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Care and Cleaning Recommendations for Mount Vernon Mills AMTEX™ Flame Resistant Fabrics

Mount Vernon Mills, Inc. has continuously operated as a US textile manufacturer for more than one hundred and sixty five years. On October 12, 1845, the first Mount Vernon textile plant began operation in Trion, Georgia. The Trion plant has grown into a fully integrated piece dyeing and finishing plant and denim mill.

Preparation, dyeing, flame resistant treatment and finishing of cotton and cotton blend fabrics requires precise control in each area. Mount Vernon had experience in both flame resistant technology and in producing fabrics for the military, industrial laundry and workwear markets. Mount Vernon applied investment, experience, and proprietary technology to develop AMTEX™, a family of flame resistant protective fabrics. Coupled with manufacturing expertise and quality control, Mount Vernon's state of the art process control has resulted in total accountability for the shade, feel, finish, and performance of the flame resistant treated fabrics.

Mount Vernon Mills has an unwavering commitment to the safety of the men and women in hazardous occupations whose work exposes them to the hazard of garment ignition and burning. Since 2005 Mount Vernon has delivered more than 100 million yards of FR fabrics with no failures of the material in use. Backed by unmatched process and quality control, equipment, and technology as well as testing and certification to industry standards and specifications, **all Mount Vernon flame resistant fabrics are guaranteed to maintain flame resistance for the expected life of the garment, as long as recommended laundering instructions are followed.**

AMTEX™ Flame Resistant Garments in the Workplace

Mount Vernon offers 100% cotton fabric and fabrics that are a blend of 88% cotton and 12% high tenacity nylon in a wide range of weights styles and colors. These fabrics are designed for use in garments intended for daily wear in occupations where a risk of ignition exists. These include oil and gas

exploration and production, transmission and distribution of electricity, working on energized electrical parts, welding and flame cutting and general industry tasks where flame or exposure to high temperature surface contact is possible.

Because the fabrics produced by Mount Vernon are made into garments for daily wear they serve as the normal work apparel for many tasks. As such, they will become soiled with the wide variety of oil, grease, sweat and dirt that is experienced daily in these occupations. These soils can disrupt the operation of the flame retardant chemistry in the fabric, or in extreme cases be flammable themselves. It is therefore critical that these garments are thoroughly cleaned and all contaminants are removed. **If during the work day a garment becomes saturated or contaminated with a high level of flammable substances it must be removed immediately and replaced with a clean garment.**

General Considerations

- Fiber Content: Garments made from AMTEX™ fabrics that are 100% cotton or a blend of 88% cotton/12% high tenacity nylon may be laundered by the same processes in either industrial or home washers. They may also be laundered together in the same load. Garments made from flame resistant and non-flame resistant fabrics should be washed separately.
- Water quality: Hard water contains mineral salts that can form insoluble deposits on the fabric surface. It can also precipitate soaps and reduce the cleaning ability of detergents. Soft water (less than 25 ppm or 1.5 grains of hardness) is recommended.
- Products to avoid: The objective in cleaning any flame resistant fabric is to remove soils and not to add anything that could serve to mask the action of the flame retardant or to serve as an ignition source. Therefore products such as starch, fabric softener or any other laundry additives such as soil release or anti-statics must not be used.
- **Bleach: Chlorine bleach (sodium hypochlorite) and oxygen bleach (hydrogen peroxide), either alone or in combination with other chemistry must never be used on flame resistant treated fabrics. Repeated exposure to bleach will destroy the flame retardant polymer and result in flammability failure if the fabric is exposed to an ignition source.**
- Soap: Natural animal fat or tallow soap (anionic) is uncommon, especially in products for home laundering. Tallow soap should not be used to launder flame resistant garments as it could build up on the fabric surface and mask the flame retardant or serve as an ignition source.

Industrial Laundering of Garments Made from AMTEX™ Fabrics

- Sorting and Loading the Washer: Garments should be sorted by color and separated by type – shirts, pants, coveralls, etc. Soil type and level of soiling must also be considered to prevent cross contaminating garments from different accounts. Washers are normally loaded to 80% of their rated capacity, but if required for soil removal a lower load factor should be considered to increase mechanical action.

