

Winkle Standard Recycled PLA Recycled Gray

Material Engineering Report
MaterialID MAT0157

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

Complete

ENGINEERING AXES

6/6

PUBLIC MSRP

\$58.50 USD/kg

Material identity

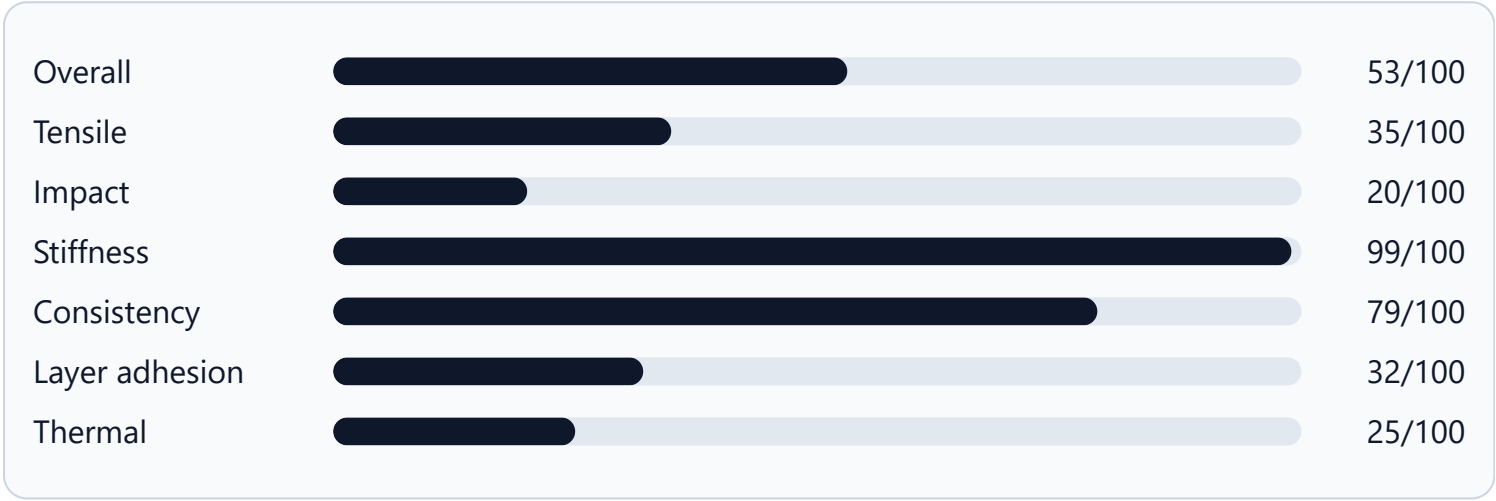
MaterialID	MAT0157
Material	Winkle Standard Recycled PLA Recycled Gray
Manufacturer	Winkle
Product line	Standard
Base material	PLA
Category	Standard
Variant / finish	Recycled
Reinforcement	—
Color	Gray

