Moisture Study

A newsletter on moisture-related issues with concrete slabs.

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The most expensive option is to ignore the problem altogether.

Moisture

Floor Failure

Bio Hazards

Lawsuits

Down Time

Evaluation

Testing

Prevention

The Five Options to a Slab Moisture Problem

Specifying moisture testing of concrete slabs prior to installation of floor finishes is intended to identify the risk of a very costly floor system failure later on.

Smart specifications have a clearly defined approach that calls for a certified, independent testing agency to conduct the proper moisture tests and to report the results directly to the architect.

Other specifications may leave the responsibility in the hand of the floor covering contractor to conduct tests according to the specifications of the flooring material. Some project specs have no mention of the subject at all.

The importance of proper testing prior to the installation of floor coverings or polymer coatings speaks for itself through the history of flooring failures and lawsuits that typically follow them.

To get to the subject of this article, imagine a project in the 11th hour of construction. Moisture tests have just been conducted and the results show the slab is not within compliance for installation. The project is essentially put on hold and now they come to you, to find out what to do.

There seems to be only 5 options to a slab moisture problem. [Should anyone have a better idea, we would welcome that and share it with others in order to better resolve this issue.]

OPTION 1: Do not install the flooring, yet. That is, give the slab more time to dry.

Concrete is said to be hydrophilic and hydroscopic, meaning it both loves moisture and absorbs it from everywhere. In order to promote evaporation of moisture, in most cases, the slab must be in an acclimated environment that will allow moisture to be drawn from the slab. That usually does not begin until the room is enclosed with the HVAC system up and running.

Even with capital equipment brought in to "de-humidify" the slab, it cannot withdraw moisture any faster since only so-much of it by volume can be drawn out of the concrete over time.

Under ideal drying conditions, most slabs will only reduce their moisture at a rate of about ½ to 1 inch in thickness, per month. It may be some time before a slab can dry to levels low enough to safely support the floor. So what else can we do?

OPTION 2: Replace the slab. While obviously ridiculous, it has been done by people who thought there was no other choice. The only time a slab should be replaced is if it has reactive aggregates and results in an alkali-aggregate reaction (AAR).

OPTION 3: Find an alternative flooring system. That is, use broadloom carpeting or paver tiles which are both less sensitive to moisture than rubber or vinyl flooring, or polish the concrete slab instead. A raised-floor system is not an alternative here, since unchecked moisture under the raised floor system may promote biological growth and result in a far worse problem.

OPTION 4: Install the floor to stay on schedule, and deal with it later if it fails. This is the most practiced option and is responsible for untold billions of dollars in losses over the years.

Taking chances with the owner's livelihood is never a good option. Yet it happens because the moisture problem is frustrating and often misunderstood and poorly communicated to owners.

This option may be viable if the costs to shut down a facility in order to replace the floor are minimal, but seldom is that the case, for it requires a complete move-out, as everything is on top of the floor.

OPTION 5: Seal the slab topically with a qualified moisture mitigation product which will allow the project to stay on track and the floor to be safely installed. This is by far the most cost-effective solution other than selecting an alternative type of flooring.

Topically sealing a slab surface or "negative-side vapor-proofing" requires a specialty-contractor. It demands being able to properly profile the slab surface in order to apply the sealer product.

The process employs capital equipment to grind or blast the surface of the slab to remove contaminants, curing compounds and bond-breakers that would prevent a strong chemical and/or mechanical bond to the slab surface. Then the sealer is applied.

Any product that claims it works without the need to profile the slab surface will be full of excuses as to why it failed to work. Any product is only as good as the substrate it is bonded to, just as any paint-job on a car is only as good as the bodywork done first.

The purpose of these articles is not to provide in-depth technical support on this subject, but to stimulate thinking and therefore communication about this topic between all construction parties.

No owner should ever experience a floor system failure caused by slab moisture (and slab chemistry to be exact), as long as the problem can be understood, expected to be encountered and ready to be treated correctly if moisture testing shows a risk. This is where the power of a specification can save the day.

Please contact us for more information. We welcome your opinion as well as your simplest or toughest questions alike.