- Wash Formulas: Wash formulas are based on consultation between the laundry and the laundry chemical provider and review with the end use customer to determine the types and levels of soil in the accounts being served. Guidance can be found in ASTM F1449 *Standard Guide for Industrial Laundering of Flame, Thermal, and Arc Resistant Clothing*. An example heavy soil industrial laundry formula can be found in *NFPA 2112 Standard on Flame-Resistant Garments for Protection of Industrial Personnel against Flash Fire*.

For heavy soil a flush can be used prior to the break step to remove particulates and reduce abrasion in the wash wheel. Most formulas will contain the following operations: a flush (optional), a break, a carry-over or second suds (depending on soil level), three rinses and a sour step. Complete rinsing is required to ensure that all contaminants are removed. The sour step neutralizes the fabric to prevent wearer skin reaction to the highly alkaline detergents used in the break step.

As a general rule, nonionic surfactant based detergents or detergents based on built metasilicate chemistry can be used. Wash temperature will affect color retention of the fabric, but lower temperatures may reduce soil removal. Generally break temperatures between 150°F and 165°F are used. As these fabrics do not contain major amounts of thermoplastic fibers, shock wrinkles are not a concern but normal step-down cooling should follow the higher temperature break step.

- Extraction and Conditioning/Drying: Extract as you would non-flame resistant 100% cotton garments. Condition at a stack setting of 165°F. Fabric temperature in the dryer basket must not exceed 280°F or loss of color and increased garment shrinkage may result. Do not over dry the clothing as this will result in excessive shrinkage.
- Tunnel Finish/Pressing: Garments made from AMTEX™ fabrics may be tunnel finished. As with conditioning, fabric temperature must not exceed 280°F. If desired, garments may be pressed using normal cotton settings with the press head temperature set at or below 300°F.

Home Laundering of Garments Made from AMTEX™ Fabrics

- Guidance for home laundering can be found in ASTM F2757 *Standard Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing*.
- Home laundering with typical powered laundry detergents including those made with “color safe” bleaches such as sodium perborate is recommended. Liquid detergents or other products containing hydrogen peroxide must not be used because of the risk of damage to the flame resistant properties.
- Flame resistant clothing should be laundered separately from the family wash to prevent cross contamination. Turning the garments inside out before laundering will help prevent streaking, especially with flame resistant denim jeans.
- If stain removal is required, any commercial stain removal product that does not contain hydrogen peroxide is acceptable. The detergent being used to launder the clothing can also be poured directly onto the stain to aid removal. It is possible that heavy stains may not be completely removed, but the presence of a visible stain doesn't necessarily compromise the flame resistant characteristics of a garment. If the smell of petroleum or solvent is present,

launder the garment again, or consider dry cleaning or other professional care to remove the soil.

- Wash on the Cotton/Sturdy cycle with the wash temperature set to Hot.
- Dry on the Cottons setting, but do not over dry the garments as this will result in excessive shrinkage. If desired, garments may be ironed on the normal cotton setting.

Repair and Maintenance of Garments Made from AMTEX™ Fabrics

Guidance for repair and maintenance of flame resistant garments made from AMTEX™ fabric can be found in 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*. 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. Because garments made from AMTEX™ flame resistant fabrics are guaranteed to remain flame resistant for the life of the garment when laundering in accordance with our recommendations, they should be removed from service on the same basis as normal wearing apparel: they are ripped or torn and cannot be repaired, have stains that cannot be removed, have lost color, or are just worn out.

Dry Cleaning

Flame resistant garments made from AMTEX™ fabrics can be dry cleaned if needed. If the clothing requires dry cleaning, the services of an industrial laundry with dry cleaning capability or a commercial cleaner should be obtained. The dry cleaner will be able to be certain that all of the cleaning fluid is completely removed from the garment. It is also possible that in a situation involving heavy oil and grease, an occasional dry cleaning may be required to completely remove potentially flammable contaminants. This can be coordinated with the laundry provider or commercial dry cleaner as needed.

A Final Word

Each work environment and occupational exposure is unique. The employer and those responsible for selection of flame resistant protective garments and their care and maintenance must consider all aspects of the installation and constantly monitor the condition of the garments in service. Laundry conditions must be adjusted to remove potentially flammable soils so that the garment can perform its protective function if required. Soil removal is more important than appearance and color retention and must be the top priority.

For the latest information from Mount Vernon Mills on care and maintenance of garments made from AMTEX™ flame resistant protective fabrics, find us on the web at www.mvmfr.com.

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