

# Proper Care of Waterproof Breathable Fabric

Waterproof breathable materials allow water vapor to pass thru while stopping liquid water. This is done with a membrane of Fluoropolymer (Teflon type) material that has very small spaces allowing single molecules of water vapor to pass, but stopping water droplets.

These materials are made by manufacturers such as W.L. Gore® and Associates (makers of Gore-Tex®) and others. They are made in different densities from very water resistant (limited breathability) to slight water resistance but excellent breathability. They are always sandwiched between two or more layers of material for physical protection against tearing, and abrasion. Being made of Fluoropolymer, nothing sticks to the membrane itself short of roofing tar. Fluoropolymers are resistant to all common chemicals, it matters little if the membrane is clean, or what is used to clean it. The most common problems to affect the Fluoropolymer membrane are damage from sewing, tearing, or stretching. Proper care is not dictated by any special needs of the Fluoropolymer membrane.

It is the Outer Shell that determines how the garment must be cared for. Typically jackets or pants and turnouts that have a Fluoropolymer membrane will have an outer shell that is factory treated with a fluoropolymer water repellent coating. This has obvious advantages if the Fluoropolymer membrane should leak. It is always important however that the Fluoropolymer coated outer shell remain clean and dry to allow the water vapor to escape. This is because the body moisture that passes thru the Fluoropolymer membrane must be allowed to escape thru the shell or it will accumulate reducing further evaporation and in some cases condensing making the garment feel wet. When it is raining the Fluoropolymer coating on the outer shell must keep beading and shedding the rain. Saturation of the shell stops its breathability, leaving nowhere for the body moisture to go.

So how do you care for the shell to keep it dry and breathing? Mostly, it must be clean. Never wash with a soap or detergent that leaves residue behind. This detergent residue covers the Fluoropolymer coating making it ineffective, allowing the water drops to spread out and leak thru the shell. W.L. Gore® recommends powder detergents to avoid the suggestion that special care is required for their Fluoropolymer membrane. Unfortunately, the residue from typical laundry powders and liquids covers the durable Fluoropolymer coating on the outer shell. These residual wetting agents allow water to spread out and soak in instead of beading and running off. Another source of wetting agents is air pollution. A new raincoat can lose its ability to bead water just by hanging in the closet for a year. Dry cleaning is not recommended as it also leaves a residue behind that stops the beading action.

Tests conducted at Clemson University School of Textiles demonstrate that Sport Wash Laundry Detergent leaves absolutely no residue. They rinse completely, leaving nothing behind to cover the fluoropolymer coating while other laundry products deposit chemical residue. Leaving no residue allows the fluoropolymer coating on the outer shell to work like new.

Ironing at the highest setting recommended by the garment manufacturer further enhances the effectiveness of the repellent by activating the fluoropolymer molecules so that they can optimize their orientation and maximize the beading action of the water droplets. But ironing your turnout is not recommended due to fabric being nylon and other fabrics that may melt or become brittle with. People often claim that washing with Sport Wash restored the waterproofing of their garment. There was nothing wrong with the Fluoropolymer coating at all; it was only dirty, allowing the water droplets to spread out and soak thru the shell.

By washing the garment in an appropriate cleaner as Sport Wash you are restoring the water repellence and breathability of the outer shell therefore enhancing the performance of the Fluoropolymer membrane.

If washing in Sport Wash without fabric softener fails to restore the shell to water repellent condition you can be certain there is no repellent present. It is rare to find a waterproof breathable garment without a fluoropolymer type Durable Water Repellent (DWR). It may have been an error, it may have been treated with wax or silicone instead of a DWR because it is not washable, or the DWR may have been exhausted by age, use, and improper washing or dry cleaning. The under-side of most turnouts have a coating on the reverse side of the shell.

For washable and ironable fabrics use our a permanent water guard which is generally set in by a high dryer setting. It is a superior fluoropolymer DWR in a non-flammable solvent-free non-Volatile Organic Compound formula. When applied and cared for per the instructions, permanent water guard will exceed the performance and durability of factory applied DWR's because we do not use wax, silicone, or other extenders that make a big first impression and then wash away. However, this requires heat, such as a high dryer setting which is not recommended for turnouts due to other blanket parts that may be subject to shrinkage.

A permanent water guard set in with a dryer will withstand approximately 25 washings in Sport Wash, detergent. Standard laundry detergent is not recommended and will remove any DWR created by permanent water guard, or even a waterbased Silicone repellent treatment. Leather, Suede or "Dry Clean Only" garments and boots can not be washed in Sport Wash required by fluoropolymer bonding, and can not be heated to cure and activate a DWR.