

Performance Fabric Care

(That includes your turnout)

From the latest micro fibers to synthetics, blends, silk like cotton and wool, every fabric needs proper care to deliver maximum performance. Often the label instructions are intended to manage liability or facilitate sales rather than maximize the durability and features of the fabric. Some manufacturers specify "Dry clean only" hoping to insure that inexperienced owners won't damage a garment with excessive heat or improper drying. Waterproof Breathables will suggest powder detergent because they don't want to create the appearance that special care is required. This usually results in loss of performance after a single washing. Occasionally you are instructed to use residue - free detergent or dish detergent. The manufacturer may not know that superior detergents are available or want to be bothered by evaluating products and maintaining current data on availability for his customers.

Washing Performance Fabrics with ordinary laundry detergents destroys the very properties that you are trying to restore. Detergent residue is the chemical scum deposited on the fabric with every washing. In about 10 washings it reaches 2 % of the weight of the fabric. It consists of Perfume, Ultra-Violet Brightening Dyes, Salts, Surfactants, Processing Aids, Washing Machine Lubricants, and a variety of Oils, Fats, and Polymers to glue it all to the fabric. This stiffens the fabric by binding the fibers together. Now Fabric Softener is added to reduce stiffness adding more residue.

Residue stops water repellency, breathability, wicking, and moisture transfer. It attacks fibers, adhesives, elastomers, colors, and coatings. Residue irritates skin especially in warm moist areas where the residue is activated and the skin is more permeable. Detergent residue even attracts insects, spooks game animals, and increases flammability. Dry cleaning deposits similar residue gathered from all the items already cleaned.

The solution to most high tech cleaning problems is to remove soil, stains, odors, and the oils that fasten them without depositing a residue. No residue means fewer problems, fabrics work like new if the DWR is in tact.

Water-Repellent Fabric should be washed only in a detergent specifically designed to preserve waterproof fabrics and elastic. Durable Water Repellents (DWR) such as Scotch Guard, Zepel, Teflon, and others rely on changing the electrical potential of the fiber surface so that water is not attracted to it. Water should bead-up and roll off instead of sticking, wetting, and saturating. Typical detergents deposit chemical residue equal to 2% of the weight of the fabric (more on microfibers because of the increased surface area). **The residue covers the fluoropolymer in the DWR allowing the water to spread out and soak into the fabric instead of beading up and rolling off.**

Washing the residue away with the appropriate detergent for water repellent fabrics such as Sport Wash or Rambo Wash, will restore the repellency. Sometimes, fabric can be further enhanced by ironing or placing in a dryer to activate the molecules of DWR enabling them to reorient themselves for maximum effectiveness. This is not an advisable method for turnout blankets because there are may be parts that are subject to shrinkage. This method is primarily for waterproof clothing. In some cases the factory applied DWR repellent may not recover because it was a poor application or has been removed. If after laundering with Rambo or Sport Wash and ironing, the shell does not repel water it must be retreated.

The shell can be retreated by but not as permanent factory applied DWR. With a bit more effort, you can actually apply a DWR to exceed factory performance using fluoropolymers and head. But this process isn't designed for turnouts after they have been sewed together. This is actually a process generally done when turnout fabric is still on the roll.

Waterproof breathables are a special category of garments with a liner membrane made of Fluoropolymer (Teflon) in a non-woven web. The liner does not require any special care. The outer shell usually has a DWR. Simply care for the shell as if the liner wasn't there.

Insulation value is dependent upon fabric care. Insulation depends on the creation of air pockets to reduce the transfer of heat. Whether down, polyester, or anything in between, oils and other residues tend to stick fibers together. This prevents them from fluffing up and expanding to provide the big voids that stop heat transfer. When insulation mats down, heat moves thru it more easily. The proper detergent will leave insulation cleaner because it will rinse out completely. Cleaner fibers can slide easily among each other to expand for maximum loft. This same freedom of motion is the reason why you never need fabric softener as funny as that may sound. Other detergents coat fibers with sticky residue that paste them together so they feel stiff, hard, and scratchy. Closed cell foam does not gain and loose insulation value with washing but is not breathable. Items using closed cell foam tend to have drying and odor problems, so it is important that they too be washed an appropriate sport fabric wash. This is also true of Coated materials such as tents, bags, and packs, and of course horse blankets.

Wicking and water transport depend on proper cleaning. Recent advances in active wear include socks, underwear, cycling shorts, shirts, expedition wear, etc. with the ability to move moisture away from the skin to maximize comfort. This can be a natural property as in the case of Wool and polypropylene or it may be the result of physical properties such as fleecing for separation or channeling fibers for increased surface. Surface treatments can also be applied to enhance wicking, transport, and evaporation. In all cases these properties are lost when coated with detergent residue. As with all performance losses, you can reverse the damage by washing with a good sport fabric wash, which not only leaves no residue but washes away residue left by other detergents.

Fabrics actually last longer when washed in Sport or Rambo Wash. This difference will be most noticeable on items that are washed daily like exercise leotards, swim suits, or socks. Detergent and hard water residues and chlorine compounds will attack fibers by filling micro fissures on the surface and deepening them as temperature and humidity fluctuate. Some detergents contain oxidizers such as hydrogen peroxides, etc. and actually try to bleach away soils and stains instead of removing them. This process usually burns up the good along with the bad. It is especially hard on natural fibers, colors, and elastic whether rubber, latex, lycra, or spandex. Most turnouts have some thickness of the rubberized backing on the shells.

Mechanical Damage can be reduced by proper cleaning. Fabrics exposed to abrasive particles as in concrete work or mining will last longer if these abrasive particles are removed. Webbing and rope for work, rescue, and recreational climbing can lose critical strength if used without proper cleaning. A sport wash cleans away particles, even those held in place by oil and grease, without damaging oxidation or chemical residue. This leaves ropes and webbing more flexible to further reduce damage and wear.

Hand wringing and even high speed spin can cause shrinking or stretching and other mechanical damage. Wool, Silk, and delicate items should be patted gently between towels and air dried while supported on a flat mesh or sweater rack.

Rinsing a garment with a few drops of Sport Wash added to rinse water will actually leave it with less residue than rinsing in plain water. It easily removes salt, perspiration residue, and chlorine that plain water won't remove. Fabrics are cleanest just after the last of the surfactant rinses away. Continued rinsing actually adds back damaging minerals from the rinse water, shortening the life of swim wear and exercise wear.

Heat can damage delicate fabrics. Typical powders may waste the wash cycle just to dissolve in cold water. They are useless for silk, acetate, and other delicate items that must avoid heat. When a detergent has marginal solubility it will not rinse well. A liquid cleaner will excel in solubility and rinseability.

Many serious outdoorsmen still use oiled cotton canvas for tents and clothing. These have a long life and can be highly waterproof. The ideal treatment for such canvas materials is Beeswax Waterproofing. As on leather boots, it is applied to warm material until no more is absorbed. These outdoor fabrics need the same careful care to ensure they will remain waterproof.

You may believe that dry cleaning leaves your clothes cleaner than detergents. This is not true, dry cleaning can add new residue (odors) extracted by the solvents from previous garments. The solvents are constantly distilled and filtered but gradually carry more and more as they are recycled again and again. That's why they are periodically replaced. You don't want your clothing to be the last item cleaned before the solvent is finally replaced. Do not send your turnout to the dry cleaners. For maximum performance, when cleaning your horses clothes, it needs to be totally residue free. No fragrance, dyes, salts or surfactants to interfere with the properties.

(Research and writings from Atsko)