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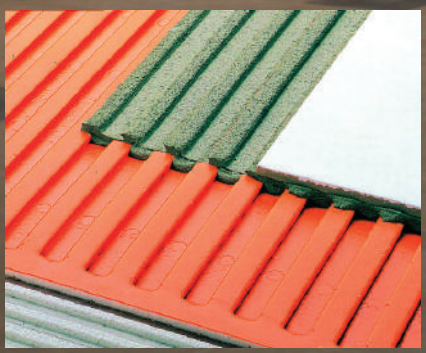
Tile and uncoupling drive benefits for car dealership

by Dale Kempster

In 1987, a relatively obscure and little-known company from Germany launched a new product in North America that many could argue changed the very face of the tile industry. The product, an orange membrane, was made of polyethylene ribbed in one direction and polypropylene mesh heat-bonded on the underside. The mesh allowed this unique product to be adhered to almost any substrate where tile was to be applied and was only 3/16"- (4.5 mm) thick.

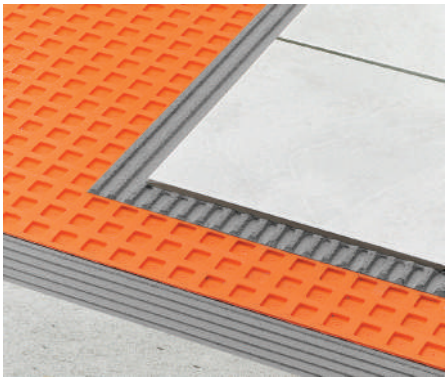
At first glance, this flexible and non-rigid membrane seemed suspect, certainly for applications over plywood, but especially for use over a single layer of plywood. The membrane was put to the challenge and endured a gamut of testing through then-named Tile Council of America, based then in Princeton, N.J.

One of the first tests (1990) was



The original DITRA uncoupling membrane was made of polyethylene ribbed in one direction and polypropylene mesh heat-bonded on the underside. Photo credit: Schluter Systems

under ASTM C627, and is commonly known today as the Robinson Floor Tester. This test was conducted over 5/8" particleboard 16" o.c. (400 mm) in an effort to replicate the worst-case scenario. To the surprise of the lab technician at the time, Ken Erickson, the test pad received a "marginal light commercial" rating. This was the beginning of a legacy of testing that has been conducted by Schluter®-Systems. Today it can easily be said that the original DITRA uncoupling matting, and the newest version that was launched around 2002, have been tested in literally hundreds of third party and internal tests under the auspices of ASTM C627.



The current version of DITRA is similar in make-up to the original but uses dovetailed square cavities to hold the thinset in place. Photo credit: Schluter-Systems

Over the past couple of decades, uncoupling has become part of both the Tile Council of North America's *TCNA Handbook for Ceramic, Glass and Tile Installation* and the TTMAC (Tile, Terrazzo and Marble Association of Canada) *09 30 00 Manual*. Several details have been submitted and evaluated and voted on to be part of both of these industry-wide recognized installation manuals.

Uncoupling over green/young concrete

In both American and Canadian manuals there is one very important installation detail for uncoupling over green/young concrete (TCNA Detail F 128 and TTMAC Detail 311F-D). Both these details address situations where the concrete slab is less than 28 days old.

In the case of the TCNA, the detail specifies that tile can be installed as soon as the concrete is solid enough to be walked on, which is typically between 24 to 48 hours. The TTMAC detail requires a minimum of 48 hours before the membrane and tile can be installed.

The concern with young/green concrete is that the concrete slab has large amounts of residual moisture that still needs to be released from the concrete. This release of moisture can affect the curing of the mortar and grout. Many crack-isolation/waterproof membranes, specifically flat membranes, have limited resistance to pressure from moisture, since there is nowhere for the moisture to be released. This in turn creates pressure that can cause the membrane to bubble or debond from the concrete slab.

