



Novel fibre value chains & ecosystem services from sustainable feedstocks

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Extraction of Hemp Fibres

Objective:

- A standardized process for producing technical fibres from hemp biomass already exists and is used by BAFA in the automotive industry.
- The process has the potential to generate valuable by-products, making use of residual biomass.
- These by-products can be used in the manufacturing of sustainable thermal insulation panels.

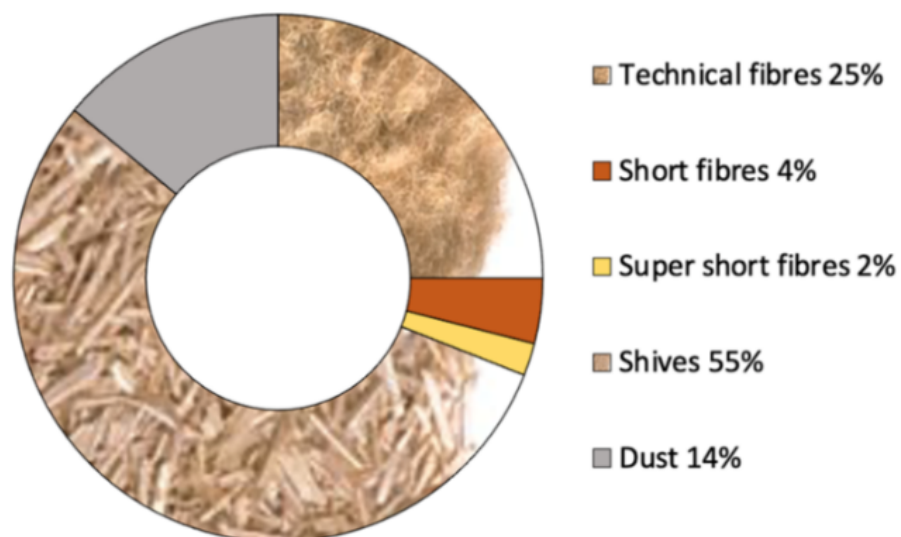
Equipment, materials and methodology

- BAFA's standard process for obtaining technical hemp fibres.
- Raw material: hemp straw consisting of stems with different degrees of retting (slightly retted or well retted).
- Impact of retting degree:
 - Higher retting makes the straw more brittle.
 - Reduction in the amount of woody parts (shives).
 - Less straw mass available in the field.

- Variation in the ratio between fibres and woody parts (shives) depending on retting duration.
- Higher degree of retting results in:
 - More fibres in relation to woody parts.
 - Improved mechanical decortication, facilitating processing.
 - Darker fibres due to lignin degradation.
 - Reduced time and energy required for decortication.
- Process adjustments according to retting degree:
 - Regulation of the fibre comb and fibre cleaner.
 - Adjustments in fineness and fibre length.



Details of yield



- **Yield estimation for a 1 ha hemp field** (planted with 1 tonne of hemp seed):
 - **Technical fibre yield** (after BAFA's mechanical decortication): 2000 kg.
 - **By-products:**
 - **Short fibres:** 320 kg.
 - **Super short fibres:** 160 kg.
- **Average yield for 1 ha of USO 31 hemp variety:**

- **Seeds:** 800 kg – 1000 kg.
- **Leaves:** 500 kg.
- **Stalks (straw):** 5000 kg – 8000 kg.

Preliminary Results

The technology and processing of stock from Cannabis sativa L. into fibres with the generation of super short fibres (fines) and fibres is already fully functional. The processing parameters are simply adjusted at the fibre cleaner and comber to address the degree of retting of the straws.

Partner of the month



BAFA Badische Naturfarbenaufbereitung GmbH (Managing Director: Bernd Frank) was founded in 1996, the year industrial hemp cultivation was re-legalized. As a link between agriculture and industry, BAFA was the first German hemp fiber processor to mechanically process local hemp straw into fibers and shives. BAFA is also actively involved in product developments made from fibers and shives in order to broaden the market for your products. BAFA made a significant contribution to the development and building approval of the thermal hemp mat, the first building-approved hemp insulation material in Germany. BAFA is also involved in the development of injection-mouldable hemp fiber PP pellets and a wide range of other applications.

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