CFR The Commercial Flooring Report
For the Commercial Floor Covering Industry
Volume 134 - November 2019 Click here to View and Download all CFR Newsletters

WHAT'S IN THE MIX?

Concrete substrates are a source of anxiety for every flooring contractor, manufacturer and general contractor. The main concern is moisture, but that's not the only thing to be concerned with. There is so much more that can compromise a flooring installation lurking in the concrete. You must understand that no two concrete slabs are alike. Whether new or old they vary, and you can't expect any of them to perform the same. Every concrete slab, below, on or above grade, has the potential to contribute to a failure without warning. What the future holds for concrete mix and design is even scarier, and its impact on flooring requirements, installation or performance, no one knows.

In a recent issue of Concrete Construction Magazine there were several articles such as controlling concrete construction problems and enhancing concrete with alternative supplementary cementitious materials. The one we felt most pertinent to flooring contractors, general contractors, architects and flooring manufacturers, as well as adhesive manufacturers, was the article on Moving to Alternative Cements. What does this mean for the aforementioned group? First, let me say this. Moisture in concrete is the all consuming issue everyone is focused on. What you may not realize is that every concrete slab, that is, every single one of them, is different. There are no two alike and there is no one way to approach each flooring installation as a "one size fits all" project. Your thoughts however and your concerns should also be with the concrete you're installing the flooring on.

Alternative cements such as Fly Ash and Slag are the result of the concrete industry being under pressure to allow alternatives to supplement Portland cement and employ blended cement mix-designs. The reasons given are: to reduce costs, reduce environmental impact and the need for specific properties that aren't attainable or possible with ordinary Portland cement concrete. There are a slew of newer materials (most inorganic) coming onto the market which include, but are not limited to, geopolymers, activated glassy cements, and others. There is no way of knowing what effect these changes, which are indeed being made and coming down the pike, will have on the concrete you'll be installing on. Nor is there any way for you to tell what's in the mix you're dealing with, without a forensic analysis of the Division 03 Concrete scope. In all of the information provided by the concrete industry there is no comment or concern for how flooring installation on these slabs will be affected. This is understandable since the concrete industry is focused on their issues and not yours and there is virtually no dialogue between the concrete industry and the flooring industry. The disconnect between concrete flatness and levelness in Division 03 Concrete (FF/FL method) and Division 09 Flooring (Straight-edge method) is a prime example of the disparity and often-times incompatibility between dependent operations.

In addition to the alternative cements is alternative aggregates and this includes recycled materials which can include crushed hydraulic cement concrete or recycled aggregate. From your experience installing virgin and recycled flooring products, do you think there may be unforeseen issues that result from recycled concrete components? All of these changes have to meet requirements for structural and durability properties. These changes have an effect on the water/cementitious materials ratio. Again, this can have an affect on your flooring project. None of this information, as it enters the concrete

industry and gets used, is going to be known to the flooring contractors and even if it was, you're not going to know anything about what it means and how it may affect your installation. And far be it for the flooring manufacturers of any type product or those ancillary products used, such as adhesive, to know this either. So, if you think moisture is an issue get ready for the onslaught in the variations in the new concrete.

In scaring you, let me share a recent project we were involved in. This is a brand new building, several stories high, where the flooring installed was exhibiting areas losing adhesion. When our concrete associates, who I consider some of the very best in the business, finished reviewing the concrete specifications, batch tickets, concrete mix design and all other pertinent materials, as well as analyzing the results of the core samples taken and tested, we found a component on the concrete surface that was acting as a bond-breaker and had compromised the installation. The independent testing agent for the General Contractor stated in their prior report that the bond-breaker on the surface was unremoved curing compound. Naturally the GC blamed the flooring subcontractor since flooring manufacturer guidelines all read "surface must be free of bond-breaking contaminants including curing compounds, etc." Through analytical testing we were able to confirm the material was not a curing compound, but was the super-plasticizer used as an admixture in the concrete. Prior to our involvement the flooring contractor was being blamed for a problem that wasn't his. This is the type of situation you guys may be finding yourselves in down the road with the changes on the way. Consequently, you're going to need to find someone that can help you steer clear of these mine fields, that knows and understands this stuff and knows what and how to look for it. I will tell you; this is very heady stuff and once our guys get into it, they start speaking a language they have to interpret for me.

