

floor trends

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Contractors Discuss Moisture Mitigation
Carpet Color Trends: What's Hot for 2015
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Contractors Discuss Moisture Mitigation

The following is part of a continuing series of retailer and contractor forums *Floor Trends* is doing over the course of the year.

These “roundtable” discussions will focus on a specific topic, in this case moisture mitigation. For the story, we interviewed flooring contractors from around the country to get their input on this specific topic.

The idea is to put forth a series of best practices as well as to point out when it comes to certain things, in this case moisture mitiga-

tion, there is no place in the country where the issue doesn’t come up.

While there are certainly a variety of answers that came from the different contractors we encourage readers to pay attention to both the similarities and differences—and more important the reasons given—to give you a better perspective on what these companies are doing compared to how you might be doing it. The hope is you glean an idea to implement in your business strategy when faced with the topic at hand.

In the area of how contractors handle moisture mitigation issues, which many people both in and outside of flooring consider to be the No. 1 issue facing the industry, we asked a variety of questions, ranging from common problems contractors come across to their processes and procedures for testing as well as how they handled a difficult situation—sometimes at great costs to their company—to give readers even more insight in case they run into a similar circumstance.

Here’s what they had to say:

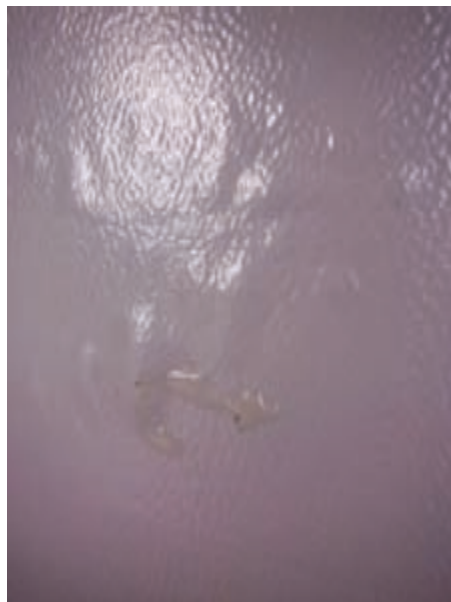
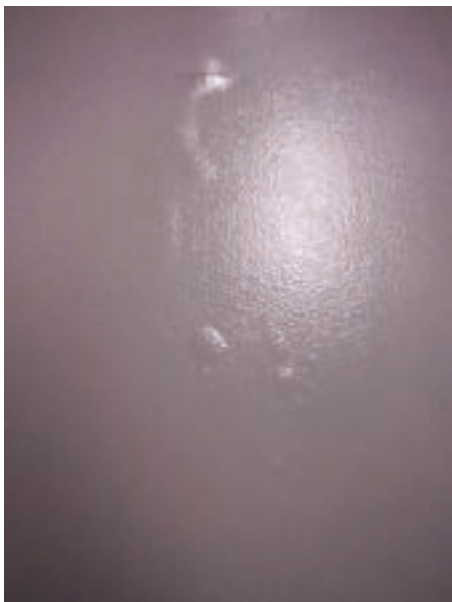
•What is the most common moisture-related problem you come across?

Edward Covington, Covington Flooring Co., Birmingham, Ala.: The responsibility of who is going to pay for moisture mitigation is becoming more and more of a problem for us. We have had several projects where the general contractor (GC) has tried to stick us with the cost of mitigation. I am not sure if that is the kind of “problem” [others are facing] but it is definitely a problem for us.

Jobs are delayed for one reason or another—by no fault of ours—and it comes time to do our work and the slab is wet and everyone looks to the flooring contractor to handle it.

I have even had a GC say he considers this “standard floor preparation.”

Rick Kercheval, Intertech/Supercap Southwest, Dallas: Usually, it’s high permeability concrete and required



As these photos from Flooring Resources Corp., Elk Grove, Ill., show sometimes the floor will start to “bubble up” from the moisture underneath, and sometimes there is so much it literally starts seeping through the surface.

rapid turnaround on new pours. Also, poorly run or no testing prior to installing a sensitive floor finish and not knowing a failure was imminent or [due to happen within a] short time.

Les Lippert, Lippert Tile Co., Menomonee Falls, Wis.: Project schedules do not always allow for proper concrete drying conditions. Delayed building enclosure and HVAC system operation, combined with the short project durations, make concrete drying an issue. Once we are at the point where concrete moisture is preventing us from performing our work according to the schedule, there are two solutions to the problem: Extra time permitting concrete drying or extra money spent on remediation.

