

# Thorwell Standard PLA Plus PLA Plus White

Material Engineering Report  
MaterialID MAT0154

3DPiceland Engineering Platform  
3DPiceland Labs  
Generated with 3DPiceland Engineering Platform v60.0.6  
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

**\$32.00 USD/kg**

## Material identity

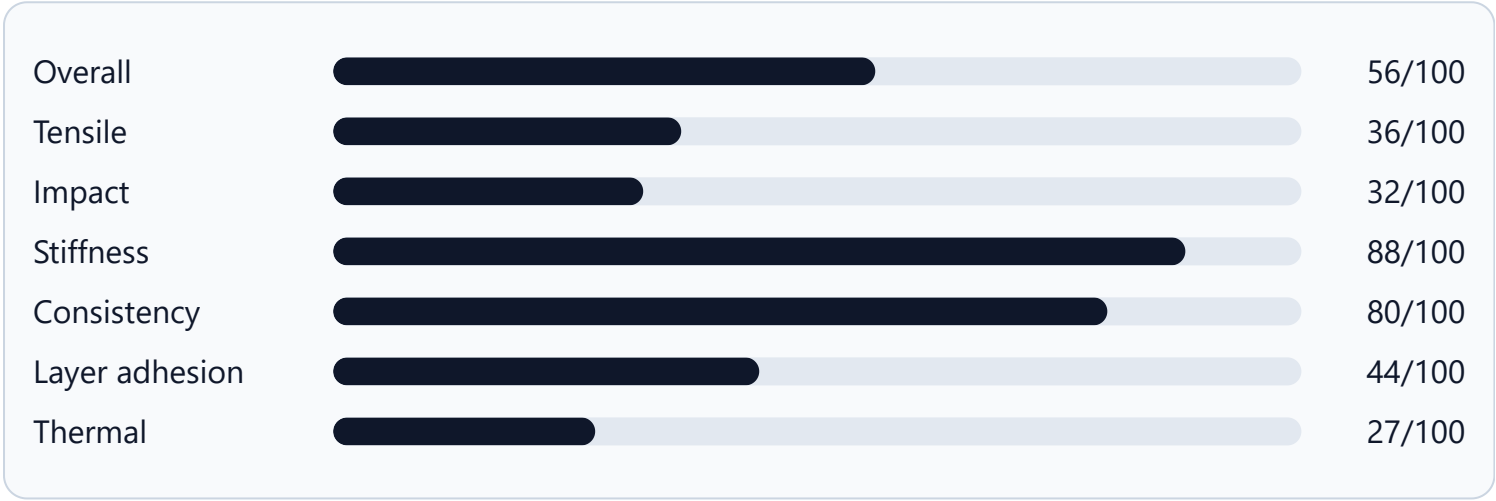
|                  |                                           |
|------------------|-------------------------------------------|
| MaterialID       | MAT0154                                   |
| Material         | Thorwell Standard PLA Plus PLA Plus White |
| Manufacturer     | Thorwell                                  |
| Product line     | Standard                                  |
| Base material    | PLA                                       |
| Category         | Standard                                  |
| Variant / finish | Plus                                      |
| Reinforcement    | —                                         |
| Color            | White                                     |

