

Coex 3D Standard Carbon Filled PLA CF Black

Material Engineering Report
MaterialID MAT0268

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

\$0.22 USD/kg

Material identity

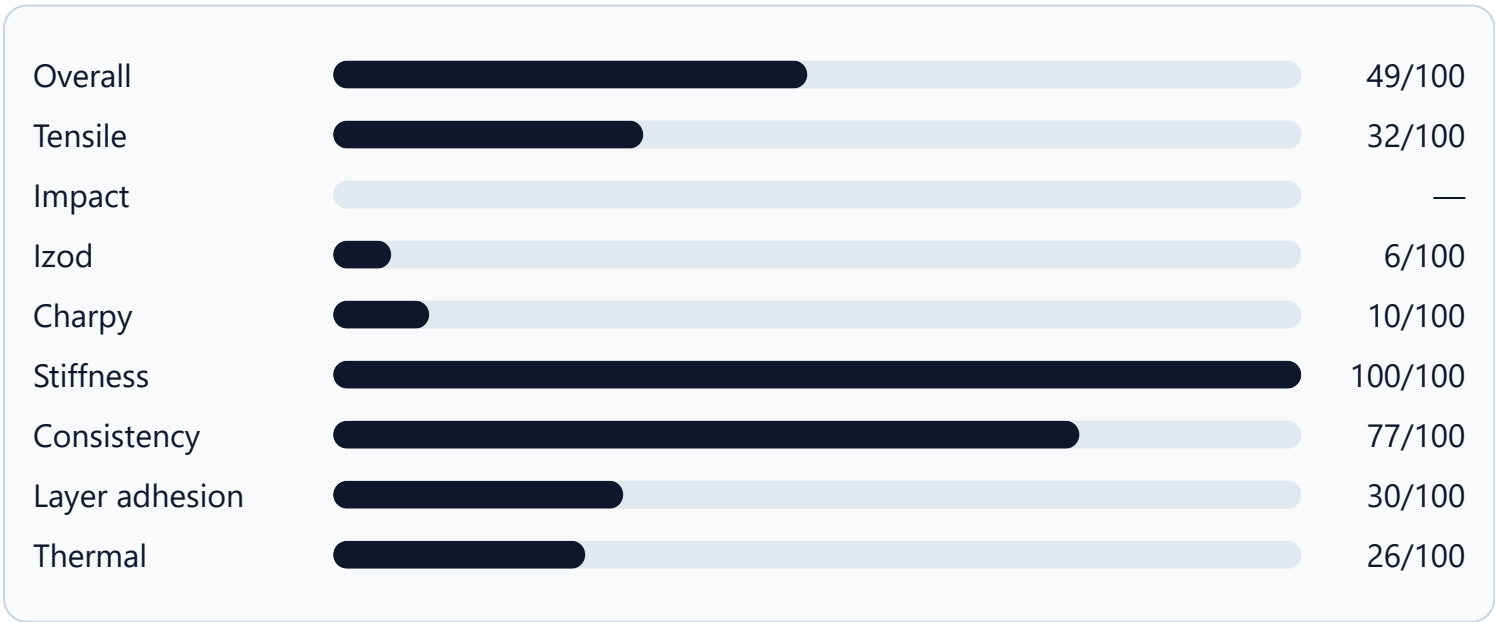
MaterialID	MAT0268
Material	Coex 3D Standard Carbon Filled PLA CF Black
Manufacturer	Coex 3D
Product line	Standard
Base material	PLA
Category	Standard
Variant / finish	—

Reinforcement	CF
Color	Black

Governed engineering profile

Overall	49/100
Tensile	32/100
Impact	—
Izod	6/100
Charpy	10/100
Stiffness	100/100
Consistency	77/100
Layer adhesion	30/100
Thermal	26/100
Best available axis	stiffness

