

Recommendations for printing PM PA Jet Filament (PA12)

PA Jet is pure polyamide 12 (PA12) without reinforcement – a tough, chemically resistant, self-lubricating engineering plastic that is used industrially for plain bearings, gears, cable glands, snap-fits, living hinges and parts in engine compartments. Among FDM filaments, it is one of the most demanding to print, but with a properly tuned profile you will get parts that no PLA, PETG or ABS can replace.

What to expect from this profile – and what not to

This is not a beginner filament, and our profile does not make PA12 an easy material. It is a starting point tuned for a specific hardware combination (see below) that gives reliable results on functional parts with sufficient cross-section. **It is not a universal profile for all geometries** - for each print, you need to consider whether a given model is suitable for PA12, and if necessary, adjust the settings for the specific part.

Expect from this profile: solid functional parts, excellent interlayer cohesion, dimensional stability and long part life in real use.

Don't expect: visual perfection like PLA, flawless thin vertical elements (chimneys, narrow columns), or that you can print PA Jet without preparation. PA12 requires dry filament, a prepared bed, and a preheated chamber. It won't work without it.

⚠ Golden rules for successful PA Jet printing ⚠

Before you start printing, review these rules. They apply to all PA12 filaments and following them will determine whether you get a solid, functional part or a disaster.

1. Drying is an absolute necessity, not an option

PA12 is hygroscopic – it absorbs moisture from the air quickly (within hours). Moisture in the hotend causes spattering, bubbles in the walls, loss of gloss and a dramatic decrease in interlayer strength. Wet PA12 will crack audibly during printing – if you hear a “hissing” sound, stop printing and dry the filament.

Procedure: Dry the filament at **85 °C for 8–12 hours** before printing. For example, Bambu AMS HT can handle drying at 85 °C and at the same time protects the filament from moisture during printing - we recommend it. Standard AMS serves only as a storage and PA Jet cannot be dried in it. Alternatively, place it in a dry box with silica gel.

2. The chamber must be preheated

PA12 needs a stable, homogeneous temperature in the chamber from the first layer. If you start printing on a cold machine, the first layers will curl before the chamber heats up.

Procedure: After starting the print, let the printer **warm up at the target chamber temperature for at least 15 minutes**. For printers with a passive chamber (P1S, Prusa Core One and others) it is necessary to count on a longer time (30+ minutes) – let the hob preheat with the door closed.

3. Adhesion: Magigoo PA

PA12 has very poor natural adhesion to common FDM substrates. Engineering Plate, Satin, or Textured PEI alone will not hold PA12 well - your part will tear off during the first shrinkage.

Procedure: Use e.g. **Magigoo PA** – a special adhesive developed specifically for nylons. Apply it to a **cold substrate** before printing, let it dry for 2-3 minutes. If the part still peels off, check that the sheet is clean before application and that you have a wide enough brim.

4. After printing, let the part cool down slowly

PA12 has a high rate of cooling shrinkage. If you open the door after printing and expose a hot part to cold air, you will experience thermal shock - the part may warp, crack in layers or tear off the bed.

Procedure: After printing , **leave the printer closed** until the bed temperature drops below 40°C. Patience pays off - this will help the part maintain dimensional accuracy and maximum interlayer strength.

5. AUX fan must always be turned off

The side fan of printers creates an asymmetrical flow of cold air from one side. For PA12 this means some twisting of the part and its separation from the substrate. **AUX fan : always 0%**. No exceptions.

For which printers is the profile debugged?

We offer profiles for two platforms that we have tested in practice. Both give reliable results, each has its own strengths.

System 1: Bamboo Lab H2S (0.6 mm hardened nozzle)

The choice for maximum mechanical strength, production printing and large functional parts.

- **Benefits:** The actively heated chamber creates a homogeneous hot environment in which PA12 loses its tendency to curl. You can print larger parts and long prints.
- **0.6mm hardened nozzle:** Wider material stripes carry more heat energy, perfectly melting the previous layer and creating incredibly strong walls. Higher interlayer cohesion, faster printing of bulky parts.
- **Limitations:** Larger nozzle diameter casts small micro details .
- **Pad:** we recommend Bamboo Engineering Plate with Magigoo PA.

System 2: Prusa Core One (0.4mm brass nozzle)

A reliable choice for smaller and medium-sized technical parts where detail, dimensional accuracy and tight tolerances matter. Ideal for snap-fits , gears, thin-walled housings and parts with fine details.

- **Advantages:** Passive chamber with high thermal stability gives predictable and repeatable results.
- **0.4mm brass nozzle:** Brass has excellent thermal conductivity and transfers heat evenly to the material. PA12 melts reliably in it and the profile reflects this behavior.
- **Limitations:** Passive chamber requires longer preheating. For large parts (over 150 mm) the risk of warping is higher.
- **Pad:** recommended Prusa Satin plate with Magigoo PA.

Key printing parameters

The following table summarizes the basic parameters that apply to both profiles. The exact speeds, flow rates and other detailed settings can be found directly in the downloaded profile - we are continuously fine-tuning them based on experience, so you always have the current values in the profile itself.

Parameter	Value
Nozzle temperature	240-270°C
Pad temperature	100–110°C

Parameter	Value
Filament drying	85°C / 8–12 hours
Adhesive	Magigoo PA
Brim	5–10mm
Chamber preheating	at least 15 minutes
Cooling after printing	in a closed chamber below 40 °C
AUX fan	0%

Every piece deserves a little tweaking

This profile is not and cannot be perfect for every geometry. It is a reliable starting point - some parameters may need to be adjusted for a specific part. The most common minor adjustments that you can make yourself:

- **Large flat parts (over 150×150 mm):** increase the brim , ensure thorough preheating of the chamber.
- **Small detailed parts:** reduce the speed of the outer walls for a better finish.
- **Parts with large overhangs:** overhang You can temporarily increase the fan slightly, but only for a specific print - we will leave the default value in the regular profile.
- **Parts requiring extreme precision:** perform dimensional calibration – print a 20×20×20 mm cube, measure with a caliper, or adjust the % size (shrinkage) compensation).

If you are printing a production run of the same part, we recommend printing a single test piece, verifying dimensions and functionality, and only then starting a full print.

Summary

PA Jet is a premium engineering material for functional parts. It is not a filament for beginners and it is not a material to try without preparation. However, if you follow these five things, you will get prints that will last for years in heavy use:

- **Filament dried at 85°C for 8-12 hours**
- **Chamber preheated at least 15 minutes** before starting printing.
- **Magigoo PA on a cold pad** , let dry for 2-3 minutes.
- **After printing, let it cool slowly** in a closed chamber below 40 °C.
- **AUX fan off** at 0%. Always.

With our profiles and following the above principles, you will get PA Jet prints that are mechanically durable, chemically stable and self-lubricating. Bearings, gears, snap-fits , bushings.

One last tip: each profile is a living document. If you have experience with specific part types or find a better combination of parameters for your application, let us know. We are happy to improve the profiles.