

# BambuLab Basic PA12 PAHT CF Black

Material Engineering Report  
MaterialID MAT0167

3DPiceland Engineering Platform  
3DPiceland Labs

Generated with 3DPiceland Engineering Platform v60.0.6  
WORKFLOW-RELIABILITY - Bug Fixes and Workflow Reliability  
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**Public-data contract:** This static report contains only allowlisted material identity, public links, canonical MSRP and existing Verified Material Summary / governed score outputs. It excludes raw specimen rows and non-public operational data.

TEST COVERAGE

**Complete**

ENGINEERING AXES

**6/6**

PUBLIC MSRP

**\$159.84 USD/kg**

## Material identity

|                  |                                   |
|------------------|-----------------------------------|
| MaterialID       | MAT0167                           |
| Material         | BambuLab Basic PA12 PAHT CF Black |
| Manufacturer     | BambuLab                          |
| Product line     | Basic                             |
| Base material    | PA12                              |
| Category         | Engineering                       |
| Variant / finish | PAHT                              |
| Reinforcement    | CF                                |
| Color            | Black                             |

## Governed engineering profile

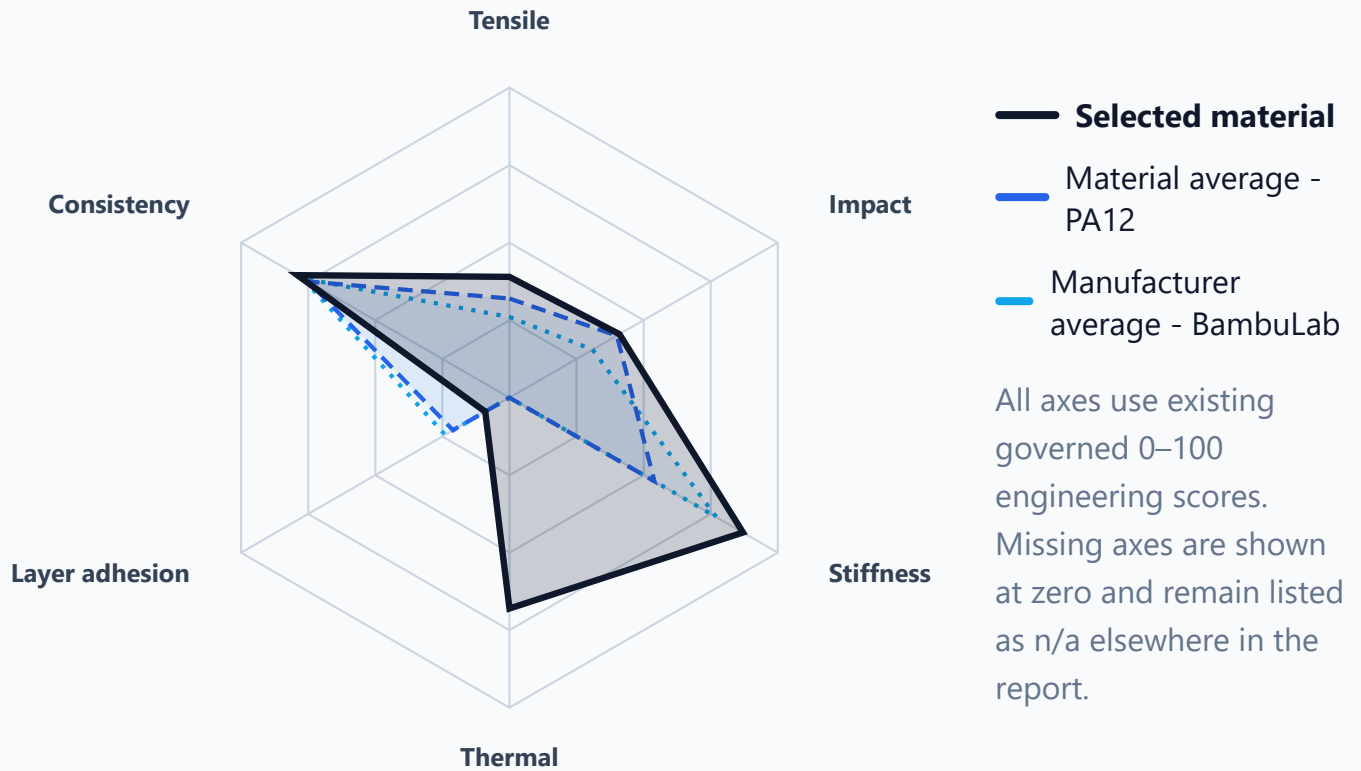
|         |        |
|---------|--------|
| Overall | 51/100 |
| Tensile | 39/100 |

