Janne-Constantin Albrecht, M.Sc., M.Sc.

Ceresana FoB:Plast 2026, 25th of June

Expandable Polylactide – EPLA, a Sustainable Drop-In Solution for the Replacement of EPS

What is EPLA?

Expandable polylactide, a sustainable bead foam

biobased, thermoplastic, circular

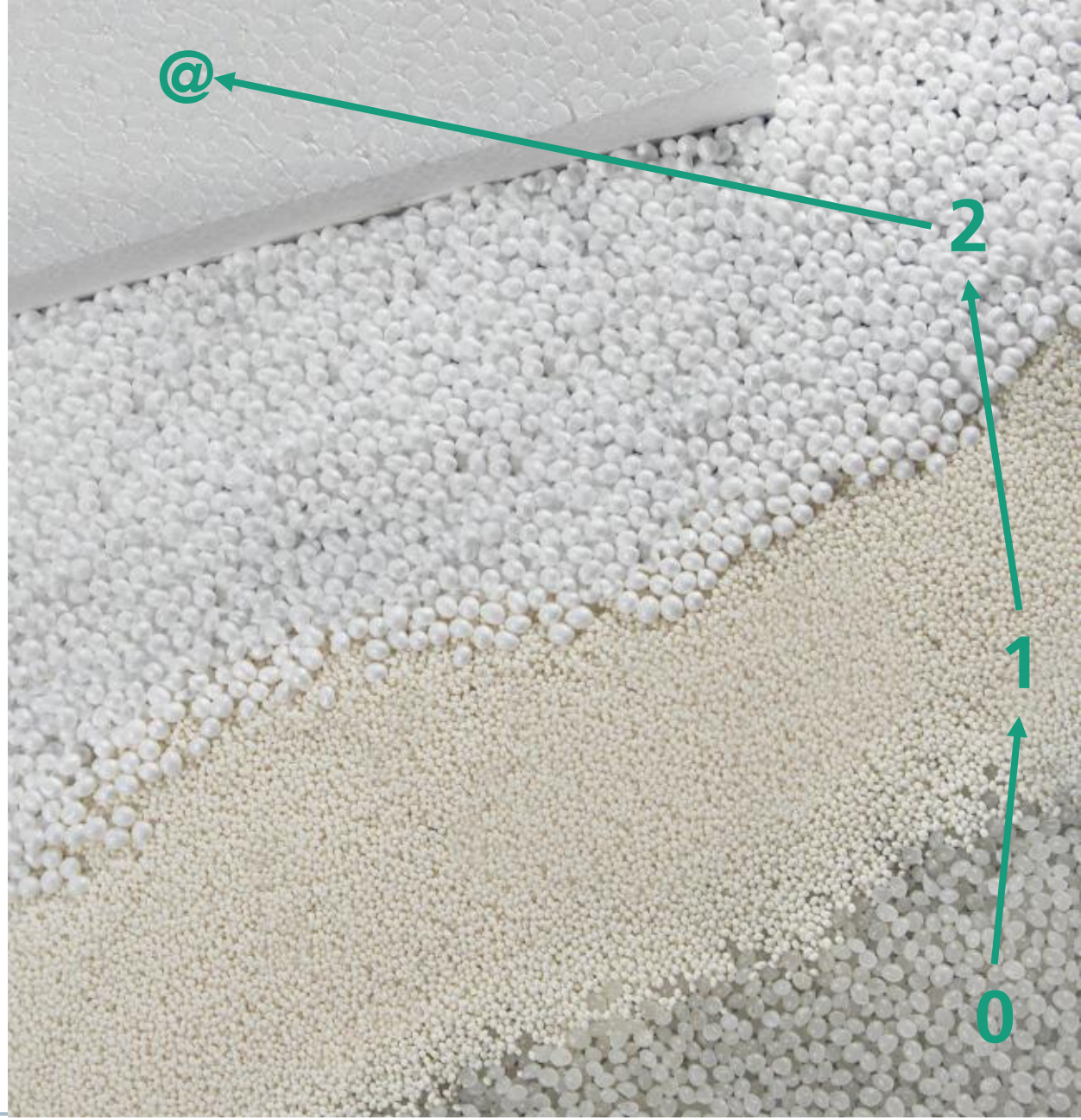
- EPLA (expandable polylactide) is a biobased drop-in solution for the substitution of EPS: comparable mechanical properties, same machinery and tooling like EPS
- EPLA can be used in density ranges from 30 kg/m³ up to 150 kg/m³
- With pre-treatment also between 20-30 kg/m³
- Recyclable both mechanically and chemically
- Industrially compostable

