In a Nutshell

VIBES presents an innovative solution to resolve the end-of-life issues of thermoset composite materials, based on the development of a new green technology, focused on the controlled separation and recovery of composite material components, by means of developing customised biobased bonding materials (BBM).

Products and services

- 100% Biobased Bonding Materials, specific for epoxy, polyester and vinyl resins.
- New 100% biobased resins (epoxy, polyester, vinyl) and fibres.
- Thermoset Composites with intrinsic recycling properties.
- New recycling technology for thermoset composites based on green pre-treatments.
- Valorised resins (monomers / oligomers) and fibres, recovered from recycling treatment.
- Training course for industrial professionals on the circular economy for thermoset composites.
- Summer master classes for students on green composites.

Identity

Project title:

Improving recyclability of thermoset composite materials through a greener recycling technology, based on reversible biobased bonding materials.

Grant Agreement No: 101023190

Start: 1 June 2021 Duration: 48 months

BBI-JU contribution: € 5,230,049.63

Find out more

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Youtube: https://www.youtube.com/channel/UCauYtwBy8V47hLdnpzROZ8Q

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Project partners



FUNDACION AITIIP

Research & Technology Organisation

https://www.aitiip.com/ Spain



SPECIFIC POLYMERS
Industrial Developer

https://specificpolymers.com/

France



ACONDICIONAMIENTO TARRASENSE ASSOCIACION

Research & Technology Organisation

https://www.leitat.org/

Spain



UNIVERSITY OF LIMERICK - Bernal Institute

Academic Institution

https://bernalinstitute.com/ Ireland



DEUTSCHE INSTITUTE FUR TEXTIL UND FASERFORSCHUNG DENKENDORF

Pasearch & Technology Organisation

Research & Technology Organisation https://www.ditf.de/en/ - Germany



WEVERIJ FLIPTS EN DOBBELS NV

Industrial Developer https://flaxco.be/ Belgium



BCIRCULAR COMPOSITES SOCIEDAD LIMITADA

Industrial Developer

https://www.bcircular.com/

Spain



CONSORCIO AERODROMO AEROPUERTO DE TERUEL

Industrial Use

http://www.aeropuertodeteruel.com/en/ Spain



BUSINESS AS UNUSUAL

ACCIONA CONSTRUCCION SA

Industrial User

https://www.acciona.com/ Spain



INGENIERIA Y DESARROLLOS EN COMPOSITE S.L.

Industrial Developer http://www.idec.aero/ Spain



JUNO COMPOSITES LTD

Industrial Developer

https://junocomposites.com/ Ireland



LABORATORI ARCHA SRL

Technology Consultant http://www.archa.it/



Q-PLAN INTERNATIONAL ADVISORS PC

Innovation Management Consultant https://qplan-intl.gr/ Greece







This project has received funding from the Bio-Based Industries Joint Undertaking under the European Union's Horizon 2020 Research and Innovation Programme, under Grant Agreement N° 101023190.



Aim

Develop and demonstrate an innovative, greener, cost-efficient, and non-toxic recycling technology solution that resolves the end-of-life issues of thermoset composite materials, with the aim of decreasing the amount of non-biodegradable polymers sent to disposal or discharged to the environment by at least 40%.

Project Goals

- Design and develop at least three 100% biobased bonding materials (BBM) for thermoset composites with tailored debonding functionalities.
- Design and develop at least three 100% biobased thermoset composite materials.
- Validate the thermoset composite materials with intrinsic recycling properties for optimum performance / cost ratio, in three high-demand industrial sectors: aeronautical, construction and naval industries.
- Design and implement a green recycling technology at pilot semi-industrial environment to separate and valorise the composite components as new feedstocks for the development of new products.
- Assess the life cycle impact of the developed products from environmental, social and economic point of view.
- Develop an exploitation & IPR strategy for Key Exploitable Results.
- Develop a Business Plan to demonstrate the commercial potential of the developed solution and describe how this potential will be realised.
- Inform, promote, communicate and disseminate the project objectives, activities and results; engage stakeholders to create synergies.
- Provide new knowledge and skills to industry, students and open society.

Stakeholders

The VIBES project covers the whole composites value chain by taking into account, apart from the consortium partners, the Stakeholders Board and interaction with other projects of Biobased Industries through communication and dissemination activities:

- Industrial developers: thermoset composite developers, composite recyclers.
- Industrial converters, dismantlers & end-users: aeronautical, naval, construction and energy industries; waste management; logistics and transport.
- Technology & innovation experts: academic / researchers; technology and innovation consultants.
- Impact multipliers: policy makers; media / journalists or bloggers.

Project Phases



Exploring combinations and synergies Biobased fibres and surface treatments Technical validation tests Handling toxicity and safety evaluation Aligning with Green Deal and climate neutral strategy Testing debonding treatments Testing debonding design Involvement of supply chain & EPR considerations Upscaling best composite components Valorisation of recovered fractions Pilot recycling plant Exploitation & IPR management	Phase 1: Biobased Bonding Materials (BBM)	Phase 2: Biobased Thermoset Composite Components	Phase 3: Inherent Recyclable Thermoset Composites	Phase 4: Recycling Technology Development	Phase 5: Sustainability and Commercial Exploitation
composite applications treatments design chain & EPR considerations Upscaling best composite components Valorisation of recovered fractions Upcycling into high design chain & EPR considerations Exploitation & IPR management Upcycling into high Building a business case	approaches Exploring combinations and synergies	resins —— Biobased fibres and surface treatments ——	Technical validation tests	to recycling Handling toxicity and safety evaluation	economical assessment —— Aligning with Green Deal and climate neutral strategy ——
	Upscaling best BBM	composite applications —— Upscaling best	treatments Valorisation of recovered fractions Upcycling into high	design	chain & EPR considerations Exploitation & IPR

Communication, Dissemination and Training Communication, dissemination and training plan.

Communication campaign and dissemination actions.

Stakeholders' engagement, creating synergies.

Providing knowledge and skills to industry, students and open society.

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Benefits

- Improved properties of thermoset composite materials and recycling technology, leading to reduced environmental impact, combined with higher cost-effectiveness and increased profitability.
- Reduced use of primary materials and landfilling.
- Use of thermoset composite materials in industrial sectors without restrictions or environmental concerns.
- New knowledge for the European Industry on the circular economy for thermoset composite materials.

- New knowledge and skills for European students in material science, engineering and chemical fields, for new arising demand in technical jobs.
- Increased jobs and turnover by promoting two new industrial sector interconnections in the newly created "Intrinsic Recyclable Thermoset Composites Value Chain":
 - Interconnection between waste management and biotechnology sectors.
- Interconnection between thermoset composites and biotechnology sectors.