NewWave

SUSTAINABLE BIOPRODUCTS FOR THE CONSTRUCTION INDUSTRY

The objective of NewWave is to transform existing fossil-based manufacturing lines into new bio-based ones. The new products must exhibit similar, or better, mechanical, physical, and chemical properties compared to the existing products, and must be non-toxic and recyclable. The Manufacturing Lines developed in the NewWave project will ensure these qualities.

MANUFACTURING LINE #1

NEW WAYS TO PRODUCE POLYOLS AND POLYURETHANES

To kick start the production of new bioproducts for the construction industry, the first step is to grant a safe and clean supply of raw materials. Biomass residues will be processed in a Pyrolisis plant and subjected to very high temperatures, transforming it into Fast-Pyrolisis-bio-oil (FPBO).

In the first Manufacturing Line, BTG will provide AEP Polymers with polyols derived from the sugar part of the pyrolysis oil separates via Thermo Chemical Fractionation (TCF). At BTG, the polyols are produced by applying bench- or pilot-scale hydro-treaters. The hydrogenation step is performed under elevated temperature and hydrogen pressure and demands a robust catalyst suitable to perform in the complex watery and acetic pyrolytic matrix.

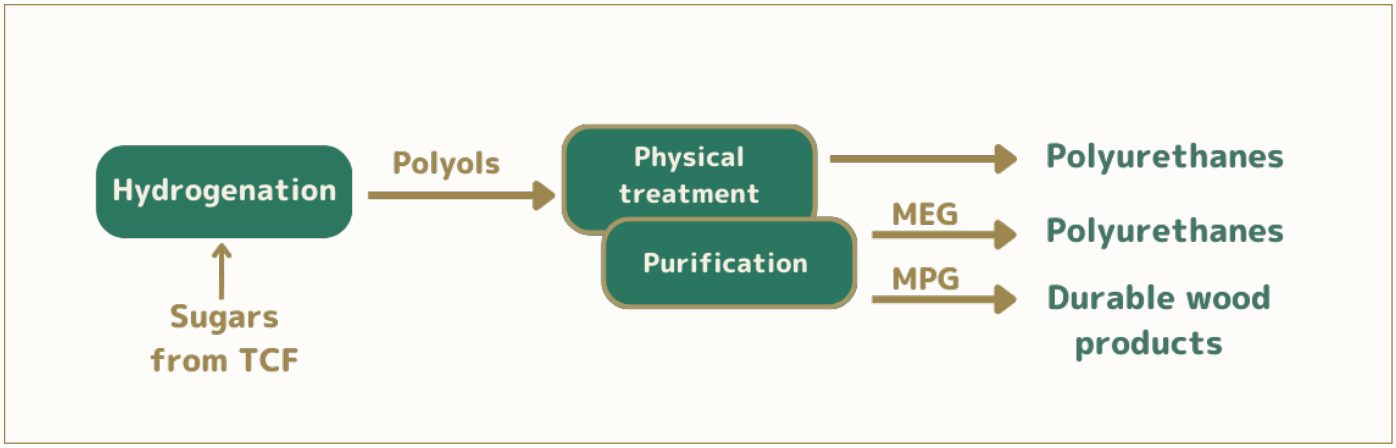
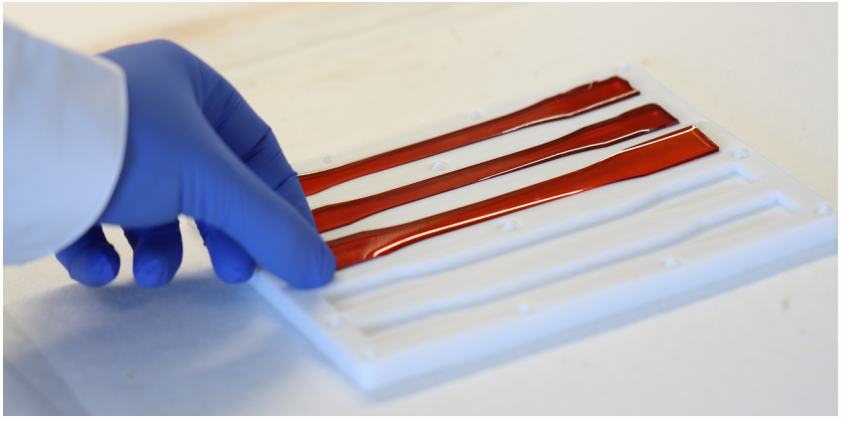


Diagram of manufacturing line #1

Polyol stream

The produced polyol stream after hydrogenation is a complex mixture containing small monomeric polyols such as ethylene glycol (MEG) and propylene glycol (MPG) and larger oligomeric polyol molecules which can be separated and subsequently be used in PUR-based adhesives and foams.



ML1 Specimen (AEP Polymers)

Treatment and further use

After a series of treatments, Polyols will be made suitable for use as **green solvents/homogenizers** or as raw materials for polyurethanes.
Such compounds will be used by AEP in polyurethanes foams and adhesives, combined with the Cross Laminated Timber panels produced by FORESA. These modified wood panels will be tested by INNORENEW in construction applications, in particular for building cladding (see ML #3).

A sample of polyols

Partners involved

AEP Polymers is an Italian SME active in R&D for the development of bio-based building blocks and polymers for industrial application in polyurethane foams and CASE (coating, adhesives, sealant, and elastomers), as well as in composites and thermoplastics. Spanning from organic chemistry to polymer science, AEP supports industrial clients and brings this experience into collaborative projects.

BTG Biomass Technology Group BV (BTG) is a private company of consultants, researchers and engineers specialized in sustainable energy production from biomass, residues and waste. BTG gradually focused its expertise on fast pyrolysis and pyrolysis oil applications. Nowadays significant effort is dedicated to the development of processes for the production of biofuels and bio-based products.

Learn more

Thermo Chemical Fractionation: newwave-horizon.eu

NewWave

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