EPLA Bead Foams

Patented Technology developed by Fraunhofer ICT

- **Step 1**: the PLA pellets are **loaded with a blowing agent** in an extrusion process with underwater pelletising (0→1)
- **Step 2**: the gas-loaded granules **are pre-foamed to the desired density** (spectrum: 25-100 kg/m³; 1→2)
- **Step @** the pre-foamed beads are moulded to **@D shaped parts** in the steam chest moulding process (2→3)

→ Zero CAPEX, all on EPS equipment



Fraunhofer ICT

Birth of EPLA: BioFLIP

Bio Foam Light Pallet

T oal: Development of a lightweight and sustainable pallet made from EPLA for use in transportation and storage logistics.

Advantages: Reusable, easy to clean, contributes to reduced transport costs and improved ecological footprint.

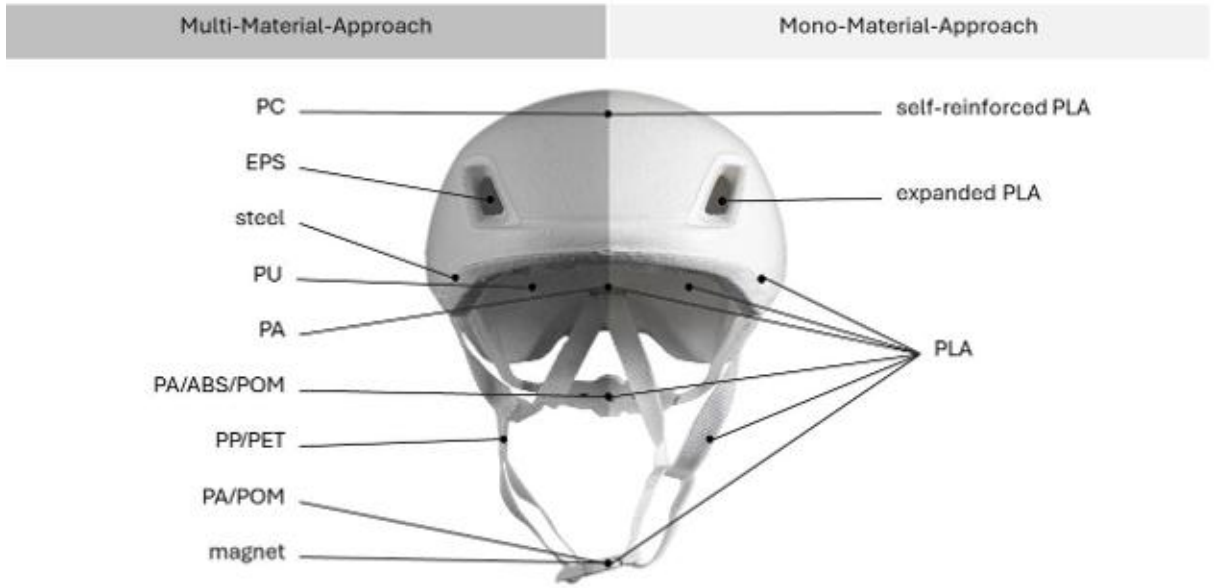
→ biobased
→ recyclable (monomaterial)

