Today, we find membranes used in most ceramic and natural stone tile installations. The 2011 TCNA Handbook has recommendations in nearly every detail for the use of membranes, and they are mandatory in suspended floors. There are many reasons for their use, including the prevention of crack migration from the substrate to the tile and sound transmission reduction through the floor to adjacent rooms. However, the most common and probably the most important reason is to waterproof the tiled surface. Most often, tile is used because the area is likely to be exposed to excessive water; other floor coverings will not hold up to long-term water exposure. Water migration into wall cavities and under flooring can cause damage to the building structure and create an environment suitable for mold growth.

By Steve Taylor
Director of Architecture and Technical Marketing, Custom Building Products
There is a misconception that a ceramic tiled surface is waterproof - it is not. The weakest link is the grout. If a cement based grout is used, the water will penetrate the grout and work its way to the substrate through the micro-capillaries in the grout. Treating the grout joints with penetrating sealers will slow this down, but will not eliminate water intrusion completely. The grout is not the only area for water migration; the tile itself can have enough porosity to allow water through. Grout can also separate from the edge of the tile and allow water through. If there is movement in the assembly, it is possible for the tile edge to separate from the grout and leave an opening for water. Because we cannot rely on the installed ceramic tile to waterproof the installation, a waterproof membrane must be incorporated in the assembly.

There are many choices for membranes that will waterproof the surface before the installation of ceramic or natural stone tile. Most are designed for flooring, but many can be used on walls as well. The first step in choosing a membrane is to decide between a prefabricated sheet and a liquid-applied membrane. Both have advantages and disadvantages, but performance is not an issue. Prefabricated sheets and liquid-applied membranes are both designed to meet the waterproofing requirements of ANSI A118.10, and when properly installed, will waterproof the tile installation. The primary differences are in installation preferences, and that is where each type of membrane shows its advantage.

Prefabricated sheet waterproofing membranes are available in many styles, and each has a unique method of installation. It is important to become familiar with the particular membrane and how it is installed before beginning the installation project. The most common sheet membranes are plastic or elastomeric sheets that have to be bonded to the substrate prior to the installation of tile. Some membranes are coated with a pressure-sensitive adhesive backing, while other are installed with a separate adhesive or cement mortar. There are also uncoupling membranes that will uncouple the tile assembly from the substrate, as well as waterproof the installation. Many waterproofing membranes fulfill multiple functions in the tile installation; the most common is as an anti-fracture membrane. While prefabricated sheet membranes may seem fast and easy, care must be exercised to make sure the membrane is
installed properly. Nearly all pressure-sensitive, adhesive-backed membranes require a primer be applied to the substrate before adhering the membrane to the surface. These primers are generally water based polymer dispersions; they are rolled or brushed on the surface and must be completely dry before bonding the membrane to the primer. Depending on environmental conditions, this can take an hour or more.

Membranes that do not have a pressure-sensitive adhesive backing must be bonded to the substrate with an adhesive. Most commonly, this is a cement-based thin-set mortar which, depending on conditions, can take some time to cure. The thin-set mortar is spread on the substrate with a notched trowel, and the membrane is rolled into the wet thin-set mortar. If the membrane is walked on before the thin-set mortar has cured, the bond between the membrane and substrate can be broken. This can lead to hollow-sounding spots and the possible failure of the tile assembly. So generally, the installed membrane should remain undisturbed for 24 hours to allow the thin-set mortar under the membrane to fully cure.

Since a prefabricated sheet membrane is not produced to fit the area of the tile installation in one piece, smaller strips (generally 36” wide) have to be pieced together on large projects. To maintain waterproofness, it is important that the seams where the sheets come together are properly treated and sealed. There are various ways to do this, and the manufacturer’s directions must be followed. It is also important to follow directions when transitioning surface planes (horizontal to vertical) or fitting the membrane into a corner. Some membrane manufacturers will supply preformed corners to satisfy the need for properly fitting membranes. If the seams are not properly treated and all gaps filled with the appropriate sealer, water may leak through and damage surrounding areas.

A liquid-applied waterproofing membrane eliminates some of the hassle of installing prefabricated sheets. There are no primers to apply, there are no seams to treat and transitions up walls and through corners are continuous. The liquid-applied membrane is simply brushed, rolled, or sprayed onto the substrate. However, to assure a continuous film, it is necessary to apply more than one coat. Brushing, rolling and spraying can leave voids or pinholes in the film that will allow water
penetration to the substrate. Therefore, it is necessary to apply a second coat of the liquid-applied membrane to ensure that all these voids are filled before installing tile. As with the primer, it is important that each coat dries before proceeding; this is why some installers hesitate in using liquid-applied waterproofing membranes. Depending on climatic conditions, the drying time can be quite long.

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CUSTOM’s new RedGard formula can be applied thinner (30 mins dry) and still meet the requirements of ANSI A118.10 for waterproofing membranes and the requirements of IAMPO for shower pan liners. The revised formula is made with the latest faster drying polymer technology and the thinner wet layers dry more quickly. The result is a liquid-applied membrane that dries in hours rather than days, and is ready for flood testing the next day. The elastomeric quality of RedGard also makes it an ideal choice as an anti-fracture membrane to isolate the tile assembly from cracks in a concrete substrate. RedGard meets the requirements of ANSI A118.12 Crack Isolation Membranes. So the next time ceramic tile is going to be installed in a wet area, consider RedGard liquid-applied waterproofing membrane. CUSTOM will warrant the installation up to a lifetime when RedGard is used in conjunction with one of CUSTOM’s thin-set or medium bed tile installation mortars and one of CUSTOM’s quality grouts.

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ABOUT THE AUTHOR

Steve Taylor is Director of Architecture and Technical Marketing for Custom Building Products and has more than 30 years of experience developing products for the construction industry. Steve is a member of the Tile Council of North America (TCNA) and Materials & Methods Standards Association (MMSA), helping to determine proper tile installation methods and standards; including the simplification of tile installation processes which enable tile professionals to save time and money.