Bob Plann, Resource Arizona, Phoenix: When existing facilities change to carpet tile and the existing slab has no moisture barrier underneath. [This causes] adhesive emulsifying. This is when the dried adhesive mixes with the moisture coming up from the slab and returns to its liquid state, which creates a bonding issue with the floor covering.”

George Spanske, Flooring Resources Corp., Elk Grove, Ill.: New construction with relative humidity (RH) levels in the concrete beyond manufacturer’s recommendations. Occasionally, we see pH levels that are too high as well.

John Stanfield, Resource Colorado, Denver: High RH readings on fast track new construction projects.

Steve Woodman, G&W



Sometimes you don’t know exactly how bad a moisture/water problem truly is until the flooring is taken up and the results can sometimes be troubling as seen here.

Commercial Flooring, Kent, Wash.: The construction schedule does not allow cure time for the slab. It’s a scheduling problem—not a flooring problem. Once that is understandable by all parties a rational discussion can occur.

•What is the first thing you do when looking at a moisture mitigation problem?

Covington: After we have tested to determine the level of vapor emission we then have to decide what type of system to use. This is dictated by the type of floor covering we are installing and the monetary impact to the project.

Kercheval: Gather all information about the project and then test for suspicion to eliminate any doubts or conclusions until there is a clear pathway to the present condition.

This problem is not cookie cutter at all. You need to search for what caused the problem to begin with.

Symptoms are not what you are treating—problems producing the condition are. [For instance] 95% of building management and construction is controlling completely the access of moisture into and keeping it out of a building. It doesn’t just magically show up. There is science involved here with sound principle.

If you can explain it that way to the owner of the problem, you then will be required to explain in simple terms how a product and its claims can be shown compatible to this problem. Otherwise, it is simply a ‘hurry-up me-too’ product that has the potential toacerbate the problem.

We ask the person who brings the solution to explain the problem thoroughly and then how the material he will use to fix the problem resolves the science, the physical condition, and how long similar projects with this same problem have been successfully performing

with expected floor finish wearing life.

Lippert: The highest priority is installing the work properly with the highest standards for craftsmanship, as opposed to simply getting it done incorrectly by a deadline.

We quantify the current conditions in relation to the schedule. The severity of the moisture issue will suggest the proper course of action.

The best solution often involves both time to allow additional concrete drying and money for a moisture tolerant adhesive, product or mitigation system.

After we leave the project, both the client and the material manufacturer must have floors that perform as designed and intended. That gives us a plausible reason to claim our expertise and a relationship with the client, as opposed to a simple transaction.

Plann: We will review other floor covering prod-



While many people around the country will think places such as Arizona are not as susceptible to moisture related problems, the folks at Resource Arizona in Phoenix will beg to differ as their crews had to prep this floor—and room—to help solve a difficult moisture problem. As the after photo shows they were able to mitigate the issue and had the subfloor ready to receive the actual floor covering.

ucts and various mitigation options—and we evaluate them with the client.

Spanske: We look at RH levels at the current site, the installation schedule and manufacturer’s recommendations. If needed we get mitigation partners involved.

We often use the expertise of product manufacturers’ technical services departments and sometimes have them visit the installation sites with us.

We may need to talk to a number of manufacturers depending on the severity of the problem.

Stanfield: The first thing we do is make the customer aware of the issue. Then we take the time to educate them on what the potential issues will be as well as the costs involved.

Woodman: Collect information, including the age of the slab, type of slab, duration of permanent heat, survey topography around

the building, understand what flooring is being installed with appropriate requirements, explain testing methods, and, if needed, educate the customer about slab moisture issues.

•Do you test before every job?

Covington: Yes, because it’s the cheapest form of insurance.

Kercheval: Yes, it is responsible to do so for both to the buyer and seller. Professionalism is expected by all parties—anything else is an error of omission or a general lack of experience and, in worst cases, a hit-and-run artist.

This moisture problem is common and real because of the mandatory environmental tightening of homes and buildings going “green” and the demands of energy conservation. Also, concrete has more and more additives to control costs while main-

taining strength and cost. Long gone is the availability of hard rock aggregates that made up concrete. Concrete today in some cases, uses crushed (old) concrete as aggregate.

Lippert: We test every project, with very few exceptions, to provide a record of the concrete condition supporting our decision to proceed with the work.

We focus on the risk management benefit of testing rather than on the expense and inconvenience.

Plann: Yes, because moisture tests are usually required by the floor covering manufacturers in order to validate the product’s warranty.

Spanske: Yes. We test for our own information as well as to assist our customers.

Stanfield: We test every job because...moisture testing is cheaper than a failure.