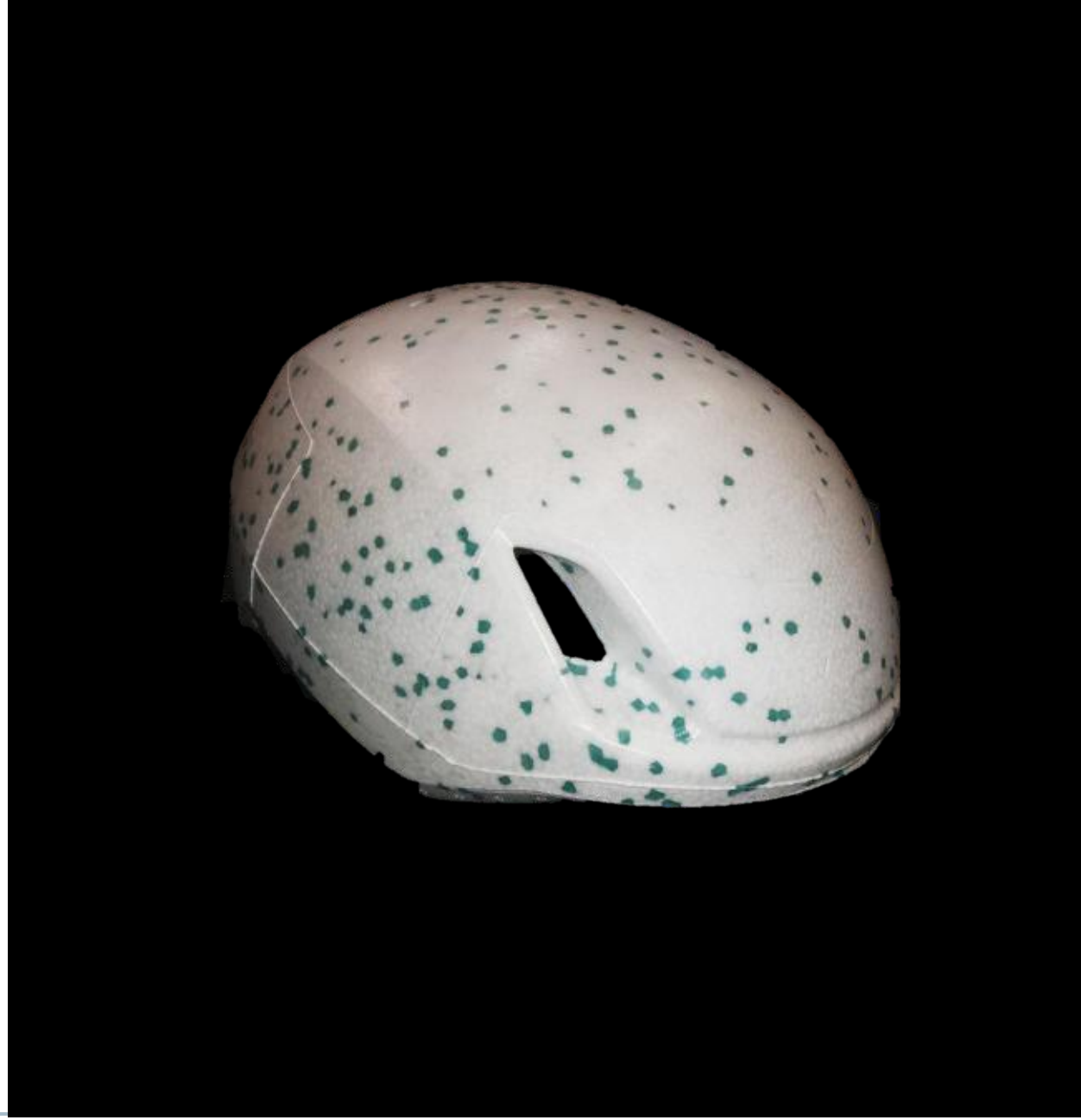
→ Showcase the drop-in solution (pre-foaming, EPS tools)

