



## BERGERON PROTECTIVE CLOTHING

54 SUNCOOK VALLEY HIGHWAY  
BARNSTEAD, NH 03218  
603 435-6962



### Care and Cleaning for Protective Clothing



### Bergeron Information Station

Document: 04-102; July 2004

The following document is authored and maintained by Globe Manufacturing. The source document appears in its entirety below and is unedited except for comments in red. These comments represent Bergeron Protective Clothing's view on the specific topic. Our intention is not to provoke controversy but to stimulate thought relative to an increasingly important subject.

#### Overview

Recently there has been a greater awareness among firefighters for the need to have turnout clothing laundered regularly. The NFPA Technical Committee for structural clothing addressed this in the 1991 revision of NFPA 1971, by adding an appendix item dedicated exclusively to the care and cleaning of bunker clothing. Simply put, clean protective clothing reduces the potential for health and safety risks. In February of 2001, NFPA published a new user document for the Selection, Care, and Maintenance of Protective Clothing (NFPA 1851). This standard sets minimum requirements for the inspection, care and cleaning of all protective elements covered by NFPA 1971. The Globe label on every garment provides basic information for laundering; however, what follows is a much more comprehensive set of instructions for cleaning gear.

#### Guidelines

- If the Liners are detachable, they should be removed from the Shell and laundered separately.
- All closures should be fastened: Velcro® hook covering pile, hooks & dees fastened, zippers zipped and snaps closed. It is imperative that you cover the hook portion of all Velcro® to prevent snagging during laundering.
- We recommend a front loading washer machine, which does not have an agitator, and preferably one that is designated specifically for cleaning turnouts. A stainless steel tub should be utilized if available.
- We suggest using a laundry bag to protect the inside of the washing machine from the hooks & dees (and to protect the hooks & dees from the agitator of a washing machine when using a top load model).

**BPC Comment** - Laundry Bag: Many manufacturers recommend the use of a laundry bag to help protect a garment from friction especially in top loading machines. The use of top loading machines and the use of a laundry bag are not recommended. It is inherently difficult for any detergent to "access" the entire garment when in a laundry bag and thorough rinsing will be equally difficult. We have found that the use of a laundry bag inhibits the cleaning and rinsing processes such that a garment may appear clean but in fact may still be contaminated to some degree.

**Machine Washing** – The special fabrics that make up your turnouts contain inherent flame and heat resistance properties, which cannot be washed off or worn out. However, given the nature of the contaminants to which firefighters are exposed, we recommend that you never, never, use the same machine that you do your home laundry in. When machine washing, always prepare the clothing as directed, by fastening all closure systems. Use warm water and a normal cycle. Following each complete wash cycle, thoroughly rinse your garments; we recommend a double rinse with clear water.

Protective clothing should always be washed separately in a laundry bag; do not overload the washing machine, do not use softeners, and NEVER use chlorine bleach. We do not suggest machine drying; our recommendation is to hang in a shaded area that receives good cross ventilation or hang on a line and use a fan to circulate the air. Naturally, the turnout system will dry more quickly if you separate the layers for laundering and if you turn the liner system inside out to facilitate drying of the quilt Thermal Barrier.

**BPC Comment** - Water Temperature: Manufacturers guidelines recommend using "warm water". Water temperature is very critical to a successful cleaning. If it is not warm enough it will not break down any oils (including body oils) or fatty acids. This would be similar to washing bacon grease from a frying pan in a cold brook. If the water is too hot you will begin to develop problems with the adhesives that hold together any hook and loop (such as Velcro) and eventually problems with the integrity of reflective trim by breaking down the bonding agents that hold the trim together. Recommended water temperature for effective cleaning is 100-120 degrees F. Many commercial extractors that are purchased for use in a Fire Station do not have the ability to control water temperature accurately.

**Cleaners** – Cleaners generally fall into two categories, detergents and soaps. Of the two, detergents make the best cleansers because they are formulated to contain special agents that help prevent redeposition of soil. Soil redeposition is soil which is first removed from a laundered article, but later in the same wash cycle is redeposited as a thin soil film on the entire surface of the article. All cleaning agents are clearly labeled as being either detergents or soaps; and we recommend liquid detergents, since they are less likely to leave any residue on the clothing. Examples of some of the better known detergents would be Cheer or Tide.

**BPC Comment** - Cleaners generally fall into three categories, detergents, soaps and surfactants. Of the three, surfactants make the best cleansers because they are formulated to contain special agents that help prevent redeposition of soil. Soil redeposition is soil which is first removed from a laundered article, but later in the same wash cycle is redeposited as a thin soil film on the entire surface of the article. All cleaning agents are clearly labeled and we recommend liquid detergents, since they are less likely to leave any residue on the clothing.

**Spot Cleaning and Pretreating** – Precleaners can be used to clean light spots and stains on protective clothing. Squirt the precleaner onto the soiled area and gently rub fabric together until a light foam appears on the surface; this foam should be completely rinsed off with cool water prior to washing. A soft bristle brush, such as a toothbrush may be used to gently scrub the soiled area for approximately one to one and a half minutes. An alternative method would be to pretreat garment by applying liquid detergent directly from the bottle onto the soiled area and proceed as with precleaners. Any spot cleaning or pretreating should be followed by machine washing prior to field use.

