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Research area: Product aims

End products made of paper, paperboard and board// carton products, Other

Key words:

Paper-Polymer-Composites, additive manufacturing, tool-free production, functional folded box

Title:
Additive manufacturing on paper substrates

Background/Problem area

Nowadays different approaches to Paper-Polymer-Composites are available on the market. Blister cards and cartboard headers on plastic pouches without metal clips are only a few examples. Material and technological developments as well as further improvements in process stability have made additive manufacturing methods an increasingly attractive option also for the (small) batch production of plastic components. In order to achieve a tool-free production the use of laser creasing is implemented. Laser creasing leads to a stability reduction in the folding boxes which can be compensated by the addition of stabilizing polymeric structures.

Objectives/Research results

The project aims to develop the scientific basis for the production of paper-polymer composites by means of additive manufacturing methods (extrusion process/fused deposition modelling FDM). Selected paper substrates and polymers will be characterized to realize an optimized composite. Based on this, the project partners will analyze the compatibility of materials in terms of adhesion and dimensional stability. In order to achieve reproducible results measuring technics have to be adapted to the new material combinations and measuring standards have to be defined. The results will be used to demonstrate the potential of the manufacturing approach for the example of a folding carton with reinforcing framework.

Application/Economic benefits

In particular the growing trend towards mass customization with its associated small production quantities requires the economic use of these technologies. This makes not only the rapid manufacturing of demonstrators and (semi-) functional prototypes, but also the production of ready-to-use functional and structural components an important application area of additive manufacturing methods.

A growing demand for customized products can also be observed in the packaging sector: small lots of folding cartons that meet special functional, regional, seasonal or advertising requirements or follow a current trend are increasingly popular in the market.

Period of time: e. g. 01.02.2017 – 31.01.2019

Remarks

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