

Bedrock 3D Standard Natural PLA Tough Natal

Material Engineering Report
MaterialID MAT0244

3DPiceland Engineering Platform
3DPiceland Labs
Generated with 3DPiceland Engineering Platform v70.0.4
DIRECT-IMPACT-METHODOLOGY - Izod and Charpy
Methodology
Generated 2026-10-04 18:07:33

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.

RIGID TEST COVERAGE

Complete; 5/5 score families; Izod/Charpy 2/2 measured, 2/2 scored; Overall eligible; policy engineering-score-v70-1

ENGINEERING AXES

7/8

PUBLIC MSRP

\$35.83 USD/kg

Material identity

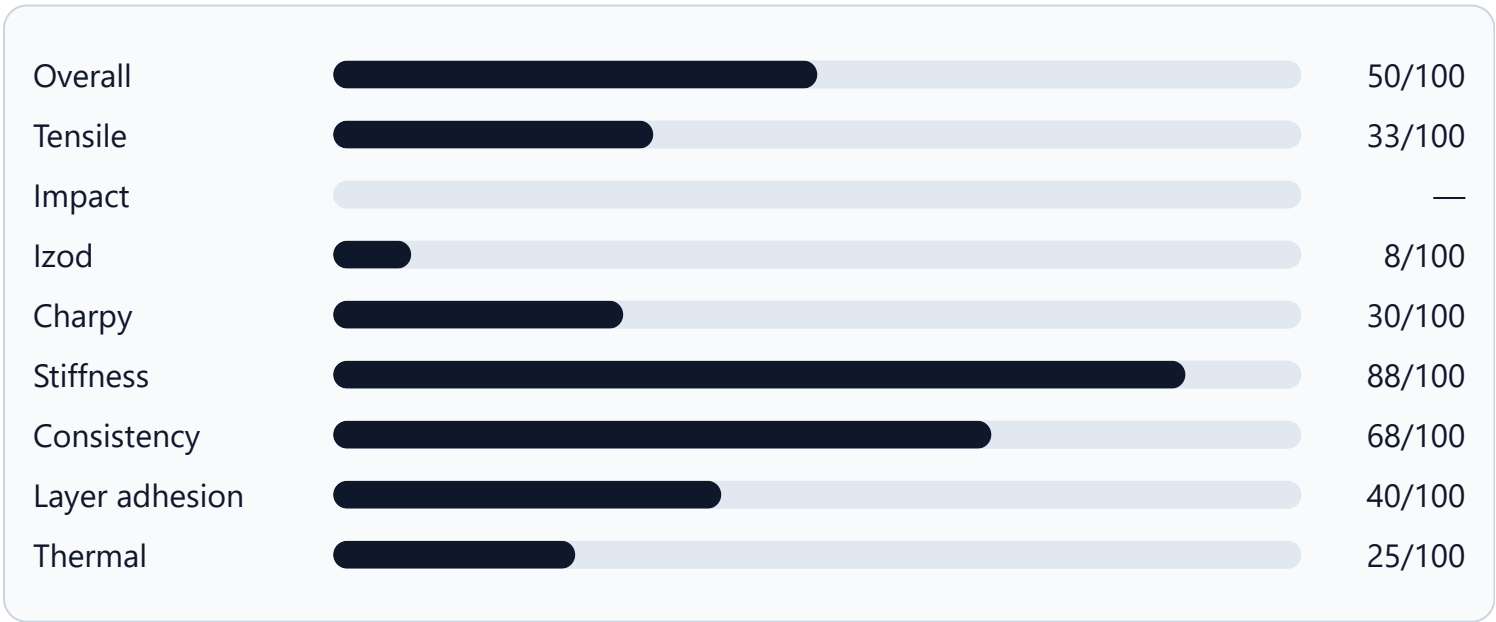
MaterialID	MAT0244
Material	Bedrock 3D Standard Natural PLA Tough Natal
Manufacturer	Bedrock 3D
Product line	Standard
Base material	PLA
Category	Standard
Variant / finish	Tough

Reinforcement	—
Color	Natural

Governed engineering profile

Overall	50/100
Tensile	33/100
Impact	—
Izod	8/100
Charpy	30/100
Stiffness	88/100
Consistency	68/100
Layer adhesion	40/100
Thermal	25/100
Best available axis	stiffness