KLAUS KUNSTSTOFFTECHNIK
Erlenbach Maschinen
TecPart Verband Technische Kunststoff-Produkte e.V.
WSVK
DHBW Duale Hochschule Baden-Württemberg

PLA versatility

Multi-morphology approach

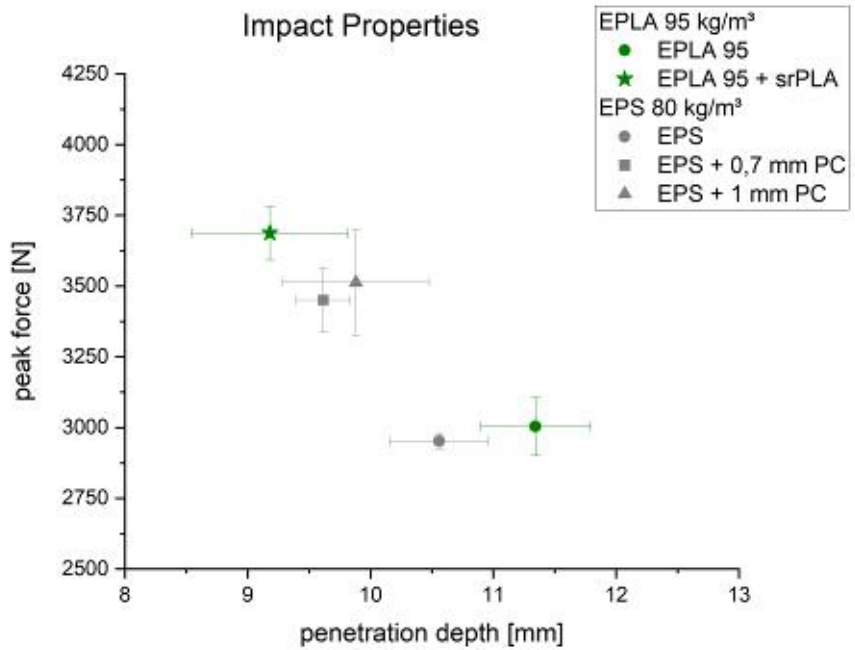


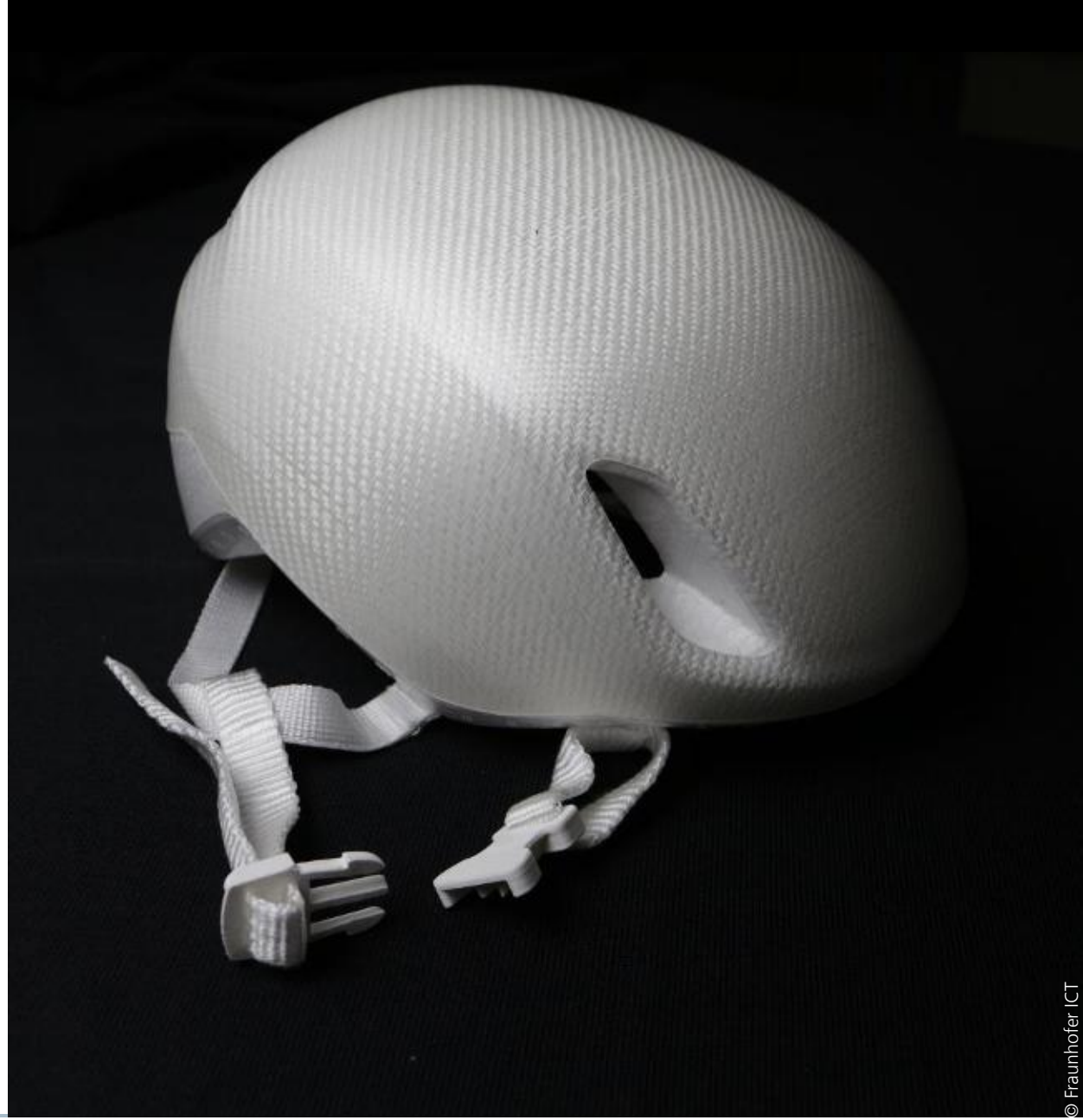


Complex Combination of Morphologies

Impact protection

- comparable impact properties between the PLA-helmet and conventional helmets





