FLAME RETARDANTS FOR FABRICS... Fire Is Not the Only Risk

As early as the 1700’s, cellulosic materials were being made flame retardant by a patented process using a mixture of several inorganic salts. Current versions of these topical flame retardants are much improved and inherent problems with the chemistries are gradually being addressed. A discussion of the more important potential problems follows.

**Shrinkage**
Any time water-based chemicals are involved there is the potential for shrinkage, particularly on rayon and natural fibers. When flame retardants are applied on site, this problem is cause for special concern.

**Corrosivity**
Many flame retardants in use today have a corrosive effect on metal surfaces. This can be a problem if the fabric is in direct contact with metal staples, buttons, pins, etc. When flame retardants are applied on site, it is imperative that metal surfaces be protected. We have seen one instance where painted metal ceiling grids started rusting within several weeks after the application of flame retardant on an adjacent wall fabric.

**Chalking**
Proper flame retardant treatment for most fabrics requires add-ons of up to 35% of the original fabric weight. Especially on darker colors, some flame retardant chemicals can become visible on the surface as a light-colored “chalkiness”.

**Change of Hand**
Again mainly due to the very significant quantity of chemicals required to produce the desired effect, flame retardants sometimes cause a slight to moderate change of hand, noticed as a “tackiness” or a “heavy” feel. These changes, as you would expect, are more significant on fabrics that begin with a soft, smooth hand. Unless the fabric is intended for a seating piece, change of hand is not generally a concern.

**Hygroscopicity**
Some flame retardants are hygroscopic, meaning that they attract moisture from the atmosphere. There are several possible problems that can emerge from this phenomenon: (1) the fabric may feel cold and clammy, or actually damp (2) especially if it is on a wall, the fabric may sag or wrinkle (3) moisture may cause the flame retardant compounds to move, causing salt rings, and (4) corrosion is accelerated by moisture.

**Durability/Cleaning**
Flame retardants are generally water-soluble chemicals. Though there are sometimes claims made to the contrary, we are aware of no flame retardants which are truly durable to wet cleaning.
Moisture of any kind can move flame retardants and localized spills can cause light-colored rings which can be difficult to correct.

Most manufacturers recommend dry-cleaning for flame retardant-treated fabrics. Dry-cleaning is not generally as effective as wet cleaning and the abrasion and agitation will remove a certain amount of the flame retardant chemistry. Professional cleaning by a knowledgeable firm is a must for these fabrics.

**Dye Changes**

One of the most serious problems with flame retardants is also, unfortunately, the most difficult to predict. A small number of fabrics, most of them made from cellulosic fibers colored with fiber reactive dyes, have been known to undergo dramatic color shifts due to a reaction between the flame retardant and the dye. These color changes first appear several weeks to several months after the installation is complete, becoming gradually more intense over time.

In one instance of this type, a muted gray-blue matelassé (cotton/rayon) changed to a very bright peach color after six months. The color change was apparent only on exposed areas of the fabric, suggesting that oxygen was required to move the reaction forward. In another situation, a green cotton fabric began after six months to take on a dingy brown appearance. Again, only exposed areas changed color and the problem grew progressively worse.

There is no screening test for this type of long-term damage. At this time, we know of no flame retardant companies that will guarantee against this problem.

**The Experts on Your Side**

Fiber-Seal’s worldwide system of fabric care experts stands ready to help whenever we are needed. From maintenance recommendations to in-person assistance for stubborn spots and spills, the professionals of the FIBER-SEAL Fabric Care System create success stories and happy clients every day.

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Or, you can always give us a call at 214.333.9400 or email us at info@FiberSeal.com.