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This month's issue has been provided in part by Jason Spangler of Wagner Meters http://www.wagnermeters.com/author/jspangler/ and deals with the continuing issue of moisture in concrete and testing for it. This issue is not going away and continues to plague the industry so you have to test but you have to understand the testing and that it must be done and done correctly. This article should help you deal with that.

# RH Testing and That 72-Hour Wait: How Do You Manage It?


Author: Jason Spangler

Anticipation is a good thing if you're watching a spy-thriller. Waiting 72 hours for concrete moisture sensors to equilibrate – less fun.

It's especially frustrating now that research has validated the contention that a relative humidity (RH) reading taken at 24 hours is essentially the same as you'll see at the 72-hour mark. However, until the ASTM F2170 standard changes, you must wait 72 hours to meet the standard's requirements.

In fact, your contract probably requires ASTM F2170 compliance for good reason: RH testing is the only moisture condition test method that reliably provides accurate readings and can dependably predict RH levels under service conditions.

We wanted to hear how flooring installers and other concrete construction professionals on the ground handle the 72-hour waiting period. So we asked for their stories and how-to(s) on social media. They didn't disappoint. Here are the most popular coping mechanisms shared.

Providing F2170 Education Is a Constant Task

It seems that educating clients and general contractors early and often about the 72-hour waiting period needed to comply with F2170 is an unwritten task on the project plan for flooring subcontractors. At least it has two great benefits. First, it makes sure that you get the full 72 hours built into the project timeline from the start. Second, it short circuits any pushback on waiting when the time comes.

For David P. there was one more great benefit to the early education. Namely, weeding out bad projects, or at least putting you on notice for other potential issues. He wrote, "If you cannot convince a site owner or a GC to wait 72 hours, then he/she has other problems that need to be evaluated."

Standing Your Ground


Regardless of whether the conversation about 72 hours happened during the planning stage or later, a lot of you handled it best by simply standing your ground. Any pushback to "beat the timeline" or "just get it done quickly" should be met with the confidence of your professional expertise. The standard requires a 72-hour wait.

Don C. put it this way, "We don't give them an option, it is either 72 hours or we won't do the testing and they can get someone else. Once they know it is to conform to the standard and for their own protection, we don't have any issues."

Practical Tips of Varying Utility

Some respondents offered their practical tips of getting the RH testing done. One suggestion was to use a moisture barrier if you can't wait 72 hours, although others felt this approach should be used with caution. From a documentation perspective, it's not F2170 compliant. From a practical perspective, if you don't accurately know what level of moisture you have, how can you determine which moisture barrier is appropriate?

As another respondent put it, "Patience [will turn out to be] a lot cheaper." Basically, the most common-sense advice may be to just go about your work as it should be done without making a production out of the waiting period.

RH Testing Is Preferred for a Reason

Using the RH test method is written into project documents and contracts for a reason. No other test method provides as reliably accurate readings of a slab's moisture condition. Why insist on the most accurate test method if testing won't be executed properly?

If you're the one doing the testing, you're the one who will bear the brunt if standards aren't met. John D. put it best when he wrote, "It's extra effort to educate the client, but that is far outweighed by the peace of mind in doing a job right and avoiding unexpected outcomes."

***Lew's Comments:*** Educate early and often and back it up with examples of why you need to test and mitigate the slab. We've got a ton of information and visuals on this issue and years of experience handling problems and failures and we have cures. And we have a

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team of experts we feel are the best in the business when it comes to keeping you out of trouble or helping you resolve a failure after the fact – please, we'd rather help on the front side, it's cheaper and easier and far less painful.

Aside from testing for moisture in a concrete slab it's important to know some other critical information. First, does the slab, if on or below grade, have a moisture vapor retarder beneath it and if so what is it and is it wrapped? Chances are if

Moisture Vapor Barrier Under New Slab

the slab is older than 10 years or even newer, there is most likely nothing beneath it to retard moisture. Second, if you test for moisture and find it in elevated levels you need to know where it's coming from. On a recent project in an old building here in Dalton part of the slab is on grade and part below due to the grading of the building. We know the

Look Outside!

slab is wet and where it is the wettest. A look outside reveals why; there is no French drain, the downspouts are close to the building, the roof is flat with no gutters allowing water from heavy rains to

pour off the side and all the water is collecting beneath the slab. Before any mitigation can be done to the slab the problems on the outside of the building need to be corrected. The affects from outside sources are rarely taken into consideration but if you don't stem the source of the water it will continue to migrate beneath the slab and affect it. This is when you don't just have moisture vapor emission but the potential for hydrostatic pressure. We have found over the years that catastrophic flooring failures due to water not being carried away from the building will thwart all attempts to correct a high moisture reading in a concrete slab. These conditions must be corrected to prevent future failures otherwise the mitigation methods can be overwhelmed.

