Polymer Paper based on Renewable Resources ☑

Data of Your Paper ☑

Topic

○ Resilience

○ Lifestyle

○ Building

◉ Resources

○ Tourism

○ Energy

Title of the Paper
Polymer Paper based on Renewable Resources

Form of Presantation

○ Poster

◉ Presentation

Short Description (maximum 2500 characters)

Due to the high growth rate and excellent long-term potential in the sector “office papers”, a shortage of the base material cellulose is possible. Furthermore, the availability of wood and water is not given at all in some geographic regions (e.g. Arabic region). Regarding an ecological point of view, a lot of paper products are not as “ecological” as they seem to be. One example hereby are drink cartons, were polymer coated paper boards are hindered recyclable as they are dissimilar material composites. Therefore alternative products for paper need to be considered in the longer term. These future prospects were the initial point for a research project of the Polymer Competence Center Leoben GmbH in cooperation with the Chair of Polymer Processing at the Montanuniversitaet Leoben and the companies Mondi Neusiedler GmbH and Omya International AG.
Polymer paper as alternative has to meet special requirements because of the printing process and the demands during usage, ranging from thermal to optical and haptic properties. Apart from that, polymer paper must provide ecological (e.g. less environmental pollution) and economical (e.g. less investment costs) advantages. By using poly lactic acid (PLA) as matrix, the needed property profile cannot be fulfilled by a monolayer film. For this reason, the synthetic paper consists of a 3-layer structure with highly filled outer layers and a chemical foamed inner layer. Thereby the outer layers are responsible for the temperature resistance, printability, opacity and haptic whereas the density of the film structure is set through the foamed middle layer. Beside the density reduction, the middle layer is also responsible for saving material and hence reducing the costs. The multilayer film is processed via conventional coextrusion. For mechanical isotropy and minimized orientations, the 3-layer film is biaxially stretched and thermofixed.
The processed films were tested with paper- and polymer-specific methods. In summary, the polymer paper offers the same property profile (optic, haptic, mechanic etc.) as common paper with additional benefit such as water resistance or mechanically isotropy. Furthermore, a life cycle assessment has been done, confirming the ecological advantage over conventional paper. Due to the great success of this project

and the numerous inquiries from industry, the polymer paper will be commercialized this summer within an university spin off.