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OrthoFlex – Development of a novel orthopedic built-in element for flexible movement in shoes

Problem / Motivation

- Restriction of the natural foot movement by many shoe models, in particular obstruction of the dorsal and plantar flexion (up and down movement) of the foot
- Consequences: long-term problems such as poor posture and foot, knee and back pain, leading to the need for orthopaedic aids such as insoles or custom-made shoes
- In terms of improved foot health: improvement of shoes to allow the feet to move as naturally as possible
- At the same time: maintaining the protective and stabilising function of shoes

Solution

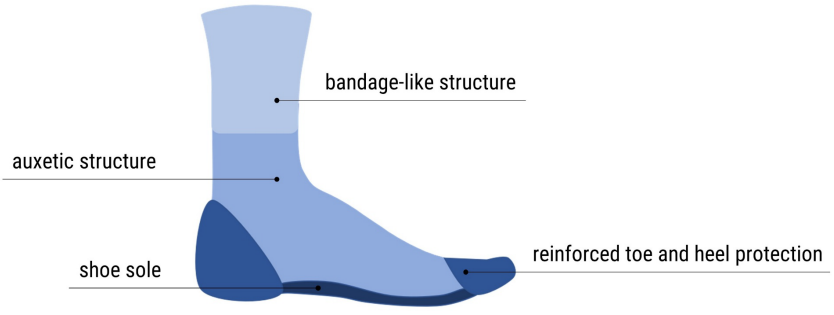
- Objective: development of a flexible built-in element that can be integrated into both orthopaedic and non-orthopaedic shoes
- Realisation using an auxetic structure consisting of a combination of a 3D print and a knitted fabric
- Iterative positioning of the novel structure and adaptation of the surrounding shoe elements such as tongue, lacing and sole
- Functionalisation to improve the protective and comfort properties

Project Launch

01/2025

Project Partner

Laufwerk Zwickau



Schematic representation: construction of shoes with orthopedic built-in element

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