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 #3

MANUFACTURING NEW ENGINEERED WOOD PRODUCTS

What is it? with the term "engineered wood" we refer to a wide range of wood products that are essentially made by wood derivatives (fibers, particles, strands, etc.) put together with adhesives or other fixation techniques. It has wide applications in the construction and furniture industries.

In this NewWave manufacturing line (ML), the partner FORESA Tech will use the lignin extracted from the Fast Pyrolisis Oil (FPBO) as a replacement for fossil phenol in a variety of existing resin formulations.

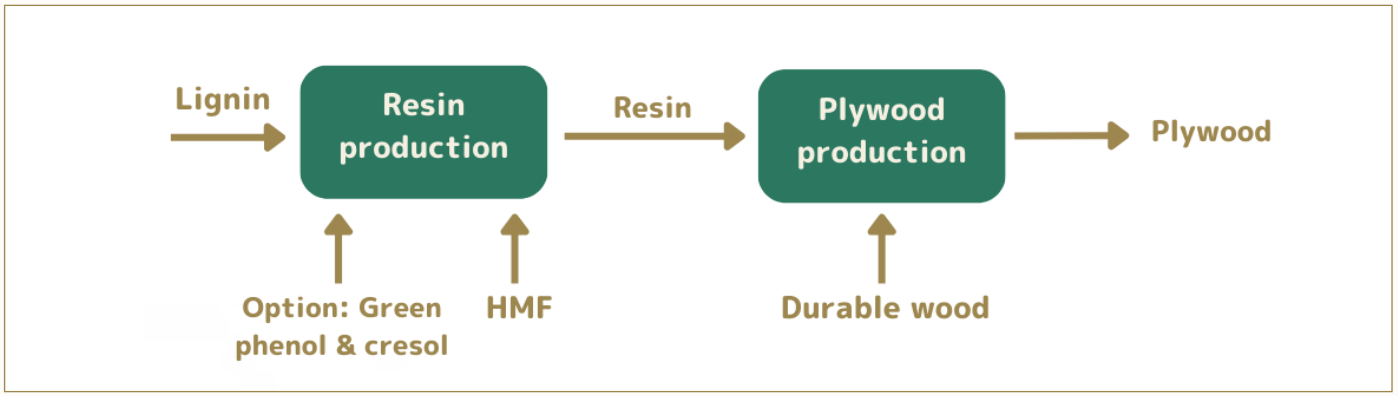


Diagram of manufacturing line #3

The importance of Lignin

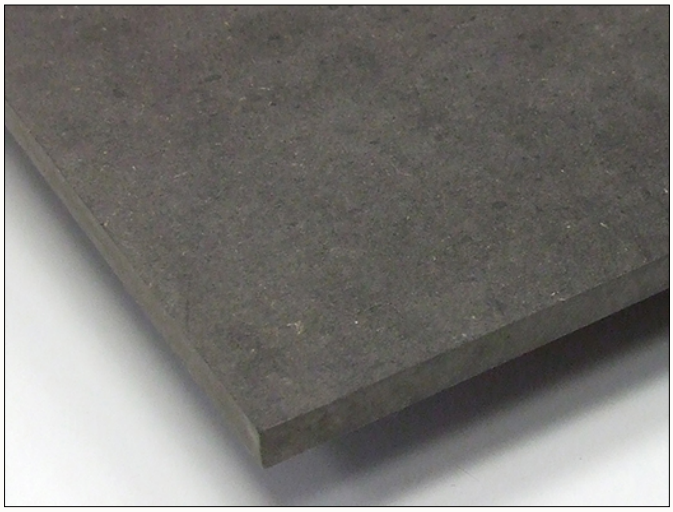
Lignin is an organic polymer that, together with cellulose and hemicellulose, is the main component of plants and trees. Essentially, it's the component giving wood resistance and waterproofness.
The lignin stream produced in the TCF process is initially obtained as a highly viscous liquid called pyrolytic lignin (PL). It is partly depolymerized and has an average Mw of ~ 1000 g/mole which is far less than the Mw's exceeding 4000 g/mole found for natural- or kraft lignins obtained in the pulp and paper industry and therefore makes it also more reactive. The lignin is free of added chemicals it doesn't contain any sulphur or minerals and can be readily be converted to a solid pastillated lignin.

Picture of pyrolytic lignin and the solid lignin pastilles.

New lignin applications

Pyrolytic lignin will be used as a replacement for fossil phenol in lignin-based resins. These resins will be then used for the production of engineered wood products, such as Plywood, Medium Density Fiberboard (MDF), and Cross Laminated Timber (CLT) (Innorenew). Foresa Tech will also test the HMF, sustainable produced by AVA BIOCHEM in the resin systems.

The wood products developed in this ML will be used in a real demonstration site, providing the cladding and interior components for an existing building.



Sample of a compact Medium Density Fiberboard (MDF).

Partners involved

FORESA TECHNOLOGIES was founded in 2019 as a new company fully owned by FORESA. The company carries out the development of novel resins as well as characterization analyses and tests on end products for formaldehyde emission, fire and moisture resistance, among others.
Company facilities include two synthesis laboratories, a pilot plant for board manufacturing, paper impregnation and lamination, a characterization and an instrumentation area with chromatography, spectroscopy, thermal and rheological analysis as well as surface characterization, among others. The main developments are related to formaldehyde-based adhesives, vinyl acetate, natural products derived from lignin, soy or sugar, paraffin emulsions and mineral or natural oil emulsions.

Learn more

The importance of lignin: www.newwave-horizon.eu/news

NewWave

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Funded by the European Union

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