Woodman: We test every new slab, those with noticeable moisture symptoms,

those located in certain parts of town or those where we don’t have much information about.

We typically do not test slabs that are not on grade and are not new unless we observe moisture related symptoms on the existing flooring or surroundings.

•Do you do the testing yourself? And what is your preferred method for testing to see if there is a moisture problem?

Covington: Unless there is a specific requirement for a third party we almost always test ourselves. We do calcium chloride and RH and really don’t prefer one to the other. It really depends on the project requirements—sometimes the documents dictate the testing method.

Kercheval: [Yes and no]. It is important to know how to plainly discuss the reasoning and procedure. You cannot ‘fake’ knowledge about the testing and you certainly will not be able to ask the necessary questions required without thorough knowledge of testing and test meaning.

It is also prudent in order to examine other testers’ procedures, locations, and thoroughness of proper test performance in most cases. I am ICRI certified and think it is almost mandatory to pick someone who is really involved in becoming certified and who understands the nature of what is going on and what has to be examined.

There is a lot to be said for this question. Using a third party is OK by me and we use it but you need to watch what is going on or you easily could be out a lot of



Some of the many aspects of moisture mitigation contractors such as those like Resource Arizona do is using epoxy in the joints and shot blasting the floor to remove the emulsified adhesive and to open the pores in the concrete to prepare it for the next step.



The foyer to Covington Flooring Co. While moisture mitigation problems are nothing new, the Birmingham, Ala., contractor is finding lately the aspect of who is going to pay for it becoming more of an issue, including a current case it is having to deal with.

money and not be any closer to the truth of the situation.

Most testing is run inaccurately—including [ones done by] engineering firms. This easily produces inaccurate data everyone uses to move forward on the floor thinking all is well when failures are inside the warranty bubble or just over the horizon because of inaccurate or shoddy testing.

For example, residential wood flooring installers spread a 3mil visqueen under the wood and on the concrete as a safety mechanism for moisture in order to make the one-year warranty. After that, it is an act of God.

When it comes to the type of testing, it's history first: What type of floor failed and for how long has this been going on; building topography; as built (vapor retarder), and then alkalinity in a presently stressed or failing condition next.

Further, RH according to ASTM F2170 and calcium chloride based on ASTM F1869 and ASTM F710 for alkalinity using a digital meter calibrated often to gain confirmation.

A whole host of other factors must be known as well. What has been tried and failed is another big one. Whose warranty did not cover the issue if a solution was applied and failed? Sometimes coring is a requirement. Is the ground out of play? What kind of finish and traffic will they be applying to the corrected floor?

Lippert: We perform the testing with our own trained project management staff. We believe this enables us to be more responsive and keep the costs down.

Our project managers are tasked with inspecting the projects before we begin on-site activities. Concrete testing is begun at this time.

We prefer RH testing per ASTM F2170. The ease of monitoring them, and the ability to record results and illustrate the drying progression for the client makes this method our preference.

Plann: We test the slab ourselves as a cost-saving tool for our client. The testing is included in every contract to protect both

us, and our client's investment. They have the option to go through a third-party at their own expense.

We perform RH tests per ASTM standards.

Spanske: We do our own testing for our own knowledge on each project. We have the ability and expertise but are not certified moisture testers.

If the owner or GC needs certification, we can provide references to certified third-party companies. We prefer to outsource the liability in that situation to a third-party as we only test for our own general knowledge.

We prefer the RH test. Currently we are using Vaisala instruments for our moisture testing. We also test pH with standard litmus strips.

Stanfield: We have certified ICRI technicians on staff that test our jobs. The reliability of our testing results has been more consistent than third parties.

We test for moisture using the Wagner RH system. We test all jobs with carpet tile, vinyl, VCT, LVT and rubber.

Woodman: We encour-

age the GC or end user to engage their own testing expert but they rarely do. Even when they do we do not rely on their findings as we have found many to not be competent.

The concept of a truly 'independent expert' is elusive in any field. Regardless, we always do our own testing. We have senior personnel who are specially trained and certified to do the testing.

This is too consequential to leave to outside parties or junior staff.

We were an early adapter with Lignomat and Wagner probes. We use both depending on circumstances, flooring spec, etc. We rarely, if ever, used calcium chloride. The first things we ask are the age of the slab, type of slab, depth of slab, as well as assess location of slab and surrounding conditions. **ft**

Editor's note: To read the rest of what these contractors had to say on the topic of moisture mitigation, visit our website, floortrendsmag.com or see the March digital edition of Floor Trends.



Many floor contractors turn to Wagner and its complete line of moisture testing equipment in helping them determine if an underlying problem exists before they even begin a job.



