

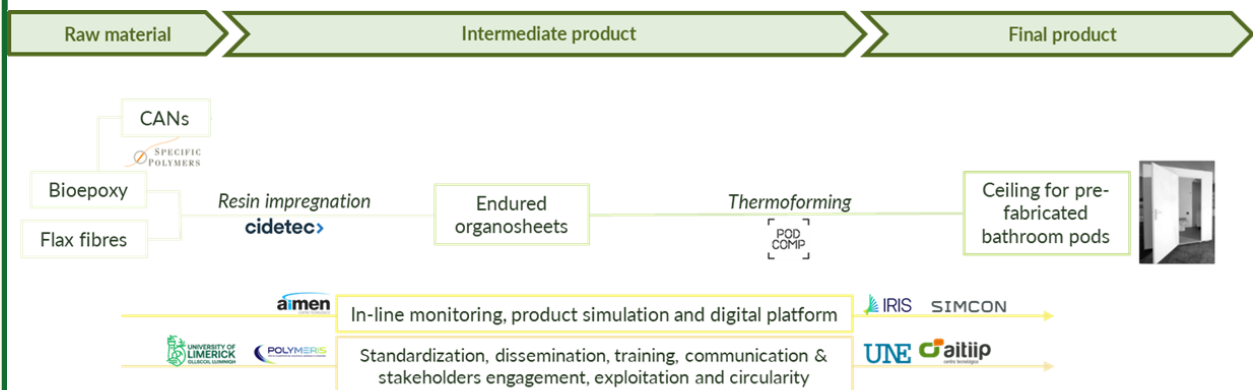


BIO-UPTAKE

For this third newsletter, after having presented you one of our demo cases, we would like to focus on the second one: the Sandwich Panels for the Ceiling for pre-fabricated bathroom pods.

Currently: The current manufacturing process used is vacuum infusion with conventional Epoxy resin and Glass Fibre (fully Oil-based) plus a balsa core (in a sandwich structure). Handmade & slow Process, Not Recyclable. Large scrap (needs of refrigeration/freezer for resin storage).

What we aim: Semi-automated process to produce endured pre-impregnated organosheets and thermoforming of the sandwich structure with the balsa core. Flax fabric pre-impregnated with Biobased 3RCANs- Epoxy + wood core with bonding-debonding reversible adhesive 30% faster process. Reprocesable and Recyclable. Storable at room temperature → No scraps (no value lost in the VC).



If you have any questions, don't hesitate to ask us!

www.bio-uptake-project.eu

OUR PREVIOUS EVENT

After a few months ahead in the project, we already attempted several events where we could present/talk about BIO-UPTAKE:

Green Chemistry and Sustainable Engineering

Anne Beaucamp from the University of Limerick gave a plenary talk titled "Valorisation of Lignin towards high performance materials, challenges and applications" at the 6th International conference in Lisbon last July

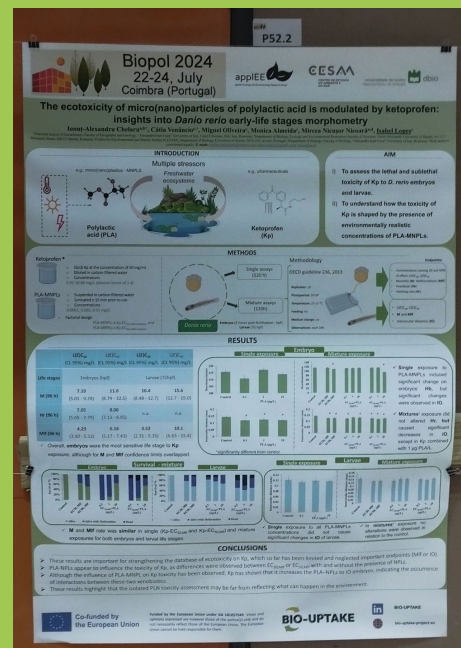
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9th International Conference on Bio-based and Biodegradable Polymers

We were at the University of Coimbra for the 9th International Conference on Bio-based and Biodegradable Polymers. Our partner from CESAM - Centre for Environmental and Marine Studies presented 2 posters about BIO-UPTAKE and studies on bio-polymers.