If you are not looking at Division 03 specifications to identify specialty admixtures, tilt-wall construction applications, topical curing membranes and other alternative concrete processes you may be installing on dangerous ground. Many well-versed flooring contractors are routinely evaluating some or all of these components to red flag potential issues prior to acceptance of the substrate. Since flooring manufacturers' will not warrant products installed over (sacrificial) curing membranes it is critical to identify up-front how concrete is cured and what additional processes will be needed to insure a compliant installation substrate. There are many specialty admixtures or treatments for concrete that may render the surface non-porous or contain soluble bond-breaking materials such as sodium or potassium silicates. There are many resources available identifying the risks associated with installation on concrete treated with these chemicals. Manufacturers are also starting to publish written statements that their warranties will be voided if products are installed over these known bond-breaking treatments.

THE COMMERCIAL FLOORING REPORT
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The number of issues that can arise from treatments or processes implemented during division 03 concrete work, adversely affecting flooring installations are too numerous to review here. But beyond delamination failures, loss of manufacturer warranties and potential incompatibilities there are many more subtle issues to be aware of. Concrete slabs treated with reactive silicate products typically render the surface non-porous and non-absorptive. Since porosity allows for water absorption during flash time of adhesives, rendering the surface non-porous dramatically affects a glues ability to flash and adhere. We have seen many cases where the glue never fully coalesced on an installation and was deemed an installation error. However, an adhesive may allow for only10-15 minutes flash time and carry warnings that allowing it to flash too long will prevent sufficient adhesion. Well-seasoned installers using familiar materials, in familiar conditions getting differing results? The variable is the installation substrate. While the industry is trying to drive pricing down and come up with magic bullets, the stakes are getting higher and responsibility becoming greater. In today's liability shell game, flooring contractors need to be more aware than ever of the potential pitfalls they face every day. Many of them have nothing to do with the flooring itself. Since most commercial flooring is installed on concrete, it is more important than ever to be aware of what's in the mix that could affect your work, reputation and bottom line.

If you think flooring manufacturers have any knowledge of what lurks in the concrete that can compromise an installation or their product, think again. There is no one employed by any manufacturer of any flooring products that is aware of the science or chemistry that may affect their products in the field. Just look at the arbitrary guidelines for moisture in concrete stated by manufacturers who basically follow each other down the path of throwing out numbers that are virtually guesses. At least moisture in concrete can be detected and measured. You have no idea what's hiding in plain site when you look at a concrete slab.

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We're seeing more and more flooring failures and issues as a result of the industry making statements their products can't keep because people are spewing inaccuracies and the flooring contractors and installers are getting blamed for doing something wrong. For an industry that's crying about training and keeping installers, there's a lot of blame being placed on the guys installing the product when the product itself may be to blame. This is not a good way to build relationships and trust. Let me shock you by saying, every

product or installation failure is not the result of the installation and this is truer now with the flood of vinyl plank and tile products. Quite frankly; most of the failures of these products we've been involved in, is a product problem. It's hard to mess up the installation of a product that you take out of a box in pieces and place on the floor with or without glue. It's not like having to install an intricate patterned piece of carpet that must be placed, matched, trimmed, edge sealed, seamed and stretched in. That's much easier to mess up than putting a piece of vinyl tile or plank flooring down.

We will continue to monitor and evaluate new and emerging developments in the concrete industry that may be beneficial or problematic for flooring success. Logic is always a good starting point. As a rule of thumb, products that render concrete non-porous on the surface must be closely scrutinized since they affect all subsequent bond-ability. Additionally, products making claims to remediate common concrete challenges should offer demonstratable proof with valid sources. There are emerging technologies utilizing nano-silica concrete we have seen employed on a client's project recently that appear to meet these initial demands (porous/absorptive surface, independent test data supporting claims). We will continue to monitor this and other applications where concrete and flooring meet and share those findings as things develop. If you are being asked to install on concrete that has been mixed, treated or cured with means and methods deviating from normal, we'd be glad to take a look and share what we have learned before you proceed.

To be sure, we're going to be seeing more challenges installing over concrete quite simply because there will be so many varieties of components in the mix. You're not going to know they're there and, when they do compromise an installation, what you have to do about it. One thing is certain. Flooring contractors don't mix, pour or place the concrete and have nothing to do with what goes into it, so if the flooring failure can be traced to the concrete, which it could be, you're going to need someone who can determine that. Fortunately, we can do that, and we have, many times. So, if the information in this newsletter has you shaking your head, know that we're always here to help you. We can always determine, honestly and truthfully, what went wrong, why, whose at fault and how to fix and resolve a flooring failure.

Keeping the flooring industry out of harm's way will be a joint effort installing on concrete in the future. We need to keep asking, "what's in the mix?"

ALKALINE DESTRUCTION OF ADHESIVE

BLISTERING OF COATING ON CONCRETE SLAB

COMPROMISED BOND ON NEW SLAB FROM COMPONENT IN CONCRETE