Both the TCNA and TTMAC man-

uals call out that an uncoupling membrane must have free space or empty cavities on the underside of the membrane to allow for moisture release and/or equalization. Vapor equalization will occur when airspace is provided over the top of a wet concrete slab. This airspace is bounded by a vapor-impermeable chamber made of polyethylene (outward evaporation is not possible). The vapor pressure in the airspace tracks the vapor pressure in the slab and equilibrium is achieved. In other words, the concrete slab reaches a point where the moisture is no longer drawn to the drier atmospheric conditions in the room above. So eventually the air is no longer drawing moisture from below the slab or releasing moisture above since it has been sealed by the polyethylene membrane, and the assembly reaches vapor equalization.

New concrete + uncoupling in action

Corwin Ford Dealership, located in Nampa, Idaho, underwent a remodel and expansion in 2014-2015 where the challenges of young/green concrete were a significant concern. Approximately 7,800 sq. ft. (724 m^2) of new concrete was poured in the new service bay area as part of an aggressive construction schedule.

Tile contractor Phil King, proprietor of Mesa Tile and Stone

The entire 7,800-sq.-ft. service area was tiled to provide a professional-looking environment that is easy to maintain and very durable. Photo credit: Schluter®-Systems

from Boise, Idaho, specializes in commercial installations and has installed over a half-million square feet of DITRA. He was very confident working with CSHQA Architects, also of Boise, to specify Schluter- Systems' DITRA uncoupling matting for this project. In addition to the service bay areas, another 18,000 sq. ft. (1672 m^2) of tile was used in the showroom, offices, and other areas using the same installation method.

By using Schluter DITRA uncoupling matting there was no need for saw-cuts (control joints) to be made in the concrete since the membrane slows down the curing of the concrete to eliminate excessive shrinking or curling. If the concrete does crack – which it will normally do about every 15 to 20 ft. (4600 to 6100 mm) – it will be neutralized by the uncoupling function of the membrane. The Portland Cement Association (PCA) specifies that for a saw-cut to perform and create a designated weak point in the concrete, it needs to be made within 12 hours after the initial concrete pour.

It was essential that the larger-format 20″ x 20″ (500mm x 500mm) porcelain tile manufactured by

The floors would be subject to frequent and heavy vehicular traffic so Schluter-DITRA was used in the entire area to provide the necessary load support and uncoupling. Photo credit: Mesa Tile and Stone

Daltile fully support and be able to withstand heavy vehicular traffic in both the service bay area and the showroom area. In multiple tests with porcelain tile, the DITRA uncoupling matting has achieved the highest rating, extra heavy duty, in the Robinson Floor Test. An ANSI A118.1 mortar, MAPEI's Kerabond, was used to bond the tile to the concrete substrate for the whole project, and Kerabond T (ANSI A118.1) was used on top to bond the tile to the membrane.

Because it's made of polyethylene, the DITRA matting is very resistant to caustic materials such as engine coolant, transmission fluid, and snow melt salt so the concrete slab, in turn, was protected from potential damage from these contaminants.

Another challenge was to manage the transitions between the tiled areas and the bare concrete. This was solved by using Schluter-Systems RENO-RAMP. To make sure that the profile was able to withstand the heavy vehicular traffic, the profile was back-filled with mortar to provide even support throughout its width.

Schluter SCHIENE, a flat profile with an aluminum anodized finish,

Tile in earth tones complements the natural, outdoor feel of the 18,000-sq.-ft. showroom and office area of Corwin Ford in Boise, Idaho. Photo credit: Schluter®-Systems

A ramp profile was back-filled with mortar to provide even support throughout the width of the profile in areas where the tile floor transitions to bare concrete. Photo credit: Schluter®-Systems

was used to trim the top of the tile base, the wainscot, and the floor where the tile meets other flooring materials, such as carpet.

In conclusion

This case study demonstrates how Schluter's DITRA matting was able to save weeks of down time by not having to wait for the concrete slab to cure for the traditional minimum of 28 days or more depending on environmental conditions, time of year, and geography. Saw-cuts were eliminated, which saved costs in both labor and time. Other trades were able to access the areas that were tiled merely one week after the concrete had been poured, allowing the project to be completed within its aggressive construction schedule and allowing the dealership to stay on track and open on time to serve its customers.

Dale Kempster, CSC, CTC, TTMAC, is the technical director of Schluter-Systems (Canada), and has been with the company for 25 years.

The top of the tile base and wainscot were trimmed with a flat profile with an aluminum anodized finish. Photo credit: Mesa Tile and Stone.