Today's professional flooring contractor has more options than ever to help it resolve potential moisture related problems such as Mapei's Planiseal, which is designed to treat concrete slabs of at least 14 days that exhibit certain moisture vapor emission rates.

•Do you have something in your contracts pertaining to moisture mitigation?

Covington: No and yes. We always take specific exclusion to moisture mitigation—unless we are actually quoting a mitigation project—and we will make sure that the contract language excludes it.

Kercheval: Every single one.

Lippert: The contracts we sign generally tie us to the terms and conditions of the construction documents, which include referenced standards, manufacturers' requirements and industry best practices.

Proper testing is nearly always included, even if only by inference. Since we self-perform the testing, contracts we write to service providers or subcontractors do not include it.

Plann: We exclude moisture mitigation in all proposals. If testing indicates that the project has moisture problems, we offer mitigation options and let them

choose the course of action based on their budget.

Spanske: Yes, depending on the specifics of each project.

Stanfield: Unless moisture mitigation is specified in the bid documents, we exclude it in our proposals

Woodman: It is always excluded and the potential for being needed called out. We always want to avoid the claim or objection of, 'Why didn't you bring this up sooner?' There are those who try to use that defense for not being responsible for the cost of mitigation.

•Have you ever turned down a job due to a moisture problem?

Covington: Yes we have.

Kercheval: Yes, recognized alkali-silica reaction (ASR) or suspected concrete contamination that would prevent mitigation performance are two very good reasons to move on. Turning down anything where the testing results were very high is not one of the reasons for not performing.

There is really nothing to hang your hat on when you offer 'conditional repair' or 'conditional warranty.' You either fix the floor permanently or you do not. There are no partial fixes with moisture. You either get it fixed or you don't. However, it is compelling enough [to] not consider becoming a specialty contractor mitigating concrete because it is somewhat like hiring a smoker to run your firework stand. You get one crack at it and you had better know what you are doing.

Lippert: We have not. We would prefer to be all or part of the solution to any problems our clients have on their projects. We would only walk away from demands to consciously ignore standards, best practices or installation requirements. That presents the risk of liability we cannot afford to self-insure.

Plann: Yes.

Spanske: No.

Stanfield: No, we have always worked through the issues.

Woodman: Yes, if the client will not have either us or others perform necessary moisture mitigation if needed. We don't even accept waivers, as even the cost of legal defense is not something we want to be involved with.

•Do you get calls to fix someone else's mistakes in dealing with a moisture problem?

Covington: Yes we have.

Kercheval: Yes. Not only hit-and-run stuff but change of tenant and new finishes required in a renovation exposing attempted fixes under old stressed flooring indicating a lack of due diligence or history of a previous attempt at a now failed 'band-aid' on the slab.

This kind of thing in discovery is even more costly to correct due to additional removal of the failed system. Also, there are brand name players in this moisture mitigation business that say they have a warranty when they actually do not have



When most people hear of moisture related problems they usually think the flooring product is either carpet or resilient but wood can be just as if not more susceptible due to its nature to absorb water. That is why companies like Bostik have created adhesives, such as its Vapor-Lock line, that are designed to protect the wood flooring.



Having a proper moisture system in place as well as making sure the flooring itself is installed correctly is critical in places that will receive a great deal of standing water, such as the public restroom of a busy convention center and concert facility like Cobo Hall in Detroit, which recently underwent a multimillion dollar facelift.

any warranty and no skin in the game by the language of their terms and conditions. The customer is left holding a failed system with a soaring budget and nor recourse.

This has given the mitigation repair business a very bad name.

Lippert: We responded to a client's request to address moisture related failures on a large rubber sheet project a few years ago.

All the flooring had to be removed, the subfloor shot blasted, a moisture mitigation system and a self-leveling substrate installed, and new rubber flooring laid while a medical facility stayed in operation. This is an exception to the norm.

We do frequently receive calls from contractors requesting advice and opin-

ions about the issues they are facing. We are happy to be considered a resource for the information and the best practices of the industry.

Plann: All the time.

Spanske: Yes. We also get calls to do testing for others, such as mock-ups and bond tests with different manufacturers and adhesives.

Stanfield: Not typically, and we would not want to attempt to repair someone else's mistake.

Woodman: Yes, and we are capable of replacing those projects with proper moisture mitigation. Rarely is it a 'fix.' It typically is a full replacement.

•What is one of the most difficult moisture-related problems you've had to deal with and what did you do

to resolve it to everyone's satisfaction?

