

# E-Clean



# Evolution of Nanotex Repellency

## C8

### Fluorocarbon based

- Trace amounts of PFOA exist
- Unintended by-product of manufacturing process.

## C6

### Fluorocarbon based

- PFOA undetectable
- Unmeasurable trace amounts may exist.

## Aquapel (C0)

### Fluorocarbon free

- PFAS free
- PFOA/PFOS is non-existent.

## E-Clean (C0)

### Fluorocarbon free

- PFAS free
- PFOA/PFOS is non-existent.
- **Enhanced stain resistance**

# C0 Repellent Technology Features

## **ECOLOGICAL**

- PFAS free/ PFOA free/PFOS free
- Improved drying rate in the dryer saves energy
- Repel water based liquid stains

## **EFFICIENT**

- Maintains moisture vapor transfer
- Maintains air permeability



**E**asy to **Clean**

**E**co-friendly to **Clean**

**E**conomical to **Clean**

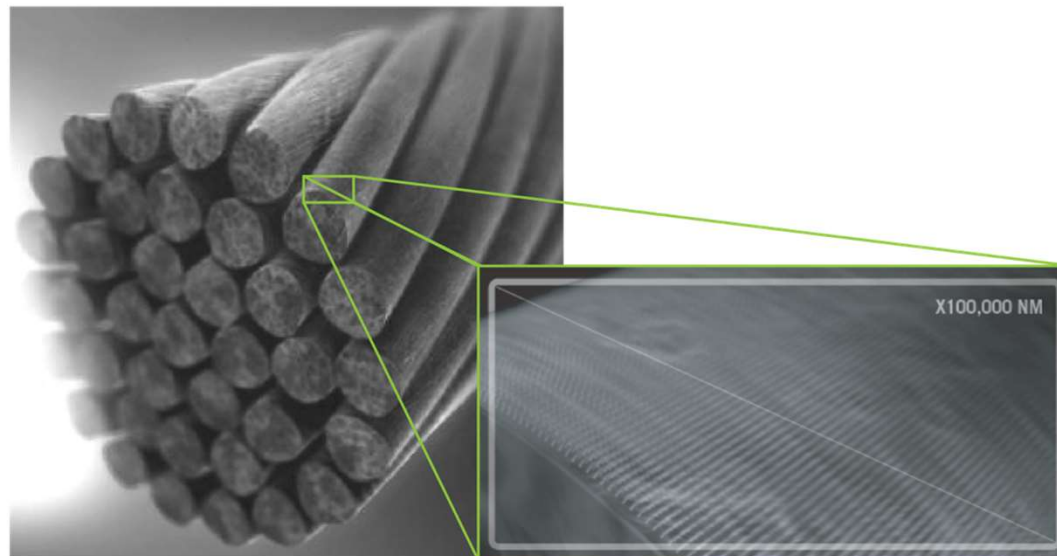
# What is Nanotex E-Clean?

**E-Clean** is a **PFAS-Free** Nanotex technology with the water **repellency** and **durability** of Nanotex Aquapel plus enhanced **stain resistance** performance.



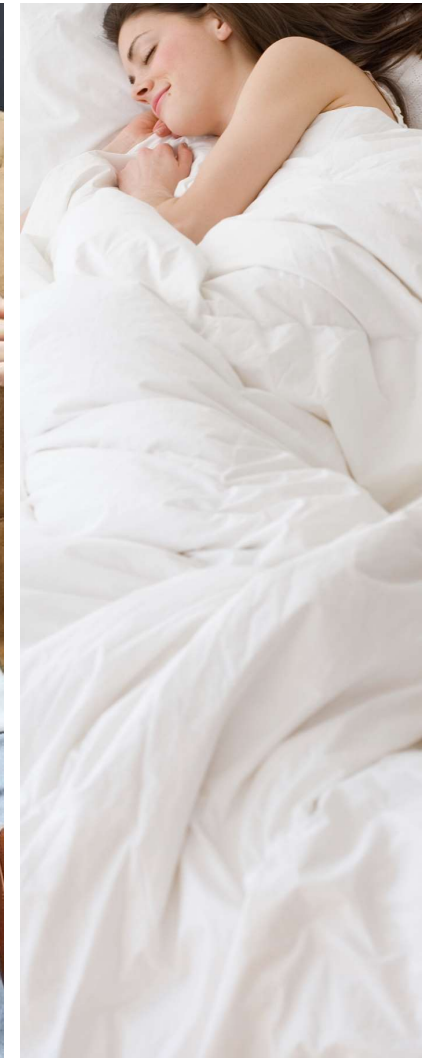
## TECHNOLOGY:

Replaces the fluorocarbon polymer chain with a hydrocarbon polymer chain capable of providing comparable performance in **eco-friendly manner** (product cannot break down into PFOA/PFOS).