|                     |           |
|---------------------|-----------|
| Impact              | 41/100    |
| Stiffness           | 87/100    |
| Consistency         | 79/100    |
| Layer adhesion      | 9/100     |
| Thermal             | 68/100    |
| Best available axis | stiffness |

## Engineering score profile



## Engineering radar



## Fixture thermal result

**136 °C** · score 68/100 · method 3dp-thermal-deflection-fixture-v1

Nearby BlueDOT probe-indicated fixture temperature from a non-standard comparative 3DPIceland method; not ASTM D648, ISO 75, specimen temperature, certified HDT or a manufacturer limit.

## Material and manufacturer context

| Metric         | Selected material | Material average | Manufacturer average |
|----------------|-------------------|------------------|----------------------|
| Overall        | 51/100            | 45/100           | 47/100               |
| Tensile        | 39/100            | 32/100           | 26/100               |
| Impact         | 41/100            | 40/100           | 31/100               |
| Stiffness      | 87/100            | 54/100           | 77/100               |
| Consistency    | 79/100            | 75/100           | 77/100               |
| Layer adhesion | 9/100             | 21/100           | 24/100               |
| Thermal        | 68/100            | —                | —                    |

# Verified measurement results

Existing Verified Material Summary outputs. The public renderer does not read raw specimen rows or recalculate these values.

| Measurement          | Average                   | Std. deviation           | CV    | Samples | Confidence |
|----------------------|---------------------------|--------------------------|-------|---------|------------|
| Tensile upright      | 5.045 MPa                 | 2.367 MPa                | 46.9% | 10      | 10/10      |
| Tensile flat         | 56.663 MPa                | 9.575 MPa                | 16.9% | 10      | 10/10      |
| Impact upright       | 131.419 kJ/m <sup>2</sup> | 13.458 kJ/m <sup>2</sup> | 10.2% | 10      | 10/10      |
| Impact flat          | 687.921 kJ/m <sup>2</sup> | 57.313 kJ/m <sup>2</sup> | 8.3%  | 10      | 10/10      |
| Stiffness modulus    | 2598.764 MPa              | —                        | —     | —       | —          |
| Stiffness deflection | 2.088 mm                  | —                        | —     | —       | —          |

# Measurement provenance

Canonical per-module measured dates from SQLite, shown in unambiguous ISO format. Missing dates are not inferred.

| Module    | Measured date |
|-----------|---------------|
| Tensile   | Not recorded  |
| Impact    | Not recorded  |
| Stiffness | Not recorded  |
| Thermal   | Not recorded  |

# Engineering interpretation

**Summary:** BambuLab Basic PA12 PAHT CF Black has a specialized or limited engineering profile. It is above its material-family average by 6,4 points and above its manufacturer average by 3,9 points. Its strongest measured axis is Stiffness, while the weakest axis is Layer Adhesion.

**Data-driven review:** BambuLab Basic PA12 PAHT CF Black is best understood as a repeatable material for cosmetic, concept and low-load prototype work. Compared with the current verified dataset, it ranks better than 68% overall, is above the material-family average by 6,4 points, and is above the manufacturer average by 3,9 points. Its strongest engineering signal is Stiffness, while Layer Adhesion is the main limitation to consider before using it for demanding applications.

