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Binder System Extension for Kraft Paper Laminate using Depolymerized Lignin

A sustainable, formaldehyde-free resin binder utilizes depolymerized lignin from forestry waste to create environmentally friendly composite boards for furniture, flooring, and countertops, meeting global regulatory demands.

Researchers at Purdue University have developed a formaldehyde-free resin binder for the manufacture of composite boards in order to meet the increasing demand for sustainably produced and environmentally friendly construction materials. The proposed resin binder leverages depolymerized lignin from forestry waste (rice or wood) to replace carcinogenic substances used in current industry-standard binders. These composites are commonly used in furniture, flooring, and countertops. As EU and US regulatory organizations seek to eliminate formaldehyde from home environments, this technology offers a compelling and sustainable alternative to traditional binder systems.

Advantages:

- Formaldehyde-free

- Repurposes waste materials

- Aligned with goals of regulatory organizations

Applications:

- Medium density fiber (MDF) board

- Kraft paper laminate composite manufacturing

- Outdoor furniture, faÃ§ade elements, bathroom stalls

Technology Validation:

This technology has been validated through testing lab-built prototypes for water absorption and thickness swell, where the samples using 30% by weight extender resin were compliant with industry standards. A continuation of this work will involve the optimization of the percentages of

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Authors
James M Caruthers
Akshay Mani Mahesh

Further information
Dipak Narula
dnarula@prf.org

View online

the resin formulations.

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Intellectual Property:

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