# Benefits of E-Clean

- Stain removal before washing, keep the clean all day.
- Saves energy and water in washing.
- CO chemical used which is eco-friendly in apparel production & usage.



# End Uses

## Engineered to work on:

- Cotton
- Polyester
- Nylon

## End Uses Include:

- Outerwear
- Outdoor apparel
- Casual apparel
- Swimwear
- Basic bedding





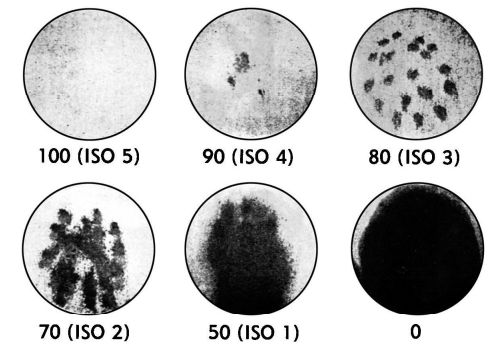
# Spray Rating (AATCC 22)

Water sprayed against the taut surface of a test specimen under controlled conditions produces a wetted pattern whose size depends on the relative repellency of the fabric.



Evaluation is accomplished by comparing the wetted pattern with pictures on a standard chart.

## STANDARD SPRAY TEST RATINGS

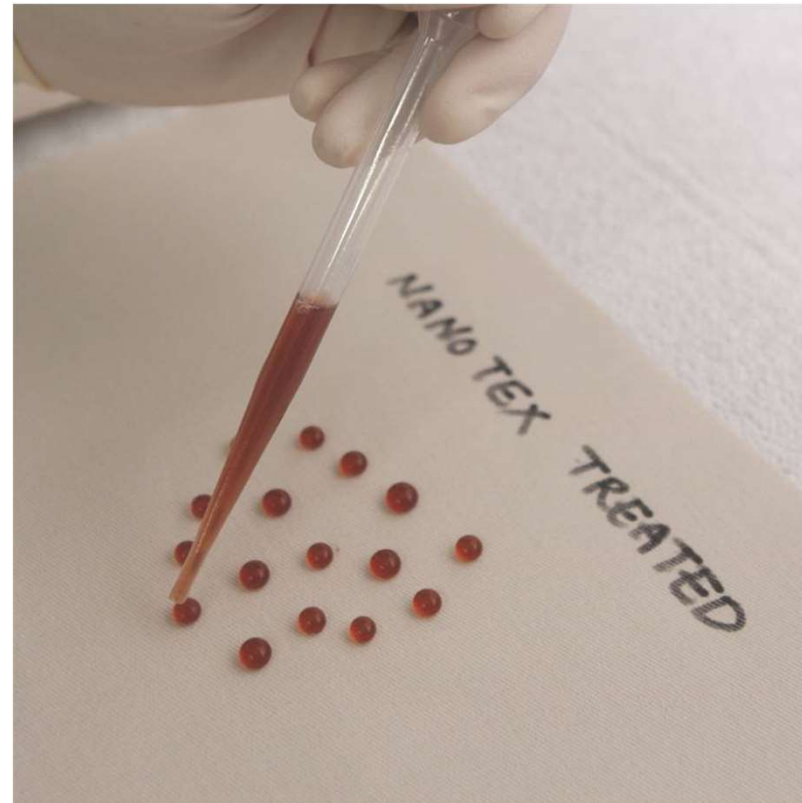


- |   |  |
|---|--|
| <b>100</b> - NO STICKING OR WETTING OF UPPER SURFACE.           | <b>70</b> - PARTIAL WETTING OF WHOLE OF UPPER SURFACE.         |
| <b>90</b> - SLIGHT RANDOM STICKING OR WETTING OF UPPER SURFACE. | <b>50</b> - COMPLETE WETTING OF WHOLE OF UPPER SURFACE.        |
| <b>80</b> - WETTING OF UPPER SURFACE AT SPRAY POINTS.           | <b>0</b> - COMPLETE WETTING OF WHOLE UPPER AND LOWER SURFACES. |

COLORLED WATER USED FOR PHOTOGRAPHIC EFFECT.

