DURO BAST

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Durable and resource-saving composite structural components based on newly pre-treated and processed native bast fibers

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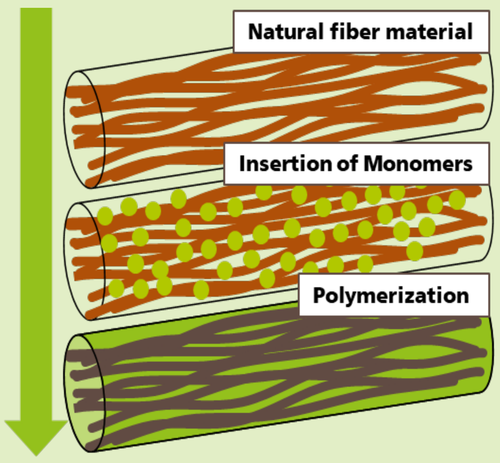
DuroBast focuses on the use of native bast fibres in the production of large scale composite structural components to be used in the production of thermoplastically formable, natural fibre-reinforced plastics. The project goals include the fibre selection, reduction of moisture absorption through pre- and post-treatment, production of natural and hybrid yarns, fabric production and the Identification of process parameters for the manufacturing of natural fiber reinforced thermoplastic composites.

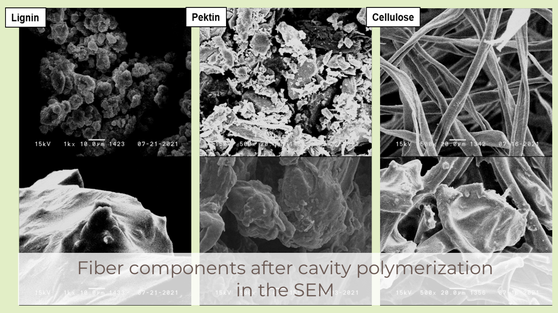
DuroBast will test the generated results in different applications such as automotive interior, bus bellows and snowboards.

Fiber Treatment

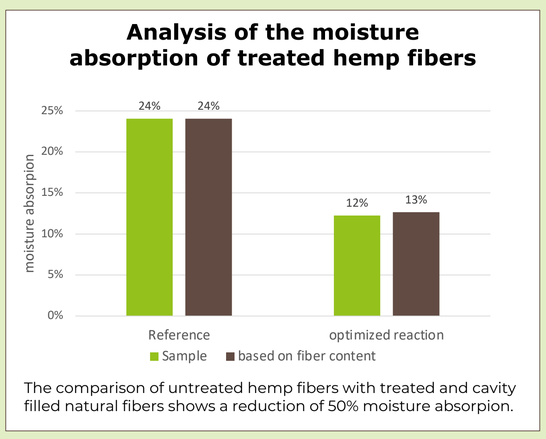
General approach of cavity polymerization



Compatibility of polymer with fiber components



Fiber components after cavity polymerization in the SEM



The comparison of untreated hemp fibers with treated and cavity filled natural fibers shows a reduction of 50% moisture absorpion.

Goals

- Determine access point possibilities for modification during fiber production.
- Reduce moisture absorption of natural hemp fibres.

Yarn Production

Drawing of Hemp Slivers

Forming Hemp Slivers

Goals

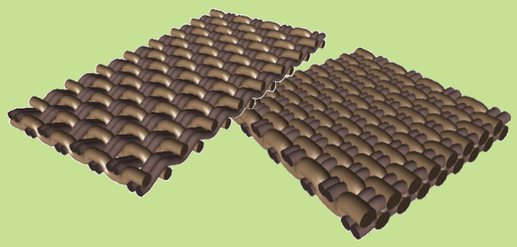
Determination of process parameters for spinning preparation, for the production of low-twist yarns from modified hemp fibers and unmodified rovings on a laboratory scale.

Production of Hemp Yarns

(98% h Sample 400 Tex Yarn emp, 2% PA)

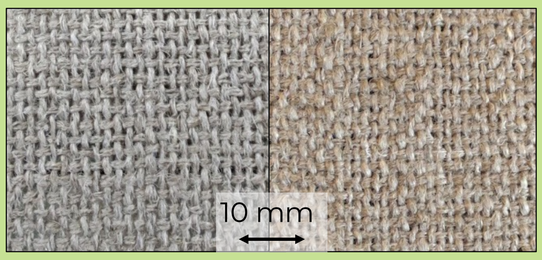
Fabric Production

Rendering of Various Textile Densities



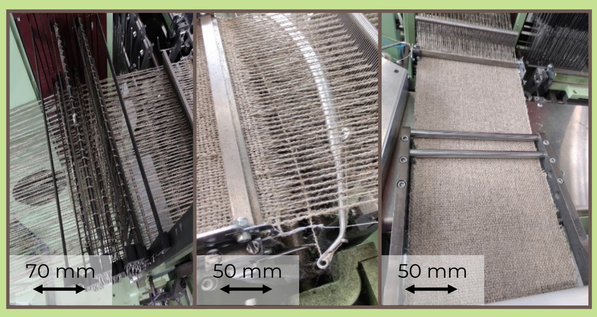
The rendering on the left is a plain weave with 5 warps and wefts per cm. The rendering on the right is 6 warps and wefts per cm.

Fabric Samples with Varying Fabric Weight



The sample on the left is a plain weave with 5 warps per cm and 4.6 fills per cm. The pattern on the right is 6 warps per cm and 4.4 picks per cm

Production of Fabric Samples



Samples were produced using a narrowband needle loom using four harnesses and a plain weave structure.

Goals

Determine the production parameters and characteristics of a hemp fabric to be used in fiber reinforced thermoplastic composites.

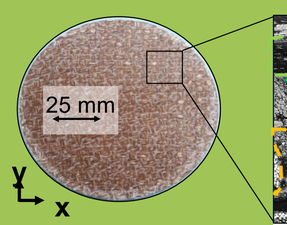
Consolidation Process

Goals

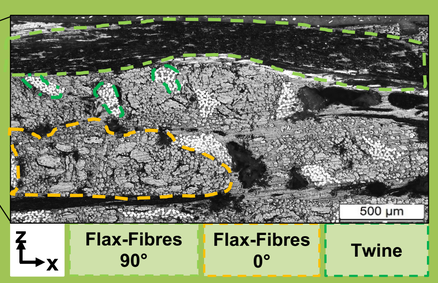
Identification of process Parameters for manufacturing of natural fiber reinforced thermoplastic composites.

Filmstack made of Flax-Fabric and PP-Film

Flax-PP Organic Sheet



Micro-ection of Flax-PP Organic Sheet



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