Engineering score profile



Engineering radar

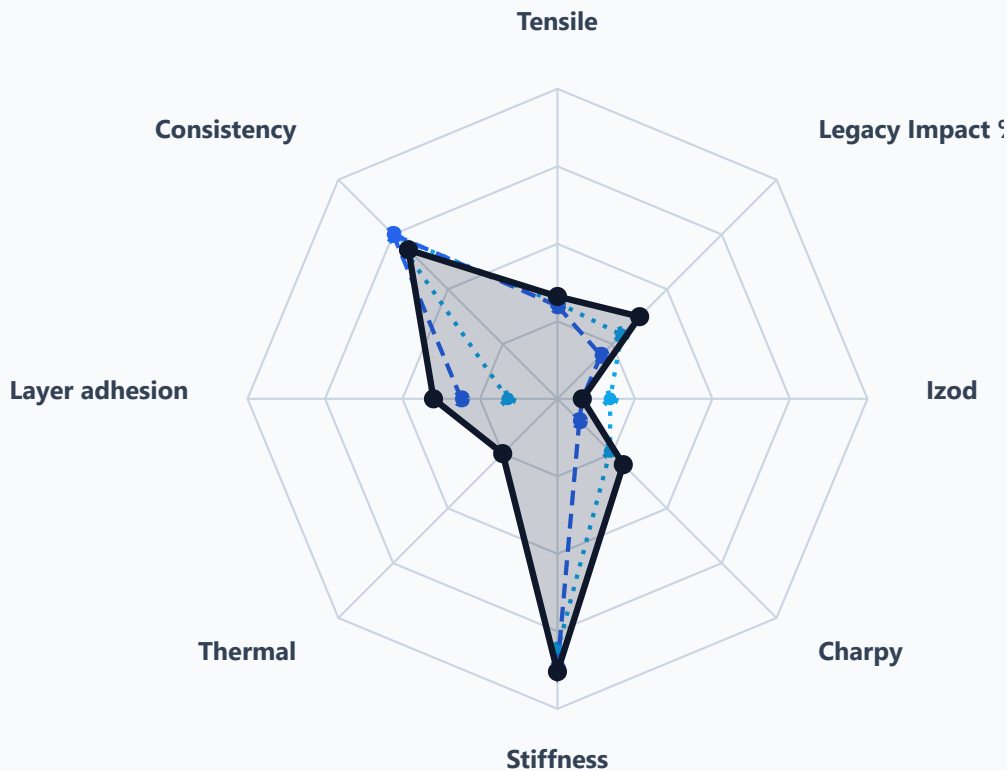
— **Selected material**

— Material average - PLA

— Manufacturer average - Bedrock 3D

Legacy Impact radar: 37.533 % of legacy rig capacity. This historical visual reference is the mean corrected Flat/Upright result divided by the matching rig capacity; it is not a modern engineering score.

Izod and Charpy use versioned method references and together form one equally weighted impact family. Overall requires all five families and both calibrated methods; incomplete profiles are not ranked. Legacy Impact and thermal are outside Overall. Missing axes have gaps with no marker or filled polygon; measured zero retains a centre marker.



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	50/100	—	—
Tensile	33/100	30/100	31/100
Impact	—	—	—
Izod	8/100	8/100	17/100
Charpy	30/100	10/100	24/100
Stiffness	88/100	87/100	81/100
Consistency	68/100	75/100	74/100
Layer adhesion	40/100	31/100	16/100
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	15.273 MPa	4.732 MPa	31%	10	10/10
Tensile flat	37.898 MPa	5.933 MPa	15.7%	10	10/10
Impact upright	8.041 kJ/m ²	0.46 kJ/m ²	5.7%	10	10/10
Impact flat	34.726 kJ/m ²	4.205 kJ/m ²	12.1%	10	10/10
Izod	6.434 kJ/m ²	1.01 kJ/m ²	15.7%	10	10/10
Charpy	24.329 kJ/m ²	16.382 kJ/m ²	67.3%	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	2026-09-05
Impact	2026-09-11
Izod	2026-09-21
Charpy	2026-09-21
Stiffness	2026-09-05
Thermal	2026-09-05

Engineering interpretation

Summary: Bedrock 3D Standard Natural PLA Tough Natual has a specialized or limited engineering profile. It is without enough material-family average context and without enough manufacturer average context. Its strongest measured axis is Stiffness, while the weakest axis is Izod.

