

The Crack-Free Guarantee

by Dave Gobis
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Everyone wants a crack-free tile floor. Some are willing to pay for it in return for the assurance that their investment will remain free of cracks. There are even local jurisdictions in various parts of the country that require the installation of a crack isolation membrane due to the extensive history of cracked slabs. So how smart is it to offer a crack-free floor guarantee?

If you plan on providing your personal assurance, then it's not something I would consider offering. A careful reading of the standard for membranes notes there is no guarantee. Warranties vary widely; many are for product replacement only. However, there are a few products on the market that will provide a manufacturer's written warranty on material and labor for varying lengths of time based on following their written instructions. You should note that those instructions usually require that elusive perfect tile job that none of us has ever done due to lack of skill, time, money or cooperation of other trades. In all likelihood, any request for product warranty satisfaction will end up being based on your relationship with the seller of the material offering the warranty rather than the merits of the claim.

I have had the opportunity to speak with the technical staffs of several manufactures that offer warranted performance of their crack isolation products. It probably comes as no surprise that while they have assisted customers with "job problems," neither has ever actually replaced a floor under warranty, ever. The fact is, with rare exception (and I have discovered a few of those exceptions), products meeting all the test parameters of ANSI A118.12, the American National Standard Specification for Crack Isolation Membranes for Thin-set Ceramic Tile and Dimension Stone Installation, will perform as represented. It's also safe to assume that products not meeting all the requirements may not perform. I think there is widespread misunderstanding on exactly what is represented by a crack isolation product meeting the standard. To complicate matters further, there are also instances of somewhat dubious advertising, where the product advertised met portions of, but not all, testing requirements.

It's important to understand exactly what you're purchasing when you buy a crack isolation membrane and what the end user should anticipate. The following is a direct excerpt from the standard:

"Crack isolation membranes for thin-set ceramic tile and dimension stone installations isolate the tile or stone from minor in-plane substrate cracking. Membranes covered by this specification are bonded to a variety of manufacturer-approved substrates covered by ANSI specifications. In some cases the trowel-applied products can be used as the adhesive for the ceramic tile or dimension stone as well. Other products within the scope of this specification are allowed to cure or are applied as sheet goods and are then used as the substrate for the application of ceramic tiles and dimension stone by traditional methods and materials. This standard applies to trowel applied, liquid, and sheet membranes."

A moisture gauge can provide a good indication if excessive moisture is present. This membrane lost bond due to excessive moisture.





A trowel on membrane was used here over a moist and dusty floor with no expansion joints. With poor prep and no room for movement this South Florida home lost bond and tented after only one year.

Even though a product may meet the requirements because a membrane passes all the standards testing does not automatically mean it is suitable for your in-service conditions. As an example, while reference is made in the title that the product may be suitable for natural stone, use of stone is not part of the testing requirements. Stone has substantially less flexibility than tile products. Consequently, if you have a large stone flooring project, it would be prudent to ask if there was any test data to support use under your specific type of stone.

Another quote from the ANSI A118.12 standard says:

“Consult individual manufacturers for specific instructions, application, performance levels, and limitations concerning their materials. Follow the individual manufacturer’s written instructions precisely. Cracking is limited to horizontal planar movement of the substrate. It should be noted that while crack isolation membranes are intended to minimize the potential for crack propagation from the substrate through the finished tile or stone installation, they may not always be 100% effective in preventing all defects in the finished tile. It is particularly important when dealing with a cracked substrate that expansion joints are properly located and filled with a suitable sealant, or prefabricated expansion joint. Movement joints in the substrate shall be carried through the tile installation.”

Elsewhere in the standard there are two separate levels of performance given for crack isolation membranes. Under testing, Standard Performance allows for tile failure (cracks to develop) after a 1/16” gap opening, but before 1/8”. A High Performance rating requires that failure not occur prior to a 1/8” gap opening. While larger amounts of movement abilities are occasionally advertised, there is no additional testing or ratings requirement.

This leads us to several considerations we consistently see ignored — perhaps due to lack of awareness or misunderstanding the scope of the product category. Not all membrane products are created equal! If one product sells for \$0.25 a square foot and the other for \$0.75, there will be a difference in performance, and it’s not because one manufacturer has a higher price for a similar product. Most of the setting material manufacturers make numerous liquid products intended to provide different performance levels and offer varying properties.

There are also varying installation recommendations for crack isolation expectations when it comes to thickness application, sometimes solely to achieve a specific level of performance. Unlike sheet membranes, most liquids do not allow for going over and the consequent relocation of control joints in the tile work. What few liquid products that do allow for relocation require full-field application, not the strip application so commonly encountered when reviewing installation complaints in the field.

Most sheet type products can be used for what is often called strip application, in which one piece is used to cover a single crack in the field of the tile. The resistance to using sheet products often comes

from the perception that they will make a hump in the floor where as the liquids won't. That is not entirely accurate.

Most flat sheet membranes are either 30 or 40 mils in thickness. A careful reading of most instructions will show that for effective crack suppression, liquids require a similar film thickness. What liquids do not possess, in particular when not used with a fabric, is the ability to resist movement that will eventually occur at saw-cut control joints. When it comes to crack isolation and dealing with control joint relocation, you must be very selective in choosing the appropriate product.

Sheet products offer more predictable performance when it comes to crack isolation for several reasons, not the least of which is factory-controlled mil thickness. Error on the part of the installer is much less likely when using a factory made rather than field made product. By their nature, sheets have greater ability to withstand more aggressive movement than the typical liquid product. The primary concern with sheets is their attachment to the substrate. This also tends to be more predictable than liquid applied products. However, when used over concrete substrates, both sheets and liquids have variances to not exceed vapor emission rates. This can fluctuate from a low of 3 pounds MVE to a high of 9 pounds depending on product selection. The vast majority recommends that moisture vapor not exceed the 3 to 5 pound range. Moisture vapor emission is a well-known enemy in the floor covering business, but not always given much thought on the tile side of the business. There is no moisture standard for the installation of ceramic tile, however, most but not all of the adhesive systems used in the application of membranes are moisture sensitive. Also keep in mind that the crack isolation membrane may also serve as waterproofing; the purpose of the waterproofing is to keep the moisture from going into the supporting structure, not to keep it in.

My last thought is on movement joints and membranes. With few exceptions, every tile job ends up with an argument about the need for movement accommodation joints. They always did for me anyway. I cannot think of a single job where anyone said, "Yes please put a strip or stripe of caulk in our floor right about the middle of the room." It's usually more like, "I paid \$20,000 for this project and there is no way you're going to ruin it with a joint going down the middle or anywhere else." Unfortunately, these joints are necessary evils and there is no way around the fact that all building materials move and move at different rates.

My personal experience when we did not put the joints in the tile work was about 80% of the time we were ok, even after five or 10 years. To be not ok 20% of the time is pretty expensive but we always left a paper trail when we were asked to omit movement joints. Consequently, with luck and good fortune, I never found myself replacing someone's floor due to memory loss on their part over their adversity to putting movement joints in. It's pointless to install a membrane that allows movement and not provide for that anticipated movement.

I'm quite confident a fair size book could be written on the dynamics of movement in any structure. All one can hope to do in the little space allowed for a magazine article is to provide a cursory glance at the many issues to consider. Hopefully this short piece provides some information of the value and cause for further thought on the use of crack isolation membranes and protection of your profits.

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