Covington: Currently it is a monetary responsibility issue on a large athletic floor project. In this case we're given a change order to install a mitigation system and then after the work was done the GC has refused to pay.

Kercheval: Anything related ASR or alkali-aggregate reaction (AAR) conditions. This is an active, dynamic cracking of concrete in the range of five to six years old or older that cannot be corrected with negative side barriers because the sealer will be compromised by future cracking.

Finding this before actually securing the confidence that you can perform is very difficult. There are only very sub-

tle attributes that give a clue to the problem yet any slab with moisture problems over six years old must be suspect in the diagnosis phase.

Lippert: Several years ago a food processing plant project was stalled by excessive moisture vapor emissions. The installation was to be epoxy set and grouted dairy brick flooring and base.

High vapor emissions can affect epoxy grouts by forming small pores in the epoxy as moisture vapor exits before the grout hardens. These pores may ultimately hold microorganisms that put the plant's certifications at risk.

We helped the contractor with placing dehumidification units and increasing the heat to speed the drying process, knowing a greater



Just like there are specially tailored adhesives to help with wood deal with moisture issue so are there ones for resilient flooring, such as can be found in Taylor's MS+ line.

degree of slab curling might occur and planning for some self-leveling work. The heating and dehumidification worked, there was some degree of slab curling that was easily leveled, the moisture vapor emission rate was suitable for the installation, and the work was completed.

There was a delay of a few days, and there was extra expense for the dehumidification and heat, but the floor was installed successfully and has performed as intended.

We have had a number of projects where our data for concrete testing has been very unwelcome news. Our next step is to make our intention to help the client resolve the issue appropriately by discussing the conflicts between the data and the standards and installation requirements we must meet. The discussion must be oriented toward the primary goal of finding solutions the client can live with.

Second, we must ensure standards and best practices are met, and manage the inherent risk downward to a level acceptable to all parties.

The most difficult moisture-related problems are those where the client doesn't recognize the magnitude of the risk, or where it lies.

Plann: It was a legal remedy—very expensive. And we were notified of the complaint eight years after installation.

Moisture levels fluctuate in concrete slabs depending on surrounding environmental conditions. We had installed a glue-down rubber floor in an MLB spring training facility and although the moisture levels were acceptable when we first tested the slab, it became apparent later on there was an issue under the rubber flooring. Working 24-hours a day for a total of 72 hours, we did the following to remedy the moisture problem:

1. Removed all furniture and training equipment from the space.
2. Removed the rubber flooring in question.
3. Shot blasted the floor to remove the emulsified adhesive and to open the pores in the concrete to prepare it for the next step.
4. Applied a two-part epoxy moisture membrane to stop the moisture from coming up through the slab.
5. Applied a primer and self-leveling system to create a smooth floor ready for new flooring.
6. Reinstalled new glue-down rubber flooring.

Spanske: We had a new construction project that had an engineering issue with the building's floor beams. We were contracted to install flooring in the majority of the 45-story building.

When the concrete was poured, the chamber was not set properly and the core area of the building was 2- to 4-inches higher than typical. To remedy the problem, other subcontractors began to pour a gypsum based leveling product.

After discussions with the building owners, this work was stopped. The flooring products we were scheduled to install were already suited for high moisture environments, but the RH of this concrete was 99%.

We spent many months in discussions with three carpet manufacturers, three floor prep manufacturers and three adhesive manufacturers. We finally mediated an agreement that each manufacturer would warranty its product in combination with the products they were

physically touching.

This was not an easy task and required discussions with many attorneys, consultants from CTL Group, George Donnelly Testing & Inspections and others. Additionally, we came to an agreement in the areas where we installed 40,000 square yards of broadloom that no file cabinets or heavy casework would be on the floor. All furniture was elevated in order to avoid trapping any moisture.

This project was not an easy task and required cooperation from all parties toward a successful end goal.

Stanfield: We had a failure with calcium chloride testing on a surgery center. The job had 600 yards of sheet vinyl that came off the floor.

We had to go in on Thursday evenings after the last surgery, remove the product, bead blast, install Koester, Ardex and the new vinyl, and have the facility ready for surgery patients on Monday morning.

We completed the process over seven weekends at a cost to us of \$91,000.

Woodman: We had an occupied healthcare facility with a long-term ground moisture problem resulting in discolored and even 'squishy' flooring when walked on.

They vacated the area for four days and we installed a moisture mitigation system and new sheet vinyl while not disturbing patient care in adjacent areas. The nursing staff actually drew interpretive figures on the floor a la a Rorschach test around the large dark areas beneath the floor. One was a figure of a body like at a crime scene. **ft**