

Polymaker PolyLight PLA Black

Material Engineering Report
MaterialID MAT0108

3DPiceland Engineering Platform
3DPiceland Labs

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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

5/6

PUBLIC MSRP

\$27.78 USD/kg

Material identity

MaterialID	MAT0108
Material	Polymaker PolyLight PLA Black
Manufacturer	Polymaker
Product line	PolyLight
Base material	PLA
Category	Standard
Variant / finish	—
Reinforcement	—
Color	Black

Governed engineering profile

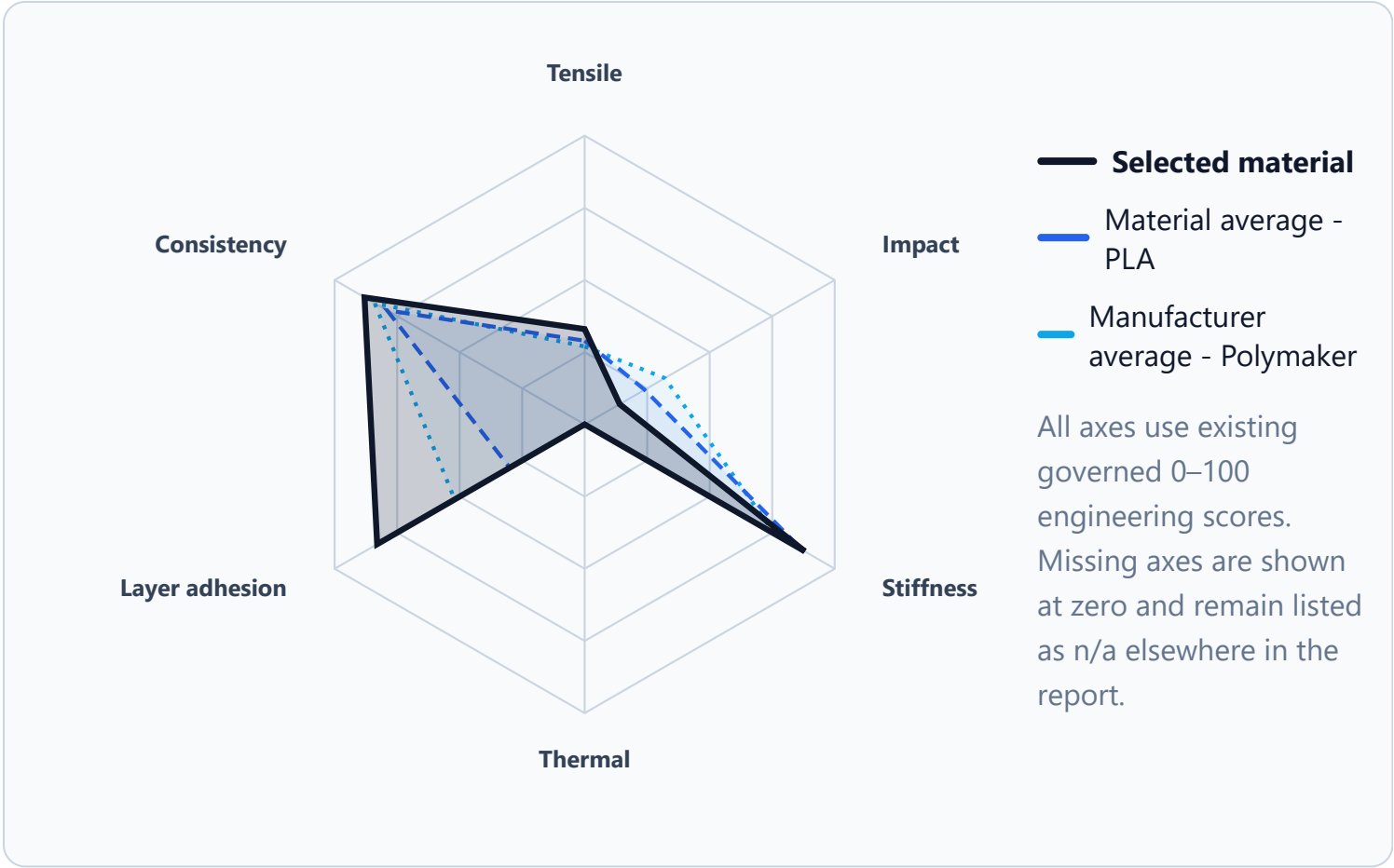
Overall	61/100
Tensile	33/100

Impact	14/100
Stiffness	88/100
Consistency	88/100
Layer adhesion	83/100
Thermal	—
Best available axis	stiffness