Governed engineering profile

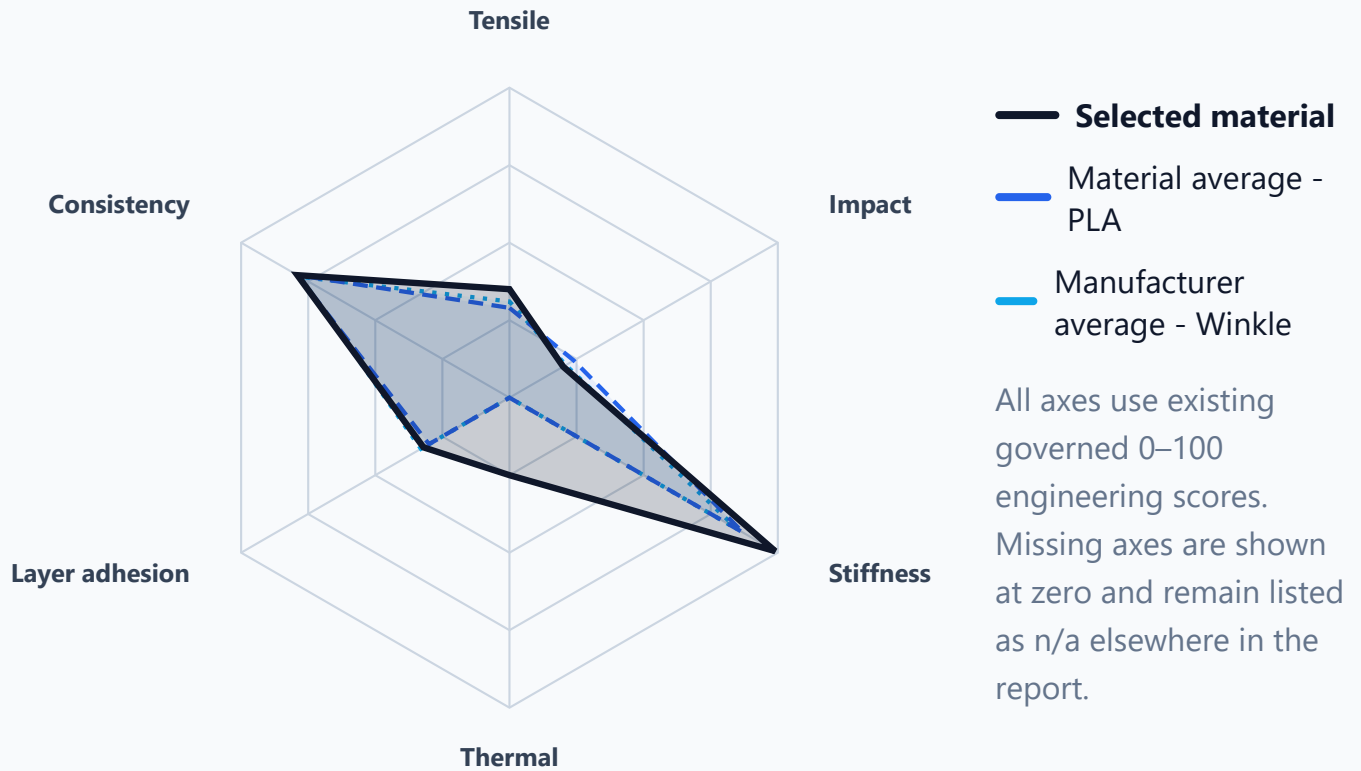
Overall	53/100
Tensile	35/100

Impact	20/100
Stiffness	99/100
Consistency	79/100
Layer adhesion	32/100
Thermal	25/100
Best available axis	stiffness

Engineering score profile



Engineering radar



Fixture thermal result

50 °C · score 25/100 · 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	53/100	50/100	49/100
Tensile	35/100	29/100	31/100
Impact	20/100	24/100	21/100
Stiffness	99/100	87/100	85/100
Consistency	79/100	79/100	78/100
Layer adhesion	32/100	30/100	33/100
Thermal	25/100	—	—

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	13.304 MPa	6.044 MPa	45.4%	10	10/10
Tensile flat	41.974 MPa	6.491 MPa	15.5%	10	10/10
Impact upright	158.776 kJ/m ²	23.095 kJ/m ²	14.5%	10	10/10
Impact flat	231.696 kJ/m ²	18.589 kJ/m ²	8%	10	10/10
Stiffness modulus	2976.004 MPa	—	—	—	—
Stiffness deflection	1.823 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: Winkle Standard Recycled PLA Recycled Gray has a specialized or limited engineering profile. It is above its material-family average by 2,7 points and above its manufacturer average by 3,8 points. Its strongest measured axis is Stiffness, while the weakest axis is Impact.

Data-driven review: Winkle Standard Recycled PLA Recycled Gray 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 78% overall, is roughly aligned with the material-family average, and is above the manufacturer average by 3,8 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 78%
52 / 234

Strengths

- Consistency: 79/100. Repeatability is one of the stronger signals in this material profile.
- Tensile: 35/100. Tensile behavior is competitive against the material-family context.
- Stiffness: 99/100. Stiffness is a relative advantage in this comparison group.

Limitations

- Tensile: 35/100. Avoid using this as the primary choice for tensile-loaded parts.
- Impact: 20/100. Avoid high impact or shock-loaded components without additional validation.
- Layer adhesion: 32/100. 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
- Avoid high tensile load applications
- Avoid high impact components

Metric rankings and percentiles

Metric	Score	Rank	Percentile
Overall	53/100	52 / 234	Better than 78%
Tensile	35/100	50 / 226	Better than 78%
Impact	20/100	138 / 226	Better than 39%
Stiffness	99/100	38 / 223	Better than 83%
Consistency	79/100	97 / 231	Better than 58%
Layer adhesion	32/100	78 / 226	Better than 66%
Thermal	25/100	190 / 209	Better than 10%

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	—	—

MaterialID	Material	Manufacturer	Overall	Tensile	Impact
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
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

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](#)