

Sustainable Sleeping – Development of nonwoven-based insulating layers for sleeping bags

Objective

- Development of a biobased and vegan filling material (mainly based on viscose fibres)
- High insulating effect, bulking capacity and resilience
- Moisture management, washability, outdoor use
- Weight, pack size corresponding to the market
- Reasonable product price
- Wearing comfort, formability

Approach and results

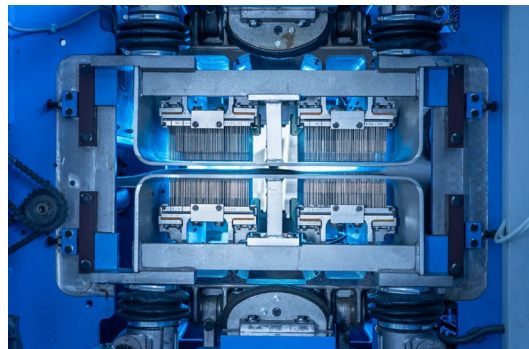
- Process development for web formation by carding and Airlaytechnology
- Web bonding by very smooth doublesided needle-punching and thermal airthrough bonding
- Using additional fibres with very low density and cavities such as Kapok
- Testing of textile-physical properties

The following properties were achieved:

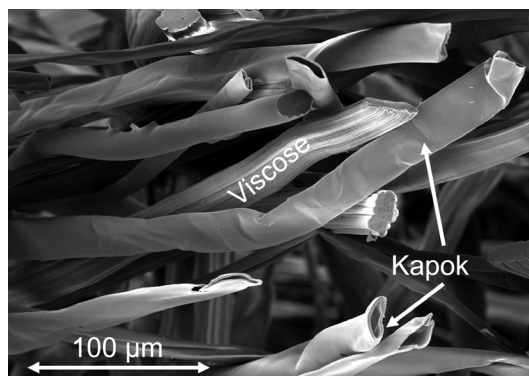
- Thickness of 4-5 mm with a 200 gsm fabric thanks to special consolidation process
- Thermal resistance increases significant with higher proportion of Kapok
- 30 % Kapok leads to highest protection class 3 according to EN 14058:2004 for protection against cool environments
- Vegan and biobased alternative to synthetic fibre fillings or down



Demonstrator sleeping bag (© Gruezi bag)



OUG needleloom (Dilo Machines GmbH) at STFI



SEM of needlepunched nonwoven made of Viscose, PLA/PBS and Kapok fibres

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The final report on this project is available on request.

Contact: Patrick Engel, M. Sc.

Phone: +49 371 5274-209

Email: patrick.engel@stfi.de

www.stfi.de

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