



## Uncoupling Membranes for Tile Installations

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Have you ever wondered when and why an uncoupling mat should be installed before setting floor tile? **CUSTOM** recommends tile installations that are continuously bonded from the tile to the subfloor. A tenaciously bonded floor will ensure that normal movement will not lead to bond loss or damage to the assembly.

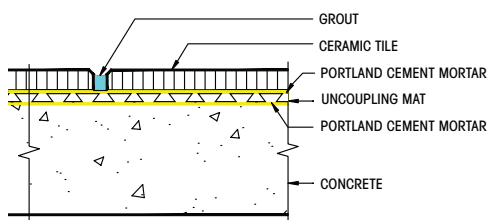


**CUSTOM**<sup>®</sup>

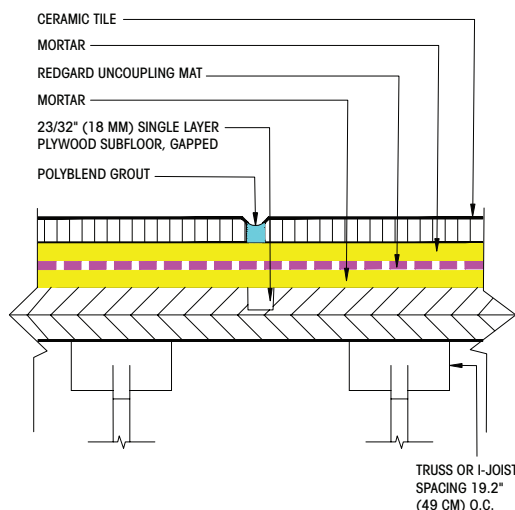
TILE INSTALLATION SYSTEMS



### CF128 Floors, Interior Crack Isolation Membrane Young Concrete Uncoupling Membrane



### CF148 Floors, Interior Wood Subfloor Uncoupling Membrane, 19.2" o.c. Joist Spacing, Thin-Set



Before installing ceramic or stone tile, most subfloors must be properly prepared with an underlayment or membrane to prevent transmission of movement that can result in cracked tiles or grout. This underlayment can be a preferred bonding material like cement backerboard or an elastomeric membrane. However, an uncoupling mat is another option that has similarities to an un-bonded system.

### What is Uncoupling?

For centuries, tile has been installed on reinforced mortar beds that have been free to move independently of the subfloor. This has been accomplished with a loose or weakly bonded plane placed between the reinforced mortar bed and the subfloor. If the subfloor moves and a crack opens, it will not be transmitted to the underlayment and through to the tiled surface. This method of installation is still used today and appears in method F111 of the Tile Council of North America (TCNA) Handbook. The un-bonded mortar bed method has a long history of success, providing that the floor will accommodate the addition of an underlayment that is 1-1/4" - 2" thick.

Most new construction and remodels today are not designed for this added floor height and weight. These projects rely on the use of the thin-set method to install tile. To minimize the thickness of the floor covering, a thin-set mortar can be used to bond tile directly to the existing flooring, resulting in a total increase in floor height typically less than 1/2". Bonded membranes and flexible mortars have been developed to prevent the transmission of crack movement in the subfloor to the tiled floor and are detailed in F125 of the TCNA Handbook.

In some situations, a crack isolation membrane or mortar may not be appropriate. For instance, most manufacturers of tile installation products require that concrete slabs cure 28 days before bonding tile directly to the surface. During the first 28 days after pouring, a concrete slab undergoes constant dimensional changes as the concrete cures and shrinks. If tile is bonded to the surface too soon, the stresses developed as the concrete cures can be transmitted to the tile installation and then cause the tile to come loose or create cracks in the tile and grout.

One solution to this is the proven method detailed in F111 for un-bonded, reinforced mortar beds. Another solution is installing uncoupling membranes or mats to provide this function in a less intrusive manner. The tiles are bonded to the top surface of the mat, while the bottom fleece is bonded to the concrete subfloor. The uncoupling mat absorbs stress from substrate movement and preserves the surface and integrity of the tile and grout.



**Most new construction and remodels today are not designed for the added floor height and weight of a 2" thick mortar bed. Uncoupling mats are the solution.**

### Installations that Call for Uncoupling

Installation method F128 in the TCNA Handbook describes using this uncoupling membrane over "young concrete." Young or green concrete is described as concrete that has cured sufficiently to support tile installation traffic. Tile can be installed after the concrete is placed and firm, typically the next day.

Custom Building Products has developed RedGuard® Uncoupling Mat for these installations. The fleece on RedGuard Uncoupling Mat is bonded to the young concrete and then tile is bonded to the geometrically configured surface of the mat. Typical movement in the concrete will transfer to the fleece to protect the tile installation, while the reinforcing will hold the mortar and tiles securely on the surface.

RedGuard Uncoupling Mat is also suitable for installing tiles over single sheet plywood subfloors supported by joists spaced up to 19.2" O.C. This is detailed in TCNA method F148 and is useful when there is a need to further minimize the height gain of the floor. It is important that an ANSI A118.11 polymer-modified mortar is always used to bond the mat to the plywood surface; an ANSI A118.1 mortar will not develop a bond to the wood surface.

As an added benefit, RedGuard Uncoupling Mat creates a waterproof barrier and provides moisture vapor control when correctly installed with RedGuard Seam Tape. The mat is made from 70% recycled materials by weight and contributes to green building initiatives.

