

Title: Cellulosic foam for packaging and insulation products

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Abstract:

Cellulosic foams are very light products (below 100 kg/m³) with applications for replacing fossil-based foam in packaging and insulation. Foams made with cellulosic fibres, from different sources or pulping process, and a surfactant are 100 % biodegradable, plastic free, recyclable and produced through a simple process of two main steps: foaming and drying. The foaming step, where air is introduced to the fibre suspension, will control the final foam properties. The drying step simply consists in the removal of the water to get the final product.

Cellulosic foam condition process can be adjusted to achieve desired properties, especially for packaging applications. Parameters such as pulp consistency or amount of introduced air affect the foam structure, its stiffness, and its resiliency. By properly adjusting the parameters, it is possible to produce cellulosic foams with properties close to polyethylene foams that are currently used in packaging. Innofibre develops a method to produce innovative mould through 3D printing. This process produces 3D shaped cellulosic foams adapted for specific products to improve their protection.

As a thermal insulation, in packaging or for the building industry, cellulosic foams have a thermal resistance factor R around 3,6 per inch (RSI 0,63). This value is close to cellulose, fibreglass, or rock wool batts with the advantage of a stiffer structure for easier handling. The process allows to uniformly add additives to achieve specific properties such as fire retardancy or low water absorption. Foams structures also give good acoustic properties with low sound reverberation and significant sound absorption.

The expertise developed by Innofibre for these products enables the research centre to support industries in the development of new biobased products.