

DiTex

Digital Technologies as Enabler of a Resource-efficient Circular Economy



Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)

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Workwear leads to enormous quantities of identical textiles. The logistics around workwear can be an optimal starting point for nearly closed-loop material flows.

Instead of buying business clothing, resource-efficient use of materials may be supported by the business model of textile rent/leasing. DiTex therefore tests and evaluates three circular textiles made of recycled fibres as well as circular business models during an eight month test phase. The aim is to generate transferable knowledge for application concerning quality, resource efficiencies and sustainability effects.

Circular product designs & tracking

Business shirt, polo shirt and bed linen are produced sustainably in this feasibility study. The product design already considers upcoming requirements for fibre regeneration.

In summer 2021, trial wearing starts at a selected police service (business shirt), rescue service (polo shirt) and in federal police accommodation (bed linen). Fixed points of distribution and return enable well-organised logistics. For precise tracking, the DiTex textiles receive an “intelligent label”. Material properties and durability will then be examined and extensively tested, including but not limited to laundry servicing and wearing tests.

The project aims for high-quality “closed-loop” recycling solutions by means of chemical fibre-to-fibre recycling.

A smart label enables accurate tracking.



First findings: sustainability benefits of multiple recyclable textiles made from recycled fibres

In September 2020, the first prototypes of the recyclable and leasable DiTex textiles were presented.

The overview life cycle assessments yield clear evidence for resource protection and sustainability advantages of the selected design concepts compared to conventional reference textiles. Particularly significant improvements in the water footprint and surface footprint will be gained by substituting cotton with recycled polyester (share in the business shirt: 38%, in the polo shirt: 100%) and recycled lyocell (share in the bed linen: 50%).

The sustainability assessment also shows that rebound mechanisms at product level, in the usage phase and over the entire life cycle may counteract possible resource efficiency gains. Various important factors such as resource and energy efficiency as well as minimal material waste are to be considered during fibre extraction, manufacturing and the recycling process.

Prerequisite for the avoidance of rebound effects is a complete substitution of virgin fibre textiles by qualitatively and functionally equivalent textiles made from recycled fibre materials. In addition, the following goods and services may not be offered at lower prices than their conventional counterparts: the circular textiles themselves, associated services, as well as textile raw materials and intermediates.



Textile yarn is also recyclable

Focus on industry and application

The Institute for Ecological Economy Research (IÖW) coordinates the network; manages the process- and cost analyses and conducts the market dialogues as well as the evaluation of the eight-month pilot phase. All partners are involved in the product design and market dialogues. WILHELM WEISHÄUPL e. K. and Dibella GmbH take over upscaling and test production of the textiles. As a service provider, circular.fashion UG contributes IT solutions and know-how. The Hohenstein Institut für Textilinnovation gGmbH and the Faculty of Textiles and Design at Reutlingen University are responsible for textile testing and the product specifications for the rental textiles. The ifeu – Institute for Energy and Environmental Research prepares overview Eco balances. As an associated partner, MEWA Textil-Service AG & Co. Management OHG supports the acquisition of large-scale consumers as test users of the textiles and the testing of the rental or leasing business model.

Central outcomes of the project: Preparation of a broad collection of materials offering the know-how required for a change to recyclable sustainable workwear.

Funding measure

Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)

As part of the FONA Field of action 6:
The circular economy – efficient use of raw materials, avoiding waste.

Project title

DiTex – Digital Technologies as Enabler of a Resource-efficient Circular Economy

Project duration

01.08.2019 – 31.07.2022

Funding reference number

033R228

Funding volume of the project

2.104.543 Euro

Internet

reziprok.produktkreislauf.de
www.ditex-kreislaufwirtschaft.de/english

Publisher and editorial office

Networking and transfer project “ReSSWInn”

Design

PM-GrafikDesign

Picture credits

P. 1: IÖW; Markus Hein/pixelio.de
P. 2: Bruno Glätsch/pixabay

Status

March 2021



Cover-Picture: Front Pilot Test: the project DiTex evaluates recyclable service clothing.

The project “DiTex” is funded within the funding measure “Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)”.

“ReziProK” is part of the research concept “Resource-efficient Circular Economy” of the Federal Ministry of Education and Research (BMBF) as part of the FONA Field of action 6: “The circular economy – efficient use of raw materials, avoiding waste” and supports projects that develop business models, design concepts or digital technologies for closed product cycles.

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