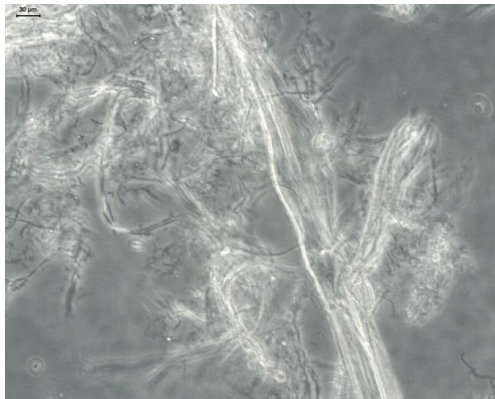




3-Dimensional Moldings from Cellulose



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The most serious challenges of the European Paper Industry :

- stagnating markets (graphic papers)
- need to increase energy efficiency
- need to increase resource efficiency
- need to generate more added value
- searching for new products



New processes for state-of-the-art and **new products** (beyond simple paper & board) have to be developed to maintain the position of **bio-based** and **biodegradable** natural fibres and create more added value in the future.

The market of high-performance 3-D packaging concepts is expected to show high growth rates in the future

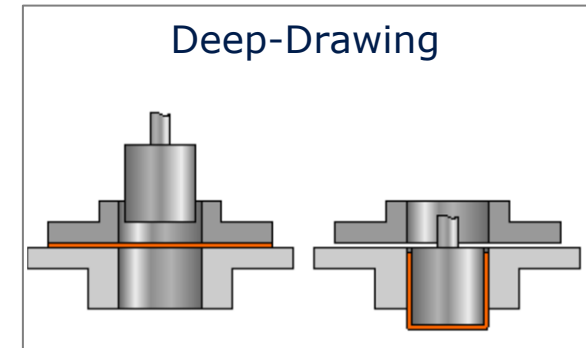
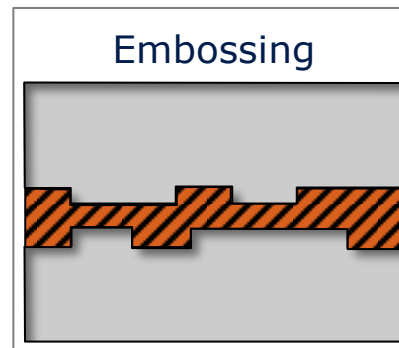
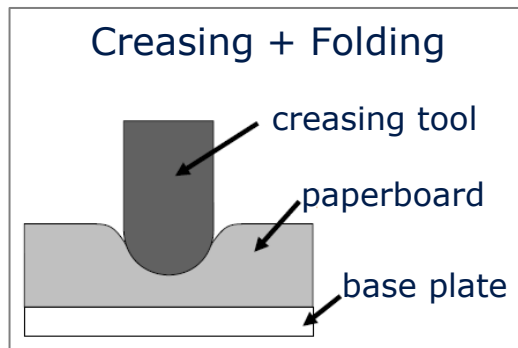
Entrance barriers for p&b based packaging, however, are high. They mainly result from deficiencies in

- barrier properties
- stability or flexibility

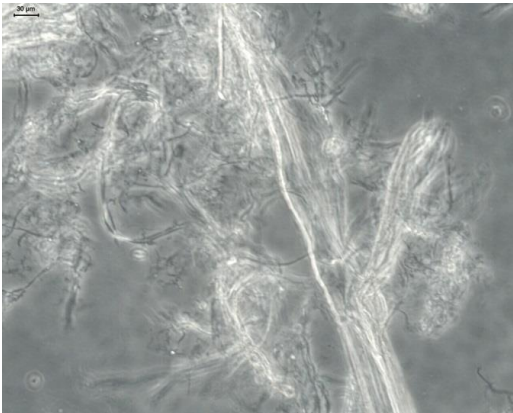
but in particular because all current converting technologies for p&b allow only very limited freedom in 3D-design



