

techtexstil_innovationprize.2007_New Materials

+ FIBRE COMPOSITES WITH FOUR PLANT INSPIRATIONS

TECHNICAL PLANT STEM

The „Technical Plant Stem“ is light-weight and stable at the same time. Inspired by four biological models, a bionic fiber composite with amazing properties was developed.

Grass and horsetails are light-weight constructions from a mechanical point of view. With their hollow stems and thin culm walls they are surprisingly stable. If plants are regarded from the point of view of material science, plant axes can be considered composite materials. They are not made from a single homogeneous material but consist of various cells and tissues with different mechanical properties. In the field, plants are – in addition to gravity – subjected to large wind loads. Even with high bending loads, the tissues form a firm laminate and do not separate.

For the „Technical Plant Stem“, four biological models were inspirations. Several construction principles of nature were transferred and thus led to a completely new bionic product, which – with these parameter values – did not previously exist neither in nature nor in engineering. A structurally optimised fibre composite was developed, which is characterised by a combination of stability and light-weight.

R & D Partner

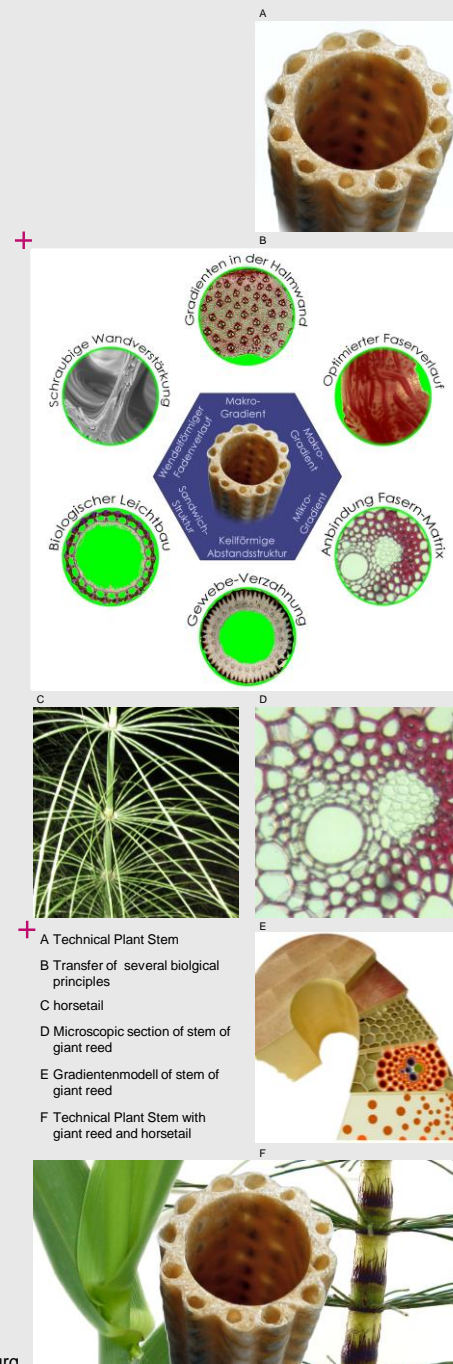
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+ A Technical Plant Stem
 B Transfer of several biological principles
 C horsetail
 D Microscopic section of stem of giant reed
 E Gradientmodell of stem of giant reed
 F Technical Plant Stem with giant reed and horsetail

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