

Clothes That Care— Flame Resistant Protection

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Concern for a safer environment has led to changes in many of the everyday products we use, including clothing. In the past decade, flame-resistant (FR) garments and fabrics have become more available than ever before. Consumers can now choose from a growing variety of styles in children's and adult's sizes. Home sewers can buy fabrics, threads and trims that are flame resistant. Since many of the finishes and fibers are new, some flame-resistant clothing and fabrics have undesirable characteristics. However, research on FR fabrics and fibers promises improvements in care, performance, durability, and cost.

This publication focuses on who needs FR protection, how FR fabrics are different from other fabrics, how to care for FR clothing, how consumers can express opinions about flame-resistant garments and how consumers can avoid fires at home.

Protection For . . .

Certain groups are more likely to be involved in clothing fire accidents than others. Many victims of fabric burns are those least able to help themselves. Statistics indicate that children and the elderly are injured by burning fabrics more often than others. In both of these age groups, burning fabric accidents occur more frequently than in their proportional share of the population. People whose reflexes are slowed by drugs, alcohol, physical disability or mental illness are also susceptible to injury or death by fire because they cannot respond quickly to an emergency. Workers involved in hazardous occupations involving combustible materials also may need the protection of flame-resistant clothing.

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Older adults and young children are involved in more clothing fire accidents than are other population groups.

A Look at FR Fabrics

Flame-resistant does not mean flame proof! FR fabrics resist flames better than ordinary fabrics and are self-extinguishing when removed from the flame or source of heat. Although FR garments may be effective in reducing the threat of injury or death, it is impossible to produce flame-retardant apparel that will provide 100 percent protection from all types of flammability accidents. Practically everything burns when exposed to sufficient heat. Fabrics can be made flame resistant by using special fibers or finishes.

FR Fibers. Manufactured FR fibers that have protective properties are known by these generic and brand names:

modacrylic	Dynel	vinal/vinyon	Kohjin
	Orlon FLR		Leavil
	SEF		Teviron
	Teklan		Valren
	Verel		
polyester	Dacron FLR	polyamidimide	Kermel
	Heim		Nomex
	Natur	acetate	Acetate FLR
	Toyobo		Kynol
	Trevira 271	nylon	Pureknit

These fibers offer greater flame resistance and last longer than FR finishes. In the long run, FR fibers are predicted to be lower in cost than the finishes.

Natural fibers that are moderately flame-resistant include wool and silk. These fibers tend to burn less readily than other natural fibers. However, when combined with other fibers, they may lose some of their ability to retard fire.

Flame-Resistant Finishes. Topical finishes applied by chemical treatments were the first techniques used to produce flame-resistant fabrics. Cotton, a natural fiber, cannot be chemically modified in the fiber solution as synthetic fibers can. Thus, finishes applied to the fabric surface are especially popular for cottons and cotton blends. Fabrics made of other fibers, such as polyester, acetate and triacetate, are also treated with FR finishes.

Some FR finishes are being investigated because of possible links to cancer. At this writing, Tris¹ is the only chemical finish the federal government has taken action against; others are being studied. Research has demonstrated that Tris can cause cancer in animals and represents a possible danger to humans. Although children's sleepwear manufacturers have stopped using Tris, some Tris-treated garments may still be in use. To tell if a garment was treated with Tris, check the fiber content on the label. Acetate, acetate blends, triacetate and triacetate blends were almost certainly treated with Tris. Some polyesters also may have been treated with Tris; however, there is no way to tell except by asking the retailer or manufacturer. Consumers who are concerned about the carcinogenic effects of some flame-resistant finishes might consider buying garments made only from inherently flame-resistant fibers.

Consumer Concerns. Flame-resistant clothes are sometimes different than those made of traditional fabrics. Some consumers complain of allergic reactions, decreased durability, a less desirable feel or hand, shrinkage problems, wrinkling and increased cost. To gain satisfaction from FR purchases, carefully examine clothing before buying. Read the care instructions, look for labels stating maximum shrinkage of one percent and report any allergic reactions or poor fabric performance to the retailer and manufacturer. Buy from stores you trust and know will stand behind their products.

Care of FR Clothing

Follow the instructions on the care label to maintain flame-resistant properties of clothing. FR garments are required by law to maintain their flame retardancy for up to 50 washings.

