

WFBR Binderless Technology

Converting lignocellulosic side-streams into fully biobased, high-quality, thermoset materials

Jeroen van Bon & Gijs van Erven, World Bio Markets, May 11th 2023, The Hague



Introduction

■ Wageningen Food & Biobased Research (WFBR)

- The contract research organization of Wageningen University & Research (WUR) in Agrifood domain.
- Create sustainable, societal and economic value by developing innovative processes and products.
- Value chain approach starting with post-harvest feedstocks (from fresh crops to waste streams).
- Pharma, food, feed, chemist





WFBR Binderless Technology

■ Converts lignocellulosic biomass into high-quality materials

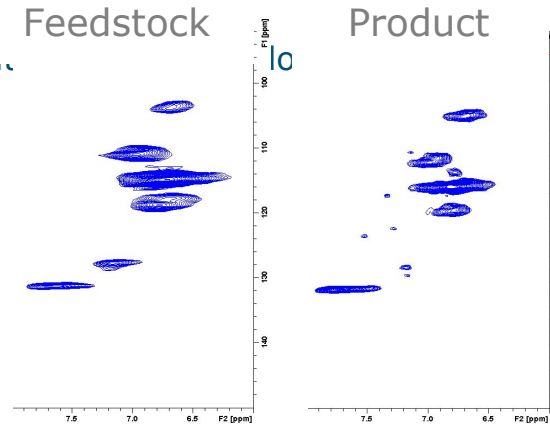
- Straightforward process. No (toxic) solvents or binders required. Only heat and pressure.
- Lignocellulosic biopolymers are key to in-situ thermoset binder formation.
- Materials are high-strength, water and oil resistant and fully biobased.
- Materials can be produced from low-value



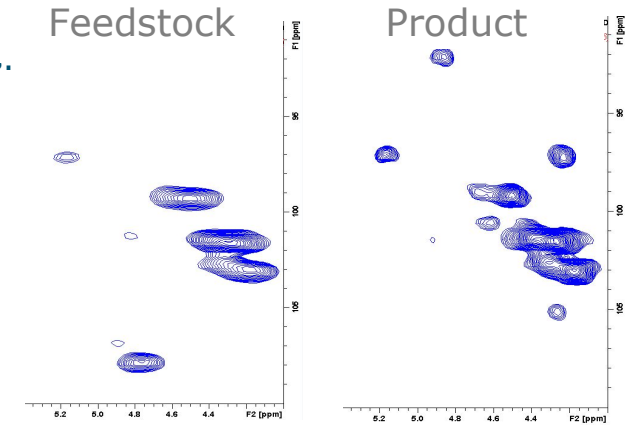
Current status

Recent findings (CBPM Sustainable Binderless Product Technology, TKI-LWV 19154)

- Understanding key thermoset reactions including the role of lignin and hemi-cellulose.
- Experimental demonstration feasibility local feedstocks, including hard- and softwood.
- Experimental demonstration of product properties.



Example 1



Example 2

Outlook

■ Further development technology based on novel insights

- Using a wide variety of (local) side streams and smart side stream mixtures.
- Converging different feedstocks into one product and diverging one feedstock into different products.
- Targeting relevant demonstration products.
- Focus on development of a techno-economically viable process demonstrated at pilot-scale.

■ New project: More with Binderless

- Dutch “Topsector Kennis en Innovatie (TKI)” innovation agenda and subsidy tender.



Consortium of knowledge institute WFBR and industrial partners.

Call for partners

■ We are looking for industrial partners

- To share their challenges, want and needs...
- actively participate in this project and exploit the generated results.

■ Value chain approach

- Feedstock suppliers
 - Create added value using lignocellulose- and hemicellulose-containing side streams
 - Wood (processing) leftovers, nut shells, reed, miscanthus, roadside vegetation, coconut husk, molasses, ...
- Technology providers
 - Create added value for their technological (processing) solutions
 - Compression molding equipment, extrusion molding equipment, ...



Inspiration



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Thank you for
your attention!

To explore
the potential
of nature to
improve the
quality of life