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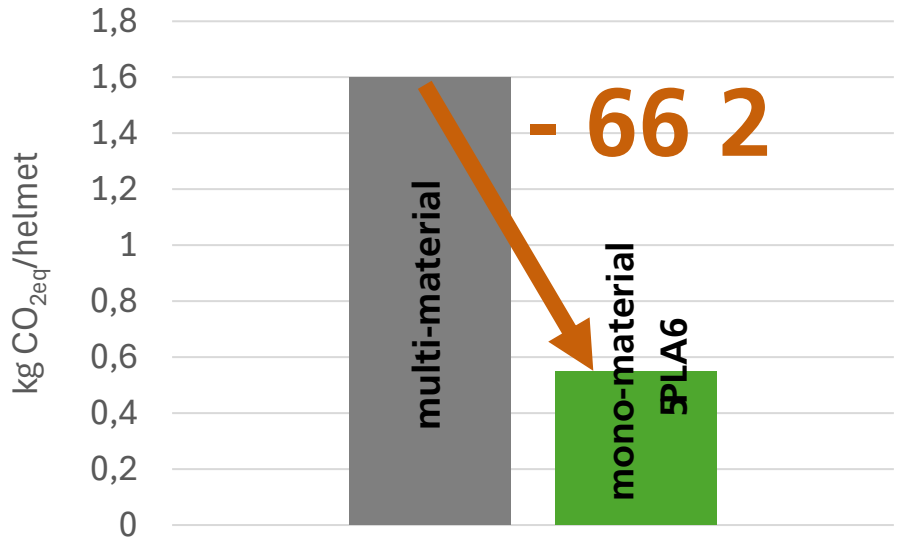
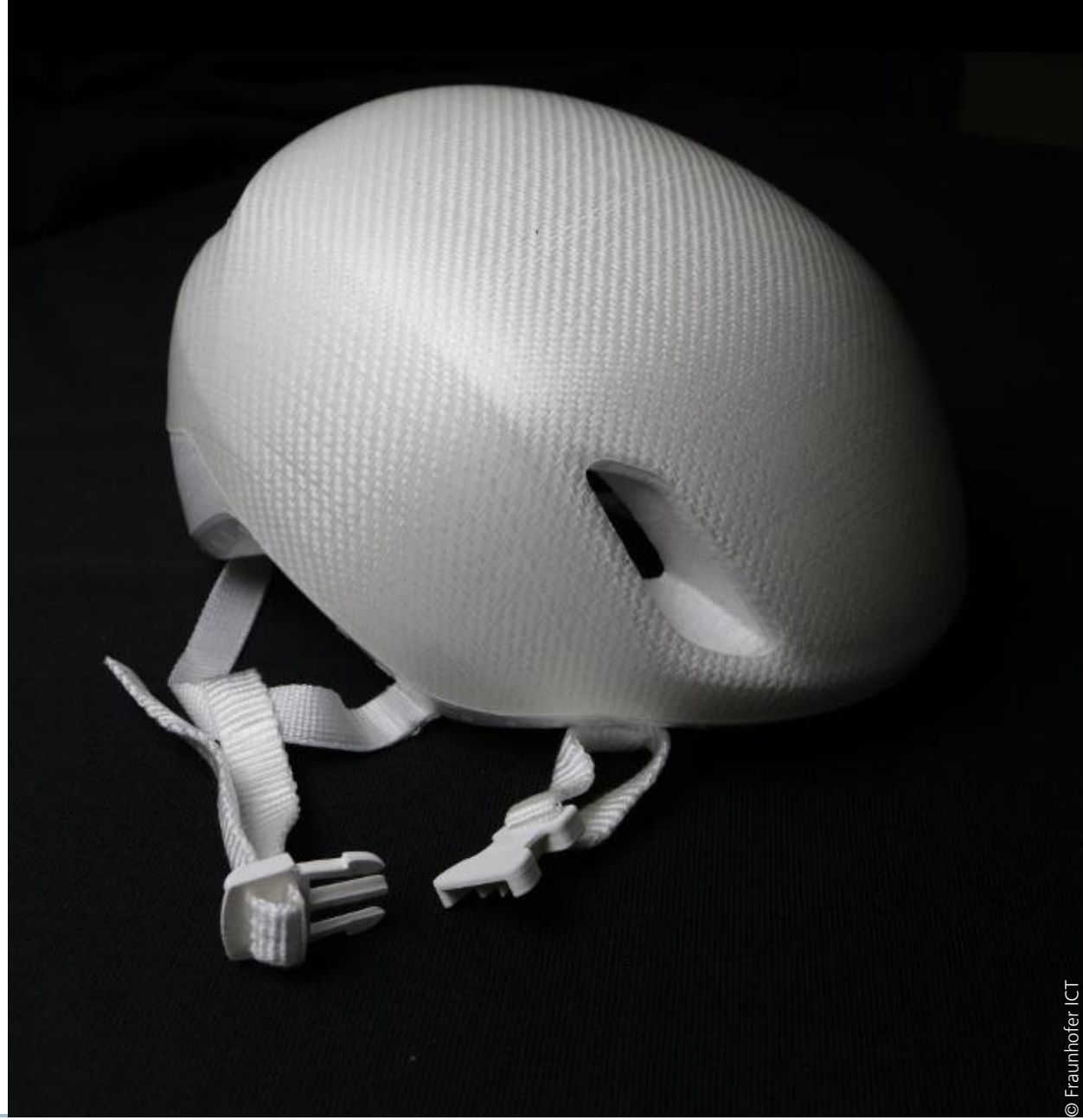
Complex Combination of Morphologies