Source: vdp-online.de



The state-of-the art converting technologies for p&b



Raw material
fibre suspensions with
100 % wood cellulose



Processing
new shaping and forming
technologies

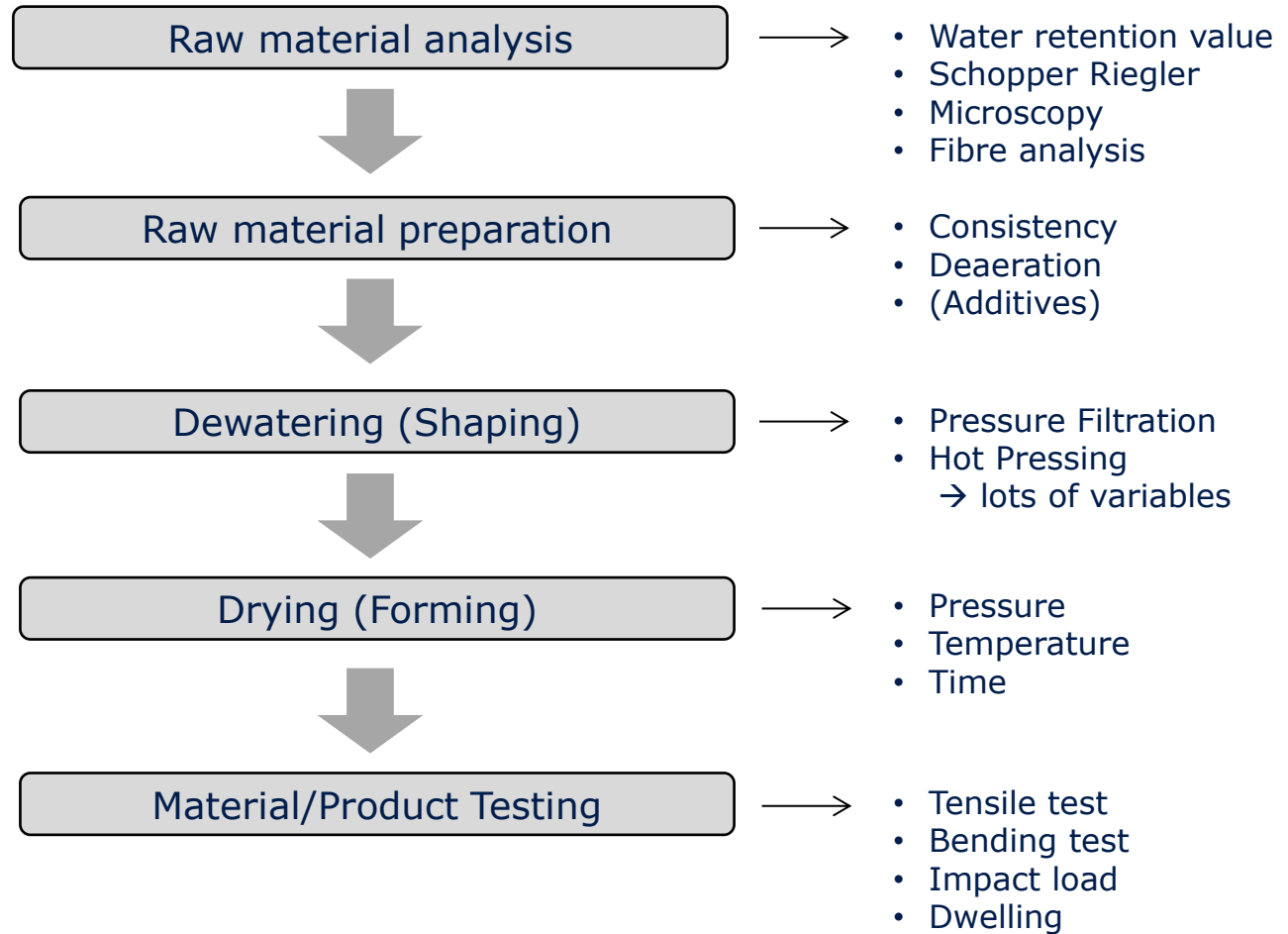
1 Production of test specimens
→ material characterization



2



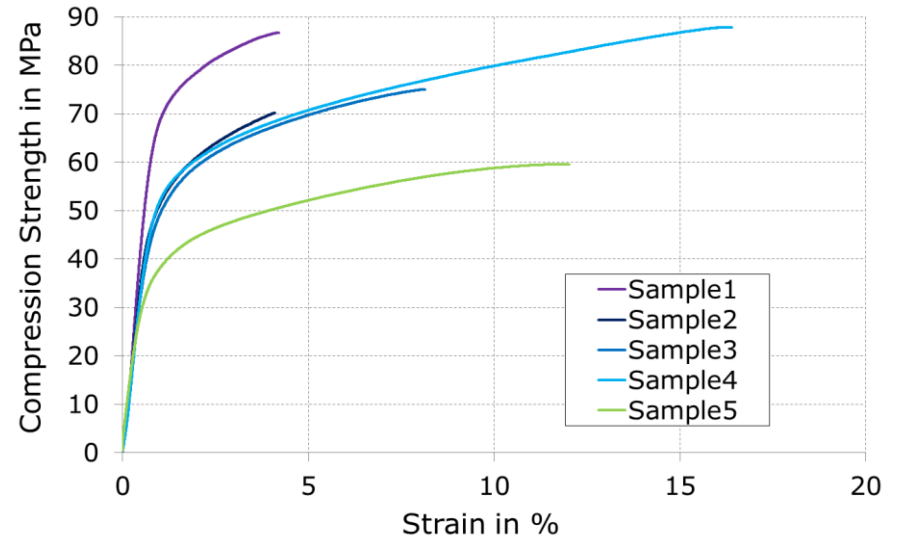
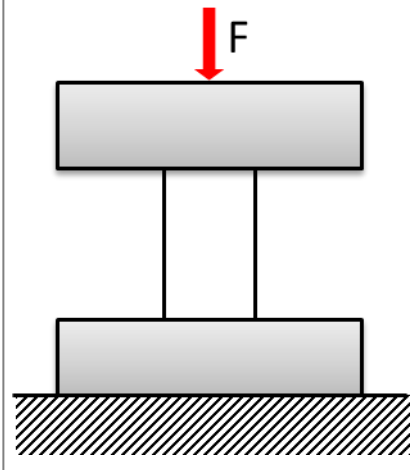
Moldings with
function-specific properties