Data-driven review: Bedrock 3D Standard Natural PLA Tough Natual 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 83% overall, is missing enough context for the material-family average, and is missing enough context for the manufacturer average. Its strongest engineering signal is Stiffness, while Izod is the main limitation to consider before using it for demanding applications.

BEST FEATURE

Stiffness

MAIN LIMITATION

Izod

DATASET POSITION

Better than 83%
15 / 80

Strengths

- Layer adhesion: 40/100. Z-axis bonding is better than the material-family context.
- Izod/Charpy impact family: 19/100. The two-method impact score is competitive against the material-family context.
- 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.
- Izod/Charpy impact family: 19/100. Validate impact or shock-loaded components against their application requirements.

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.
- The report should be read as a suitability warning rather than a general-purpose recommendation.

Recommended applications

- Rigid brackets, fixtures and shape-stable prototypes
- 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	50/100	15 / 80	Better than 83%
Tensile	33/100	73 / 243	Better than 70%
Impact	—	—	—
Izod	8/100	39 / 83	Better than 54%
Charpy	30/100	9 / 82	Better than 90%
Stiffness	88/100	90 / 240	Better than 63%
Consistency	68/100	194 / 243	Better than 21%
Layer adhesion	40/100	49 / 243	Better than 80%

Metric	Score	Rank	Percentile
Thermal	25/100	204 / 226	Better than 10%

Decision guidance

- Use this material mainly for low-load, visual or experimental parts.
- Review the listed alternatives if the application needs stronger overall performance.
- Do not choose it as a tensile-strength benchmark material.
- Validate impact-focused or shock-loaded designs against the measured Izod/Charpy results.

Better alternatives

MaterialID	Material	Manufacturer	Overall	Tensile	Impact	Izod	Charpy
MAT0265	Coex 3D Standard Scarlet Red PLA Red	Coex 3D	58/100	39/100	—		
MAT0118	Prusa3D Prusament Azure Blue PLA Blue	Prusa3D	55/100	36/100	—		

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	Izod	Charpy
MAT0265	Coex 3D Standard Scarlet Red PLA Red	Coex 3D	58/100	39/100	—	n/a	n/a
MAT0118	Prusa3D Prusament Azure Blue PLA Blue	Prusa3D	55/100	36/100	—	n/a	n/a
MAT0112	Prusa3D Prusament Galaxy Black PLA Black	Prusa3D	52/100	38/100	—	n/a	n/a
MAT0143	Prusa3D Prusament Corn Pigment PLA Recycled Brown	Prusa3D	52/100	30/100	—	n/a	n/a
MAT0203	Prusa3D Prusament Prusa Orange PLA	Prusa3D	52/100	42/100	—	n/a	n/a

MaterialID	Material	Manufacturer	Overall	Tensile	Impact	Izod	Charpy
	Orange						
MAT0264	Coex 3D Prime Scarlet Red PLA Red	Coex 3D	52/100	34/100	—	n/a	n/a
MAT0205	Prusa3D Prusament Marble Gray PLA Marble Gray	Prusa3D	51/100	37/100	—	n/a	n/a
MAT0204	Prusa3D Prusament Jet Black PLA Black	Prusa3D	51/100	40/100	—	n/a	n/a

Public links

[Manufacturer website](#) [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](#)

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Izod and Charpy Impact Strength

Izod Impact Strength · 2026-09-21

Instrument readings in kJ/m²

Mean 6.434 kJ/m²; Std. Dev 1.01 kJ/m²; CV 15.698%; Samples 10; Confidence 10

No break 0; invalid 0; excluded 0.

Comparative measurements; standard conformity unverified.

Charpy Impact Strength · 2026-09-21

Instrument readings in kJ/m²

Mean 24.329 kJ/m²; Std. Dev 16.382 kJ/m²; CV 67.333%; Samples 10; Confidence 10

No break 0; invalid 0; excluded 0.

Comparative measurements; standard conformity unverified.