NewWave

SUSTAINABLE BIOPRODUCTS FOR THE CONSTRICTION INDUSTRY

The objective of NewWave is to transform existing fossil-based manufacturing lines into new bio-based manufacturing lines. The bio-based 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 #2

PRODUCTION OF HYDROXYMETHYLFURFURAL (5-HMF) AND DERIVATIVES

In this NewWave manufacturing line (ML), partners RUG & AVA Biochem will use the pyrolytic sugars (PS) fractionated from the Fast Pyrolisis Oil (FPBO) as a non-food-competitive rawmaterial to produce hydroxymethylfurfural (5-HMF). 5-HMF is a versatile organic component produced from C-6 sugars that can be used as a renewable chemical ingredient in the production of several products such as fuels, solvents, medicines, resins and other materials. AVA Biochem will convert the PS through the innovative CORBIS technology.

This involves converting carbohydrates into particularly 5-HMF, through hydrothermal conversion. Initially optimized for fructose syrup, a demo plant in Switzerland currently produces up to 5 tons per year of 5-HMF. To evaluate the feasibility of utilizing PS in this project on a scale of approximately 10 liters, a laboratory-scale hydrothermal reactor called MRP (Mini Reaction Plant) has been developed, built, and put into operation by AVA Biochem.

The MRP enables continuous hydrothermal reactions under controlled flow rates. In order to ensure comparability with AVA's existing production plant and determine the necessary process parameters for the optimal implementation of the PS at a production scale, preparatory experiments using mock-up solutions will be firstly conducted as part of the project by the RUG and AVA Biochem. The RUG will in particular focuss on determning the optimal process conditions to convert the PS to 5-HMF.

Furthermore, in this ML, NewWave partner, Transfurans Chemicals (TFC) will develop a scalable production process for the conversion of different furan-based derivatives, including 5-HMF, to other bio-based products with various applications such as green solvents, fuel additives, and the production of fine chemicals.

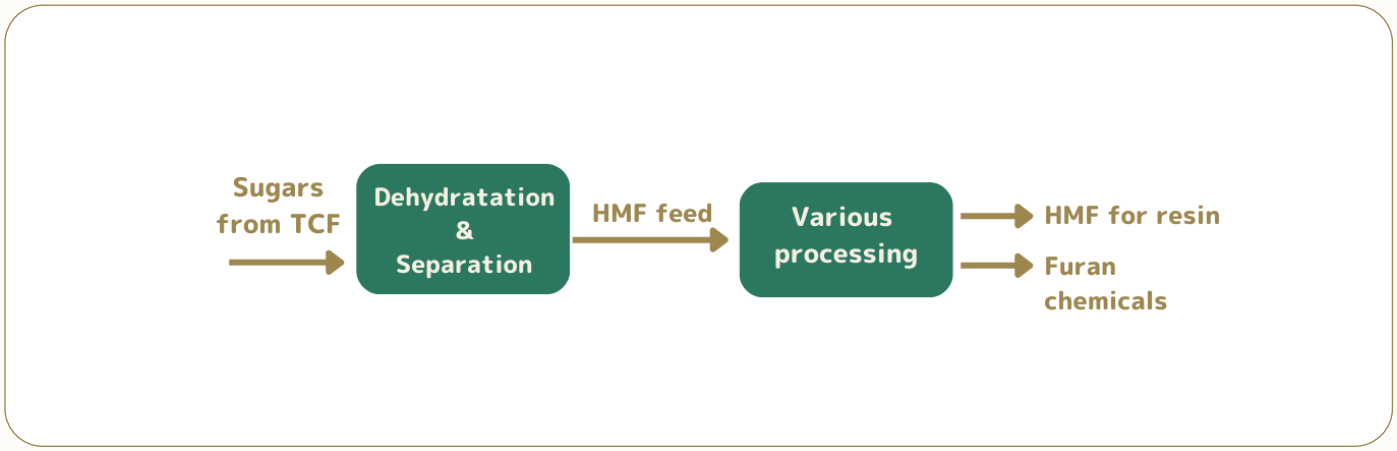
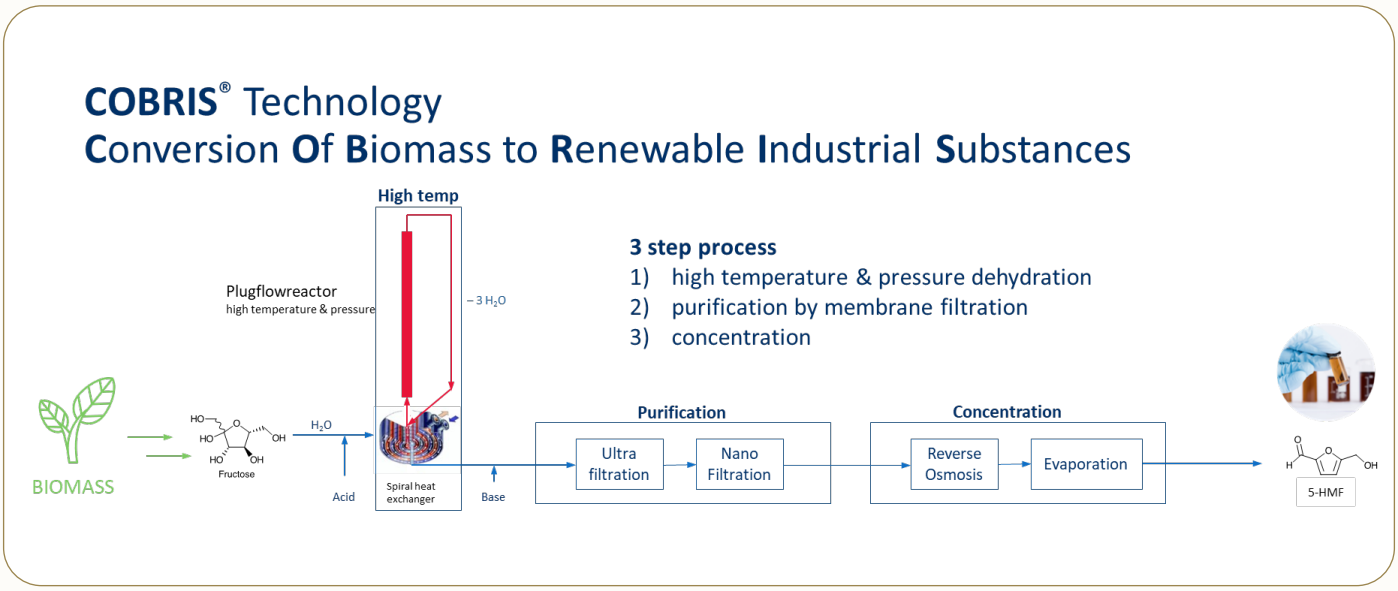


Diagram of manufacturing line #2

HMF produced in this manufacturing line will be tested as a formaldehyde replacement in the production of Engineered wood. In particular, Medium Density Fibreboard (MDF) and plywood for interior usage. Furthermore it will be used as a starting point for the production of different furan-based green products.



Partners involved

AVABIOCHEM: AVA Biochem AG is the global company active in the industrial production and sale of the bio-based platform chemical 5-Hydroxymethylfurfural (5-HMF), a renewable and non-toxic alternative to a range of petroleum-based materials

University of Groningen: is a leading European University located in the Netherlands

TransFurans Chemicals: TFC is a Belgian company dealing with Furfural chemicals. For the past 50 years they have been producing basic chemicals from renewable raw materials, like agricultural waste products.

Learn more

Thermo Chemical Fractionation: newwave-horizon.eu

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Funded by the European Union