Additional Observations

DRYING TIME: Soiling of the carpet with the fluorocarbon product led us to continue side-by-side tests versus e-clean Carpet Cleaner, allowing greater drying time, even though the longer time would not be realistic for on location cleaning. It should be reported that after 48 hours drying, the competitive product could be considered acceptable. However, a panel consistently rated e-clean Carpet Cleaner as best, the untreated carpet second best and the competitive product third.

It was noted that even after 48 hour drying, when the e-clean Carpet Cleaner carpet felt dry, swatches with the competitive product felt slightly damp. Testing with a WAGNER L609 Moisture Detector (photo 8) confirmed that the e-clean Carpet Cleaner was dry, while the competitive swatch registered near the top of the scale for presence of moisture. As further confirmation of the fast drying, e-clean Carpet Cleaner has been approved by CRI's Seal of Approval program.

PHOTO 8 – TESTING FOR DRYING

The competitive product apparently leaves a hygroscopic residue that attracts moisture which in turn causes resoiling that far outweighs any possible advantages from the small amount of fluorocarbon added.

The fact that e-clean Carpet Cleaner has, in all tests, shown slightly better soil resistance than new carpet, raises the question as to why...Our theory is the small crystals, to which e-clean Carpet Cleaner dries, may be sealing the dye sites in the carpet fiber. These dye sites are microscopic pockets on the surface of the fiber that allow it to be colored.

PHOTO 9 – e-clean Carpet Cleaner AT LEFT

COLOR: Sealed bottles of the competitive product from different sources were each of different colors, ranging from light tan to that of iced tea. The darker sample, when diluted for testing, was dark enough to discolor the white carpet. These variations in color could indicate incompatibility of ingredients. The competitive product surely was not intended to be dark brown.

Timothy C. Morris
Technical Director

Laboratory Report

Subject: Carpet Resoiling After Cleaning

DATE: DECEMBER 4, 2008

PROJECT: To compare soiling of carpet after cleaning with e-clean Carpet Cleaner versus carpet cleaned with [redacted]* containing [redacted]* fluorocarbon.

CONCLUSION: Carpets cleaned with e-clean Carpet Cleaner offer considerably better resistance to resoiling from typical foot traffic than does the competitive product. See following pages for test methods and details.

CLEANED WITH COMPETITIVE CLEANER CONTAINING FLUOROCARBON.

CLEANED WITH e-clean Carpet Cleaner SOIL RESISTANT CARPET CLEANER.

PHOTO 1

* THE NAME OF THE COMPETITIVE PRODUCT HAS BEEN BLOCKED OUT, AS THE INTENT OF THE TESTING WAS NOT TO SHOW THE FAILINGS OF THE COMPETITIVE PRODUCT.

INTRODUCTION: There's a truism about cleaning carpets, that they soil more quickly after being cleaned than they did when new. The question is, "does that have to be," and if not, what is the best way to prevent resoiling?

The problem dates back to the days when carpets were shampooed with coconut oil soap that left a sticky residue which held loose dirt that otherwise could have been removed by vacuuming. As time has gone by, the problem has been eased by development of extraction machines that reduce the residue, and by detergents that are not as sticky as soaps. Of course, if the residual is even somewhat sticky, the problem still exists, just to a lesser extent.

Some cleaning solution manufacturers have tried to improve soil resistance with additives to their products. Some have added polymers that cause their products to dry harder. This helps, but the finished product can seal in previous soil, and the polymers also tend to change the texture and resilience of the carpet... Now some manufacturers are touting the addition of fluorocarbons like 3Ms Scotch Guard and DuPont's Teflon or Zonyl. This sounds good, because such products are used in the making of stain resistant carpeting, but staining and soiling are two different things. Staining from spills of wine, cola, etc. is more of a household carpet problem, whereas the big problem with commercial carpeting is that it soils from heavy, dirty foot traffic.

When used as treatments at the carpet mills, fluorocarbons are used at high concentrations and they are cured in the carpet at high temperatures. When added to a cleaning solution, the fluorocarbon is about 1% of the total solids. Then, diluted at two ounces per gallon, the percentage is down to 1/64th of 1%, and the extraction machine will pick up most of that.

We have developed new and different technology for e-clean Carpet Cleaner that tests show it works better than any additive. Our R & D led to a new surfactant complex that suspends and encapsulates soil, then dries to microscopic size crystals that will not stick to carpet fibers and are easily removed with the next routine vacuuming.

Though side by side evaluation of carpet on the floor has consistently shown e-clean Carpet Cleaner to be superior to solutions containing fluorocarbons, the following scientific testing was done to more accurately show the degree of difference.

