



FREQUENTLY ASKED QUESTIONS (FAQs)

What are the process parameters for properly treating fabric with EverShield?

EverShield is applied to fabric in a textile finishing process at a mill. It is applied using the dip, pad and dry method. EverShield is diluted with water and is pumped into a bath. Fabric runs through the bath, through a padder, and then through an oven. The rolls of the padder subject the fabric dipped in EverShield to significant pressure, squeezing the extra liquid from the fabric. The oven dries the fabric and cures it, binding the chemistry to the base fabric. Drying will depend on oven temperature, fabric weight and wet pick-up. After the fabric has dried of excess water, the surface of the fabric should reach at least 302-320 °F (150-160 °C) for a minimum of 30-90 seconds to allow for the EverShield to properly cure. If unable to measure fabric surface temperature, a good recommendation is a curing cycle of 320-340 °F (160-170 °C) for 60-120 seconds.

What is wet pick-up (WPU)?

Wet pick-up is the amount of liquid absorbed by a fabric after it has been dipped and padded as a percentage of the weight of the dry fabric. For example, if the fabric weighs 10 oz/yd² dry, and absorbs 5 oz/yd² of liquid after being dipped and padded, weighing a total of 15 oz/yd², the wet pickup is 50%. Wet pick-up is influenced by the fabric material, weave and weight in addition to the pad pressure. Pad pressure is typically 40 psi (2.76 bar) and the wet pick up for fabrics based in nylon, cotton, polyester and their blends has ranged from approximately 50 to 120%.

What is dry pick-up (DPU)?

Dry pick-up is the percent of the weight added to the fabric after it has been treated with EverShield and cured to the original dry weight. For example, if a fabric before treatment weighs 5.0 oz/yd², and after it has been treated and cured, weighs 5.1 oz/yd², then the dry pick-up is $0.1/5 = 2\%$.

How is EverShield affected by ultra-violet light (UV)?

EverShield applied to NYCO (camouflage) has been subjected to 500 hours of QUV testing. Both the treated and untreated fabric showed equivalent yellowing. The omniphobic performance of the treated fabric did not diminish.

What is the standard wash test used for EverShield-treated fabric?

- The wash test is based on the AATCC 135 test:
 - Use enough ballast to make a 1.8 kg load
 - Use 66 g of Tide Free and Gentle or AATCC Reference Detergent with 18 gal water in every load
 - Settings: Large Load, Cold Water Wash, Cold Water Rinse, Normal
 - Dry in commercial dryer on highest heat setting

Can EverShield-treated fabric be ironed?

Ironing fabric treated with EverShield is not a problem.

How well does EverShield stand up to acids/bases?

EverShield should perform well against acids and bases, since they are water-based. However, it is recommended that testing is performed to determine if the performance of a specific fabric treated with EverShield is satisfactory for the end-user.

How does EverShield affect the air permeability of fabric?

The difference in air permeability between untreated and EverShield-treated NYCO (50/50 nylon cotton) is minimal, between 1% to 2%. This test was conducted by the military on the uniforms treated with EverShield.

Can you give me the suggested levels (amounts) of EverShield for my application so I can calculate approximate costs?

The fabric would need to be treated in a lab in order to determine the wet pick-up. Then, the cost per square yard can be estimated. The cost can vary with the fabric and the process. The padder pressure, oven temperature and processing speed of fabric can be adjusted in order to help achieve the performance desired.

What is the shelf life of EverShield concentrate?

Currently, we list the shelf life at 6 months, but that is because the product has only been recently commercialized. We continue to evaluate shelf life and will make adjustments if we find it can be extended.

Why is the dilution ratio of EverShield so different from other textile finishing products?

EverShield has been carefully crafted to provide maximum superhydrophobicity and oleophobicity that lasts up to 50+ wash cycles. The formula, in concentrate form, includes several different components that help to boost the superhydrophobicity, oleophobicity, and durability. EverShield has been carefully tuned through years of development, and it has been designed such that the only additional ingredient that needs to be added at the mill is water. Other chemical finishing products may require additional chemical components in order to increase performance, such as pre-wetting agents, softeners, crosslinkers, etc. EverShield, in concentrate form, contains water in order to maximize stability during shipping and storage. Because EverShield concentrate already contains some water, a smaller amount of water is needed when preparing the dilute form of EverShield. Although the dilution ratio may not be typical, the price per lb or kg of the concentrate should be much lower than other premier finishing products, and the price of the diluted form of EverShield should be competitive when compared to other premier finishes in their diluted form.

Can you explain the terms 'C6' and 'C8'?

Fluorochemicals are commonly used in the textile industry because they deliver water, oil and dirt repellency when applied to clothing. C8 fluorochemicals (or "C8s"), molecules which contain eight carbon atoms and several fluorine atoms break down into PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulphonate). PFOA and PFOS are toxic above certain levels, and they are environmentally and biologically persistent.

EverShield contains a C6 fluorochemical (or "C6"). This C6 is composed of six carbon atoms and several fluorine atoms. C6 fluorochemicals do not break down into PFOA and PFOS. Traditionally, shorter chain fluorochemicals are considered to offer lower repellency performance than longer chain fluorochemicals (in this case, it would typically be thought that a C8 would outperform a C6), but the invention of EverShield has revealed that it is possible to incorporate a C6 into a textile treatment that can outperform some textile treatments that contain C8 fluorochemicals.

Can EverShield be applied to finished garments as a post-process?

EverShield is currently not suitable for applying to finished garments. Applying EverShield to finished garments presents significant challenges, including, but not limited to the following: 1) finished garments will shrink significantly at 150 °C, 2) different parts of a finished garment will absorb different amounts of the treatment, resulting in uneven performance, 3) finished garments often have finishing chemicals applied which interfere with the application and/or performance of EverShield, 4) certain elements of a finished garment may melt at 150 °C.

Does EverShield work well on leather?

The current formulation requires a cure temperature of at least 150 °C (302 °F). Many materials composed of hide and plastic may deform, shrink and/or lose some degree of tensile strength if subjected to this curing condition. Fabric made of nylon, cotton, polyester, as well as other natural and synthetic materials and their blends have been treated with EverShield successfully (at the fabric finishing mill level). Some aramid fabric materials have also been successfully treated with EverShield, including Nomex. Preliminary testing has been performed on Kevlar.