Engineering score profile



Engineering radar

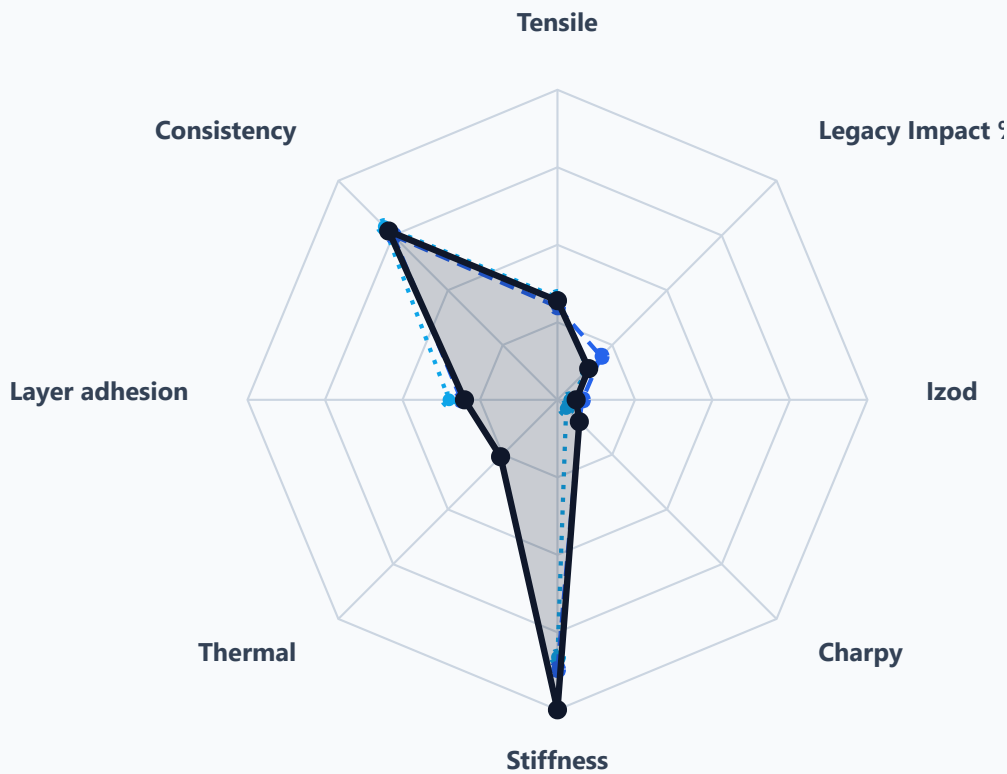
— **Selected material**

— Material average - PLA

— Manufacturer average - Coex 3D

Legacy Impact radar: 14.26 % 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

52 °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	49/100	—	47/100
Tensile	32/100	30/100	33/100
Impact	—	—	—
Izod	6/100	8/100	4/100
Charpy	10/100	10/100	4/100
Stiffness	100/100	87/100	83/100
Consistency	77/100	75/100	79/100
Layer adhesion	30/100	31/100	35/100
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	11.828 MPa	4.201 MPa	35.5%	10	10/10
Tensile flat	39.959 MPa	8.351 MPa	20.9%	10	10/10
Impact upright	6.001 kJ/m ²	0.573 kJ/m ²	9.6%	10	10/10
Impact flat	10.248 kJ/m ²	1.111 kJ/m ²	10.8%	10	10/10
Izod	5.197 kJ/m ²	0.4 kJ/m ²	7.7%	8	8/10
Charpy	7.664 kJ/m ²	2.03 kJ/m ²	26.5%	10	10/10
Stiffness modulus	3548.312 MPa	—	—	—	—
Stiffness deflection	1.529 mm	—	—	—	—

Measurement provenance

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

Module	Measured date
Tensile	2026-09-25
Impact	2026-09-26
Izod	2026-09-29
Charpy	2026-09-28
Stiffness	2026-09-25
Thermal	2026-09-26

Engineering interpretation

Summary: Coex 3D Standard Carbon Filled PLA CF Black has a specialized or limited engineering profile. It is without enough material-family average context and above its manufacturer average by 2,5 points. Its strongest measured axis is Stiffness, while the weakest axis is Izod.

Data-driven review: Coex 3D Standard Carbon Filled PLA 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 81% overall, is missing enough context for the material-family average, and is roughly aligned with 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 81%

16 / 80

Strengths

- Consistency: 77/100. Repeatability is one of the stronger signals in this material profile.
- Stiffness: 100/100. Stiffness is a relative advantage in this comparison group.

Limitations

- Tensile: 32/100. Avoid using this as the primary choice for tensile-loaded parts.
- Izod/Charpy impact family: 8/100. Validate impact or shock-loaded components against their application requirements.
- Layer adhesion: 30/100. 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.
- The report should be read as a suitability warning rather than a general-purpose recommendation.

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	49/100	16 / 80	Better than 81%
Tensile	32/100	81 / 243	Better than 67%
Impact	—	—	—
Izod	6/100	50 / 83	Better than 41%
Charpy	10/100	35 / 82	Better than 59%
Stiffness	100/100	1 / 240	Better than 100%

Metric	Score	Rank	Percentile
Consistency	77/100	116 / 243	Better than 53%
Layer adhesion	30/100	93 / 243	Better than 62%
Thermal	26/100	168 / 226	Better than 26%

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	—		
MAT0112	Prusa3D Prusament Galaxy Black PLA Black	Prusa3D	52/100	38/100	—		

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

MaterialID	Material	Manufacturer	Overall	Tensile	Impact	Izod	Charpy
MAT0143	Prusa3D Prusament Corn Pigment PLA Recycled Brown	Prusa3D	52/100	30/100	—	n/a	n/a
MAT0203	Prusa3D Prusament Prusa Orange PLA Orange	Prusa3D	52/100	42/100	—	n/a	n/a
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

Charpy Impact Strength · 2026-09-28
Instrument readings in kJ/m²
Mean 7.664 kJ/m²; Std. Dev 2.03 kJ/m²; CV 26.494%; Samples 10; Confidence 10
No break 0; invalid 0; excluded 0.
Comparative measurements; standard conformity unverified.

Izod Impact Strength · 2026-09-29

Instrument readings in kJ/m^2

Mean 5.197 kJ/m^2 ; Std. Dev 0.4 kJ/m^2 ; CV 7.707%; Samples 8; Confidence 8

No break 0; invalid 0; excluded 0.

Comparative measurements; standard conformity unverified.