

# CONCRETE CURING ADDITIVES AND TOPICAL APPLICATIONS

Successfully installing any type of floor covering material or floor preparation treatments such as leveling and smoothing compounds is challenging enough without impeding their effectiveness with bond inhibiting compounds applied to the surface of the slab. We've discussed before the use of Fly Ash in concrete and how, if in high enough quantity, it can prevent anything from bonding or sticking to concrete substrates. (CFR Volume 8-Be Aware of Dangerous Situation-March 2008) The flooring industry, and anyone else involved in flooring which includes the General Contractor, Architect, Designer, Facilities Managers and Owners, are facing another obstacle to successful floor covering installations due to the use membrane forming curing compounds or chemical compounds that are alleged to provide Both curing and topical moisture mitigation. Worse yet a bill of goods on these systems are being sold to Architects and General Contractors and the systems are being written into the construction specs. This forces the flooring contractor to either install the flooring material and face imminent failure or not do so and lose the work or face legal action.

The successful installation of any type of flooring material, underlayment or smoothing compound continues to be far more challenging than it needs to be. As stated, in previous issues we have discussed the challenge of bonding any type of flooring material to the surface of concrete mixtures containing very high levels of fly ash or slag.

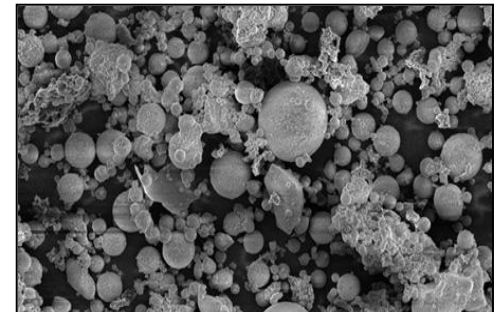
In this issue we look at another all too common practice that while proper in intent often results in flooring problems or installation failures. The practice we refer to is that of curing. Proper curing is absolutely necessary for hydration of the cement used in the concrete mixture. However the curing process need only be maintained for a period of 7 days.

## ***Curing Compounds:***

Curing compounds are fluid applied, spray or rolled on thin mil membranes designed to slow down the loss of moisture from the slab surface. While it is most important to maintain moisture in the slab for the first 7 days after placement, the use of a curing compound will slow down the drying of the slab over time and in many cases the material will act as a bond breaker. ASTM F 710 does not specifically prohibit the use of curing compounds. It does require that the material be completely removed from the slab surface before moisture testing is performed or any type of floor covering material is installed. Removal often requires shot blasting which can be a very expensive process at later stages in the project.



**Self-Leveling Compound**



**Fly Ash**



**Ground Granulated Blast  
Furnace Slag**



**Rolled Application of Curing  
Compound**



Spray Application of Curing Compound



Floor Shot Blasting

There are a number of chemical formulations and variations in solids content used to produce membrane forming curing or curing and sealing compounds. Curing compounds that are also sealing compounds will remain on the surface permanently until mechanically removed or continuous abrasion wears them off of the slab surface. There are also several hydrocarbon formulations that will break down over time with either exposure to ultraviolet light or high pH. While this class of curing compounds will chemically break down over time, abrasion is still required to remove the resin residue from the floor surface. The challenge this poses is that if there is not traffic on the entire substrate or exposure to UV, the compounds will not break down. Whatever residual material remains can and will compromise the installation of floor covering materials.

There are also several curing compounds referred to as “dissipative” that will break down over time with either exposure to ultraviolet light or high pH. While this class of curing compounds will chemically break down over time, abrasion is still required to remove the resin residue from the floor surface. The catch is fast tracked construction which speeds the job along not giving these types of treatments time to break down. Even when given months to break down the material will remain on the surface of non-trafficked and less trafficked areas. So residual curing compound remains on the floor, the installation fails and the arguments begin as to what type of treatment was used and who was responsible for not properly removing the compound from the slab surface. The hot potato usually winds up in the hands of the flooring contractor who has to prove it was not his installation that failed but the substrate which he was given that caused the failure. This is usually visibly evident when the flooring material is lifted up effortlessly, with the adhesive found mostly on the back side of the flooring material with little to none on the substrate or what’s there is degraded.



Failed Adhesion

Over the past decade the use of so called; “Chemical Curing Compounds” has gained great popularity in this country. These non-membrane forming, water-based materials

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typically use one form of silicate or another in an attempt to densify the slab surface and slow down the loss of moisture in the slab. Some manufacturers of these compounds go so far as to suggest that applying this type of material to a freshly finished concrete surface will mitigate potential moisture-related floor problems. Oh that it could be that easy.

In the professional opinion of all of our LGM staff and consultants, chemical curing, and chemically reactive topical moisture mitigation treatments have too many issues working against them to be relied upon. As one member of our group suggests the use of these types of materials as a moisture mitigation strategy basically amounts to Russian Roulette.

