

Printing Reference:

- Open Bambu P1P, Generic PA profile: 260 °C / 95 °C (nozzle / bed)
- Closed Bambu P1S, Generic PA profile: 245 °C / 95 °C (nozzle / bed)