

# F<sup>3</sup>D PRINT

FABRICATION OF FUNCTIONAL  
& CUSTOM-FIT TEXTILES USING  
3D PRINTING BASED ON  
SCANNING TECHNOLOGY

## Background

The production of products with a higher added value opens a market in Europe for high-end functional or custom-fit products that will distinguish itself from the large-scale standard production in low wage countries. In addition to a focus on the functional aspect of products, there is now a growing demand for a higher level of comfort. In apparel, for example, there is an increasing demand for custom-fit products improving the wearer's comfort. The market also witnesses a high need of optimised products for medical and assistive applications with supporting or corrective parts.

One of the main challenges is to find a balance between functional performance, comfort and aesthetics. This is particularly the case for high-value apparel such as sportswear and workwear.

Current production technologies for custom-fit textiles require the production of a minimum quantity of pieces to make them profitable or will need several manual - expensive - production, assembly or adaptation steps.

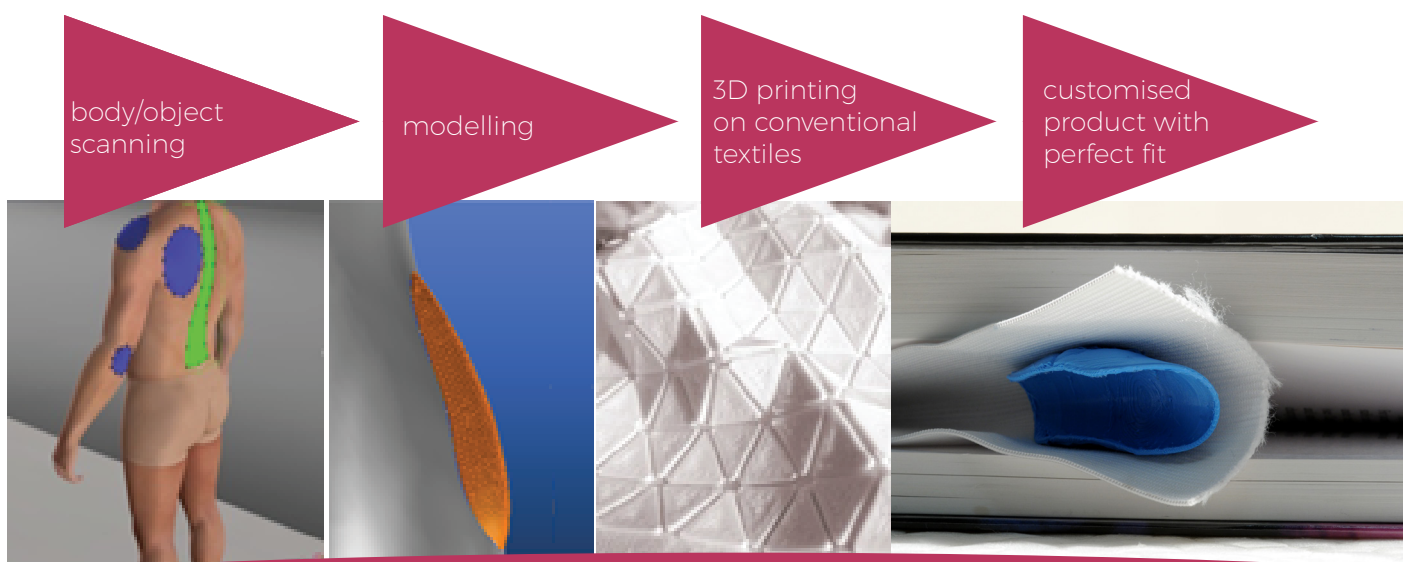
New and rapidly emerging technologies such as 3D printing and body scanning can be beneficial to the fabrication of perfectly fitting and functional textiles.

Therefore, it is necessary to configure the digital process from body scanning to the 3D printing of the required fitting parts on textiles.

## Goals

The F<sup>3</sup>D Print project intends to develop and evaluate a very innovative process that will take product customisation to the next level. The direct 3D printing of functional add-ons on textiles will introduce a more customer-specific approach.

In combination with the modern scanning technology, the whole creative process becomes a digital one resulting in a perfectly fitting product.



# F3D PRINT

FABRICATION OF FUNCTIONAL  
& CUSTOM-FIT TEXTILES USING  
3D PRINTING BASED ON  
SCANNING TECHNOLOGY

## Objectives

- Definition of materials for 3D printing of textile applications
- Development of new materials for 3D printing
- Development of filaments for FDM technology or of compounds for other extrusion-based 3D printing technologies
- Conversion of person-specific data from digital scanning into 3D CAD model for 3D printing
- Study of 3D printing mechanisms and factors determining good adhesion between printed polymers and textiles
- Development and identification of standards to test 3D printed polymer/textile composites
- Realisation of demonstrators

## Economic potential

The use of digital technologies for small series and fast changing production processes will lead to a more cost-effective process while enabling a local production.

The comparison between conventional production techniques and additive manufacturing (3D printing) shows that the benefits of additive manufacturing lie in lower unit production costs and processing time (from model to end-product through digital processes).

The F3DPrint project will develop a new methodology to generate a custom-fit profile (modelled from the scanned data) that can be used directly for 3D printing on textiles to create a customised product that fulfils the comfort needs of the customer against an acceptable price.

## Project consortium

Research tasks are performed by Centexbel and Hochschule Niederrhein (FTB) supported by Forschungskuratorium Textil (FKT). Both research centres are pioneers in exploring the possibilities of direct 3D printing on textiles. The expertise from previous research will be included into a new production concept that may result in a faster and economically more viable production of customised textile products.

An international user committee (UC) of the sportswear, workwear, orthopaedic and military textile industry and the compounding, polymer and filament production, will monitor the progress and the industrial relevance of the project. The UC will be informed on a regular basis on the progress and will have the opportunity to steer the project to short to medium term implementations.

the project will start on 01.01.2018 and end on 31.12.2019



Dr. Karen Deleersnyder  
Functional Thermoplastic Textiles  
Tel.: +32 9 243 82 48  
Email: kdl@centexbel.be



Dr. Michael Korgor  
Digital Textile Printing & Functional Surfaces  
Tel.: +49 2161 186 6099  
Email: michael.korgor@hs-niederrhein.de

