Sächsisches Textilforschungsinstitut e.V.

An-Institut der Technischen Universität Chemnitz

ZENTRUM FÜR TEXTILEN LEICHTBAU

Sustainable Sleeping

Development of nonwoven-based insulating layers for sleeping bags

Project aim:

development of marketable insulation layer that can be used in outdoor applications such as jackets, blankets and sleeping bags with following properties;

- bio-based and vegan filling material
- high insulating effect, bulking capacity or resilience
- moisture management, washability and outdoor use
- weight, pack size corresponding to the market
- reasonable product price, wearing comfort, formability

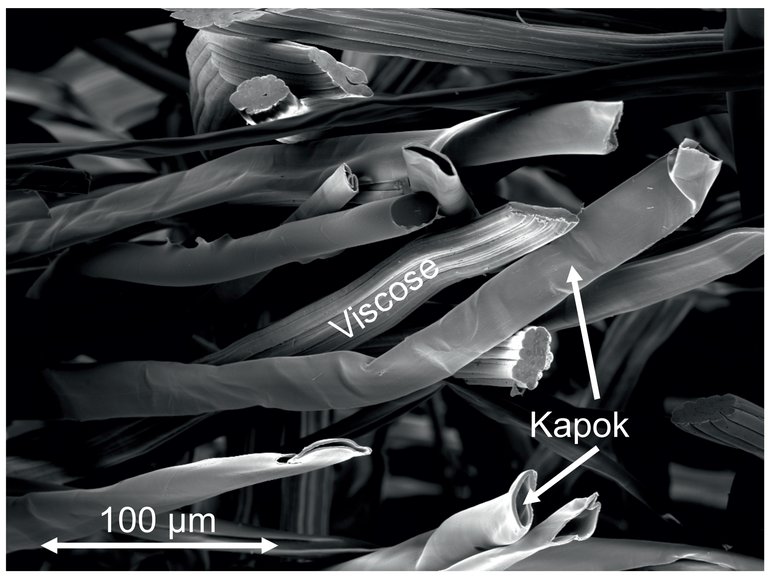


figure 1: SEM of needlepunched nonwoven made of Viscose, PLA/PBS and Kapok fibres

Approach:

- Process development for web formation by carding and Airlay-technology
- Web bonding by very smooth doublesided needle-punching (fig. 2) and thermal airthrough bonding
- Using additional fibres with very low density and cavities such as Kapok (as seen in the SEM, fig. 1)
- Testing of textile-physical properties

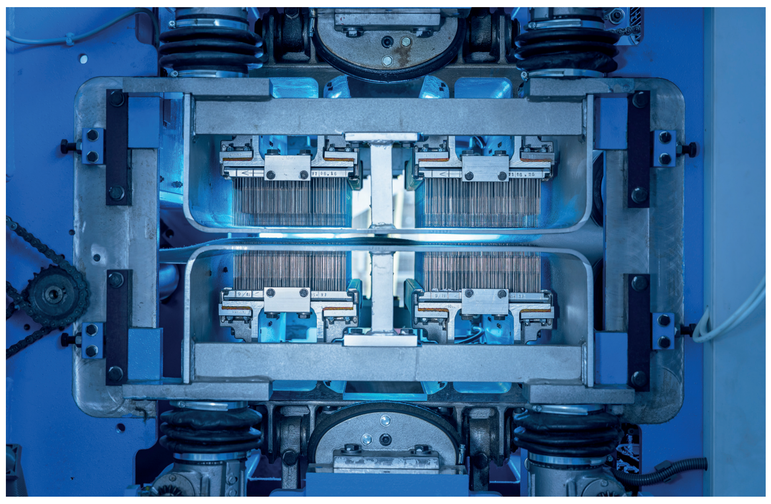
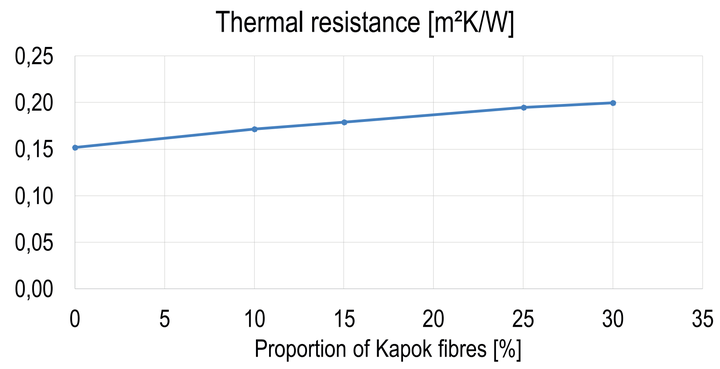


figure 2: OUG needleloom from DILO Machines in STFI technical centre
photo: ©STFI/Dirk Hanus

Results:

- 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 against cool environment (EN14058)



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