CONSORTIUM

FIBERLEAN TECHNOLOGIES LIMITED

ALFA WOOD GROUP AEVE

SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES

SUNDEALA LIMITED

CONTACT US

PROJECT COORDINATOR

Yun Jin, PhD
Senior Research FiberLean Technologies
yun.jin@fiberlean.com

www.lifeb3furn.eu

info@.life3furn.eu

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linkedin.com/company/life-b3-furn

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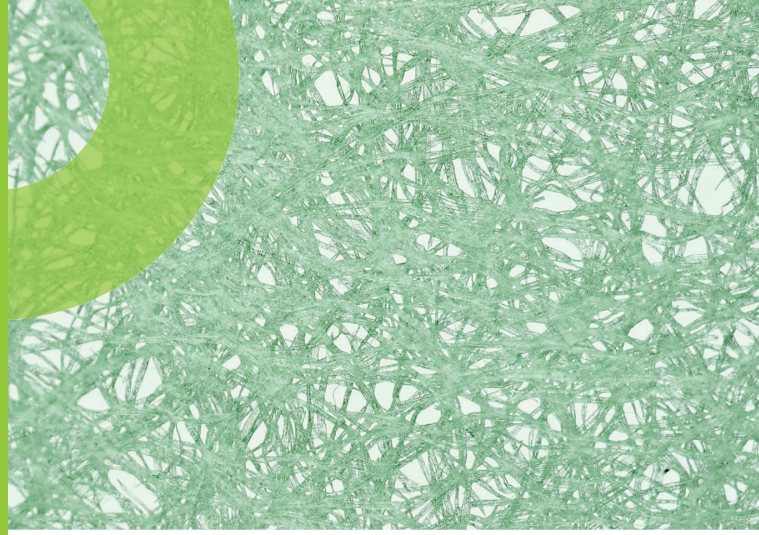
The LIFE B3 FURN – LIFE20 ENV/UK/000329 project has received funding from the LIFE programme of the European Union



LIFE B3 FURN

Bio-based binder for furniture:
Fibreboard production with
microfibrillated cellulose (MFC) as binder

THE PROJECT

The furniture and construction sectors strongly rely on the extensive use of the Medium Density Fibreboard (MDF), an engineered and highly versatile wood-based material that displays valuable properties, such as smooth finish, machinability, strength and consistency. MDF is widely employed in the manufacture of kitchen cabinets and is well suited for residential construction of modern homes where cabinets and built-ins showcase the performance of MDF beautifully. It is the material of choice in home interiors where tight tolerances, smooth surfaces and intricate machining are critical.

Despite the remarkable performances that make the MDF an indispensable material for different sectors, these panels present serious drawbacks, namely the difficulty of recycling, their formaldehyde content (a toxic substance that works as binder) and the large depletion of natural sources caused by their production. In this context, the European furniture and construction industries are currently facing serious environmental challenges due to the extensive production and consumption of the unsafe and unsustainable MDF-made products.

The LIFE B3 FURN will bring to the market the first formaldehyde-free wood panel made from 100% recycled material and 100% recyclable at end of life – called B3 Board (Board made with Bio-Based Binder) – with equal performance to the traditional MDF.

The innovative concept proposed in the project, i.e. making recyclable formaldehyde-free wood-based panels for furniture and construction, is based on the use of the premium Microfibrillated Cellulose (MFC)-mineral composite (FiberLean® MFC) produced by the project coordinator FiberLean Technologies Limited. When applied in fibreboards production process, the FiberLean® MFC shows unique properties ad binder, replacing toxic formaldehyde, improving product quality and reducing production cost.

THE OBJECTIVES

The LIFE B3 FURN project will demonstrate that a drastic waste reduction and GHG emission savings can be achieved in the furniture and construction sectors. The core technology consists in the production of the innovative B3 Boards, i.e., recyclable formaldehyde-free wood-based panels. To achieve this goal, the specific objectives are:

- To demonstrate the scalability of the technology for the B3 Board production by installing a demonstration plant producing boards with the surface quality equal to the traditional MDF.
- To optimise the B3 Board upgraded production process, by defining and fine-tuning the optimal parameters to deliver boards with required mechanical properties whilst maximising throughput and minimising cost, progressing from TRL6 to TRL8.
- To validate the B3 Board performances under an end-use perspective, assessing properties, confirming the surface compatibility with high-grade treatments required by the furniture market (e.g. lamination, veneering and lacquering), and demonstrating the usability as a furniture component.
- To validate the sustainability of the B3 Board production process, assessing all the environmental benefits associated with the LIFE B3 FURN project considering a broad range of impact categories such as potential GHG emissions, depletion of resources and eco- and human toxicity aspects.
- To ensure continuation, replication and transfer of the project results, by engaging relevant stakeholders, implementing a sound commercialisation strategy, and outlining a business plan for the full-scale commercialisation of the solution.
- To increase awareness of the LIFE B3 FURN solution among general public, policy makers and the whole furniture and construction industries.

IMPACT

ENVIRONMENTAL

- Significant wood waste reduction from the furniture sector after the project end (when the industrial replication plant will be operative) as well as carboard and paper waste reduction due to the use of this recycled material as component of the B3 Boards.
- CO2 emission savings due to the recycling of B3 Board-made furniture (when the industrial replication plant will be operative) and due to the recycling of paper and cardboard as B3 Board components.
- Reduction of the use of the toxic urea-formaldehyde in MDF, replaced by the FiberLean®MFC.

TECHNICAL

- Upscaling and upgrading the production process of innovative furniture and construction boards, 100% recycled and recyclable and safe for human health and the environment.
- Reaching equal mechanical and cost performances to traditional MDF, i.e., increasing the board production capacity, improving surface quality and mechanical properties, and ensuring compatibility with high-grade treatments required by the furniture market (lamination, veneering and lacquering) while decreasing the production costs.

SOCIO-ECONOMIC

- Investments mobilised and boost of the annual turnover for the industrial partners.
- Preservation of operators in the furniture industry from the toxic formaldehyde exposure.