

Wood K plus

WOOD: next generation materials and processes – from fundamentals to implementations

Programme: COMET – Competence Centers for Excellent Technologies

Programme line: COMET-Center (K1)

Type of project: COMET 4.7 Alternative bonding, 01/2019-12/2022, multi-firm



COMPETITIVE ALTERNATIVE ADHESIVES FOR WOOD-BASED PRODUCTS

THE TRANSITION FROM ESTABLISHED, FOSSIL-BASED ADHESIVE TO MORE SUSTAINABLE SOLUTIONS IS A CHALLENGING TASK FOR THE WOOD INDUSTRY AND REQUIRES INTENSIVE R&D. THE PROJECT RESULTS CONTRIBUTE TO THE FORMULATION OF STRATEGIES FOR THE SUCCESSFUL DEVELOPMENT OF COMPETITIVE ALTERNATIVE ADHESIVES.

The wood industry plays a central role in the strategic development of a sustainable bioeconomy in Austria. The currently established, fossil-based adhesives on the market are highly reactive and use cheap raw materials in the production, such as formaldehyde. The ambitions of developing a competitive, bio-based alternative adhesive have not been successful yet.

The project represents a bridge between fundamental and application-oriented research. The main outcome of the project is a general understanding of the adhesive-adherend interactions and identifying remaining barriers in the establishment of bio-based alternative

adhesives. A crucial finding was that these result from a reduced reactivity of the bio-based adhesives and/or the use of raw materials with low availability. The publication of these findings in an internationally well-respected review article with over 100 citations laid the foundation for numerous research activities worldwide. The methods developed within the project to evaluate the reactivity of binders are essential for the development of competitive alternative resin formulations with reliable adhesion strength and low emissions.

SUCCESS STORY

Impact and effects

The success of the project attracted international attention, which led to Wood K plus becoming a member of the organisation committee of the world's leading conference on wood adhesives, the ICWA in the USA. As a leader in the field of alternative adhesives, Wood K plus places great value on further boosting the scientific discourse in this field. The results of the project and resulting spin off projects were presented to a transnational audience in over 20 conference presentations, three online seminars and two podium discussions. The main findings were communicated to the public also in over 16 mainly open access publications. This further strengthens the cooperation with other international partners and thereby enables the interdisciplinary exploitation of the adhesive development strategies in a broad field of applications.

The internationally renowned project results provided the basis for further developments of adhesive formulations in several national and international projects, for example within the EU-project SusBind. Together with the COMET industry partner Fritz EGGER GmbH & Co. OG and ten European partners, a

highly reactive, carbohydrate-based adhesive was developed, which is suitable for the manufacture of interior wood particleboards. The competitiveness of the alternative adhesive formulation was impressively proven in the pilot-scale production of a furniture prototype.

The results of the project established Wood K plus an internationally leading research institute in the field of alternative adhesives and further strengthen the Austrian and European wood industry.



Comparison of wood-based products made of alternative adhesives or low-formaldehyde containing adhesives (left), SusBind furniture prototype (right). © Wood K plus

Project coordination (Story)

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Project partner

- BOKU University, Austria
- Fritz EGGER GmbH & Co. OG, Austria
- Henkel & Cie. Ag, Switzerland
- Metadynea Austria GmbH, Austria
- HB Fuller GmbH, Austria
- Dynea As, Norway

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