

TECHNICAL DATA SHEET

ApolloX Foaming

Date of issue: 25-07-2025 / Date of update: 25-07-2025



Product specifications

FormFutura ApolloX Foaming – Lightweight Foaming ASA Filament for High-Performance 3D Printing

ApolloX Foaming is a high-performance ASA-based filament with advanced active foaming technology. It delivers up to 3x weight reduction on 3D printed parts without sacrificing strength, surface quality, or UV/weather resistance.

ApolloX Foaming is built on our trusted ApolloX formula, enhanced with advanced additives that enable controlled expansion during 3D printing. The foaming effect activates at approximately 230°C, reaching peak expansion between 270°C and 285°C. Below 230°C, the material performs like "standard ApolloX", offering users exceptional flexibility in temperature-controlled 3D printing and print profile customization.

In its fully expanded state, ApolloX Foaming triples in volume, reaching an ultra-low density of just 0.33 g/cm³! The foaming additives used offer precise control over material flow, allowing weight reductions of up to 66%, and enables users to fine-tune the foaming degree and speed by adjusting the printing temperature. This allows for customized part density and weight optimization as needed. The foaming effect also supports faster 3D printing, making it possible to use thicker layer heights or create strong single-wall prints efficiently.

ApolloX Foaming 3D prints with a matt and textured surface finish that effectively hides layer lines. It delivers a clean and professional appearance straight off the printer. As the foaming degree increases, the filament's color may appear lighter and more muted, adding a subtle visual cue to part density. Despite its lightweight nature, this foaming ASA filament retains all core ASA properties, such as high UV resistance, mechanical strength, and dimensional stability. It's the ideal choice for lightweight functional components, including RC models, drone parts, floating parts, and outdoor parts where strength, durability, and weight reduction are essential.

Important key features

- ASA with active foaming technology.
- Achieve over 3x weight reduction.
- Fine-tune density, part structure and weight.
- Extremely low final density of 0.33 g/cm³
- Matt and textured surface finish.

Suitable applications

- Manufacturing drone parts.
- Fabricating lightweight automotive parts.
- Various outdoor applications.
- Floating applications.
- 3D printing miscellaneous end use goods.

Recommended print settings

Nozzle temp: ± 220 - 285°C

Print speed: ± 10 - 200 mm/s

Drying: ≥12 hours at 70°C

Experience level: Intermediate

Heat bed: ± 50 - 90°C

Nozzle: ≥ 0.2mm

Drybox: Recommended

Fan speed: ± 0 - 50%

Buildplate adhesion: EasyFix Nr. 1

Enclosure: Recommended

Material properties (unfoamed)

Specific Gravity (23°C)

Melt Flow Rate (220°C, 10kg)

Typical value

1.07 g/cm³

5.0 g/10min

Test Method

ASTM D792

ASTM D1238

Mechanical properties (unfoamed)

Tensile Strength @ Yield (23°C, 50mm/min, 3.2mm)

Tensile Elongation at Break (23°C, 50mm/min, 3.2mm)

Tensile Modulus (23°C, 50mm/min, 3.2mm)

Flexural Strength (23°C, 15mm/min, 3.2mm)

Flexural Modulus (23°C, 15mm/min, 3.2mm)

Izod Impact Strength (Notched, 3.2mm, 23°C)

Izod Impact Strength (Notched, 3.2mm, -30°C)

Rockwell Hardness (R-Scale)

Typical value

42 MPa

35% (Min)

1800 MPa

64 MPa

1900 MPa

435 J/m

60 J/m

92

Test Method

ASTM D638

ASTM D638

ASTM D638

ASTM D638

ASTM D638

ASTM D256

ASTM D256

ASTM D785

Thermal properties (unfoamed)

HDT

Typical value

86°C

Test Method

ASTM D648



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VICAT (50N, 50°C/h) 94°C ASTM D1525

Flammability properties (unfoamed) *

Typical value	Test Method
Fire Resistance (1.5mm)	UL94
Fire Resistance (3.0mm)	UL94

* UL Yellow Card cannot be provided due to proprietary information about the composition of ApolloX Foaming filament.

Pre-drying ApolloX Foaming

Moisture and humidity have a negative impact on the foaming agent. Therefore it is necessary to pre-dry the filament at 70°C for approximately 12 hours before usage. For optimal print results we recommend to print ApolloX Foaming filament from a drying box to avoid that the material can accumulate humidity from the environment during the 3D printing process.

