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www.texshield-project.eu

Project partners:

sampaş nanoteknoloji

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON

CTF2000 flame retardants & chemical specialities

HoGent

Panaz® Innovation in contract fabrics

DECCA

techtera Technical Textiles Rhône-Alpes

unitex

TWI

EVA COMMERCE®

nw texnet advanced flexible materials

UPtex

Reduced fluorine content oil- and water-repellent treatments for technical textiles

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TEXSHIELD is a project supported by funding from the European Union's Seventh Framework Programme. The project features a consortium of companies from across Europe including four associations who represent hundreds of potential members that can benefit from the work, five SMEs, who represent knowledge of markets and trends, and three research organisations - TWI from the UK, INSA LYON from France and University College of Gent in Belgium.

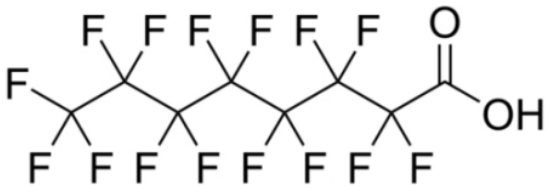
Functional textiles require superior stain and water repellency

Introduction

Textiles in applications such as personal protection, sportswear and furniture, for example, use the properties of fluorocarbons to provide the water and stain repellency required of these demanding applications. The fluorocarbons used are based on an eight-carbon chain and are often referred to as PFOS or PFOA.

Such materials are harmful and are known to accumulate in the environment. Consequently the Environmental Protection Agency has introduced a significant new use rule to restrict these materials, impacting their use and availability for textile applications.

The TEXSHIELD programme aims to provide the European textile market with alternative low-VOC material sets to replace the C8 fluorocarbons whilst maintaining performance in terms of repellency and durability.

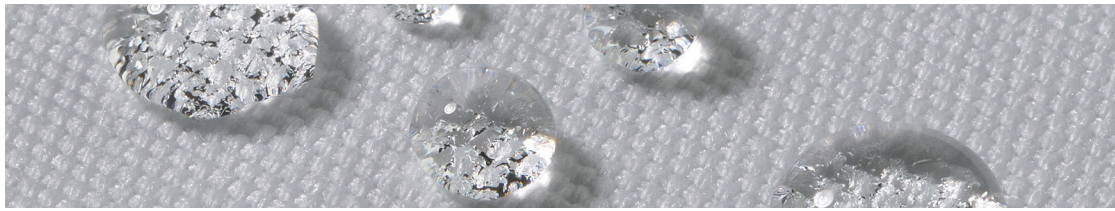


Structure of a C8 fluorocarbon, perfluorooctanoic acid or PFOA

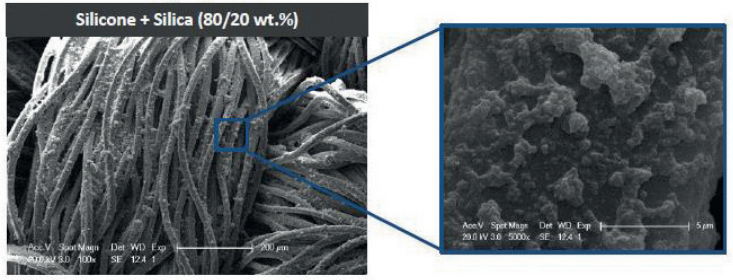
Approach

Research partners are investigating a number of different routes to achieve the goal. The materials that are being developed use a combination of multi-scale structure and surface energy to control repellency performance, including:

- Optimisation of commercially available products and processes
  - coatings based on C6 and C4 fluorocarbons, modified topography and 100% solid solutions
  - UV and plasma curing to reduce energy and material consumption
- Development of novel, reduced-fluorine-content chemicals
  - water based siloxane systems with multi-scale silica functionalised with novel low fluorine content
- Development of fluorine-free treatments
  - novel coating solutions based on multi-scaled particles with oil and water repellent functionality, bonded directly to the textile surface



Cotton fabric treated with a TEXSHIELD product



Multi-scale texture of a TEXSHIELD product on a fabric weave