SPECIAL REQUIREMENTS: 1. That the two cleaning solutions be diluted at the same percentages... 2. That exactly the same amount of each cleaning solution be used on test carpets of the same size... 3. That drying time after application of the cleaner be realistic and the same for both products... 4. That the soil and the amount of soil the carpet is exposed to be the same for each product.

TEST METHOD: Because meeting the above provisions for fairness would be difficult, if not impossible on a floor test, it was decided to conduct the tests with accepted laboratory equipment known as a Snell capsule. As shown, this is a hexagonal box that turns much like a squirrel run. It was developed by Foster D. Snell test laboratories and used widely to evaluate floor finishes for black mark resistance.

PHOTO 2 – THE SNELL CAPSULE

TREATING THE CARPET: Testing was done on Galaxy, New Creation, Ice Cap color nylon, cut pile carpet. It had been previously established that a $4^1/_2$" x $5^1/_2$" carpet swatch would absorb 20 ml of liquid without wetting to the point of dripping when uniformly applied. Products were diluted precisely at 1 part cleaner to 8 parts water, then 20 ml was poured into separate 100 ml beakers. To avoid any differences in the amount of cleaner going into the carpet, the cleaners were applied with 1" paint brushes that would not absorb product as would a cloth or sponge,

THE CAPSULE TEST: Two panels on opposite sides of the hectagon capsule are removable and each allows space for three separate carpet swatches. On the inside of each removable cover we mounted one piece of carpet done with e-clean Carpet Cleaner, one done with the competitive product and one piece of new, untreated carpet. The capsule was closed and it was set to rotate for 5 minutes, in which time it made 175 turns... When the equipment was stopped, the panels were removed. The carpet was vacuumed and then evaluated for retained soil.

PHOTO 3 – CLEAN CARPET MOUNTED

PHOTO 4 – RUBBER HEELS AND DIRT ADDED

PHOTO 5 – AFTER RUNNING CAPSULE

DRYING TIME: To determine the effect of fast, complete drying on soil resistance, carpet was tested in the capsule with varied, but realistic drying time after treatment. In the photos, e-clean Carpet Cleaner is at the top of each photo.

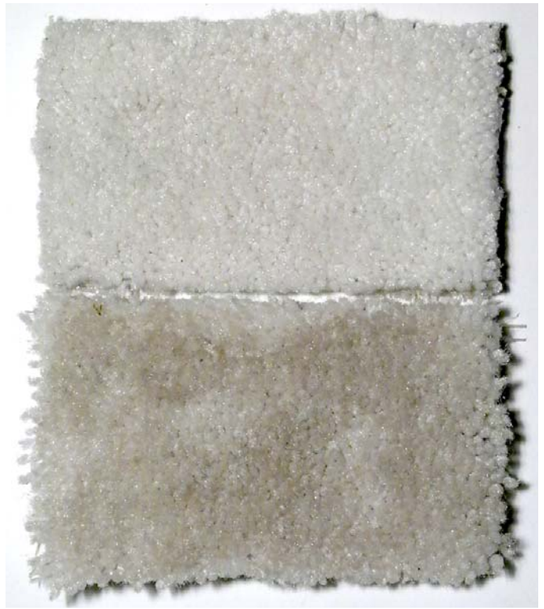

PHOTO 6 – AFTER 9 HOUR DRYING

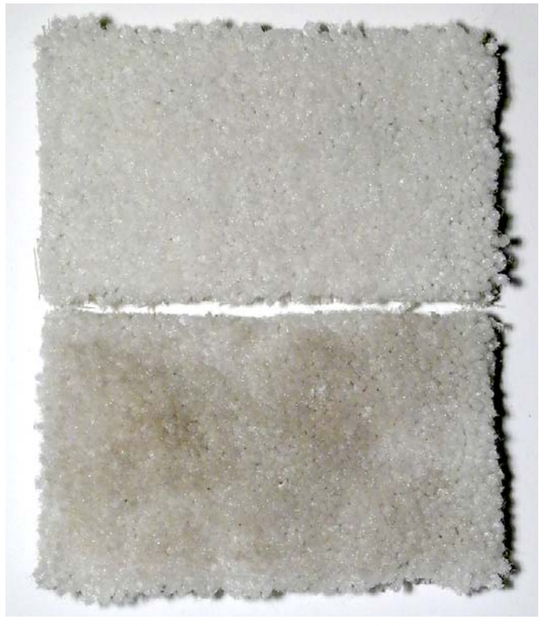

PHOTO 7 – AFTER 12 HOUR DRYING