

Biobased and biomimetic functionally structured stretch film

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In Europe, around 25.8 million tons of plastic waste are produced annually, with 59% of this coming from the packaging sector, including pallet packaging. Especially in pallet wrapping in the manufacturing industry and in retail, plastic has the status of disposable packaging. Plastic as a conventional plastic is based to a large extent on fossil raw materials (crude oil, natural gas, coal). A substitution of these with bio-based plastics in the sense of sustainability is imperative and is strongly pushed by means of national and international political activities.

Compared to conventional films, a biobased and biomimetic functionally structured stretch film (inspired by natural patterns and shapes; see Figs. 1 and 2) leads to a material saving of up to 30 % due to its improved structure. These activities result in a reduction in the use of wrapping films based on biobased raw materials for packaging or safeguarding load units.

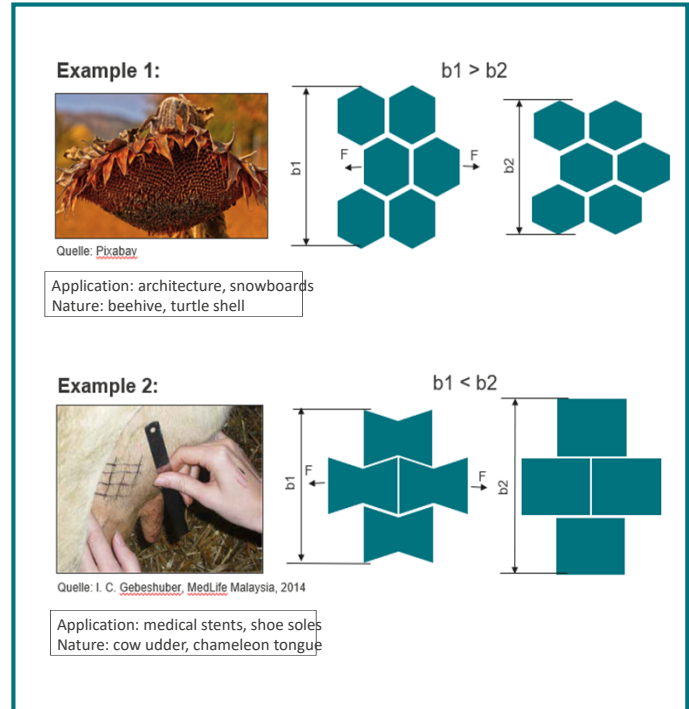


Fig. 1

Two different examples of biomimetic structures with typical applications.

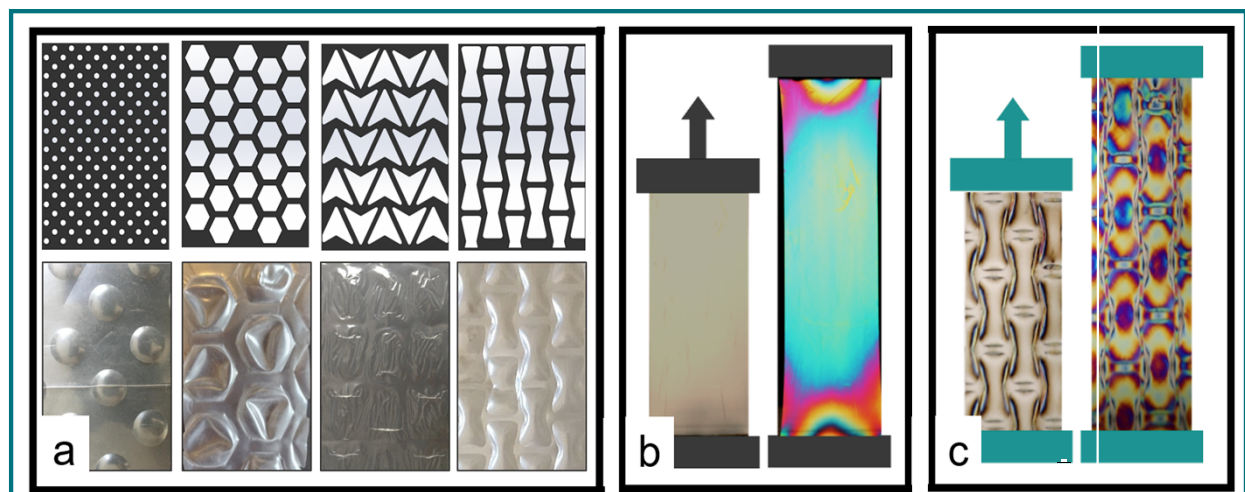


Fig. 2

a) different types of biomimetic structures and their application to films. The effect of these structures could be demonstrated during a tensile experiment adapted with polarized microscopy. b) shows the stress distribution of a film without a structure, and c) that of a structured film.



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RESEARCH FOCUS: polymeric nanocomposites, recycling of polymers, morphology analysis with X-ray scattering, advanced dynamic mechanical analysis

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