



# Care and Maintenance Instructions for Garments made with Carolina Protect® Fabrics

## HOME LAUNDERING FOR GARMENTS MADE WITH CAROLINA PROTECT® FABRICS

Information for home laundering of flame resistant garments made from Carolina Protect® FR fabrics may be obtained in the following industry publication: ASTM F2757 Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal, and ARC Resistant Clothing. The following procedures can help to provide optimum cleaning of FR protective garments.

### LAUNDERING PROCEDURES

Garments made from Carolina Protect® FR Fabrics can be laundered and dried at home with regular household methods. If necessary, they can be ironed, and the fabric will not lose its Flame Resistant Properties. When washing garments made from Carolina Protect® FR fabrics at home, it is important that they be cleaned thoroughly. All stains must be removed since some stains can leave traces of flammable material. For that reason, if difficult stains remain, it is recommended to wash garments periodically at a professional laundering service.

### SORTING THE WASHER

To avoid color transference between FR garments, light and dark color garments should be washed separately. Separate the clothing by garment type, coverall, pants, shirts, etc. It is recommended that you turn garments inside out before washing and drying to reduce streaking from abrasion. FR Clothing should be laundered separately from the family wash to prevent cross contamination. Garments made from Carolina Protect® 100% cotton or 88% / 12% high tenacity nylon may be laundered together in the same load. It is not recommended that FR Garments constructed from other fabric types be washed or dried with garments made from 100% cotton or 88% cotton/12% high tenacity nylon.

### LOADING THE WASHER

When washing garments made from Carolina Protect® FR fabrics, it is important not to overload the machine to ensure a cleaner washing and avoid wrinkling. The load should allow garments to move freely during the washing and rinsing cycles. For the best results when washing, the FR garments should be turned inside out during wash.

### PREWASHING

Stains that are too difficult, or lodged too deep into the FR fabric, may be removed more easily when they are pre-washed. The stains must be rubbed using a full-strength, heavy-duty liquid detergent or any off-the-shelf liquid detergent or a special pre-washing product. This must be done with enough time before washing to allow for the penetration of the product and dislodge of the sediment. If the smell of petroleum or solvent is present, launder the garment again. Dry cleaning or other professional laundering to remove the soil can be considered. Pre-Washing products must not contain chlorine and/or hydrogen peroxide.

### WASH TEMPERATURE

When washing FR garments that are overly soiled, the temperature setting should be "Hot." FR garments with less filth can be washed in lower temperature, this will also benefit color fastness. The maximum temperature for washing FR garments is 122°F (50°C) set on the Cotton/Sturdy cycle.

### DRYING

FR garments can be machine or line dried following washing. For machine drying, drying time should be carefully monitored so that garments are removed from the dryer immediately when dry or while slightly damp. Damp garments may be hung to complete drying. Over drying will result in excessive shrinkage. Drying times will vary depending on the load size. It is possible to achieve better drying performance when using the permanent press or easy-care sensor-dry settings, instead of a time-to-dry setting because sensor-dry settings will help avoid over drying. The maximum temperature for drying FR garments is 149°F (65°C).

### IRONING

A steam press or household iron can be used on FR garments. DO NOT USE STARCH on FR clothing. Ironing will not have an adverse effect on the garment's flame resistant properties.

## HOME LAUNDERING DETERGENTS AND OTHER WASHING PRODUCTS

It is important to use a Neutral Washing Detergent and a temperature high enough to remove stains. The detergent must not contain fabric softener, chlorine bleach, or hydrogen peroxide. Washing temperature must not be higher than 122°F (50°C).

### FABRIC SOFTENER AND STARCH

There is a great variety of softeners and starch products on the market. Most of them will affect the Flame Resistant properties of the fabric, which is why fabric softeners and starch are NOT recommended for garments made with FR Fabrics.

### WATER SOFTNESS

It is important to verify the quality of the water used for laundering. Hard water contains magnesium and calcium salts that can build up on the garment, and create non-soluble deposits. These contaminants are hard to rinse off, and can affect the FR properties of the fabric. Using soft water reduces detergent consumption, improves the quality of washing, and avoids adverse effects on the fabric's FR properties.

### BLEACH

Chlorine bleach (sodium hypochlorite) and oxygen bleach (hydrogen peroxide), either alone or in a combination with other chemistry must never be used on flame resistant treated fabrics. Repeated exposure to bleach will adversely affect the flame retardant polymer and result in flammability failure if the fabric is exposed to an ignition source.

### SOAPS

The use of soaps (fatty acid salts) is not recommended for garments made with Carolina Protect® FR Fabrics. Tallow soap should not be used to launder FR garments as it could build up on the fabric surface and mask the flame retardant or serve as an ignition source.

### PRODUCTS TO AVOID

Laundry products such as fabric softeners and starches present a complex situation relative to use with all flame resistant garments. Therefore, products such as fabric softener, starch, or any other laundry additives such as soil release or anti-statics must not be used. Never use Bleach, Peroxide, or products containing them on FR clothing.

