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Extending the life cycle – Novel wood-plastic composites as potential applications for post-consumer wood and plastics

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Plastics from packaging are of major importance in residual waste, which are either energetically recovered or land filled. Only a small amount is recycled to secondary materials due to the high efforts for sorting and a lack in market of value added products for the recycled plastics. In the first decade of the 21st century, rising prices of crude oil has led to rising prices of plastic from hydrocarbon sources which has in turn affected the demand and rising prices for wooden fuel. In Germany, about 50% of the harvested wood is directly used as a renewable energy carrier. Studies estimated that in the next 15 years wooden resources will become scarce in Europe due its heterogeneous usability as an energy carrier, as a durable building product and as a precursor for the chemical industry by promoting wood as the sustainable key resource in the European Bio-economy Strategy. Innovation in biomaterials has led to an increasing demand for wood-plastic composites (WPC), which combine the technical advantages of wood and thermoplastics by minimizing the disadvantages of the neat resources. Recent developments of new thermoplastic bio-based recycled materials will be shown. Using secondary resources for WPC exhibited equal stiffness, strength and physical performance compared to virgin resources, what is also beneficial from an ecological point of view by applying the product LCA methodology. An environmental basket of products study assessed the preferable end-of-life alternative of WPC. Recycling of post-consumer WPC tend to be the preferable alternative. Up to now, the least preferable options, incineration and land-filling, are the dominant disposal routes.

Biography

Andreas Krause has completed his PhD from Georg-August-University Göttingen. He is the Professor for Wood Composites and Processing Technology at University Hamburg. He has published more than 50 papers in reputed journals.

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