Environmental benefit

- significant reduction due to mono-material approach through plant-based raw materials and recycling





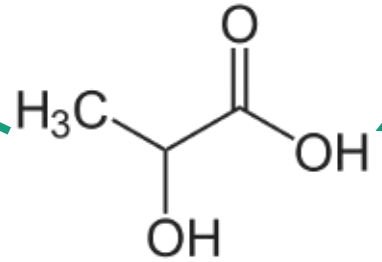
Chemical Recyclability Check

Futerro Loopla Technology

PLA Product at EoL

Waste Collection and Sorting

LOOPLA[a] Chem. Recycling



Starting over with lactic acid enables virgin-like product performance!

Date: April 2026

futerro

LOOPLA® VALIDATION

PLA monomaterial helmet

Fraunhofer-Institut für Chemische Technologie ICT

OBJECTIVES

- Validate LOOPLA® process applicability to Fraunhofer-Institut für Chemische Technologie ICT material.
- Steps followed during the experiment:
  - Pre-treatment
  - Solubilization & Filtration
  - Depolymerization
  - Purification
  - Qualification

CONCLUSION

Futerro S.A. confirms that the product "PLA monomaterial helmet" sent by Fraunhofer-Institut für Chemische Technologie ICT is recyclable through the chemical recycling technology LOOPLA®.

APPROVED

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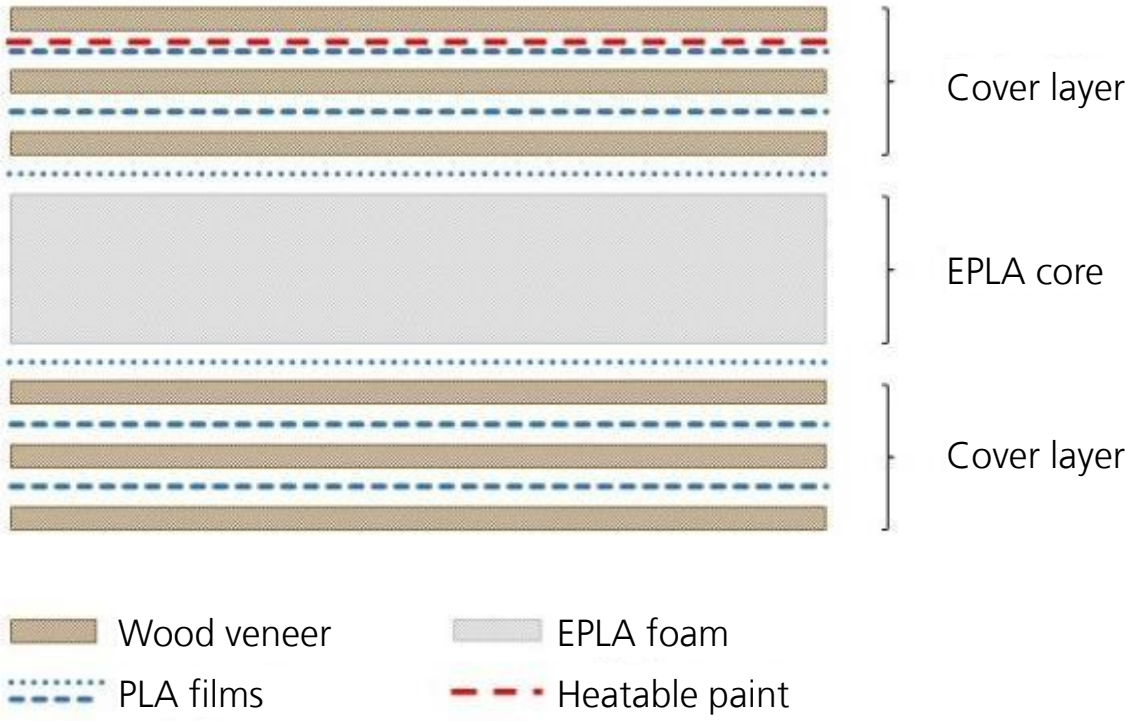
  Offen

Fraunhofer ICT

Leihmmi – complex technical parts made from PLA composites

Leichte und heizbare Materialien für den Möbel- und Innenausbau



Toal: Development of a PLA- and wood-based sandwich construction with integrated functionalities

Advantages: sandwich for interior fittings in vehicles and buildings, integration of heating and lighting functions directly into the material, creating added value in interior design that combines functionality and sustainability.