CAROLINA PROTECT® FR FABRICS ARE GUARANTEED TO MAINTAIN FLAME RESISTANCE FOR THE USEFUL LIFE OF THE GARMENT, AS LONG AS THE RECOMMENDED LAUNDERING INSTRUCTIONS ARE FOLLOWED



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### INDUSTRIAL LAUNDERING FOR GARMENTS MADE WITH CAROLINA PROTECT® FABRICS

Information for industrial laundering of flame resistant garments made from Carolina Protect® FR fabrics may be obtained in the following industry publications: NFPA 2112-2018 Standard on Flame Resistant Garments for Protection of Industrial Personnel against Flash Fire and ASTM F1449 Standard Guide for 3 Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing.

The following procedures can help provide optimum cleaning of FR protective garments.

#### SORTING AND LOADING THE WASHER

FR garments constructed from Carolina Protect® FR fabrics, should be sorted by light and dark color garments. Separate by garment type, coverall, pants, shirts, etc. FR garments can be washed in a variety of wash formulations depending on the degree and type of soil. Garments made from Carolina Protect® 100% cotton, or 88% cotton/12% high tenacity nylon may be laundered together in the same load. It is not recommended that FR Garments constructed from other fabric types be washed or dried with garments made from Carolina Protect® 100% cotton, or 88% cotton/12% high tenacity nylon. It is recommended that FR garments be washed and dried inside out to reduce abrasion and aid in maintaining the surface appearance of the garments. Normal washer loads are generally set at 80% of their rated capacity. If required for soil removal, a lower load factor should be considered to provide better cleaning for heavily soiled garments.

#### WASH TEMPERATURE

The range of wash temperatures suggested take into account various degrees of soiling. The higher the temperature, the better the cleaning for heavily soiled garments. Wash temperature will affect color retention of the fabric, but lower temperatures may reduce soil removal. The recommended maximum wash temperature for Carolina Protect® 100% cotton and 88% cotton/12% high tenacity nylon is 165°F (74°C).

#### RINSING

As for all washed garments constructed from Carolina Protect® fabrics, they must be adequately rinsed to remove wash chemicals and to lower the pH to that of the water supply. To minimize washer-induced wrinkles, water temperature should be reduced in each of the three succeeding rinse cycles until the last operation (sour cycle) where it should be 100°F (38°C) or lower.

#### DRYING

In many instances, tumble dry conditioning is the only finishing necessary for garments constructed of Carolina Protect® FR fabrics. For best results, tumble dryers should not be overloaded. Dry garments efficiently at stack temperatures between 140° F (60° C) and 165° F (74° C). Garment temperature measured in the basket should not exceed 280° F (138° C). Do not over dry garments constructed from FR Fabrics, or excessive shrinkage will occur. Remove garments constructed from FR Fabrics from dryer when slightly damp (about 10% moisture) and hang to dry or tunnel process. Garments should not remain in hot tumbler when not in motion.

#### TUNNEL DRYING AND FINISHING

Garments made from Carolina Protect® FR fabrics may be tunnel finished. As with conditioning, fabric temperature must not exceed 280°F (138°C). If desired, garments may be pressed using normal cotton setting with the press head temperature set at or below 300°F (149°C).

### INDUSTRIAL LAUNDERING DETERGENTS AND OTHER WASHING PRODUCTS FOR GARMENTS MADE FROM CAROLINA PROTECT®

#### DETERGENT

A variety of commercial and industrial detergent formulations have been evaluated and tested for their cleaning effectiveness and impact on wash fastness. Test show that formulations designed for use at a temperature of 140°F (60°C) or less, such as high-surfactant, low alkalinity products, adequately clean FR garments made from Carolina Protect® FR fabrics.

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## Care and Maintenance Instructions for Garments made with Carolina Protect® Fabrics

### DRY CLEANING OF GARMENTS MADE FROM CAROLINA PROTECT® FABRICS

Dry cleaning is very useful for garments made from FR Fabrics to effectively remove grease and oil stains that would not be easy to treat with home or industrial laundering. Dry cleaning will not adversely affect the flame resistance of our FR fabrics. Thorough removal of all traces of dry cleaning solvent from garments is recommended. Dry Cleaning is not recommended for denim because of possible loss of color.

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### REPAIR AND MAINTENANCE OF GARMENTS MADE FROM CAROLINA PROTECT® FR FABRICS

Information for repair and maintenance of flame resistant garments made from Carolina Protect® FR fabrics may be obtained in the following industry publications: *ASTM F2757 Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing* and *ASTM F1449 Standard Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing* and *NFPA 2113 Standard on Selection, Care, Use, and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire*.

In order to perform its protective function, a garment must be maintained in its original condition. Minor repairs that do not affect the integrity of the garment can be made by darning with flame resistant thread, patching with a flame resistant heat seal material, or patching with like materials. For advice on proper repair techniques, contact your uniform service provider or clothing manufacturer.



USA

Blvd. Manuel Ávila Camacho 570 El Conde, Naucalpan. Edo. México  
C.P 53500 MEXICO  
+ 521 (55) 5220-2900

11615 Spring Cypress Rd. Suite A  
Tomball, TX 77377  
Tel: +1 (800) 216-7033