



Sub-area POB3: Modern materials for use in construction

Presentation title: Structural and spatial functionalization of biodegradable wood lignocellulose composites for use in construction

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Abstract:

The idea of structural and spatial modification of the lignocellulosic fraction of wood to substantially improve the physical and chemical properties of this construction material fits perfectly into the idea of the fourth industrial revolution. Both the material itself and the technology of its production meet all the assumptions of the Industry 4.0 strategy, of the Circular Economy (CE) and the principles of sustainable development.

So far, two PBL projects have been successfully implemented, which resulted in the production of a new building material samples. In the case of spruce wood, a material with a strength of over 300 MPa was obtained. The newly developed material can therefore be a real competition even for steel, and as a renewable material, it perfectly meets the requirements of the Circular Economy strategy.

This idea concerns the integrated technology of wood functionalisation and allows for automated, highly efficient and waste-free processing of most wood-based materials. Until now, wood has mainly been shaped and processed using subtractive techniques. The proposed method allows for practically waste-free production of constructional materials. A broader approach to the process of chemical processing and mechanical processing, including machine integration and the use of integrated IT systems supporting production, will allow for flexible introduction of changes in the production process (different types of wood require different processing parameters).