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1-800-944-2840 www.beaulieu-usa.com

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Fluorochemical Carpet Protectors: How they Work

The carpet industry is one that is in constant evolution. Because of this, carpet continues to be made using better raw materials and manufacturing technologies in our on-going mission to provide consumers with longer lasting carpets that consists of more vibrant colors, intricate designs, and performance features. While these progressions in carpet manufacturing technology continue, protecting textiles, whether they are used in carpet, clothing, draperies or furniture, often relies on almost unchanged fluoro-treatments that were discovered by the 3M Company more than fifty years ago.

Fluoro-treatments **consist of phenolic resins and other copolymer blends such as acrylic** (no PFOS: perfluoro-octanyl sulfonates) that are applied to carpets during the manufacturing process to protect the fibers from dry and wet soils, as well as water- based and oil-based contaminants. These treatments, which are estimated to be used on somewhere between 70-90% of all carpets, can consist of common name products such as Scotchgard,™ Teflon,™ or a near cousin in-house proprietary formulations such as our own Permashield, that can be applied to individual fibers or to the fibers during either the dyeing or coating process. These products coat carpet fibers from their base to their tip, and work by reducing surface energy so that spills will remain suspended on the carpet fiber longer in order to better assist in immediate spot cleaning and removal, and minimize spreading of spills. This same characteristic causes soils to stay on the carpet's surface longer for easier and more effective vacuuming, and when properly reapplied after cleaning, helps reduce re-soiling. This same reduction in the surface energy of the carpet's fibers offers two other noteworthy carpet features: a reduction in the static generating properties of a carpet, and less potential for wicking.

In addition to fluoro-treatment protectors, colorless acid-based dye blockers can be added to nylon fiber to increase this fiber's stain resistant properties. Stain blockers accomplish this by impregnating fiber dye sites and forming a barrier that protects the fiber from stain-producing contaminants, especially those that contain acid-based dyes (e.g. colas, coffee, tea, fruit punch, etc.) that are similar to the acid-based dye stuffs used during the carpet dying process. Dye blockers and fluorochemical can be steamed and heat-set during manufacturing to provide more long-lasting protection, thus giving added value to carpet.

Although fluorochemical treatments and acid-based dye blockers help extend the beauty and life of a carpet, they are not permanently attached to carpet fibers. As a result, their effectiveness diminishes as a result of foot traffic abrasion and from cleaning. Because of this, and because solution dyed fibers offer permanent and more effective stain resistance features than fluorochemical additives and do not require the use of dye blockers, the application of fluorochemical treatments on solution dyed fibers used in the manufacturing of commercial carpet is often considered to be more about sizzle than steak. As a result, while the technology surrounding the benefits of fluorochemicals is sound, when a manufacturer offers an occasionally ambiguous, and typically very specific and "limited" stain-resistant warranty with a commercial carpet, one should take into account the difference between the "ideal world" and the "real world".

In an ideal world, commercial carpet is always properly cleaned and maintained in strict compliance with the manufacturer's requirements, and fluorochemicals are always properly applied after cleaning so that a carpet continues to benefit from the advantages of this type treatment. Unfortunately, the carpet cleaning industry is quick to point out two particular "real world" things to consider: very few commercial carpet cleanings are done "as be

needed". And very few commercial carpet facility managers are willing to pay the additional 25% to often as much as 50% increase in carpet cleaning cost (.12 to .16 cents per sq. ft or more) they just paid in order to also have a fluorochemical re-applied to their often sizeable carpeted facility. While the additional "down-time" required for carpet to dry with the application of fluorochemical treatments may not be an inconvenience to consumers, it might be considered a disadvantage to commercial facility requirements.

Generally speaking, the effectiveness decline rate of fluorochemicals is approximately 30 % with each scheduled cleaning. For this reason, carpet manufacturers typically recommend re-application of a fluorochemical with every deep carpet cleaning in order for the carpet to be capable of providing adequate soil resistance and stain repellency properties.

While a loss of 30% of the original effectiveness of a fluorochemical may not sound significant, if a carpet has been poorly maintained, or, is more heavily soiled, such as is often the case with commercial carpet installations, the carpet cleaning technician is often required to use more aggressive, higher pH cleaners. In these instances the decline rate of these protectors can be as much as 50% of their original properties and the re-application of the fluorochemical becomes necessary to re-establish and enforce the soil repelling and stain resist properties of the carpet.

With these considerations in mind; any consumer, be them of residential or commercial carpet, who is genuinely committed to obtaining optimum carpet appearance and performance during the life cycle of their carpet should consider having the re-application of a fluorochemical treatment as an essential part of each professional carpet cleaning.

When a carpet has been properly cleaned using the hot-water extraction cleaning method, the down time (i.e., the time required for the carpet to dry before it is put back into use) is typically 4-5 hours. Consumers who are concerned about down time should understand the very necessary and significant role it plays in the over-all success of a carpet cleaning.

Written by: Mark Johnston
Technical Services Staff: Mark Johnston,
Tammy Smith, Tonya Monk, Greg Raborn