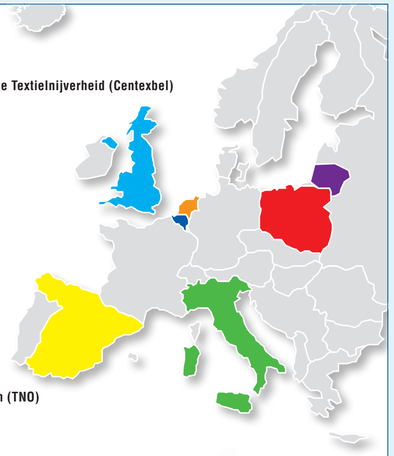
Digitex participants



Belgium
Wetenschappelijk en Technisch Centrum van de Belgische Textielnijverheid (Centexbel)
J. Sarens NV (Sarco)
Liebaert
Hogeschool Gent (CTO-TO2C)

Italy
Grado Zero Espace S.r.L.
IRIS DP S.r.L.
D'Appolonia SpA
Lamberti SpA

Lithuania
UAB Skalmantas

Netherlands
Ten Cate Advanced Textiles bv (TenCate)
B&B Corporate Knitwear VoF
University of Twente
Netherlands Organisation for Applied Scientific Research (TNO)
Saxion
Reden
AntWorks

Poland
CIM-mes Projekt S.P. z.o.o.
JPC S.P. z.o.o. (Jomex)
SKA Polska S.P. z.o.o.
Institute of Applied Optics
Politechnika University

Spain
Guantenor S.L.
Aitex

United Kingdom
Vexed Generation Ltd
Xennia Technology Ltd
Heriot-Watt University
Univerity of Manchester
Xaar PLC

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aitex
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gze grado zero espace
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Heriot Watt University
TO2C
IRIS DP
Jomex Protective Clothing
lamberti
liebaert Since 1887
reden research development nederland
sarco
Saxion
SKA Polska technology in action
Skalmantas
TenCate materials that make a difference
The University of Manchester
TNO
PŁ
University of Twente.
Vexed
Xaar
Xennia

Digitex

Realising reliable digital processing in the textiles industries

Digitex is funded under the EU Sixth Framework Programme
Contract no. IP 026740-2
www.digitex-conference.eu
www.digitex-eu.com

About Digitex

The Digitex initiative

Digitex – Digital Programmed Jetting of Fluids for Multifunctional Protective Textiles – is a joint research and innovation initiative of the European (high tech) textiles and clothing industries which started in May 2006 and was finalized in December 2010. The Digitex consortium is composed of 28 partner organizations representing large industries, SME's and research institutes from Belgium, Italy, Lithuania, the Netherlands, Poland, Spain and the United Kingdom. The project has been coordinated by TenCate. The Digitex project has developed technology – chemistry and engineering – that enables fabrics and garments to be 'digitally finished'.

Digital finishing uses technology evolved from inkjet printing to enable chemicals to be deposited and fixed on textiles in controllable quantities and prescribed locations. The application of different chemicals to the textiles can give the substrate (fabric) – and the garments or other products made from it – multiple functionalities and performance characteristics.

The new opportunities offered by the new digital finishing technology inspired a new generation of chemistry that will have a considerable impact on the process and the fuctionalities of textiles.

Project objectives

The main objective of the Digitex project was to develop new technologies based on inkjet technology that would take the textile industry to a higher level in terms of new production methods and technologies, cleaner and more efficient processes and enabling new and more advanced textile functionalities and products. The main research activities focused on the development of proof of concepts and demonstrators for digitally printed textile functionalities and digital coating and dyeing processes. Whereby there was a strong focus on understanding and modeling the complex interaction of inkjet fluids with textile substrates and the influence of post and pre treatments in order to help the research on and the development of digitally printed textile functionalities and digital finishing processes.

Project achievements

In the four and a half year of activities, the Digitex project delivered a wide range of results in the form of scientific publications, papers for conferences, lab scale demonstrators and proof of concepts of textile functionalities and processes and computer models and software tools to simulate processes conditions and print results.

