VITAL Fact Sheet: Durable Poly Lactic Acid (PLA)

The Challenge

While the use of biobased thermoplastics (b-bTP) in biodegradable packaging applications is now well-established, their adoption in more durable applications has been slower due to challenges such as:

- Limited large-scale **availability**;
- Higher **cost**;
- **Processing** difficulties;
- **Performance** limitations in some areas.

Despite these challenges, use of b-bTP has clear benefits for reduction of environmental footprint of products, and manufacturing processes. Furthermore, the anticipated **near-term increase in global production capacity** is expected to mitigate current limitations related to supply and cost.

Within this context, the VITAL project addressed the outstanding challenges associated with material performance and processing. We focused on the development of **lightweight, thermoplastic products**, where foaming is used to reduce raw material consumption. Thermoplastics are also much easier to recycle compared to conventional foamed materials such as thermosets.

Project at a Glance:

Project Name:	**VITAL**
Type:	Research & Innovation Action
Funding:	Horizon Europe CL4 "Twin Transition"
Timeline:	June 2022-Nov 2025
Technology:	Biobased Thermoplastic Foams
Industry Sectors:	Automotive, White Goods, Marine Leisure
No of Partners:	14

The Polylactic Acid Solution

- **Durable biobased thermoplastic blends based on polylactic acid (PLA)** were developed. These blends have the performance and long term durability needed to replace plastics in demanding applications.
- Biobased polymer (PLA) pellets are blended with modifiers such as mineral fillers and other additives which increase their **resistance to impact, burning and degradation**.
- The blends have been optimised to work in **novel manufacturing processes** such as foam injection moulding (FIM) and large scale 3D foam printing to produce lightweight and high performance parts.

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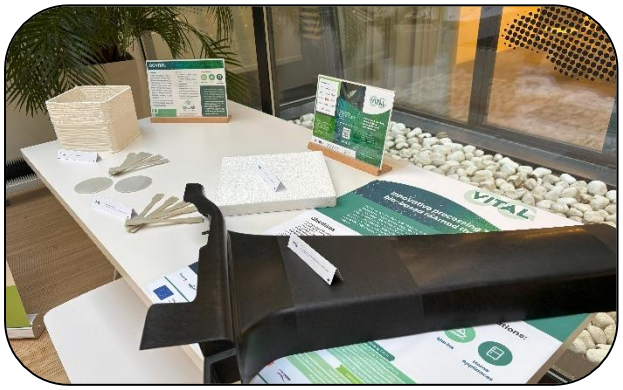
Innovate UK

Key Achievements

- The b-bTP blends have been shown to meet the specifications required to replace existing products such as refrigerator interiors and automotive interior components.
- Commercial scale FIM and 3D printing trials have been successfully completed.
- A **weight reduction of around 10% was achieved in FIM** through the use of compatible foaming agent masterbatches.
- Blends have progressed from TRL 4-5 (validated at lab scale) to TRL 8-9 (commercial readiness) through the project.



Benefits & Impacts

Automotive	Marine Leisure	Home Appliance
Lighter parts **improve fuel efficiency and reduce emissions**	**One-off designs** in recyclable materials	**Recyclable, components** with reduced material use

- The b-bTP blends can also be used in any other application areas where safety and durability are required.
- The **material and carbon footprint reductions** achieved will lead to significant reductions in greenhouse gas emissions related to materials and manufacturing.

Next Steps

Building on the successes of the VITAL project, the high-performance biobased blends have been fully validated in real-world applications, demonstrating their technical performance, durability, and environmental benefits. These case studies can support brands and manufacturers in exploring sustainable alternatives, helping to stimulate the wider adoption of biobased plastics and advance the transition toward a circular, low-carbon economy.

Contact Us

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