### Use a Mortar Recommended by the Tile Manufacturer

Some of the uncoupling membranes available today recommend the use of an ANSI A118.1 non-modified thin-set mortar to bond the ceramic or stone tile to the plastic surface of the membrane. However, most manufacturers of porcelain or natural stone tile caution against using a non-modified mortar for installation, instead recommending a polymer-modified mortar meeting the requirements of ANSI A118.4 or A118.15. A dilemma is created if you need to bond a tile requiring an ANSI A118.4 or A118.15 modified mortar to an uncoupling membrane that recommends using an ANSI A118.1 non-modified mortar.

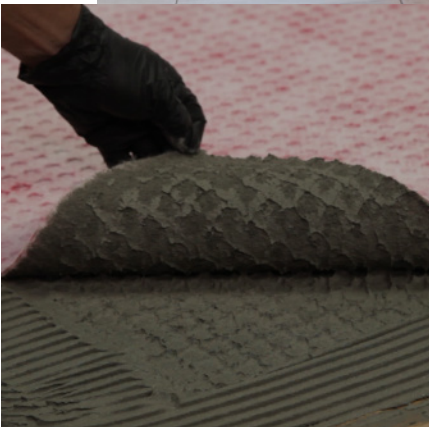
CUSTOM has resolved this dilemma with RedGuard Uncoupling Mat. As with many bonded membranes, such as CUSTOM's Crack Buster® Pro and EasyMat®, it is preferable to use a polymer-modified mortar meeting ANSI A118.4 or A118.15 to bond tile to the surface of RedGuard Uncoupling Mat.







**Mortars designed for use with large and heavy tile can be installed up to 3/4" deep to correct irregularities.**



Extensive testing in Custom Building Products' labs has shown that the polymer-modified, Portland cement-based mortars will cure under the tile and support traffic as expected when bonding over any impervious surface. The Portland cement hydrates as it cures, absorbing the water used to make a workable mix. As the water level is consumed by the hydration process in the mortar, the polymer will coalesce to aid in forming a strong bond between the tile and mat.

RedGard Uncoupling Mat meets the installation recommendations of many porcelain and natural stone tile manufacturers for use of a polymer-modified mortar meeting ANSI A118.4 or A118.15.

### **Large Format Tile requires Specific Mortars**

The vast majority of tile sold today qualifies as large format tile, which is any tile with a side 15" or longer. To properly install these tiles, special mortars have been developed to compensate for irregularities in the flatness of the tile and floor. Because an uncoupling mat will follow the contours of the floor, it becomes necessary to compensate for irregularities with tile bonding mortar. Thin-set mortars are suitable for correcting irregularities up to 1/4". However, when installing large format tiles where both the floor and tile are not completely flat, it may be necessary to correct larger than 1/4" variations.

In these cases, it is best to use a mortar that has been designed for use with large and heavy tile. Most mortars can be applied up to 1/2" thickness after bedding, CUSTOM Large and Heavy Tile rated mortars are suitable up to 3/4" thick. Thicker mortar beds are more easily damaged by movement in the floor. For this reason, many manufacturers of large format tile (LFT) mortars add a polymer modification.

Custom Building Products has developed many mortars to specifically address the needs of large format tiles that work in conjunction with RedGard Uncoupling Mat. ProLite® Premium Tile & Stone Mortar, ProLite® Premium Rapid Setting Tile & Stone Mortar, VersaBond®-LFT Professional Large Format Tile and VersaBond®-LFT RS Professional Rapid Setting Mortar are just some of these mortars for setting large and heavy tile.

### **Enhanced Performance for Fast-Track and Exterior Applications**

CUSTOM's rapid-setting mortars are formulated with the latest technology for curing quickly to allow grouting in as little as 2 hours and light traffic in as little as 4 hours. ProLite mortars exceed the requirements of A118.15F High Performance Mortars and with its special cements is ideal for exterior applications to reduce or eliminate efflorescence, while VersaBond®-LFT RS meets ANSI A118.4F requirements. All of these mortars meet the requirements of ANSI A118.11 for bonding RedGard Uncoupling Mat to plywood substrates.



**Properly installed membranes extend the life expectancy of the tile installation.**

### RedGuard Uncoupling Mat Solves the Problem

While most ceramic and stone tile installation projects will benefit from a direct bonded system, there are instances that demand the unique properties of an uncoupling system. While there are several uncoupling products and methods available to the installer, the use of an uncoupling mat minimizes the floor height gain from additional tile installation materials. This translates into less work in surrounding areas to maintain level floors when transitioning between different floor coverings.

It is important to respect the recommendations of the manufacturer and supplier of the ceramic and stone tile that is being installed. If they recommend a higher performing ANSI A118.4 or A118.15 polymer-modified installation mortar, then look to CUSTOM. Utilizing a complete installation system from a single manufacturer guarantees the maximum warranty for the installation. When RedGuard Uncoupling Mat is installed with an eligible system of CUSTOM mortar and grout, the entire assembly can qualify for up to a Lifetime System Installation Warranty.

CUSTOM's Technical Services Department is available at 800-282-8786 to help determine the tile installation system for any project challenge.



### 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). In these roles, he helps to determine proper tile installation methods and standards. This includes simplifying the tile installation process to save tile professionals time and money.

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