Public engineering report

Polymaker PolyLight PLA Pro Black

Material Engineering Report
MaterialID MAT0079

3DPIceland Engineering Platform
3DPIceland Labs
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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	ENGINEERING AXES	PUBLIC MSRP
Complete	**6/6**	**$32.13 USD/kg**

Material identity

MaterialID	MAT0079
Material	Polymaker PolyLight PLA Pro Black
Manufacturer	Polymaker
Product line	PolyLight
Base material	PLA
Category	Standard
Variant / finish	Pro
Reinforcement	—
Color	Black

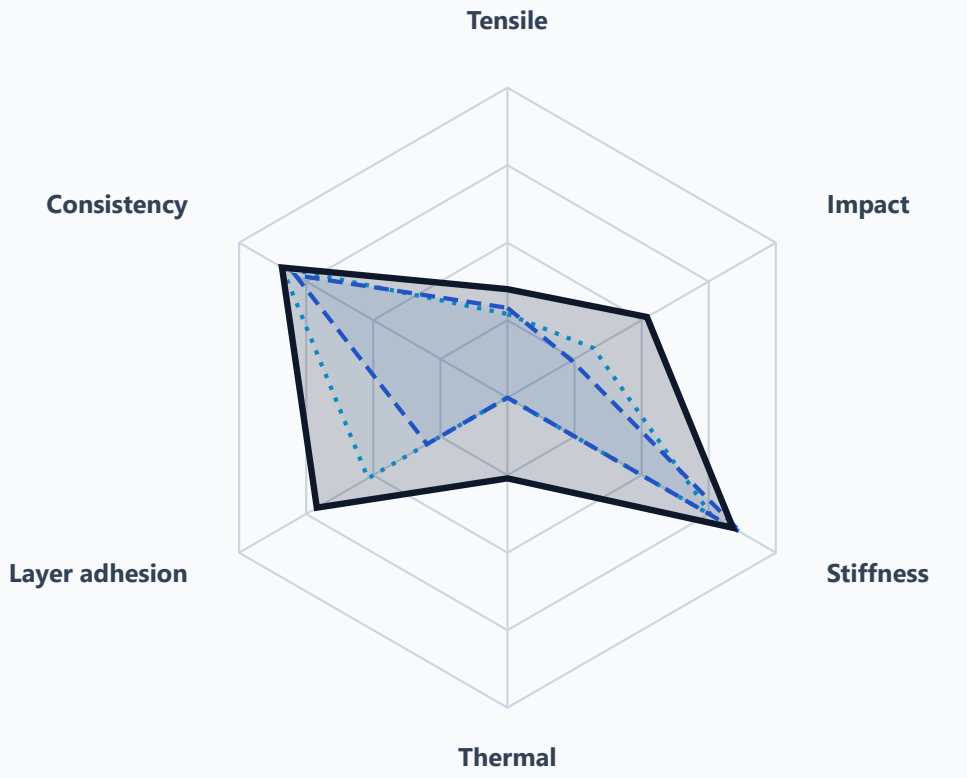
Governed engineering profile

Overall	65/100
Tensile	35/100

Impact	52/100
Stiffness	84/100
Consistency	84/100
Layer adhesion	71/100
Thermal	26/100
Best available axis	stiffness

Engineering score profile

Engineering radar



All axes use existing governed 0–100 engineering scores. Missing axes are shown at zero and remain listed as n/a elsewhere in the report.

Fixture thermal result

51 °C · score 26/100 · 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	65/100	50/100	54/100
Tensile	35/100	29/100	27/100
Impact	52/100	24/100	32/100
Stiffness	84/100	87/100	76/100
Consistency	84/100	79/100	84/100
Layer adhesion	71/100	30/100	52/100
Thermal	26/100	—	—

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	23.456 MPa	4.86 MPa	20.7%	10	10/10
Tensile flat	33.13 MPa	5.755 MPa	17.4%	10	10/10
Impact upright	143.39 kJ/m²	23.468 kJ/m²	16.4%	10	10/10
Impact flat	889.783 kJ/m²	88.086 kJ/m²	9.9%	10	10/10
Stiffness modulus	2527.565 MPa	—	—	—	—
Stiffness deflection	2.147 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 Pro Black has a balanced mid-range engineering profile. It is above its material-family average by 15,1 points and above its manufacturer average by 11 points. Its strongest measured axis is Stiffness, while the weakest axis is Tensile.

Data-driven review: Polymaker PolyLight PLA Pro Black is best understood as a balanced material for general functional prototypes. Compared with the current verified dataset, it ranks better than 99% overall, is above the material-family average by 15,1 points, and is above the manufacturer average by 11 points. Its strongest engineering signal is Stiffness, while Tensile is the main limitation to consider before using it for demanding applications.

BEST FEATURE
Stiffness

MAIN LIMITATION
Tensile

DATASET POSITION
Better than 99%
3 / 234

Strengths

- Layer adhesion: 71/100. Z-axis bonding is better than the material-family context.
- Consistency: 84/100. Repeatability is one of the stronger signals in this material profile.
- Impact: 52/100. Impact behavior is competitive against the material-family context.
- Tensile: 35/100. Tensile behavior is competitive against the material-family context.

Limitations

- Tensile: 35/100. Avoid using this as the primary choice for tensile-loaded parts.

Engineering trade-offs

- Good repeatability does not compensate for low tensile capability in load-bearing designs.

Recommended applications

- Rigid brackets, fixtures and shape-stable prototypes
- Parts where Z-axis bonding is important
- Repeatable print jobs and production-style batches

Metric rankings and percentiles

Metric	Score	Rank	Percentile
Overall	65/100	3 / 234	Better than 99%
Tensile	35/100	42 / 226	Better than 82%
Impact	52/100	21 / 226	Better than 91%
Stiffness	84/100	100 / 223	Better than 56%
Consistency	84/100	32 / 231	Better than 87%
Layer adhesion	71/100	3 / 226	Better than 99%
Thermal	26/100	176 / 209	Better than 16%

Decision guidance

- Use this material for moderate requirements after checking the weakest axis.
- Review the listed alternatives if the application needs stronger overall performance.

Better alternatives

MaterialID	Material	Manufacturer	Overall	Tensile	Impact
MAT0069	ProtoPasta HTPLA Blood of My Enemies PLA Red	ProtoPasta	100/100	—	—

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	—	—
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
MAT0108	Polymaker PolyLight PLA Black	Polymaker	61/100	33/100	14/100
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