

Stain Protection in Performance Apparel: Striking a Balance Between Functionality and Sustainability

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Abstracts

Stain protection is a key functional feature of performance apparel—especially medical clothing and industrial workwear where it is important to prevent spills which could potentially cause harm. However, stain resistance is also in demand for everyday wear. Stain repellent treatments minimise the need to launder and dry clean garments, and a combination of stain resistance, wrinkle resistance and anti-odour treatments helps to keep clothes looking fresher for longer. But several stain repellent treatments are based on fluorocarbons—whose manufacture can result in the generation of chemicals which may have adverse effects on the environment and on human health. This has prompted several companies to invest in innovation and the development of treatments which are environmentally sustainable without compromising on performance. This report provides a wealth of information on stain repellent treatments, applications of stain repellent clothing, and developments in stain protection technologies. The report also features information on: the market for stain repellent clothing; the properties of stain repellent materials; the benefits of stain protection; methods used to achieve stain repellency; materials and technologies used for stain protection in textiles; innovations in stain repellent clothing; and the outlook for the stain protection market.

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Contribution to environmental sustainability
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Oleophobicity
Superamphiphobicity

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Stain protection in performance apparel

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AATCC TM79-2014, Absorbency of Textiles

AATCC TM118-2013, Oil Repellency: Hydrocarbon Resistance Test

AATCC TM130-2015, Soil Release: Oily Stain Release Method

AATCC TM193-2012, Aqueous Liquid Repellency: Water/Alcohol Solution Resistance Test

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Albert-Ludwig-Universität Freiberg (university of Freiburg): self-repairing material

Chemours: Teflon

Teflon EcoElite

Columbia Sportswear: Omni-Shield

Dropel Fabrics: DropelTech

Harvard John A Paulson School of Engineering and Applied Sciences (SEAS) and the Wyss

Institute for Biologically Inspired Engineering at Harvard University: slippery liquid infused porous surfaces

HeiQ: HeiQ Eco Dry

Institute of Textiles and Clothing (ITC) at The Hong Kong Polytechnic University: fabric modelled on the microstructures of aquatic bird feathers

MIT: superhydrophobic material modelled on nasturtium leaves and morpho butterfly wings

Nanotex: Aquapel

Nanotex: Releases Stains

Nanotex: Resists Spills

Nanotex: Resists Spills & Releases Stains

POSTECH: environmentally friendly superhydrophobic coating made with salt particles

RMIT University: textile which degrades organic matter when exposed to light

Stain protection in performance apparel

Schoeller: 3XDRY Bio and ecorepel Bio

Schoeller: NanoSphere

University of Michigan: durable, spray-on coating with self-healing and superhydrophobic properties

W L Gore & Associates (Gore): fabrics with durable water repellent (DWR) treatments which are free from perfluorinated compounds (PFCs)

INNOVATIONS IN STAIN REPELLENT CLOTHING

Ably Apparel: Ably

Labfresh: shirts with stain repellent, anti-odour and anti-wrinkle properties

ODO: jeans which are resistant to odours and repel stains

Old Navy: Stay White jeans

Threadsmiths: the Cavalier

Vardama: stain repellent men's wear

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