The challenges to the topical application of a chemically reactive material intended to provide moisture mitigation are many. First of all, applying a water-based material to the surface of a freshly finished concrete slab means that

the chemical compound is being applied to the slab surface when it is at its wettest state which significantly limits the depth of penetration.



Fresh Slab Pour

Secondly, if fly-ash or slag was used in the mix, the chemical reaction of the sprayed on compound may not take place completely as the ash and slag compete for the calcium hydroxide necessary to complete the chemical reaction. When this occurs all of the chemically reactive surface treatment may not properly react and a bond breaking material can be formed.

Chemically reactive materials do not always result in a flooring problem however the seriousness of the issues associated with their failure preclude acceptance of the approach by all of us at LGM and Associates. When a silicate-based,

chemically reactive material fails to protect the flooring installation it may require removal of more than 1/8 inch of the concrete surface to effectively correct the problem.



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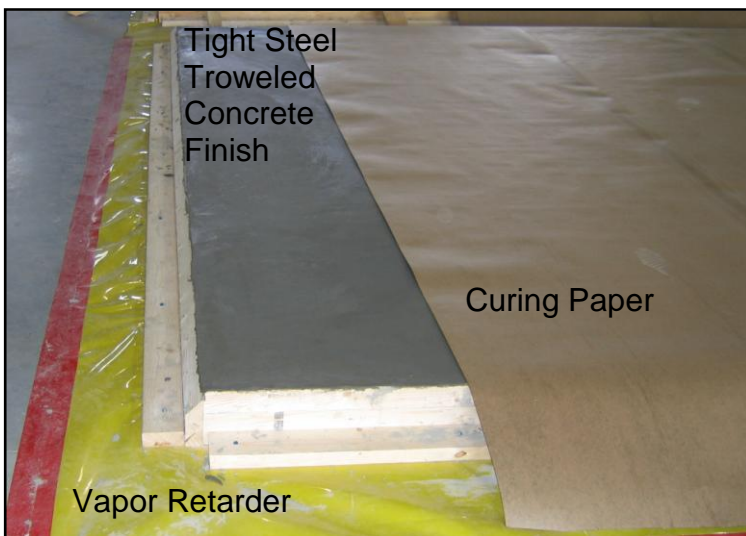


These products get sold and worse yet specified because of the unsubstantiated promises they make. People want to believe that all they have to do is spray a compound on the concrete surface or put it in the concrete and all flooring problems will simply go away. Oh, that is could be that easy.

These systems and the issues that follow help keep us very busy at LGM and Associates. While we enjoy the business we would much prefer to earn our living helping people avoid problems, not create them.

It may sound old fashioned but the prescription for a successful flooring application follows a back to basics formula.

1. The use of a low-permeance vapor retarder placed in direct contact with the underside of the slab.
2. Low water-to-cement ratio concrete.
3. The use of continuous reinforcing steel to help mitigate slab curl and eliminate joints.
4. Concrete finished to a smooth, but non-burnished finish.
5. Cover curing of the finished slab with dry, wet-strength curing paper for 7 days.
6. Use no sweeping compounds or compounds that do not contain oil or wax.
7. Condition the ambient environment to warm the slab and reduce ambient relative humidity to below 50%.



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U.S. Patent 7,231,815. Additional patents pending



Be wary of adhesive products or topical applications that are said to be cures for concrete curing compounds or high moisture and alkalinity in concrete. They too are likely to fail overtime. You can't put a bandage on a hemorrhage. There are systems that will work without having to bead blast the substrate or remove it to great depths. The EnviroSTIX system, when used with the proper primer and sealer, can adhere hard back carpet tile and sheet goods to these substrates. Systems that don't use adhesive, such as the Velcro Hook Squares System, at this point for carpet tile only, are also effective means of installing without worry of failure since no adhesive is used. There is also a system being developed that does not use adhesive which will bond broadloom carpet and carpet tile to the substrate when specialty backings are applied to them. Remember, if you have need help with flooring issues call us we have the answers.



EnviroSTIX Installation System



Velcro Hook Squares System

Systems like EnviroSTIX for hard surface and hard backed flooring materials and Bentley Prince Street Contact Release for carpet are systems that will help prevent the failure of flooring installations. There is more technology coming, most of which we are involved with. We'll keep you informed to help you. In the meantime understand that moisture, temperature and humidity have a profound effect on flooring materials and the integrity of their installation.

The new **Velcro Brand Carpet Protector** is ready to go. This product takes the place of clear plastic coverings with pressure sensitive adhesive that have created a host of problems for the industry. The **Velcro Brand Carpet Protector** is made for use on loop and cut and loop carpet; the vast majority of commercial carpet. Bentley Prince Street is the first carpet manufacturer to offer this unique product. Contact Velcro for more information and samples.

