

Q What is the difference between modified and unmodified thinset, and in what situations should each be used?

A Tom Meehan, co-author of *Working With Tile* (Taunton Press, 2011) and a second-generation tile installer from Harwich, Mass., responds: The question about when to use latex-modified thinset (called latex/polymer-modified mortar) versus when to use unmodified thinset (called dry-set mortar) has been the subject of many heated debates in the tile industry and has even had the pros and big manufacturers at odds.

Types of thinset. First let's look at what each type of thinset is composed of and how the Tile Council of North America (TCNA) describes the two types. According to the TCNA, dry-set mortar is Portland cement mixed with sand and additives that impart water-retentivity, and it's used as a bond coat for setting tile. (Water retentivity is the ability of the thinset to resist drying out rapidly when it comes in contact with porous tile.) Dry-set mortar is suitable for thin-bed installations of ceramic and natural stone tiles over a variety of surfaces. It's used in one layer nominally between $\frac{3}{32}$ - and $\frac{1}{4}$ -inch thick. After tiles are embedded, dry-set mortar has excellent water and impact resistance; is water-cleanable, nonflammable, and good for exterior work; and does not require that the tile be soaked for installation.

The TCNA describes latex/polymer-modified mortar as a mixture of Portland cement, sand, and special latex/polymer additives and says it also is used as a bond coat for setting tile. The TCNA doesn't list or describe the types of tile that latex/polymer-modified mortar is most suitable for, but it does say that the latex additives in thin-bed Portland-cement mortars are designed to improve adhesion, reduce water absorption, and provide greater bond strength and resistance to shock and impact. It goes on to say that these additives also allow some latitude in time, working conditions, and temperatures during tile installation.

Certain types of tile, such as glass tile, may require thinset that's designed specifically for that tile. Here, the bag of adhesive is clearly labeled for its purpose (right), and the thinset is applied to the wall in accordance with the tile manufacturer's instructions (far right).



Changes in the industry. Years ago when I learned the tile-installation business from my father, the choices were plain and simple. When we tiled over concrete slabs, cement board, drywall (gypsum board), or similar products, we used dry-set mortar with no latex additive. And when we tiled over plywood substrate, we used latex-modified mortar. If we used dry-set mortar over plywood, the bond between the tile and the plywood substrate usually failed within a year. This was the thinset rule of thumb for many years.

In the last few decades, new types of tile have been gaining popularity, and many require different formulations of thinset for proper adhesion. For example, porcelain, which has taken a large share of the market, is very dense and has a low moisture-absorption rate. Glass tile—also popular—has an even lower absorption rate. These properties call for some sort of modified thinset. Because these types of resilient tile are being made by a variety of tile companies in a variety of configurations, thinset manufacturers have had to create different types of latex/polymer-modified mortars to work with the specific tile that's being installed.

It can make a big difference which type of thinset is used with each product. Manufacturers of specialty products like glass tile almost always specify the type of mortar to be used. Even some natural stone tiles require a specific type of mortar, and installers should not take those recommendations lightly. The formulation of today's tile is just too complex, so instructions must be followed exactly.

So the answer to this confusing question about which thinset to use—and when—is pretty simple: Always follow the tile manufacturer's recommendation. The manufacturer knows its products, and more importantly, it warrants its products only when they're installed according to its recommendations. If the tile manufacturer doesn't recommend or require a specific type of thinset, then go by what the thinset maker recommends for the type of tile you're installing. The TCNA is also a good resource. The TCNA Handbook is the best all-around reference for all types of tile information, and the TCNA has technicians on hand who can help you choose the right thinset.

Exceptions for membranes. So far we've talked about thinset choices for types of tile and for different substrates. But uncoupling membranes, waterproof membranes, and crack-isolation membranes can literally add another layer of confusion to the issue. As with the tile, you must consult or research the membrane manufacturer's instructions and use the correct setting material recommended for the specific product.

With some uncoupling membranes, you may actually need to use both types of thinset if you are going over a plywood substrate. The membrane bonds to the plywood with latex-modified thinset, and then the tile beds to the membrane with dry-set mortar—different mortar on each side of the membrane. And be aware that the installation process may be different for different types of membrane, so manufacturers' requirements have to be followed for the product to be warrantied.

So here's the million-dollar question: Will it be a disaster if I use the wrong thinset (latex modified) on top of an uncoupling membrane? The answer is no, but it is much better to use dry-set mortar as recommended by the tile manufacturer to maintain the warranty. The bond would still be there, but because the latex slows down the hydration process, the modified thinset does not set up as readily as the dry-set mortar. Using dry-set mortar also avoids other minor problems, such as latex leaching into grout joints in wet areas, or the need to wait before grouting or walking on the tile.

Additionally, there are dry-set mortars made especially for uncoupling membranes. These mortars have a little more Portland-cement content, which provides a stronger bond without latex. Dry-set mortar is also much cheaper than latex-modified thinset, so it literally pays to use the right product.