

WOOD
next generation materials and
processes – from fundamentals to
implementations

Program: COMET – Competence
Centers for Excellent Technologies

Program line: COMET-Center (K1)

Type of project: PowderExteriorWood,
09/2016 – 08/2019, multi-firm (Non
COMET)



WEATHER-RESISTANT COATING SYSTEMS FOR WOOD AND WOOD BASED COMPOSITES

SUCCESSFUL INTERNATIONAL RESEARCH COOPERATION LEADS TO IMPROVEMENTS OF WOOD PLASTIC COMPOSITES AND POWDER COATINGS ENABLING THE DURABILITY FOR EXTERIOR USE OF WOOD COMPOSITES.

Wood fiber composite materials generally lack in durability for exterior use. The materials need special modification for water and moisture resistance and coatings with several layers on all sides, which requires relative high process effort, long drying times and nevertheless only short maintenance cycles are expected for the end customer. The powder coating technology on the other side is a durable, ecologically friendly and resource efficient technology that can satisfy the customer's request for ecologically harmless products made from renewable raw materials with optimized weather resistance and thus extended maintenance cycles for the use. However, the conventional, weather-resistant powder coating systems are to be processed at elevated curing temperatures, which are far above the temperature permitted for wood-based materials. In the interest of environmentally friendly and sustainable surface

treatments, it becomes clear that new activities, in particular the expansion of possible uses for powder coating applications, are urgently required. The main technical achievements of the project were the development of new wood polymer formulations with reduced electrical resistance and optimal adhesion properties, the targeted surface treatment of weather-resistant fiberboards and acetylated solid wood using conductive impregnations to achieve a defined electrical conductivity as well as the development and optimization of the manufacturing process for weather-resistant, highly reactive powder coatings, which are appropriate for wood-based materials due to their low curing temperatures.

With the research results presented here, it was possible to modify weather-resistant wood fiber materials, solid wood and wood polymer composites

SUCCESS STORY

for the powder coating process, to develop highly reactive low-temperature powder coating systems for the required weather resistance of the wood-based substrates and to adapt and optimize the process technique of powder coating application and curing.

Impact and effects

The research results and products developed in the project with an exceptional combination of functionality and properties contribute to the growth of the ecologically friendly powder coating technology in the decorative coating market for wood and wood-based products for exterior applications. The target markets include, on the one hand, exterior and weather-resistant products from timber construction (terraces, balconies, ...) and from the furniture sector (garden furniture, playground equipment, ...). An adequate estimate of the continuously increasing demand for natural products made of wood and wood-based materials is also reflected in an increase in the market for coating materials, whereby the market share of powder coatings has increased. The success of the project will further expand the market leadership of

the company TIGER Coatings in the field of highly reactive powder coatings, with the technology of highly reactive powder coatings remaining in higher-quality niches for the next 3 - 5 years.



Figure above: Modified wood plastic composite profiles untreated (left) and powder coated (right);
Figure below: Wood plastic composite profiles and weather-resistant wood fiber composite boards in natural weathering (test facade) (©Wood K plus)

Project coordination (Story)

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Project partner

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- LEEB Balkone GmbH, Austria
- Institut für Holztechnologie Dresden gemeinnützige GmbH (IHD), Germany
- Wobek-Design GmbH, Germany
- Ramseier Woodcoat AG, Switzerland

This success story was provided by the center management and by the mentioned project partners for the purpose of being published on the FFG website. Wood K plus is a COMET Center within the COMET – Competence Centers for Excellent Technologies Program and funded by BMK, BMDW and the provinces of Carinthia, Lower Austria and Upper Austria. The COMET Program is managed by FFG. Further information on COMET: www.ffg.at/comet