ALPAX OUTDOOR

Hochschule Niederrhein
University of Applied Sciences

Textil- und Bekleidungstechnik
Faculty of Textile and Clothing Technology

Alpax

Yarn-, fabric- and product development for outdoor clothing made of alpaca fibers

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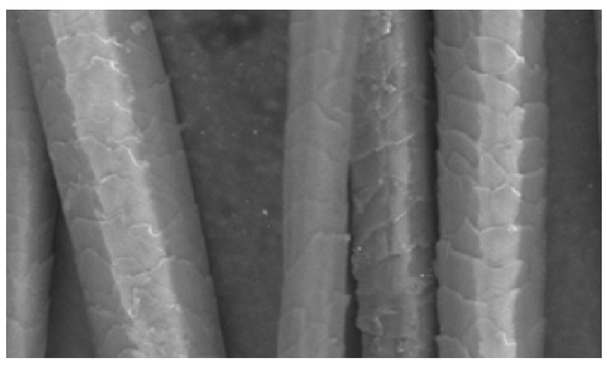
The aim of this research project was the development of yarns and knitwear made from alpaca fibers for sustainable and functional outdoor garments. A concept for a baselayer and a midlayer was created. Functional and technical features were developed for both garments, adapted to their purposes.

The fur of alpacas has the property to keep them warm in cold weather and cool in hot weather. Even after processing the alpaca hair into clothing, the principle of natural temperature equalization remains, which is a good prerequisite for outdoor clothing, e.g. for mountaineers.



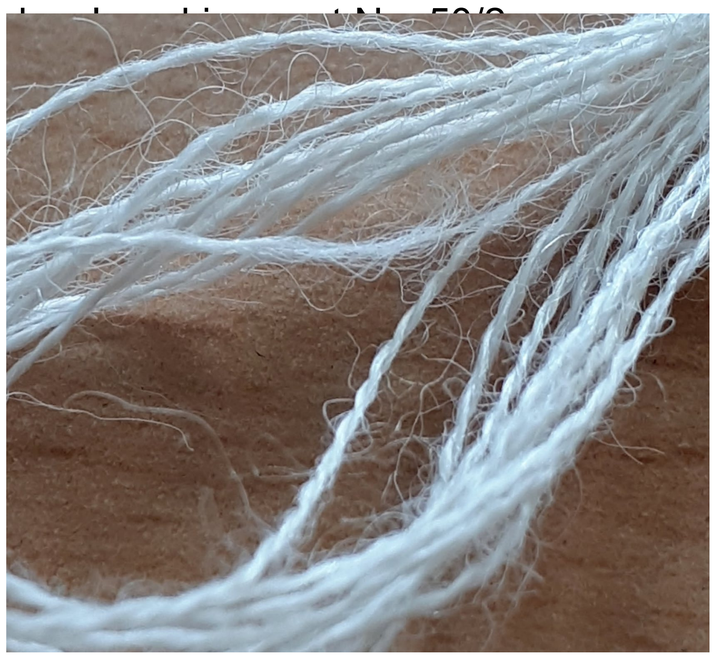
The fiber

Alpaca fibers are very light and soft and have antibacterial, breathable, heat-insulating and skin-friendly properties [1]. This makes them very suitable for outdoor applications. The fibers have a very smooth surface [2] and therefore very low fiber adhesion properties. This complicates the spinning process, so usually the fibers are blended with other materials. Different alpaca fiber types were investigated, and spinning trials carried out. The fibers used are certified according to the Responsible Alpaca Standard (RAS) standard.

The yarn

The challenge in the project was to produce fine yarns from 100% alpaca fibers for different product types. Finally, this was achieved with the finest fibers
(super baby alpaca).

Several yarns were developed in a yarn count of Nm 50. In addition, various twist variations have been



The fabric

Various knitting constructions have been developed on a circular and on a flat knitting machine. They are designed to support the functional properties of outdoor clothing in terms of breathability and heat insulation.

Due to the lower fiber adhesion properties, the knitwear doesn‘t felt, which makes it easily washable.

The functionality

In order to determine the resilience and suitability of the developed materials for outdoor use, various tests were carried out

The tests confirmed that the alpaca knitted fabric has higher air permeability, breathability, lower basis weight and higher abrasion resistance compared to merino wool. In addition, the alpaca knit is more thermally insulating after a wet finish.

Summary and Outlook

The results of this project show that alpaca fibers are an interesting option for functional outdoor sportswear applications. The development of sustainable and recyclable outdoor clothing made from 100% alpaca fibers is possible. The RAS certified fibers are thus a sustainable alternative to merino wool. In the follow-up project *Alpax 2*, the results will be further deepened and expanded.

References:
[1] Näsemann, Robin (Hg.), Leidenschaft Alpaka: Haltung, Zucht & Shows, Wuppertal: Show-Richter, **2020**.
[2] Freitag, Angelika, Warum Alpakas? Alpaca Royal Fiber, Ladbergen, **2016**.

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