→ Reduce material diversity and rely on biomaterials

→ Technical integration of 5E6PLA

→ Complex product development

EPLA – where do we go from here?
Outlook

EPLA packaging grade

→ **Packaging J A1 2 of world EPS market**
(source: Ceresana EPS report 2023)

High expansion ratios → minimal material usage

Small bead size → filling detailed cavities perfectly

Cycle time optimisation ongoing → machine efficiency

Ideally in the future: home compostable formulation

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EPLA thermal performance grade

→ **insulation J 5@2 of world EPS market**
(source: Ceresana EPS report 2023)

Optimisation for low thermal conductivity, e.g. through IR absorbers

High thermal and dimensional stability → high temperatures in the summer

Stabilised against ageing and hydrolysis → lifetime of at least 30 years must be guaranteed

Nexofoam – EPLA Commercialization

EPLA pilot lots

- Small lot sizes for testing and pilot productions – 20 kg to 2 t
- Gas-loaded or pre-foamed

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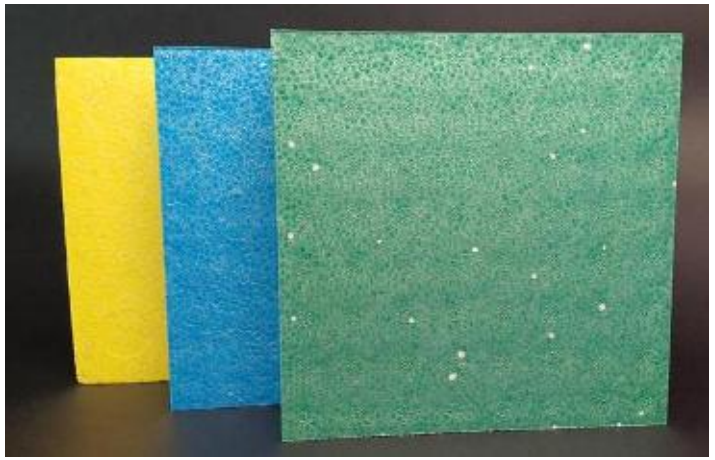
Tailored material grades

- Application oriented recipe formulation to fit your requirements
- Including heat stability, particle size, BA content, colour, etc.



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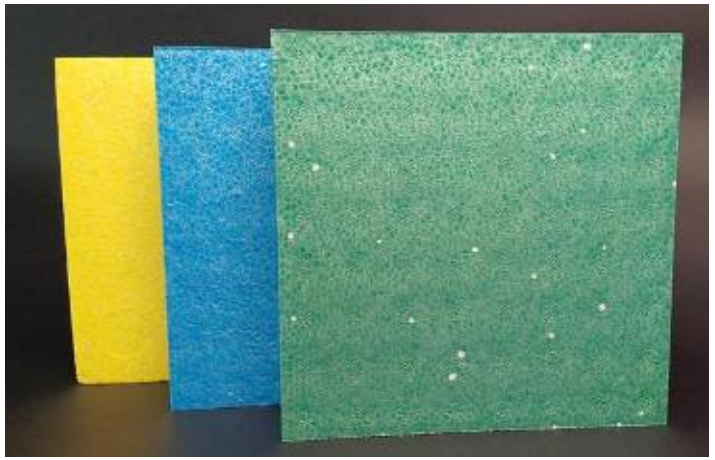

Implementation support

- Accompanied trials for implementation success and on-side trouble shooting

Contact

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