The Floor Covering Installation Contractors Association (FCICA)
Updated position on the original
Floor Covering Industry White Paper Position Statement on Moisture Emission Testing

# Concrete Moisture Testing
## Responsibility and Qualifications For Testing
## Floor Covering Industry White Paper Position Statement on Moisture Emission Testing

FCICA was one of the original sponsors of this document when it was first released in October of 2001. Realizing the changes that have occurred in the construction and flooring industry, we have taken on the task of updating the information contained in this document to better reflect the best flooring installation practices of 2013. Originally written from a flooring inspector's standpoint, enough has changed over the last 12 years that we at FCICA feel that a new treatment was warranted. FCICA's mission is "to provide a unique network for problem solving, education and support, to enhance our members' businesses and the flooring industry." We have worked directly with our contractor members and associates to present to the industry what we feel is the most responsible position with regard to the testing and evaluation of concrete floor slabs as it pertains to floor covering installation. What hasn't changed is our recommendation that independent, third party testing companies be contracted to conduct moisture testing in accordance with Industry Standards and manufacturer's recommendations.

This white paper is designed to provide general contractors, owners, architects, and flooring contractors with reliable assessments of their concrete substrate's moisture condition. In light of the many changes in floor coverings, substrates, and moisture testing in recent years, we recognize that the best and most reliable source for an unbiased assessment of the concrete substrate's moisture condition is an independent and certified moisture testing company. This is not an indictment of the abilities of the flooring contractors or installers who historically may have done the testing. In most cases, they are the most informed about the suitability of substrates for floor covering materials. Rather our position of using independent testing companies is predicated on the fact that these companies have no agenda with regard to whether the floor passes or fails the test. In addition, these companies are thoroughly trained in the procedures and practices contained in the most current ASTM test procedures. There is wide-ranging acceptance in the construction industry for independent testing of concrete to include slump and compressive strength. We recommend using qualified independent testing agencies to test the moisture condition of the concrete as well.

In the ever changing world of construction – increasing environmental focus, fast-track construction practices, technological changes in concrete admixtures, installation methods, adhesives and floor covering materials, and advances in measuring and testing concrete – it requires more attention than ever before to provide general contractors, architects, flooring contractors and ultimately the building owner with optimum substrate conditions/solutions. Flooring contractors alone can't be expected to

determine such critical points as the chemical composition of concrete due to moisture content, alkalinity, or the effects of various admixtures on the concrete itself. To determine the concrete's suitability for floor covering installation, testing by an independent specialist is a prudent and necessary safeguard for general contractors, owners and architects.

## RESPONSIBILITY AND QUALIFICATIONS FOR TESTING

Changes within the construction industry continue to keep even the most dedicated flooring contractors in a constant struggle to install all kinds of flooring systems properly. Floor covering materials themselves are in a constant state of flux with new materials, backings and coatings being developed that often have an impact on the installation of these materials. Flooring adhesives are for the most part solvent free, meaning that more care is needed during flooring placement to ensure excess water from the adhesive has dissipated. High water/cement ratios that facilitate concrete placement and finishing, concrete with lightweight aggregate and concrete that dries from only one side mean longer drying times are required before flooring can be installed.
This is in direct opposition to what the owners want; fast track construction. A construction schedule that was once a yearlong process is now compacted into a few months. Add to this the changes in the location of the vapor retarder, the increased use of lightweight aggregate, fly ash and admixtures in the concrete mix design, and it is clear that a more scientific approach is needed to clearly identify problems associated with substrate induced flooring failures.

To best identify those capable of evaluating the substrate for moisture and other conditions that could contribute to failure, the following factors should be considered as part of the evaluation process by an appropriate testing agency.

## FACTORS TO CONSIDER

Underslab Conditions:

- Vapor retarder – Is there one? What type and where is it positioned?
- Blotter layer – Note if included or omitted. If included note if it is located above or below the vapor retarder.
- Capillary break – Note if present.
- Water table - Note whether below grade waterproofing was specified and installed in areas of high water table.

Concrete:

- Water to cement ratio of the mix design.
- Type and grade of aggregate.
- For lightweight concrete, was water added to the aggregate and was it factored into the water to cement calculations?
- Compressive strength of mix design.
- Slump at time of placement.
- How much, if any, water was added to facilitate placement of the concrete?

- Curing method: Cover cure and length of cure, membrane forming curing compound or no curing method used.

- Concrete finishing: floated only, hard troweled, power troweled, etc.
- Admixtures: If used, what type and quantity (i.e., fly ash, silicates, high or low range water reducers.
- Is the concrete Porous or Non-porous?

**Building Envelope Condition/Environment:**

- Temperature of room
- Relative humidity of room
- Concrete surface temperature
- Air movement

**SUMMARY**

With all the above referenced factors listed, it is unreasonable to expect a flooring installer to be responsible to correct concrete problems that they have had no role in creating. While they are continually encouraged to develop sufficient expertise to anticipate and ask the proper questions for evaluation of potential concrete/flooring problems, it is not their responsibility to correct problematic substrate conditions created by others.

Another factor is that the flooring contractor has a vested interest in ensuring the integrity of the substrate as being 100% suitable prior to beginning the flooring installation process. We know the adage – "once you start installing, you own the floor." For this reason, flooring contractors are often viewed as having a built in agenda to get change orders for flatness and moisture mitigation that are naturally resisted by the general contractor, owner and/or architect. An independent testing company has no such agenda; they test the substrate and report the results. Decisions can then be based on unbiased test results.

General contractors and flooring contractors must be made aware of all of the test results. Most flooring manufacturers have specific test criteria and limits required for the moisture conditions of concrete. The flooring contractor should only commence installation once these requirements are met and should not begin flooring installation if any requirement is outside of the manufacturer recommended limits.

FCICA recommends that one of the best ways to ensure fair and responsible testing is to specify that it be done by a third party independent and/or certified testing company. Their results are clear and unbiased. The project can then proceed in accordance with the findings.