Many fabrics made of flame-retardant fibers can be machine washed with any kind of detergent in warm water. Generally these fibers have a low melting point, so they should not be ironed. They can be line dried or tumble dried at a low setting.

¹Tris is an abbreviation for tris (2, 3-dibromopropyl) phosphate.

Fabrics with a FR finish last longer if they are washed with a high phosphate detergent. Some homemakers, concerned about the ecological effects of high phosphate detergents, may prefer to use soap or low phosphate detergents. However, soaps leave a fatty deposit that will build up on the fabric resulting in the loss of flame resistant properties. Remember the warning "Do Not Use Soap" does not mean "Do Not Use Detergent."

If you prefer using low phosphate detergents, manufacturers suggest using a low suds type and doubling the amount. Doubling the amount will help keep mineral and soil particles in suspension so they can be rinsed away instead of collecting on the fabric.

Clothes treated with some flame-retardant finishes should not be laundered with chlorine bleaches because they chemically attack the finish. However, read care labels for specific instructions. Strong chemicals often used in commercial laundries can attack the flame-retardant finish as well.



Maintain flame-resistant properties of clothing by following care instructions provided by the manufacturer.



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Hard water may also reduce the effectiveness of the finish. If hard water is prevalent in your area, use detergents that are at least 8.7 percent phosphate; do not use non-phosphate detergents. (To find out the hardness of water in your area, call the city or town water department.)

Certain fabric softeners may build up on fabrics and cause the garment to lose its flame resistance. When you launder FR clothing, use fabric softeners sparingly, perhaps once a month.

Consumer Action

Consumers will be faced with important decisions regarding clothing in the next few years. The Consumer Product Safety Commission enforces a flammability standard for all clothing. Periodically, organizations or groups request that the standard be changed to include stricter tests, certain types of garments or certain fabrics.

Consumers can contribute to the decisions regarding clothing flammability standards. Consider the issues:

1. Is extending flammability standards to all clothing in the consumer's best interest?
2. Is the additional safety of FR clothing worth an estimated 25 percent increase in cost?
3. Is it fair to increase the price of clothing when persons with limited incomes may not be able to afford the prices?
4. Will consumers be willing to forfeit durable press characteristics for FR protection?
5. Should safety standards be developed only for the elderly and the handicapped?
6. Should the government devote greater attention toward regulating ignition sources, such as space heaters, gas ranges and matches, rather than, or in cooperation with, clothing regulations?
7. Is the cost for additional protection against fire a reasonable price for fewer burn injuries and death caused by clothing ignition accidents?

Decide what is important to you. Meet with organized groups or as individuals to discuss your feelings.

Write down your opinions and send them to the Consumer Product Safety Commission, 1750 K Street, N.W., Washington, D.C. 20207 or to your United States Senator or Congressman. Your government representatives are interested in hearing your opinions.

Safety Precautions

Clothing fires do not start spontaneously. They are caused by exposure to flame or sources of heat. When children are involved in fires, the most frequent ignition sources are matches and lighters. For adults 65 and over, the most frequent ignition sources are ranges and smoking materials (including cigarettes, cigars, pipes, matches, lighters and lighter fluid). Observe the following precautions for a safer home:

1. Caution children not to play near heat or flame sources. If a clothing fire does occur, do not run. Running increases the burning rate. Roll on the floor to smother the flames or, if available, smother flames with any heavy material such as a throw rug, coat or blanket. Remember, fire needs air to burn, and cutting off the air supply is the best way to put out a fire.
2. Keep matches and cigarette lighters out of the reach of children.
3. If elderly or bedridden people live in the household, do not leave them alone while they are smoking.
4. If electric or gas space heaters are used, ask the utility company to recommend a safe type.
5. Store flammable liquids out of reach of children and away from stoves or heating appliances.
6. Place open space heaters away from curtains, towels and bedspreads.
7. Never smoke in bed.
8. Keep a fire extinguisher handy in the kitchen and garage.
9. Install smoke detectors for effective early warning in case of fire.
10. Hold fire drills and train family members to leave the house without panic if an emergency occurs.

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the Texas Agricultural Extension Service is implied.

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The author acknowledges the assistance of Becky Saunders, Beverly Rhoades and Ann Vanderpoorten, Extension clothing specialists, and Marlene Odle-Kemp and Carla Shearer, former Extension specialists, The Texas A&M University System, in preparation of the manuscript.

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