Buildplate adhesion

For optimal buildplate adhesion, and releasing properties, we recommend to set your buildplate temperature at 50°C - 90°C and to use our EasyFix Adhesive – Nr. 1. Please lower bed temperature if the printed part sticks too firmly to the buildplate. Removal will be easier when bed is cooled down and if a buildplate adhesive has been applied.

Tips & tricks

- Foaming levels vary by printer.
 - Example: Bambu Lab P1S/X1C achieves flow values as low as 0.33,
 - Prusa i3 MK3S typically around 0.42.
- Better foaming performance is achieved on enclosed-chamber printers.
- Moisture affects foaming efficiency – always dry the filament before use for optimal results.
- Increase retraction settings to reduce stringing or artifacts.
 - Minor imperfections can be easily cleaned up by hand.
- Too much bed adhesion?**
 - Lower the bed temperature, and/or
 - Clean the build surface, and/or
 - Apply a bed adhesive for easier part removal.
- Model too brittle?**
 - Your flow rate is likely too low – try increasing flow slightly until the part is stronger.

Storage and handling

Filament should be stored at room temperature in a dry and dark place with humidity below 15%. Recommended storage temperature is ca. 18-25°C (64.4 -77.0°F). Keep out of moisture, sunlight and direct heat. When stored properly, product has a shelf life of at least 24 months. To obtain the best parameters of the printed object, it is recommended to dry the material prior to usage and to 3D print it directly from a dry box.

Product export information

HS Code	Description	Origin
39169090	Monofilament for 3D printing	European Union

Disclaimer

The product- and technical data provided in this datasheet is correct to the best of FormFutura BV's knowledge and are intended for reference and comparison purposes only. Actual values may vary according to printing conditions, model complexity, environmental conditions, etcetera. Typical values are indicative only and are not to be construed as being binding specifications. All other information supplied, including that herein, is considered accurate but is furnished upon the express condition that the customer shall make its own assessment to determine a product's suitability for a particular purpose. We make no warranty, express or implied, including regarding any information supplied or the data upon which it is based or the results to be obtained from the use of such products or information, or concerning product, whether of satisfactory quality, merchantability, fitness for any particular purpose or otherwise, or with respect to intellectual property infringement as a result of use of information or products, and none shall be implied.



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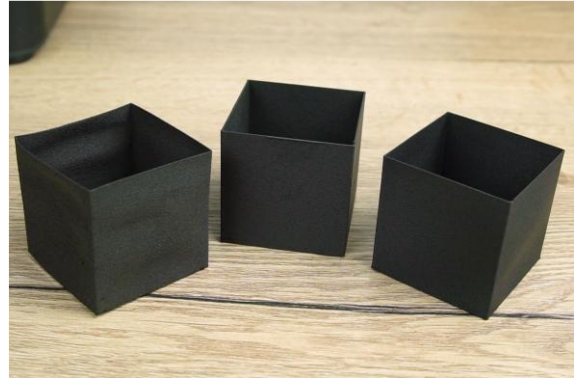
How to Use ApolloX Foaming – Optimize for Maximum Lightweight Performance

To achieve the maximum weight reduction using this foaming ASA filament, it's essential to determine the optimal expansion rate and fine-tune print settings accordingly.

Step-by-step calibration guide:

Step 1: print a thin-wall test cube

- Use vase mode (1 perimeter, no infill)
- Print at temperatures between 230°C–285°C, in 5°C increments
- Set fan speed to 0–10%
- Set print speed to ≤ 15 mm/s
- Use low acceleration and travel speeds
- Dry the filament before printing for best results



Step 2: Measure wall thickness

- Measure the wall of each test print
- Select the temperature that produces the thickest wall (indicating maximum expansion)



Step 3: Calibrate flow rate

- At the chosen temperature, print calibration cubes
- Gradually lower the flow rate until wall thickness matches your nozzle diameter
- Typical flow values range from 28–40%



Step 4: print your final model

- Use the calibrated settings
- Make final fine adjustments to flow rate if needed
 - Usually within \pm a few % of the value obtained in step 3

Following these steps will ensure you get the most from ApolloX Foaming's lightweight printing capabilities, while maintaining surface quality and structural integrity.

