



AIMPLAS

Excellence in Plastics

SUSTAINABLE COMPOSITES FOR CONSTRUCTION: A REVIEW

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What is AIMPLAS?

A **technology centre** with more than 30 years' experience in the plastic sector.



More than **12,000 m²**
of cutting-edge
facilities

Pilot plants (6,500 m²)

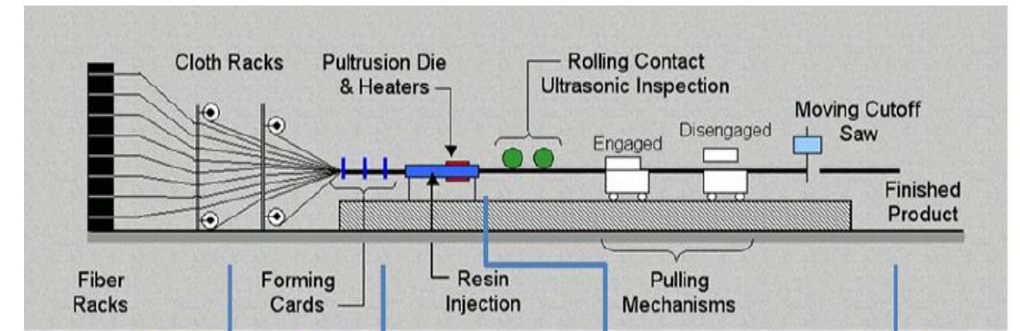
Laboratories (4,500 m²)

- Directive 2012/27 / EU (energy efficiency): the construction sector, buildings, are responsible for 40% of final energy consumption in the European Union, and approximately 30% of emissions into the atmosphere.
- Green / sustainable construction:
 - Minimize the waste of materials by design.
 - Proper selection of quantity and quality of materials.
 - Application of sustainable materials:
 - Bio-based composites materials.
 - Incorporating waste materials.
 - Recycling the building materials.

Reference: C. Galan. Materials 2016, 9, 465.

Bio-based composites - ECOXY

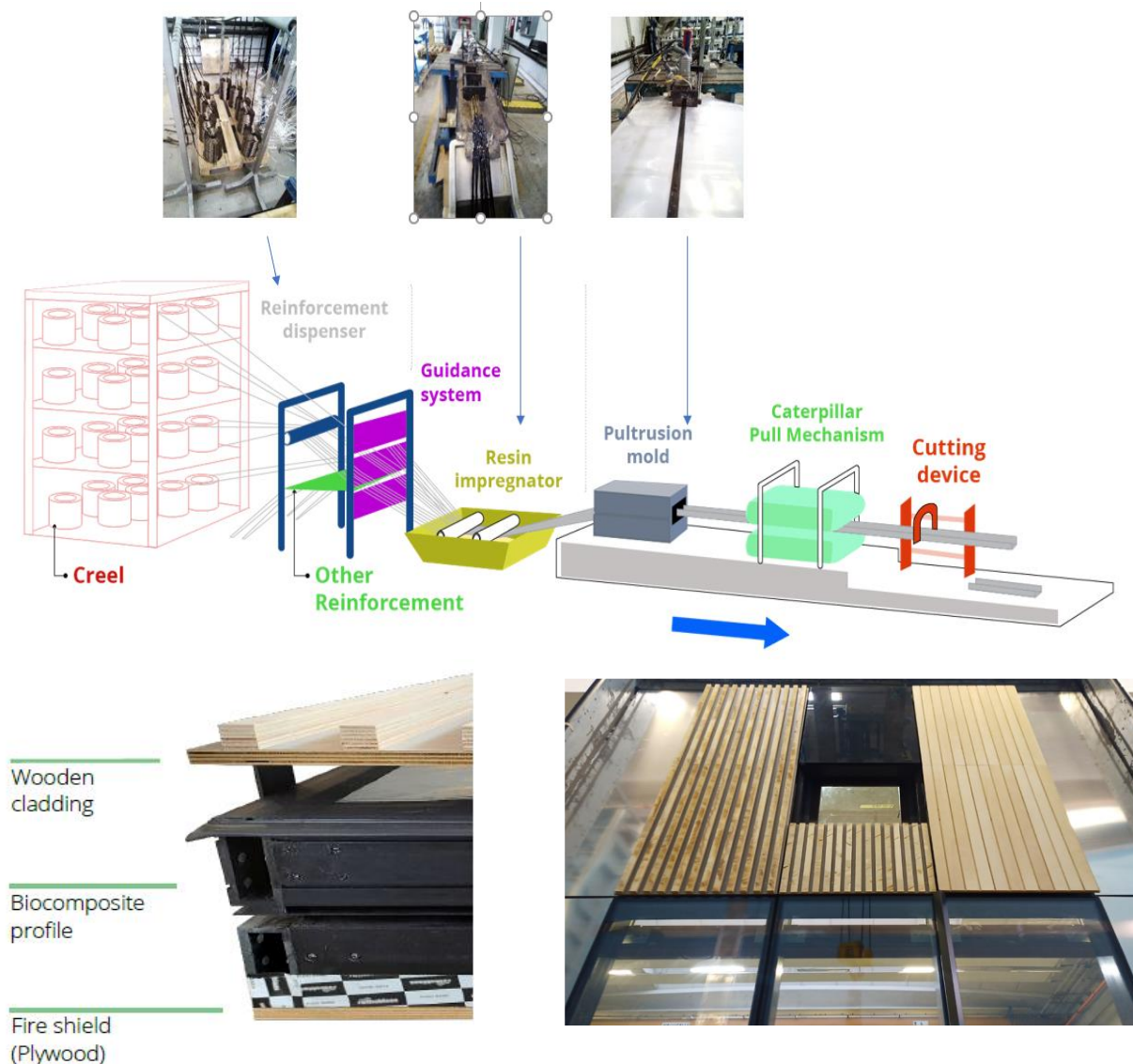
- A bio composite is a material composed of two or more distinct constituent materials, at least one being naturally derived.
 - Reinforcement: plant fibres such as cotton, flax, hemp, kenaf, jute, and sisal.
 - Matrices: polymers derived from vegetable oils or starches.
- ECOXY: Bio-based, recyclable, reshapable & repairable (3R) fiber reinforced thermoset composites.
 - A window profile has been designed, developed, and obtained by pultrusion process, using flax fibres and bio-based epoxy resin.



Reference: ECOXY - BBI JU - European Union.

Composites from agro-waste - BASAJAUN

- Reuse of such wastes as a sustainable construction material is a viable solution to solve some problems:
 - Pollution.
 - Land-filling.
 - High cost of building materials.
- BASAJAUN: Sustainable wood construction for rural development and urban transformation.
 - A biocomposite curtain wall for a façade system has been designed, developed and obtained by pultrusion process, using basalt fibres, bio-based polyester resin and agro-waste materials.



Reference: BASAJAUN - Horizon 2020 - European Union.

- Deconstruction is the process of dismantling a building to salvage its materials for recycle or reuse.
- ECOGLUE: Removable eco-adhesives for use in footwear, construction and transportation.
 - A removable or reversible bio-based adhesive has been developed for the construction sector.



Reference: ECOGLUE – ERFD funds – Valencian Community.

Conclusions

- There are eco-friendly building materials available.
- Development of new technologies means that bio-based composites coming from natural resources or from waste materials are becoming easier and easier to produce, at a higher quality with an affordable cost.
- Disassembly and recyclability are being assessed from the beginning, selecting building materials which can be reused or recycled at their end of life.

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