The breakthrough innovation in digital printing, enables the production of new functional textile materials (smart textiles, innovative technical textiles) with functionalities and qualities that could not be produced in the traditional way enabling the production of a complete new generation of smart textiles.

The results achieved in the Digitex project relate to product and process applications and computer aided modeling and tools

Product related:

- Anti bacterial
- Chromic functionalities
- Controlled release functions
- Single sided hydrophobic functions
- Functional and conceptual garments

Process related:

- Digital dyeing
- Digital UV coatings
- Substrate instability and deformation monitoring
- Substrate intake quality monitoring
- Printhead monitoring

Modeling:

- Drop substrate interaction tool
- Drying and curing tools
- Substrate simulation

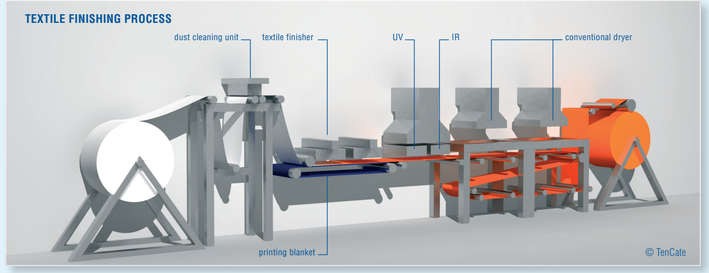
Digital technology: *a new era for textile finishing*

Controllable quantities

Digital finishing technology allows multiple and locatable fluids to be applied to a substrate in controllable quantities. Moreover it is altering textile economics in terms of production speeds, on demand and therefore mass customised production. It is unleashing the transformation of the textile sector to a knowledge intensive industry able to differentiate by adding value to the final products.

Abilities

Digital finishing has the ability of the exact localisation and patterning of functionalities in and onto the 3D matrix of a textile substrate. It enables the integration of existing and – near and far – future functionalities, like advanced thermo and hydro regulation, sensors, actuating and controlled release functions but enables also new approaches towards existing textile functionalities. This can be based on nano-technology or multifunctional materials.



Breakthrough technology

The developed breakthrough technology is based on a new, eco-friendly, flexible and reliable process, that enables to micro-dispose small quantities of multi-functional fluids – like inks and coatings – over textile substrates on demand by means of multi-nozzle jets technology in a continuous – and speedy – process.

This new way of printing and coating (high tech) textiles and other related materials takes place at atmospheric conditions and controlled room temperature in order to replace wet and high temperature conventional processes.

The impact: *towards smart textiles and green factories*

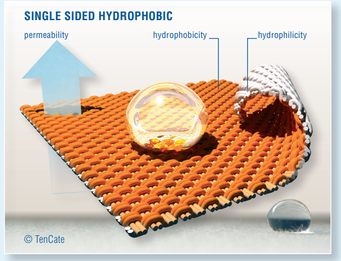
Digital processing

Digitex contributes to the impact that digital technology will deliver to the textile industry in the near and far future. This innovative technological step forward will have a broad social impact in terms of increased safety and protection in hazardous environments with more attention to the needs of specific users, e.g. non-toxicity. Thanks to the complete freedom of design mass customization in (high tech) textiles is a fact. Computer designed images are directly connected to the digital industrial printers.

Digital processing has also a considerable impact on the environment when compared to traditional wet processes: reduction of up to 90 percent of wet chemistry; up to 80 percent of process water consumption; and up to 80 percent of energy consumption. Moreover the industry is also able to concentrate on (more) sustainable fluids, like water based inks, eco solvent based inks, and UV curing inks.

PPE market

The development of new functionalities opens a complete new route for functionalization of personal protective equipment (PPE), such as workwear, enabling increased comfort and protection.



Technological impact

- Using single drops as the building blocks for products
- Cleaner production processes
- More efficient processes in terms of material and energy consumption
- Moving from analogue to digital processes
- Higher levels of process automation
- Digital data sharing
- More efficient and better quality control

Economical impact

- Lower production costs: savings in terms of process water, energy and wet chemistry
- Enabling new business models with high added value
- Shorter production runs
- Higher productivity
- Higher flexibility
- Better inventory management
- Enabling (mass) customization