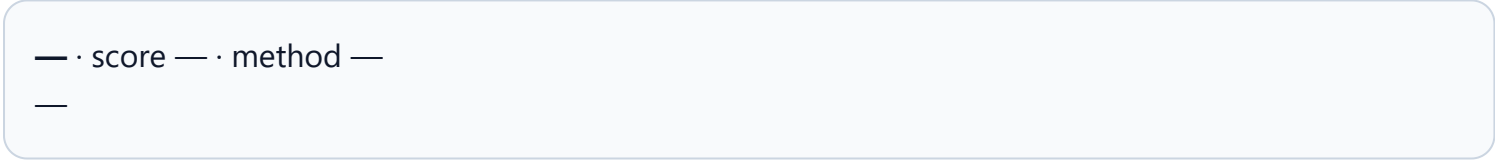
Engineering score profile



Engineering radar



Fixture thermal result



Material and manufacturer context

Metric	Selected material	Material average	Manufacturer average
Overall	61/100	50/100	54/100
Tensile	33/100	29/100	27/100
Impact	14/100	24/100	32/100
Stiffness	88/100	87/100	76/100
Consistency	88/100	79/100	84/100
Layer adhesion	83/100	30/100	52/100
Thermal	—	—	—

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	23.84 MPa	2.845 MPa	11.9%	10	10/10
Tensile flat	28.654 MPa	4.717 MPa	16.5%	10	10/10
Impact upright	99.081 kJ/m ²	10.433 kJ/m ²	10.5%	10	10/10
Impact flat	176.75 kJ/m ²	18.278 kJ/m ²	10.3%	10	10/10
Stiffness modulus	2635.889 MPa	—	—	—	—
Stiffness deflection	2.059 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: Polymaker PolyLight PLA Black has a balanced mid-range engineering profile. It is above its material-family average by 11 points and above its manufacturer average by 6,9 points. Its strongest measured axis is Stiffness, while the weakest axis is Impact.

Data-driven review: Polymaker PolyLight PLA Black is best understood as a balanced material for general functional prototypes. Compared with the current verified dataset, it ranks better than 97% overall, is above the material-family average by 11 points, and is above the manufacturer average by 6,9 points. Its strongest engineering signal is Stiffness, while Impact is the main limitation to consider before using it for demanding applications.

BEST FEATURE

Stiffness

MAIN LIMITATION

Impact

DATASET POSITION

Better than 97%
7 / 234

Strengths

- Layer adhesion: 83/100. Z-axis bonding is better than the material-family context.
- Consistency: 88/100. Repeatability is one of the stronger signals in this material profile.
- Stiffness: 88/100. Stiffness is a relative advantage in this comparison group.

Limitations

- Tensile: 33/100. Avoid using this as the primary choice for tensile-loaded parts.
- Impact: 14/100. Avoid high impact or shock-loaded components without additional validation.

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
- Parts where Z-axis bonding is important
- Repeatable print jobs and production-style batches
- Cosmetic parts, concept models or low-load prototypes
- Avoid high tensile load applications
- Avoid high impact components

Metric rankings and percentiles

Metric	Score	Rank	Percentile
Overall	61/100	7 / 234	Better than 97%
Tensile	33/100	71 / 226	Better than 69%
Impact	14/100	195 / 226	Better than 14%
Stiffness	88/100	83 / 223	Better than 63%

Metric	Score	Rank	Percentile
Consistency	88/100	8 / 231	Better than 97%
Layer adhesion	83/100	1 / 226	Better than 100%
Thermal	—	—	—

Decision guidance

- Use this material for moderate requirements after checking the weakest axis.
- Review the listed alternatives if the application needs stronger overall performance.
- Do not choose it as a tensile-strength benchmark material.
- Avoid selecting it for impact-focused testing or shock-loaded designs.

Better alternatives

MaterialID	Material	Manufacturer	Overall	Tensile	Impact
MAT0069	ProtoPasta HTPLA Blood of My Enemies PLA Red	ProtoPasta	100/100	—	—
MAT0079	Polymaker PolyLight PLA Pro Black	Polymaker	65/100	35/100	52/100
MAT0109	Polymaker PolyMax PLA Black	Polymaker	64/100	32/100	62/100

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
MAT0069	ProtoPasta HTPLA Blood of My Enemies PLA Red	ProtoPasta	100/100	—	—
MAT0079	Polymaker PolyLight PLA Pro Black	Polymaker	65/100	35/100	52/100
MAT0109	Polymaker PolyMax PLA Black	Polymaker	64/100	32/100	62/100
MAT0080	Polymaker PolySonic PLA Pro Blue	Polymaker	64/100	30/100	58/100
MAT0076	BambuLab Tough+ PLA Tough+ Black	BambuLab	63/100	26/100	59/100

MaterialID	Material	Manufacturer	Overall	Tensile	Impact
MAT0074	Winkle Matte PLA Matte Red	Winkle	60/100	34/100	—
MAT0122	Add:North Enhanced PLA Clear	Add:North	59/100	40/100	10/100
MAT0096	Prima Creator PrimaValue Light Gray PLA Plus Gray	Prima Creator	58/100	33/100	58/100

Public links

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

Methodology and limitations

Results are comparative 3DPIceland 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](#)