BEST FEATURE

Stiffness

MAIN LIMITATION

Layer Adhesion

DATASET POSITION

Better than 68%  
77 / 234

Strengths

- Consistency: 79/100. Repeatability is one of the stronger signals in this material profile.
- Tensile: 39/100. Tensile behavior is competitive against the material-family context.
- Stiffness: 87/100. Stiffness is a relative advantage in this comparison group.

Limitations

- Tensile: 39/100. Avoid using this as the primary choice for tensile-loaded parts.
- Layer adhesion: 9/100. Z-axis performance should be treated with caution.

Engineering trade-offs

- Good repeatability does not compensate for low tensile capability in load-bearing designs.
- Stiffness is useful for shape stability, but impact tolerance is a separate limitation.

Recommended applications

- Rigid brackets, fixtures and shape-stable prototypes
- Repeatable print jobs and production-style batches
- Cosmetic parts, concept models or low-load prototypes

Metric rankings and percentiles

| Metric  | Score  | Rank     | Percentile      |
|---------|--------|----------|-----------------|
| Overall | 51/100 | 77 / 234 | Better than 68% |

| Metric         | Score  | Rank      | Percentile      |
|----------------|--------|-----------|-----------------|
| Tensile        | 39/100 | 16 / 226  | Better than 93% |
| Impact         | 41/100 | 48 / 226  | Better than 79% |
| Stiffness      | 87/100 | 89 / 223  | Better than 61% |
| Consistency    | 79/100 | 91 / 231  | Better than 61% |
| Layer adhesion | 9/100  | 218 / 226 | Better than 4%  |
| Thermal        | 68/100 | 6 / 209   | Better than 98% |

## Decision guidance

- Use this material for moderate requirements after checking the weakest axis.

## Better alternatives

| MaterialID                                                                                   | Material | Manufacturer | Overall | Tensile | Impact |
|----------------------------------------------------------------------------------------------|----------|--------------|---------|---------|--------|
| No stronger same-base-material alternatives were identified in the current governed dataset. |          |              |         |         |        |

## Peer context

Highest-scoring same-base-material peers from the current governed dataset. This context is descriptive and is not recalculated by the public renderer.

| MaterialID | Material                            | Manufacturer  | Overall | Tensile | Impact |
|------------|-------------------------------------|---------------|---------|---------|--------|
| MAT0214    | Eryone Standard Black PA12 CF Black | Eryone        | 53/100  | 43/100  | 46/100 |
| MAT0020    | Extrudr DuraPro PA12 Black          | Extrudr       | 50/100  | 34/100  | 50/100 |
| MAT0209    | Eryone Standard Black PA12 GF Black | Eryone        | 49/100  | 33/100  | 67/100 |
| MAT0022    | Fillamentum FX256 PA12 Clear        | Fillamentum   | 45/100  | 28/100  | 47/100 |
| MAT0019    | MatterHackers NylonX PA12 CF Black  | MatterHackers | 42/100  | 32/100  | 22/100 |
| MAT0239    | Yasin Standard Black PA12 CF Black  | Yasin         | 41/100  | 33/100  | 25/100 |
| MAT0196    | Extrudr DuraPro Black PA12 CF Black | Extrudr       | 40/100  | 28/100  | 44/100 |

| MaterialID | Material                        | Manufacturer | Overall | Tensile | Impact |
|------------|---------------------------------|--------------|---------|---------|--------|
| MAT0021    | Yasin Standard Black PA12 Black | Yasin        | 31/100  | 22/100  | 13/100 |

## Public links

[Manufacturer website](#) [Download PDF](#)

## Methodology and limitations

Results are comparative 3DPlceland measurements from home-built test equipment. Thermal is a nearby BlueDOT probe-indicated fixture temperature, not ASTM D648, ISO 75 or specimen temperature. Missing evidence remains n/a. Scores and test results are not recalculated by this publishing layer and do not replace certified manufacturer datasheets or accredited laboratory testing.

- [Testing methodology](#).
- [Engineering methodology whitepaper](#)