

# Cell Solution® PROTECTION

PATENTED GERMAN FIBRE TECHNOLOGY 



## Botanic Fiber

Cell Solution® Protection fibers are natural cellulosic manmade fibers. The main raw material is wood pulp from non-endangered trees, and the additive paraffin is refined plant oil.

## Functionality

Cell Solution® Protection fibers provide effective and durable protection against insects - such as ticks and mosquitoes. Via direct spinning, the insect repellent permethrin is embedded in the Cell Solution® fiber core and migrates to the fiber surface in a tightly controlled manner. The patented technology ensures that a small, but just enough amount of permethrin is diffused from the inner of the Protection fiber to the surface. The direct contact with high concentrations of active ingredients for eg: In a coating is avoided because the stored permethrin from the interior of the Cell Solution® Protection fiber is resupplied in small doses. Due to the limited availability of the active substance at the fiber's surface it is avoided that the active substance is lost rapidly by environmental influences.

Impregnation by dipping, spraying or even covering of polymer-insecticide-blends on the fabric's surface give long-term permanent anti-insecticide activity at very high concentrations, only.

## Permethrin

Permethrin is an insecticide in the Pyrethroid family, which are synthetic chemicals that act like natural extracts from the chrysanthemum flower. Permethrin affects the nervous system in insects, causing muscle spasms, paralysis and eventually death. It does not however affect humans and most other mammals. In the soil permethrin is broken down by microorganisms and sunlight. WHO recommend permethrin (C<sub>21</sub>H<sub>20</sub>Cl<sub>2</sub>O<sub>3</sub>, CAS-Number: 52645-53-1) in the protection of **Malaria** and **TBE** (Tick Bone Encephalitis found in Scandinavia and Central/Eastern Europe), both of which are serious diseases.

## Moisture control

The structure of the cellulosic fiber results in an optimal body climate because of the fiber's excellent moisture absorption. Synthetic fibers do not absorb any moisture.

## Additional features

Cell Solution® protection fibers can be easily processed in to textiles and have consistent dyeability when following the recommended processing/finishing method.

Cell Solution® Protection fibers are long lasting with a high washing stability, tested to perform through the expected lifetime of the textile.

Textiles containing up to 20% Cell Solution® Protection fibers conform to OekoTex class 1 (textiles for baby clothing).

Fabrics with Cell Solution® Protection have passed - after 100 wash cycles - the rigorous guidelines "TL 8305-0331" stipulated by the German Armed Forces on:

- Yellow-fever mosquitoes (*Aedes aegypti*)
- Silverfishes (*Lepisma saccharia*)
- Tick nymphs (*Ixodes ricinus*)

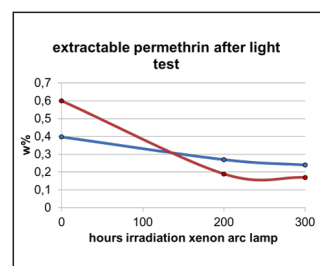
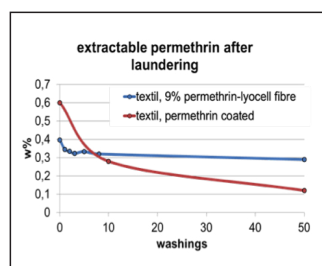
## Range of application

Protective textiles against blood sucking and other insects.

- MALARIA transmitting mosquitoes
- TBE/Tick Borne Encephalitis transmitting ticks
- Dustmites • Bedbugs • Moth

## Suggested products

- Garments for forest workers
- Textiles and garments for the defense forces
- Hiking clothing • Professional underwear • Gloves • Socks
- Tents • Mosquito nets • Floor carpets • Curtains
- Protective layer inside mattresses
- Bedsheets (dustmites, bedbugs)



## Cell Solution® PROTECTION - 2,3 dtex, 38 mm

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### Data sheet

Cellulose fibre with integrated insect protection produced according to the Lyocell - process

#### Fibre composition in conditioned state (given in % by weight):

Cellulose	>61%
Permethrin (cis/trans: 40:60 and 25:75)	8-10%
Stabilized paraffin (defined melting point)	app. 16 %
Organically modified mineral (layered silicate)	5,5 - 6,5 %
Finisher content	<0,5 %
Moisture	<10 %

Titre	dtex	2,3 ± 10%
Tenacity, conditioned	cN/tex	>21
Tenacity, wet	cN/tex	>17
Elongation, conditioned	%	12 - 15
Elongation, wet	%	12 - 15
Loop tenacity	cN/tex	7 - 9
Wet modulus	cN/tex	≥110
Whiteness		17 - 30
Staple length	mm	38 ±10%
Melting point (peak)		30°C/85°F
Thermal decomposition		>175°C/350°F
Ignition point		>200°C/390°F

Due to the large amount of n-paraffin in the fiber, longer exposure of the product in dry state to temperatures above 100°C/210°F has to be avoided or will result in vaporizing of paraffin.