

Biobased Foam Packaging for Fresh Food

The Biomac Open Innovation Test Bed (OITB) launched an open call in 2023 that selected a series of project proposal that will be upscale from lab stage to Industrial prototypes. In this factsheet, we are looking at the CASSPAK project from Cass Materials AB.

CASSPAK, stands for "Biobased Foam Packaging Boxes for the Transportation of Fresh Foods", and aims to develop biodegradable foam packaging boxes for transporting fresh food. The goal is to provide a sustainable alternative to polystyrene boxes, which are widely used but harmful to the environment.

The value proposition



The global food industry has relied on polystyrene packaging boxes for decades to keep products fresh. Polystyrene is a fossil-based plastic and the most polluting foam packaging material in the world. Chemicals like benzene and styrene released from polystyrene enter marine and terrestrial ecosystems, with possible links to liver and kidney cancer.

With increasing global bans on polystyrene, the \$1.01 trillion packaging industry (2023) is desperately seeking a durable and sustainable alternative. Bio-based cellulose foam packaging is a promising solution, but cellulose is naturally hydrophilic (attracts water), while fresh food boxes must be hydrophobic (repel water).

Most water-repellent agents available today are fossil-based plastics and do not contribute to achieving the UN's 2030 sustainability goals.

Currently, there are no commercial-scale production facilities for cellulose foam packaging anywhere in the world.

To address this situation, Cass Materials is putting forward the CASSPAK solution.

- CASSPAK boxes, made from waste fibres from the paper industry, are lightweight, have good mechanical strength, and are an excellent alternative to fossil-based foams.
- CASSPAK uses 0% fossil-based plastic, 0% detergents, and a non-hazardous process. The main input for producing CASSPAK boxes is residual brown fibre streams from the paper industry.
- CASSPAK boxes are made 100% from cellulose fibres, so they can be disposed of directly in compost and do not create pollution or accelerate climate change.
- The foam boxes can be recycled in the process, becoming a truly circular product and further contributing to the world's conversion to a biomass-based social economy.

To upscale the proposal, access to the following BIOMAC Pilot lines (PL) will provide the necessary resources and equipment to optimize and scale up the production process of CASSPAK foam, including the addition of PLA as a hydrophobic agent.

- PL2 (by RISE) for the Hydrolysis of fibre sludge and production of Bacterial Nano Cellulose.
- PL10 (by LIST) for the Mechanical grinding and production of different grades of nano-fibrillated cellulose (NFC).
- PL 11(by AIMPLAS) to achieve the reactive extrusion for PLA and PLA copolymer-based nanocomposites.
- PL13 (by ITENE) for the Mechanical treatment needed for the production of NFC and/or CNC.

The final product

The CASSPAK solution proposed by Cass Materials AB aims to revolutionize the fresh food packaging industry by offering a sustainable alternative to polystyrene boxes. CASSPAK boxes are made from cellulose fibers, derived from the waste of the paper industry, and are therefore biodegradable and compostable. To ensure the hydrophobicity necessary for fresh food packaging, the project focuses on optimizing the addition of bacterial nanocellulose (BNC) as a binder and polylactic acid (PLA) as a biodegradable waterproofing agent. The project will utilize various pilot lines from the BIOMAC project to optimize and scale up the production process, aiming for a future where fresh food foam packaging is sustainable, affordable, and environmentally friendly.