FOR IMMEDIATE RELEASE

June 9, 2008

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**BioCel™, EnviroCel™ QUALIFY UNDER EXPANDED  
USDA PREFERRED PROVIDER PROGRAM**

**Dalton, Georgia** –Recent rulings from the United States Department of Agriculture qualify high-performance BioCel™ and EnviroCel™ polyurethane carpet backing systems for Federal purchasing preference as designated biobased items under the USDA's BioPreferred<sup>(sm)</sup> program.

The BioPreferred program was established as part of the 2002 Farm Bill. It requires Federal agencies to purchase biobased products over their petroleum-based counterparts, as long as the biobased materials are reasonably available, reasonably priced, and comparable in performance. In May, 27 new product categories were announced, adding to the six categories already approved. BioCel and EnviroCel qualify in the carpet category because they replace large percentages of the petroleum-based components in their polyurethane chemistry with Agrol® polyols made from soybean plants. The two backing systems also contain Celceram®, a recovered pre-consumer mineral compound that adds to the products' environmental and performance benefits.

"I am gratified that the Federal government, the country's largest single consumer, is supporting the diverse community of biobased products, and rewarding innovation and environmental initiative on the part of the manufacturers." said Universal Textile Technologies president Tom Peeples.

Life cycle assessments funded by the National Soybean Board and performed according to ISO 14040 guidelines prove conclusively that the manufacture and use of soy-based polyols results in a significantly smaller environmental footprint compared to petroleum-based materials. Benefits were demonstrated in the areas of global warming, fossil fuel depletion, smog formation, and several other issues of environmental impact.

\*

Universal Textile Technologies supplies the carpet industry with multiple backing systems manufactured for use in mid to high-traffic commercial applications, including the corporate, healthcare, education, and hospitality markets. For more information, contact Universal at [www.universal-textile.net](http://www.universal-textile.net).

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## Concrete Moisture Testing Technician Certification – Grade I

The International Concrete Repair Institute (ICRI) is pleased to introduce their Concrete Moisture Testing Technician Certification Program. The purpose of this program is to help improve the performance of concrete slab moisture testing in the U.S. to result in more consistent, accurate results that will help flooring manufacturers, architects, and contractors to make better decisions as to when a concrete floor is ready for a floor covering installation.

The certification program has 2 tiers. Tier 1 applicants are those who are not regularly engaged in moisture testing yet have an active interest in learning more about the tests, what the tests mean and how the tests should be performed. Tier 2 applicants are those who have applied for full certification. Both tiers require attendance at a 3 hour educational session followed by a written exam. Tier 2 full certification applicants will also be required to perform each of the 4 tests under the watchful eye of a qualified judge who will not provide any level of coaching. Prequalification for acceptance into full certification Tier 2 will be previous testing experience.

Tier 1 consists of a 3 hour educational session, a written exam and a training session. Those who complete the course and pass the exam will be issued an ICRI Letter of Education. Tier 2 consists of the same 3 hour educational session, the written exam and a field performance exam. By passing both the written and performance exams, an ICRI Concrete Moisture Testing Technician - Grade I certification will be issued to those who successfully demonstrate their knowledge and ability to properly perform and record the results of each of the four field moisture tests on hardened concrete. Those who pass both the written and performance exams will receive a certificate and wallet registration card.

Both the written exam and the field tests will be based on the following four (4) ASTM Standards, including all Annexes and Appendices:

F 710	Preparing Concrete Floors to Receive Resilient Flooring; Section 5.3 pH Testing
F 1869	Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
F2170	Determining Relative Humidity in Concrete Floor Slabs Using <i>in situ</i> Probes
F2420	Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood

ICRI Certification for Slab Moisture Testing Technician– Grade I shall be valid for a period of five [5] years from the date of completion of all applicable certification requirements.

The two day certification program begins on the first day with registration from 8 - 9 am, followed by the 3 hour educational session. There will be a provided lunch and study break from 12 – 1 pm followed by the written exam from 1-2 pm. Following the written exam Tier 1 students will attend a training session where they may receive or observe hands on training on how to properly perform each of the four tests.

For those registered for the Tier 2 Certification, day two begins at 8 am, and each applicant will be required to perform all 4 ASTM tests listed above.

**Houston** —  
Tuesday/Wednesday,  
March 15/16  
(with ICRI Convention)

**Tampa** —  
Wednesday/Thursday,  
April 6/7  
(with ACI Convention)

**St. Louis** —  
Tuesday/Wednesday,  
May 17/18

**Cleveland** —  
Tuesday/Wednesday,  
June 7/8

**Denver** —  
Tuesday/Wednesday,  
September 20/21

**Baltimore/Washington**  
Tuesday/Wednesday,  
October 25/26

**Seattle** —  
Tuesday/Wednesday,  
November 8/9

**For more information on attending these ICRI events, call Caren Giles, ICRI Member Services, at 248-848-3809**

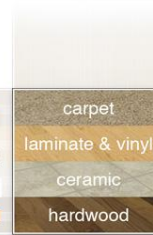


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