Crack Isolation Membrane

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What is reflective cracking?

Whenever tile is bonded to concrete, cracks occurring in the concrete can cause cracks in the tile layer - this is often called "reflective cracking."

What about tiling over control joints?

The TCNA Handbook for Ceramic, Glass, and Stone Tile Installation recommends that control joints in concrete carry through the tile. Clearly, this is an industry-approved, nearly foolproof, and very safe way of making sure that movement in the control joints does not cause a reflective crack.

Due to a lack of consensus in the industry regarding competing anti-fracture products and the standards of performance for such, TCNA does not, at present, recommend a method or tiling over control joints with an anti-fracture membrane. This is not to say this process will not work - it can if the right products and methods are used and the slab does not continue to curl.

If the slab does curl at the control joint (which is not uncommon), any curling that occurs after tiling may damage the tile.

Can you tile over control joints using an anti-fracture membrane?

Some manufacturers have proprietary products where they will guarantee a tile installation (when their products are used in accordance with their methods) over control joints, so long as vertical deflection does not occur. However, expansion joints must be used in the tile layer.

It is a frequent misconception that anti-fracture membranes allow you to eliminate movement joints - they do not. There always must be soft joints in the tilework to allow for expansion and contraction.

Typically the joints in the tile installed over an anti-fracture membrane must be placed near the joints in the concrete but not necessarily directly in line with the control joints.

What about tiling over small cracks in the concrete?

Even small shrinkage cracks in concrete can be dimensionally active; continued curing of the slab can cause these cracks to expand or propagate. This type of cracking can be easily avoided in the tile layer - either by installing the tile on a mortar bed set over a cleavage

membrane (method F111 for example), or by installing the tile over a crack isolation membrane using a thinset method.

In the mortar bed installation, the mortar bed is not bonded to the concrete - rather it is isolated from cracks in the concrete by the cleavage membrane. This allows the tile to "float" over the concrete.

In the thinset installation, a crack isolation membrane is bonded to the concrete. Tile is bonded (with thinset) to the surface of the membrane.

What is an anti-fracture membrane?

The internal make-up of this membrane is such that movement in the concrete is not directly transferred to the tile. Although the membrane is bonded to the concrete and the tile to it, the membrane stretches where needed to prevent or reduce force transference. These membranes are either trowel applied or sheet applied. In many cases, multiple components or steps are part of the system. Performance varies also - it is important to check with the crack isolation membrane manufacturer regarding their installation instructions and intended use.

Can roofing felt or scribing felt be used as an anti-fracture membrane?

Some contractors have used felt paper as an inexpensive type of anti-fracture membrane. Unfortunately, this type of installation generally does not provide suitable bond strength between the tile and the floor, does not hold up to moisture, and can promote fungal growth.

What are the uses of crack isolation membranes?

Products made specifically for crack isolation are sold for everything from isolating the tile from shrinkage cracks to tiling over control joints to protecting the entire floor from potential cracking in the concrete.

When used to cover the entire floor, many manufacturers will warrant the entire floor installation, including the cost of replacing and installing new tile.

As noted previously, it is a frequent misconception that anti-fracture membranes allow you to eliminate expansion joints - they do not. There always must be soft joints in the tilework to allow for expansion and contraction. Guidelines for expansion joint placement are given in the TCNA Handbook for Ceramic, Glass, and Stone Tile Installation. The exact placement of expansion joints is a function of many items including exposure to sunlight and the range of high to low temperature, moisture, aging of the concrete (where relevant), structural movement, expected loading, and other design criteria. The manufacturer's recommendations should also be consulted and followed.