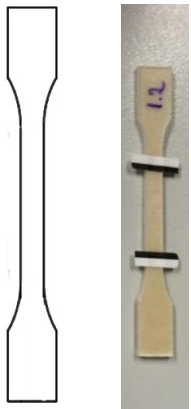
Specimen 1



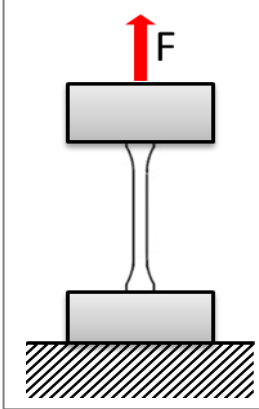
Compression load



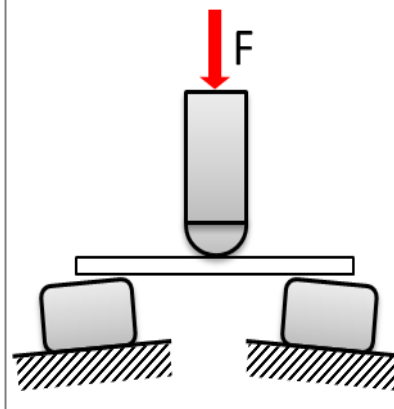
Specimen 2



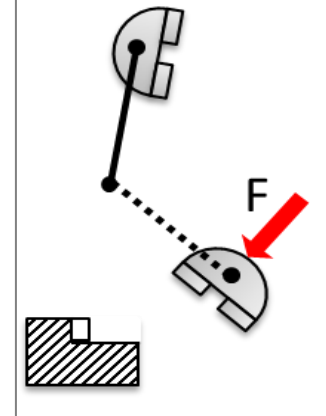
Tensile test



Bending test

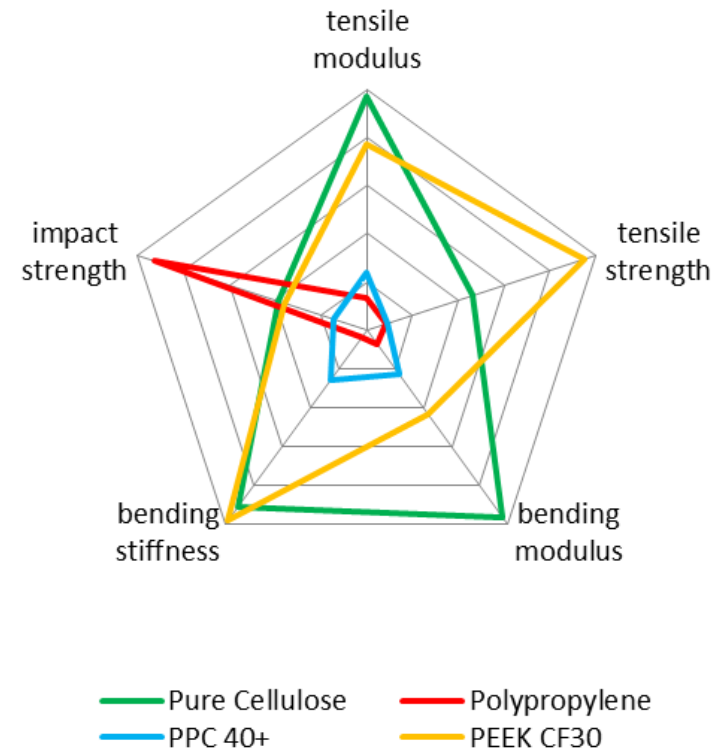


Impact load



Comparison of materials

- Strength properties significantly higher than those of plastics (PP+PE, etc.) and commercial NFRC
- Very low strains and no sharp-edged break as they are typical for CFC
- Impact strength of pure cellulose moldings comparable or higher than those obtained with (natural) fibre reinforced plastics
- Low density
- High specific electrical insulation resistance
- Good barrier characteristics against oxygen, grease and mineral oil



3-dimensional **cellulose moldings** with special properties are suitable for applications in lightweight construction and other areas.

- Further optimization of manufacturing technologies
- Deeper investigation of raw material-product-interactions
- Analysis of the impact of manufacturing conditions on the properties of the final product
- Production of moldings with different shape designs
- Identification of potential application areas in order to substitute non-biogenic materials
- Extension of the property profile with the help of additives to provide application-specific characteristics while maintaining biodegradability



Source: interactivecomms.co.uk

Know How...



Preparation of the raw material
consisting to 100 % of cellulose



Manufacturing technologies for the
production of 2- and 3-dimensional moldings
from cellulose



Modification of raw material or
moldings with special additives

(flame resistance, water resistance, wet strength, color, etc.)



High potential to substitute existing materials
in lightweight construction and other areas
with a renewable alternative – cellulose.

Thanks for your kind attention.

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