## Governed engineering profile

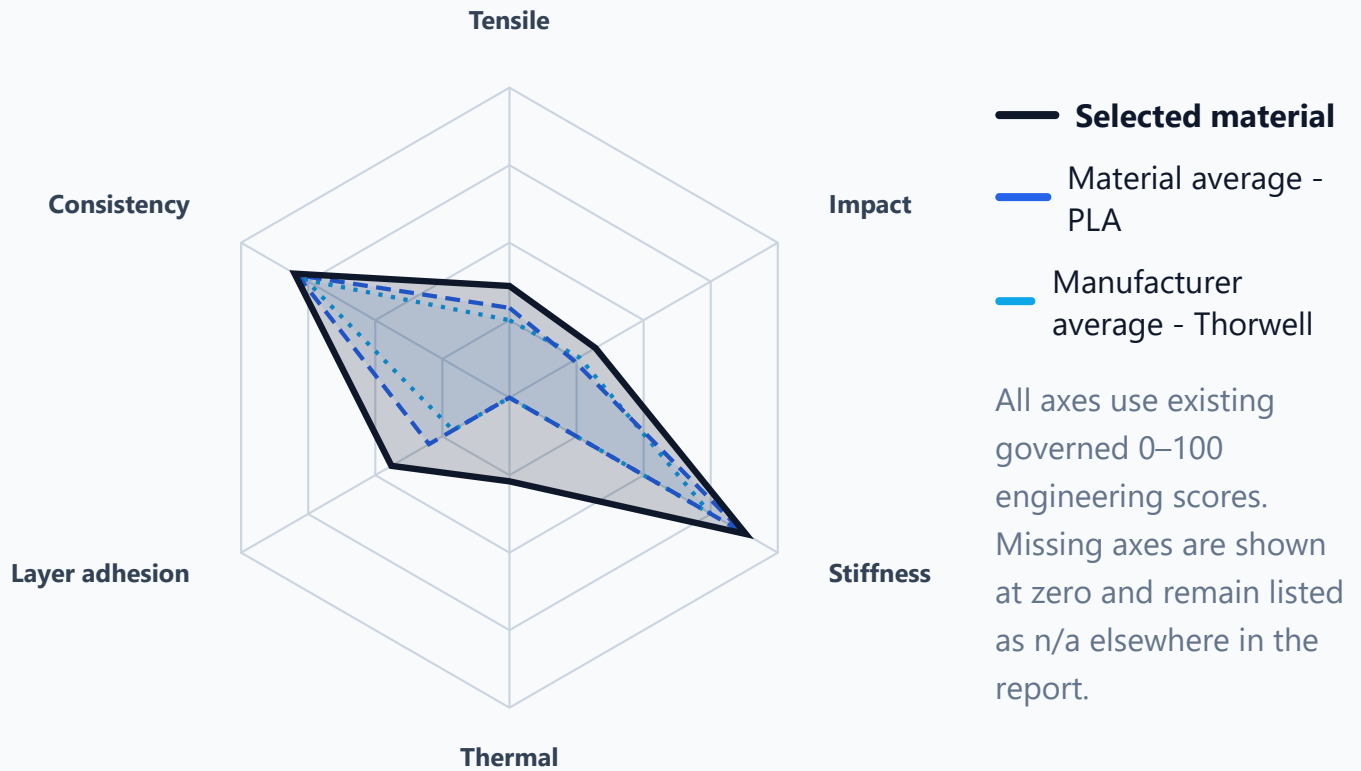
|         |        |
|---------|--------|
| Overall | 56/100 |
| Tensile | 36/100 |

|                     |           |
|---------------------|-----------|
| Impact              | 32/100    |
| Stiffness           | 88/100    |
| Consistency         | 80/100    |
| Layer adhesion      | 44/100    |
| Thermal             | 27/100    |
| Best available axis | stiffness |

## Engineering score profile



## Engineering radar



## Fixture thermal result

**54 °C** · score 27/100 · 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        | 56/100            | 50/100           | 45/100               |
| Tensile        | 36/100            | 29/100           | 25/100               |
| Impact         | 32/100            | 24/100           | 26/100               |
| Stiffness      | 88/100            | 87/100           | 75/100               |
| Consistency    | 80/100            | 79/100           | 76/100               |
| Layer adhesion | 44/100            | 30/100           | 21/100               |
| Thermal        | 27/100            | —                | —                    |

# 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      | 17.55 MPa                 | 4.206 MPa                | 24%   | 10      | 10/10      |
| Tensile flat         | 39.802 MPa                | 7.861 MPa                | 19.8% | 9       | 9/10       |
| Impact upright       | 174.221 kJ/m <sup>2</sup> | 37.934 kJ/m <sup>2</sup> | 21.8% | 10      | 10/10      |
| Impact flat          | 462.226 kJ/m <sup>2</sup> | 67.151 kJ/m <sup>2</sup> | 14.5% | 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:** Thorwell Standard PLA Plus PLA Plus White has a balanced mid-range engineering profile. It is above its material-family average by 5,7 points and above its manufacturer average by 11,3 points. Its strongest measured axis is Stiffness, while the weakest axis is Impact.

**Data-driven review:** Thorwell Standard PLA Plus PLA Plus White is best understood as a balanced material for general functional prototypes. Compared with the current verified dataset, it ranks better than 89% overall, is above the material-family average by 5,7 points, and is above the manufacturer average by 11,3 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 89%**  
27 / 234

### Strengths

- Layer adhesion: 44/100. Z-axis bonding is better than the material-family context.
- Consistency: 80/100. Repeatability is one of the stronger signals in this material profile.
- Impact: 32/100. Impact behavior is competitive against the material-family context.
- Tensile: 36/100. Tensile behavior is competitive against the material-family context.

### Limitations

- Tensile: 36/100. Avoid using this as the primary choice for tensile-loaded parts.
- Impact: 32/100. 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
- Repeatabe print jobs and production-style batches
- Cosmetic parts, concept models or low-load prototypes
- Avoid high impact components

## Metric rankings and percentiles

| Metric         | Score  | Rank      | Percentile      |
|----------------|--------|-----------|-----------------|
| Overall        | 56/100 | 27 / 234  | Better than 89% |
| Tensile        | 36/100 | 36 / 226  | Better than 85% |
| Impact         | 32/100 | 57 / 226  | Better than 75% |
| Stiffness      | 88/100 | 83 / 223  | Better than 63% |
| Consistency    | 80/100 | 88 / 231  | Better than 62% |
| Layer adhesion | 44/100 | 37 / 226  | Better than 84% |
| Thermal        | 27/100 | 119 / 209 | Better than 44% |

## Decision guidance

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