# Water/ Alcohol Rating (AATCC 193)

Drops of standard test liquids, consisting of a selected series of water/alcohol solutions with varying surface tensions, are placed on the fabric surface and observed for wetting, wicking and contact angle.



## GRADING EXAMPLES



- A. Passes; clear well-round drop
- B. Borderline pass; rounding drop with partial darkening
- C. Fails; wicking apparent and/or complete wetting
- D. Fails; complete wetting

## The development of C0 E-Clean

Fabric (HK23-0181): :

SRSW050-1A 90% polyester dyed twill, Black / Grey 195gsm



The test results of water and liquid repellency of lab trial fabrics

		<b>E-Clean Treated</b>	
<b>Washing Cycles</b>	Fabric color	Black	Grey
<b>0X</b>	Spray (AATCC 22)	100	100
	W/A (AATCC 193)	4.0	4.0
<b>20X</b>	Spray (AATCC 22)	80	80
	W/A (AATCC 193)	3.0	3.0

The fabric critical surface tension represented by the W/A test level

W/A Test Level	Standard Test Liquid	Surface Tension(dynes/cm)
1	98:2/Water:Isopropyl	59.0
2	95:5/Water:Isopropyl	50.0
3	90:10/Water:Isopropyl	42.0
4	80:20/Water:Isopropyl	33.0

The surface tension of some liquids

Standard Test Liquid	Surface Tension dynes/cm	Tested Liquid	Surface Tension dynes/cm
Coca-Cola	72.9	Soybean Oil	41.4
Distilled Water	72.8	Peanut Oil	34
Kool Aid	72.5	Olive Oil	32
Fruit Punch	63.7	Mazola Corn Oil	31
Red Wine	45		

# Results of Lab trial



The test results of spot clean of E-Clean treated fabrics (Internal test method)—represent stains resistance.

		E-Clean Treated	
Washing Cycles	Fabric color	Black	Grey
0X	Ketchup	4.5	4.5
	Coffee	4.5	4.5
	Mustard	4.5	4.5
	Dark Soy Sauce	4.5	4.5
	Red Wine	4.5	4.5
	Chocolate Syrup	4.5	4.5
20X	Ketchup	4.5	4.5
	Coffee	4.5	4.5
	Mustard	4.5	4.5
	Dark Soy Sauce	4.5	4.5
	Red Wine	4.5	4.5
	Chocolate Syrup	4.5	4.5

# Results of Lab trial

The test results of stain release of E-Clean treated fabrics (AATCC 130 modified)—represent cleanability of fabrics

		E-Clean Treated	
Washing Cycles	Fabric color	Black	Grey
<b>0X</b>	Ketchup	4.5	4.5
	Coffee	4.5	4.5
	Mustard	4.5	4.0
	Dark Soy Sauce	4.5	4.5
	Red Wine	4.5	4.5
	Chocolate Syrup	4.5	4.0
<b>20X</b>	Ketchup	4.5	4.5
	Coffee	4.5	4.5
	Mustard	4.0	3.5
	Dark Soy Sauce	4.5	4.5
	Red Wine	4.5	4.5
	Chocolate Syrup	4.5	4.0

# The Recommended Performance specification of E-Clean

TEST PERFORMED	REQUIREMENT	TEST METHOD
Water repellency: Spray test	0X, 90 20X, 70	AATCC 22
Aqueous liquid repellency	0X, 3.5-4.0 20X, 2.5-3.0	AATCC 193
Spot Clean (option)	0X, 4.0 20X, 3.0	Inhouse method Test Procedure: 1. Apply a few drops of stains, allow stain to sit on fabric for 1 hour; 2. Clean the stain with dry tissue; if stains still observed, clean with damp cloth and then scrub with a brush with 1% Tide detergent added if necessary. 3. Evaluate rating with stain replica for AATCC 130, after drying fabric and conditioning for 4 hours. 4. Stains: Chocolate syrup, Ketchup, Coffee, Dark soy sauce, Mustard and Red wine.
Stain Release (option)	0X, 4.0 for daily stains  20X, 3.0 for daily stains,	AATCC 130 modified by changing stains. Daily apparel stains: Chocolate syrup, Ketchup, Coffee, Dark soy sauce, Mustard and Red wine.