Going over old flooring is another issue that you need to be aware of when on or below grade. The old flooring may have been down for 20 years with no issues or concerns whatsoever so it would seem that because it is secure going over it won't be a problem – not so fast there Sherlock! As soon as you cover that floor you essentially put a vapor retarder over it and any moisture that was escaping all those years before is now trapped, resulting in the old floor and the new one blowing off the slab. If the old floor is Vinyl Asbestos tile with cut back adhesive get ready for some serious pain to follow. Even if not, everything will have to come up and you'll have to start from scratch mitigating the substrate and replacing the flooring material.

No problem with the slab before but when covered the installation failed

Another falsehood is believing modular flooring materials, regardless of what they are – carpet tile, vinyl tile, rubber tiles or even broadloom carpet – will allow moisture to escape around the edges or migrate through the material as in the case of broadloom

perimeter of the modular material but it will collect in middle of it which will destroy the adhesive, may compromise the PVC backing or potentially affect the flooring material itself. Typically well-constructed and stable modular carpet tile will resist the effects of moisture but if there is recycled content in the backing the flooring can react by curling. As for other modular flooring materials exhausting moisture or thinking it will and using that as a reason not to mitigate the slab is like saying "if I leave one bullet out of the chamber that should be good enough to prevent someone getting shot when I pull the trigger." Not a good idea and way to risky – eventually there will be a failure and what you thought was going to be a savings initially will be a major expense later. As for the broadloom breathing, it does as it is permeable but for the moisture to volatize through the carpet it must first come through the adhesive and the alkalinity in the moisture will eventually destroy the adhesive so you can forget about that being a fail-safe installation – it's not.

Alkaline Destruction of Adhesive

Now a lesson in simple science - There's a lot of advertising being done that states a flooring material or adhesive will withstand upwards of 95% or more of RH and over 10 (or whatever the claim) pounds of moisture vapor emission as long as the pH is between 7 and 9. Now the science - the pH of concrete is normal at 12 to 13 and when driven by moisture in any form, alkalinity in the concrete comes to the surface so to have moisture readings that are almost at the point of being liquid and to say the pH will be between 7 to 9 is absolutely ludicrous, it can't happen and it defies science. And remember what I've said so many times, "words do not change science or the laws of physics." The pH, alkalinity, is typically what does most of the damage especially to the adhesive. Per our resident



***I'm going to be traveling the country over the next three months with USG conducting a program on moisture and flooring failures. The dates and outline are on the next page so check it out and if we're in your town come and say Hello!***

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concrete expert Peter Craig, *"If the soluble alkali content in the surface region of a concrete slab is above levels known to place an epoxy coating application at risk of blistering, the surface region of the slab must be shaved down and a moisture-insensitive reprofiling material installed prior to the installation of a two-part, resin-based moisture mitigation coating".*

As for the testing; it has to be done correctly to be accurate so you better have an ICRI certified tester conduct it or make sure whoever is doing the testing is preparing and conducting the test correctly. My rule of thumb with a slab on or below grade, regardless of the age, is to consider that moisture at some level is present and that the moisture is not uniform throughout the slab, in addition, no two concrete slabs are ever going to be the same. There are no shortcuts here folks; you have to be diligent in addressing every concrete slab individually. Looking at the slab will not tell you if there's an issue, you have to test it and determine what's going on and then establish what you have to do to successfully complete the installation so that it stays in place.

**If failure is not an option you really should retain LGM to steer you in the right direction.**

## Here's the information for the USG Programs. Come and see me!!


Here is the **Baltimore/Washington D.C.** area invitation. Please share the news about the Performance Flooring Symposium with your contacts and invite them to participate. Click on the link below to get the full details on the date, location, agenda times and to register.

**There are 3 simple ways that you can invite your key contacts:**

- **Email** - forward the information to your customer database. Your customers can register themselves by clicking the link below.
- To the left - is the OVERVIEW invitation (8 cities) to email and/or print. You can click on the URL address or type it in a web browser.
- **Email the URL** - the main link for the symposium is: info.usg.com/flooring-symposium-2016