[Read more](#)



GEP24:

Both Jean Rougé and Clothilde Techoueyres from the University of Limerick gave a talk at the #GEP24 Royal Spanish Chemistry and Physics Society in Madrid.

[Read more](#)



S3 Congress:

We were in Italy at the beginning of October to present the Bio-Uptake project during the S3 congress.

[Read more](#)



R4 COMPOSITES:

We were present at the R4 Composites in Toulouse last month to exchange with key players in the composites industry, from researchers and engineers to industry leaders focused on innovation, sustainability, and the future of composite materials.

[Read more](#)



NEWS

We have made progress in our second and third work package about respectively Optimization and manufacturing of intermediate bio-composite formats and Optimization of the manufacturing processes for final bio-composite products. Please see below the news that can be shared with you:

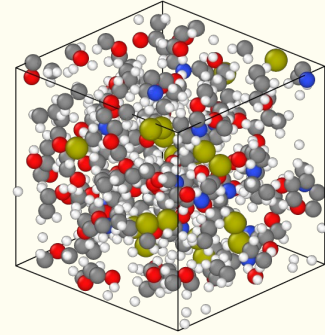
Fabrication of 3R-CAN resins

During the last period, efforts were put on the development of a reversible adhesive based on Diels-Alder chemistry. An adhesive formulation composed of a furan-modified biobased epoxy resin and a bis-maleimide hardener was developed. The adhesion strength of the formulation was evaluated on aluminum substrate with a pull-off test equipment, allowing to prove the thermo-reversibility of the adhesion with a debonding occurring at $\sim 110^{\circ}\text{C}$. Now the proof-of-concept has been validated, next step will be to optimize the formulation to match user cases specifications.



Simulations

A step towards reactive simulations was made during this last period of the project. The objective is to be able to replicate the dynamic behaviour of the vitrimers that were not modeled so far. Using REACTER on LAMMPS, time was spent on understanding the complexity of the inputs required. Indeed, as reactivity is added, each possible reaction needs to be planned ahead as the type and partial charges of the atoms are changed. The next few months will be about using this new methodology to understand how molecular dynamics can play its part when researching vitrimers.



Compounding of fibre reinforced bio-pellets

During the last period, efforts were focused on the deep characterisation of the different composite formulations. The next step is to decide the final formulations to be scaled up, based on the different characterisations made in the last steps.



Development of formulations for manufacturing bio-based preregs

1. Flame retardancy tests performed --> BUP-8 selected as the formulation based on the commercially available part A and BUP-14 selected as the bio-based formulation with SP's epoxy (DGEVA) as the part A.
2. First 10 m of bio-based prepreg were prepared using UD flax fibre and the bio-based BUP-14 formulation.
3. Additionally, new prepreg rolls were prepared with UD and BX flax fibre and BUP-8 formulation.



Over-injection of tertiary packaging

The initial overinjection trials have been successfully completed. In the coming weeks, we will be overinjecting the ribs with biopellets reinforced with recycled carbon fiber and adding CANs (an experimental reversible adhesive).



If you are interested in the solutions we have developed or would like to know more, please don't hesitate to contact us!

NEXT EVENTS

You want to meet us in person, so don't hesitate to come to these events and follow our social media to see where we will be located!

- **JEC 2025:** 04/03/2025 - 06/03/2025, Paris (France)

MORE INFORMATION ON BIO-UPTAKE

If you want to know more about us, visit our linkedin page to see the presentation of the different partners. You will discover the majority of the members involved in the project and their role with videos and images!

Stay connected with us and we will resume our content with another newsletter around mid-2025.

[Register to our newsletter](#)



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