

Biobased Facade: Illuminated Natural Fibre Polymer with Cardboard Core

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Abstract : The building envelope is integral part of buildings, and renewable resources have a key role in energy consumption. So our aim was the development and implementation of a free forming facade system, consisting of fibre-reinforced polymer, which is built up of commercial biobased resin systems and natural fibre reinforcement. The field of application is aimed in modern architecture, like the office block 'Fachagentur Nachwachsende Rohstoffe e.V.' with its oak wood recycle facade. The build-up of our elements is a classically sandwich-structured composite: face sheets as fibre-reinforced composite using polymer matrix, here a biobased epoxy, and natural fibres. The biobased core consists of stuck cardboard structure (BC-flute). Each element is manufactured from two shells in a counterpart, via hand lay-up laminate. These natural fibre skins and cardboard core have adhered 'wet-on-wet'. As a result, you get the effect of translucent face sheets with matrix illumination. Each created pixel can be controlled in RGB-colours and form together a screen at buildings. A 10 x 5 m² area 'NFP-BIO' with 25 elements is planned as a reference object in Chemnitz. The resolution is about 100 x 50 pixels. Specials are also the efficient technology of production and the possibility to extensively 3D-formed elements for buildings, replacing customary facade systems, which can give out information or advertising.

Keywords : biobased facade, cardboard core, natural fibre skins, sandwich element

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