Enduring tile assemblies get support from ancient methods and contemporary technologies

Schluter®-DITRA uncoupling membrane celebrates 25 years in North America

By Sean Gerolimatos

On the occasion of the 25th anniversary of Schluter®-DITRA uncoupling membrane in North America this year, this article presents a historical view of uncoupling methods over time and evolution of DITRA's acceptance and incorporation within our industry.

Tile installations are composite assemblies made of various components, each of which has its own unique physical properties. For example, common substrates such as plywood, OSB, and concrete expand and contract with changes in relative humidity and temperature at a different rate than the ceramic or stone tile covering, and will bend and deflect when loaded. Since ceramic tiles are hard, brittle, and unforgiving materials, they are susceptible to damage from substrate movement and deformation. The key to a successful tile installation is to combine

▲ *The use of uncoupling membranes has made thin-set tile installations viable in modern construction.*

TIMELINE OF UNCOUPLING MEMBRANES IN NORTH AMERICA

1987
Schluter®-DITRA introduced

1999
Method F147 added to *TCNA Handbook for Ceramic, Glass, and Stone Tile Installation* (double-layer plywood/24″ o.c. joists)

2000
Design improvement from corrugated shape to grid pattern

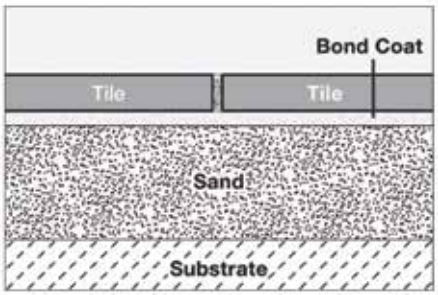
2001
Method F148 added to *TCNA Handbook for Ceramic, Glass, and Stone Tile Installation* (single-layer plywood/19.2″ o.c. joists)

2007
Method F128 added to *TCA Handbook for Ceramic Tile Installation* (young concrete)

these components in a manner that accommodates their inherent differences.

The Sand-Strata Method

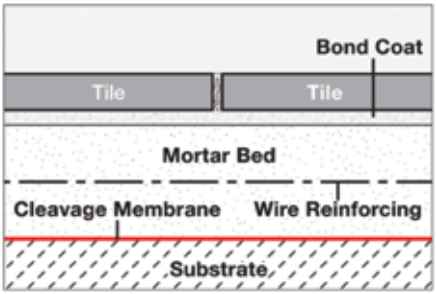
There are centuries-old cathedrals in Europe with tile floors that are still intact today due to the layer of tamped sand which was placed between the structural substrate and tile assembly. Since the sand has very little cohesive strength, it allows the tile covering to move independently from the substrate, thus preventing substrate movement from producing damaging stresses in the tile covering. In addition, the sand effectively distributes heavy loads to support the tile covering. The combination of "uncoupling" and support ensures lasting installations.



The Mortar-Bed Method

A more recent installation method that functioned on the same principles as the sand-strata method is the wire-reinforced mortar bed over a slip-sheet or cleavage membrane. In these applications, the cleavage membrane allows for

independent movement between the tile and the substrate, while the mortar bed provides the necessary support.

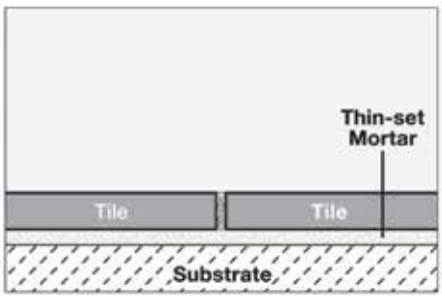


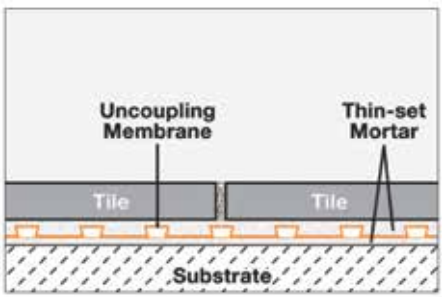
The Direct-Bond Method

Building practices and tile installation methods have changed considerably since the sand-strata method was in common use. The most fundamental change in the tile industry was the introduction of thin-set mortars in the 1960s. Originally designed for use as a bond coat in conjunction with the mortar-bed method, these products were eventually used to bond tiles directly to the substrate. Although the direct-bond method was convenient and allowed thinner and lighter tile assemblies, the benefits of uncoupling were lost. When the tile is rigidly connected to the structure, movement in the substrate can produce damaging stresses in the tile covering.

The Uncoupling-Membrane Method

Despite the inherent drawbacks, the direct-bond method became the standard for tile setting in most of North America and a return to traditional methods was unlikely. In 1987 Schluter Systems introduced the Schluter®-DITRA uncoupling membrane in an effort to improve the performance of thin-set tile assemblies. DITRA was configured to provide lateral flexibility to allow independent movement between the tile covering and the substrate. The shape of the membrane also ensures proper support for the tile through the columns of mortar formed in the cavities on the top of the matting. Thus, Schluter®-DITRA provides for reliable tile applications through the ancient wisdom of uncoupling and support in a method that matches today's building practices and tile installation techniques.





The membrane was first used as a solution for setting tile on problematic substrates. But product recognition grew as tile setters enjoyed successful installations in the most demanding applications. By the early 1990s, DITRA had become a popular underlayment for use in mainstream tile applications, particularly over single-layer plywood floors.

Ed Sanders learned about the benefits of uncoupling while working on the television show Extreme Makeover: Home Edition*, so he made sure to install an approved membrane throughout his new family home in California.*

This tiled floor on the ground-level public/retail areas of Phoenix Plaza in Oakland, Calif., was installed in 1989. It was set over DITRA uncoupling membrane, installed on post-tensioned concrete over a parking garage. It has endured frequent use – including the 7.1 Loma Prieta earthquake – and is still in excellent condition today.

In 1999, an uncoupling-membrane method for tile installation over double-layer plywood floors on joists spaced at 24″ on center (Method F147) was added to the Tile Council of North America's *TCNA Handbook for Ceramic, Glass, and Stone Tile Installation*. In 2001, an uncoupling-membrane method for tile installation over single-layer plywood floors on joists spaced at 19.2″ on center (Method F148) was added to the *TCNA Handbook*. At the time, this method was the only recognized means for installing tile over a single-layer wood subfloor on joists spaced in excess of 16″ on center. In 2007, an uncoupling-membrane method for tile installation over young concrete (Method 128) was added to the *TCNA Handbook*. This method was and remains the only thin-bed installation in the *TCNA Handbook* that addresses challenges of setting tile over concrete cured less than 28 days, which is invaluable in today's world of fast-track construction.

The acceptance of uncoupling membranes as an industry-recognized method for tile assemblies was a significant milestone. It was also proof of Schluter Systems' commitment to supporting the industry by providing innovative solutions to tile installation challenges.