

## FLAME RETARDANTS

The subject of fire retardants is too broad to discuss in its entirety in one Textile Tips. We have narrowed this discussion to color changes caused by flame retardant (FR) chemicals. For further information see the *FIBERFAX* on Flame Retardants For Interior Fabrics (Volume Four / Number Six).

### CODES DICTATE USAGE

There are all kinds of laws regulating the flammability of fabric furnishings. Many states have adopted or are in the process of adopting the stringent fire codes of California.

### CREATING THE CHEMISTRY

Manufacturers have had no trouble creating an array of chemistries to accommodate flammability laws. While successful at limiting flames, these same chemicals have been notorious for causing problems related to the fabric dyes and, in some cases, the integrity of the fibers themselves. Some FR chemicals can cause long-term color change and/or fiber damage.



At the same time, many of these manufacturers will not warranty their products for color changes or long-term damage. The darker colored fabric (below left) is the untreated fabric, while the sample directly below has been FR-treated.



This fabric is from an actual installation. The fabric had to be replaced within the first year because of color change. The FR manufacturer stated that their company had never caused a problem with any fabric. We know of no FR manufacturer or applicator offering any type of warranty against color changes, even ones that can be proven to be related to their chemical.

Quite often the customer is left out in the cold with no recourse but to replace the fabrics themselves. The designer can end up losing credibility... not a good situation.

### PERMANENT CHANGES

The color change seen here is generally not reversible and is fairly typical for this type of problem. Occasionally, alkaline-based chemicals such as WunderKleen can be

applied to the affected area, slowing or stopping further damage. In some rare cases it may even reverse the damage. Ammoniated detergents such as ProKleen should not be used to try to stop or correct the problem. Self-neutralizing chemicals cannot neutralize these types of problems over the long term.

## **FLAME RETARDANTS MAY LURK UNDERNEATH**

Few residential fabrics are FR-treated. However, cotton ticking, especially on loose cushions, is often treated with flame retardants. Be particularly wary of loose cushions that contain down/feathers or other loose cushioning material, since these are often encased in FR-treated fabric.

Over the years we have seen many cases of long term damage to outer fabric when ticking is treated with an acid-based fire retardant. Many flame retardants are hydrophilic (water loving). Moisture is drawn to the FR like a magnet. The moisture activates the chemical, which wicks to the surface fabric. The results can be devastating, depending on the nature of the fabric. Cellulosic fibers are at the greatest risk for fiber damage, but dye damage is also common. Synthetic fibers are more susceptible to dye damage than fiber damage.

These tickings have been seen all over the country, even in non-regulated states. The situation seems to be more common all the time.

## **TEST THE TICKING**

To protect yourself from later liability, you may want to consider pH testing of cotton ticking prior to cleaning or protecting. To perform the test, simply unzip a cushion, wet a pH strip with distilled water and press the strip on the ticking for approximately 30 seconds. If the pH level is above a 5, problems are unlikely. A reading of 5 or below would indicate a possible long-term problem.

The client should be made aware of any possible problems revealed in this testing, especially when dealing with cellulosic fabrics. (The PR side of this discussion is very tricky and should be carefully considered.)

Some of the biggest problems to date have been seen on white and light-colored cotton and cotton-blend fabrics. Blotchy spots start to appear on the cushions, with initial colors ranging from pale yellow to tan. With time, the blotches darken and colors can range from dark orange to brown.

## **ON THE BRIGHT SIDE**

Most of the problems associated with flame retardants can be detected through proper testing. With testing and proper care, flame retardant fabrics can be maintained with few complications.

**AS WITH ALL FABRICS AND FINISHES...  
ALWAYS TEST CHEMICALS AND/OR  
PROCEDURES FIRST IN AN  
INCONSPICUOUS AREA!**