**Special Cleaning Compounds** – Since Globe is in the business of producing firefighters clothing and not cleaning agents, we are not able to "endorse" any of the special compounds that are being advertised for the fire service, such as Winsol or Smoke Out. However, we would recommend that each department interested in these specific cleaning agents contact the manufacturers directly and make your own determination as to suitability. The appendix on cleaning found in the 1991 edition of NFPA 1971, includes the following examples of household products that may be utilized for normal laundering, spot treating and pretreating:

Detergents: Liquid Cheer, Liquid Fab, Liquid Tide, Liquid Wisk

Oxygenated Bleaches: Liquid Clorox 2, Liquid Vivid

Spot Cleaning and Pretreating: Liquid Spray & Wash, Liquid Tide, Liquid Shout, Liquid Dishwashing Detergent

**BPC Comment** - We do not recommend any specific cleaning agent.

**Dry Cleaning** – The protective qualities of your Globe turnout clothing will not be adversely affected by dry cleaning. However, dry cleaning can completely ruin trim and is therefore not recommended.

**Removing Oil or Tar** – Oil based soils such as motor oil and tar can be removed with solvents such as "Varsol" prior to washing, says E.I. DuPont, producers of NOMEX® fibers. However, they do add the cautionary statement that the garment must be thoroughly washed and rinsed to insure that all residual solvent is completely removed. They also point out that coated material should never be dry cleaned. You must always avoid using solvents on the leather or reflective trim.

**BPC Comment** - It is ok as long as absolutely all of the Varsol is removed from the fabric. Varsol is actually a flammable product if allowed to accumulate in the fabrics of the garment. We recommend 12 rinse cycles as a means to assure the cleaning agent is effectively removed from the garment.

**Bleach** – One of the most often asked questions concerns the decontamination of a turnout system, especially with chlorine bleach. UNDER NO CIRCUMSTANCES should chlorine bleach be used on firefighters clothing; most systems contain KEVLAR®, either as a blend or as the primary fiber, and KEVLAR® is completely destroyed by exposure to bleach. If it is absolutely essential that a bleach be used, we recommend 1/2 cup of liquid oxygenated bleach to one cup of detergent.

**Trim** – 3M, the manufacturer of both Scotchlite™ and Triple Trim, recommend that the following guidelines be used for their product: 1) Damp wipe, using warm water and mild detergent. Rinse thoroughly, dry with a soft cloth, or allow to air dry. (2) If you choose to machine wash, use warm water. (3) Do not dry clean. The producers of Reflexite® trim state that dry cleaning is not permissible under any circumstances, nor is ironing ever allowed. Their recommendation is that you use a soft rag or sponge and that denatured alcohol be used as a cleaning agent. They advise against abrasive cleaners, strong solvents, and machine drying.

**Decontamination** – For extreme contamination with products of combustion, fire debris or body fluids, removal of the contaminant's by flushing with water as soon as possible is necessary, followed by appropriate cleaning. In the case of bloodborne pathogens, recommended decontamination procedures include using a .5 to 1% concentration of Lysol, or a 3-6% concentration of stabilized hydrogen peroxide. Liquid glutaraldehyde, available through commercial sources, will also provide high to intermediate levels of disinfectant activity. Decontamination may not be possible when protective clothing is contaminated with chemical, biological or radiological agents. When decontamination is not possible, the garments should be discarded in accordance with local, State and Federal regulations. Garments that are discarded should be destroyed.

**BPC Comment** - We recommend the use of a commercial cleaning service for decontamination of turnout gear. Even if you were trained in the use of these decontamination agents, getting the proper percentage of agent into the wash cycle is usually beyond the capabilities of the personnel at the fire department.

**Hand Washing** – Hand washing was thought to be the least abrasive method of laundering, and allowed the user to pay special attention to those areas that required it. The industry now recognizes that hand washing is generally not able to remove the ground-in soil embedded in the material fibers and usually only serves to remove surface dirt. However, in the event that you do not have access to a washing machine and must hand wash your garment, remove your liner system and lay the Outer Shell on a non-abrasive hard surface. Using a soft bristle scrub brush and a detergent (not soap), clean your garment by making circular motions with the brush, forming progressively larger circles until the entire surface has been washed. You must then rinse the shell, using clear water, to insure that all of the detergent has been removed. We recommend that you rinse the entire garment several times to avoid any possibility of soil detergent residue.

**Outside Cleaning and Assistance** – One final question we are often asked is whether the gear can be or even should be cleaned by a professional. We are aware of several outside agencies who specialize in the cleaning of turnout clothing and just as Globe is the expert in the cutting and stitching of protective clothing, these facilities are the experts in cleaning. Since we have no control over any of their processes, we obviously cannot endorse or authorize any one of these services over another; however, we do believe they offer a valuable service and we encourage our customers to contact any of these outside cleaning facilities to determine if they are able to meet the fire department needs. Some possible questions to ask would be if they have ever had 3rd party training or testing, if they provide any warranties on their services, and whether they are able to give any guarantees concerning the effectiveness of their cleaning.

## CONCLUSION

In caring for your turnout clothing, you must always remember that it features 3-piece layering and you must consider every single layer when deciding how to clean. We do encourage every department to keep their clothing clean and to routinely inspect and repair as needed. Clean turnout gear is lighter in weight, lasts longer, and is more visible than dirty turnout gear. Having dirt, soot, and other debris clinging to your gear presents a safety hazard.