We have placed particular emphasis on the use of environmentally-friendly materials in the production of this brochure.

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FUTURE-ORIENTED MATERIALS FROM RENEWABLE RAW RESOURCES

Composite materials made from wood and other lignocellulose-containing materials have a unique character: They are environmentally-friendly and extremely functional. The department Technology for Wood and Natural Fiber-Based Materials addresses the development of composite materials, the recycling of waste wood and biocomposites (WPC) as well as image-processing procedures for process and quality control. The spectrum of our material developments encompasses classical wood-based materials (particle, fiber and insulation boards, OSB, plywood, LVL) through hybrid materials and on to biocomposites, 3D molded parts and composite materials.

Research focuses

Wood-based materials and engineered wood products
At the Fraunhofer WKI, we develop, in collaboration with our industrial partners, environmentally-friendly and resource-saving composite materials. We have facilities at our disposal for the preparation of substances, the application of binders and the production of materials which offer a direct industrial relation. By means of existing technical amenities, entire process chains can be depicted, from the raw commodity through to the finished material.

Through further development and optimization of existing process technologies as well as the combination of positive material properties, we develop and characterize classical wood-based materials, engineered wood products, biocomposites and future-oriented hybrid materials.

In addition to the classical wood-based materials, we are currently intensifying our work on topics in the field of 3D molded parts for various applications in the automotive, transport and furniture sectors.

Adhesive technology
In addition to the optimization of traditional binders, we also test new binders and bonding procedures. Particular attention is directed at alternatives to petrochemical-based adhesives as well as new formaldehyde-free adhesive systems.

Recycling of waste wood and WPC
We develop new sorting procedures and forms of usage for the efficient utilization of waste wood and old WPC as well as their coatings and constituents.

Measurement technology
We develop new non-destructive measurement and testing procedures for process and quality control within the wood-processing industry and other industrial sectors in which composite materials and bulk materials are manufactured and processed.

Material characterization and testing
- Mechanical, optical and chemical characterization of raw materials, material components and composites
- Suitability of adhesives and matrix components as well as auxiliary materials and active agents for composites
- Determination of the mechanical, thermal and hygric properties of wood composites and other composite materials
- Wet-chemical analysis of adhesives for wood-based materials
- Optical and imaging measurement techniques and evaluation procedures: particle-size measurement, spectroscopy, computed tomography, thermography, color and gloss-testing

Technical equipment/material technical center
- Pilot plants for the preparation of wood and other lignocellulosic: hackers, chippers, separators, refiners, etc.
- Industrial peeling machine and peripheral equipment for the production of veneers
- Hot and high-frequency presses with 3D tooling for production of composites
- Mixing and gluing units
- Mechanical and chemical testing laboratory
- Biocomposite technical center for the compound and material production

Services

Process engineering
- Process development and production of classical, structure-oriented and 3D-moldable wood-based materials
- Organic and inorganic bonded wood-based materials
- Thermosetting and thermoplastic molded parts
- Wood foams and foams from other lignocellulosic raw materials for adhesive and matrix-bonded wood-based materials
- Recycling of (biobased) materials
- Utilization of agrarian residues in compounds and components
- Extrusion of biocomposites and WPC
- Flame retardancy for biocomposites
- Consultancy in the field of wood-based materials and wood-based material technology

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