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Let's Talk Floor Prep

Christopher Capobianco



This is an extreme example of what can go wrong when substrate preparation is not done correctly - or not done at all! Photo by Christopher Capobianco

This column is the first one of my third year writing for Floor Covering Installer, so I'd like to thank our editor, John Moore and the team at FCI for being a great group to work for, and thank the readers of FCI for the many positive comments and suggestions I have received over the past two years.

Few issues create more problems and failures for resilient flooring installations than proper preparation of the substrate. In this column, I'll give you a crash course in things to avoid and



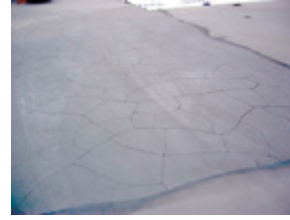
Patching compounds are designed for only 1/2-inch thick applications at a time. A hole this deep would need more than one application, or a single

some of the new products that are available.

application of pourable
(also known as self
leveling) underlayment.
Photo by Jon Namba

Terminology

As floor covering professionals, we owe it to our customers to use the right terms for the work we do so we can help them become more educated. For example, I have heard many floor covering salespeople and installers tell customers that they would need a new “subfloor” before installing the new resilient flooring. What they actually meant was “underlayment.” A subfloor is actually part of the structure of a building – the base layer of the flooring system that can be wood or concrete. An underlayment can be a panel type like plywood or a cement type like a self leveling underlayment. Underlayment is applied over a subfloor to provide a smooth substrate for the new floor covering. What’s a substrate? That is what we put the floor on. It could be a subfloor, an underlayment, or an existing floor. This may sound confusing, but there is a difference and it is explained in a document that is actually a dictionary for resilient flooring. ASTM F 141, Standard Terminology Relating to Resilient Floor Coverings, defines these terms as follows:



If the proper products or the proper methods of underlayment are not used, the surface may crack such as this one did, and need additional work to get ready for floor covering installation. Photo courtesy of Pyramid Floor Covering, Inc., Port Washington, NY

Subfloor: that structural layer intended to provide support for design loadings which may receive resilient floor coverings directly if the surface is appropriate or indirectly via an underlayment if the surface is not suitable.

Underlayment: A material placed under resilient flooring, or other finished flooring, to provide a suitable installation surface

Substrate: the underlying support surface upon which the resilient flooring is installed.

Wood Substrates

To prepare a wood subfloor, the most common method is to install a panel underlayment such as plywood. It’s important to follow the underlayment manufacturers recommendations for what type of fastener to use and how far apart to space them. The generally means appropriate length underlayment nails or staples. Never use screws because they don’t hold as well, and can be easily driven through the panel. Spacing should be 2-3 inches on the seams and 4-6 inches in the rest of the panel. Check to see if the joints of the panels need to be patched or sanded or both. As far as what type of panel underlayment to use, there have been a variety of products available over the years and there are new products arriving even today. When I started in the industry in 1978, the most common was hardboard underlayment such as Masonite brand. The industry moved away from hardboard by the early ‘80s and many of us switched to lauan plywood, back when lauan was of excellent quality. In the late ‘80s a new product arrived in the form of 1/4-inch oriented strand board, or OSB. Some of us switched and some didn’t and by the mid ‘90s OSB underlayment fell out of favor and some went back to the increasingly poor quality lauan or tried some of the new “real” plywood products that are still



Plywood or other panel underlayments usually need to be patched before installing floor coverings, although some do not. Check with the underlayment manufacturer to learn what the requirements are and what type of patch should be used. Photos courtesy of Tarkett

around today.

Today, the three most common underlayments are plywood, lauan, or fiber reinforced panels. I have included lauan as a separate category because most resilient flooring manufacturers are no longer recommending lauan as an underlayment. I did a research project for one of my clients recently and in a short time I was able to find over 20 references against using Lauan. For example, the National Association of Home Builders said, "Typically, 1/4-inch lauan plywood is used as an underlayment when vinyl is installed over wood subflooring. The problem with lauan is that it is soft and susceptible to denting and crushing under concentrated loads such as furniture legs or high heels." The Import Plywood Marketing Group, Inc website says, "Lauan or Meranti was never intended to be used as an underlayment for vinyl flooring. It was originally designed as a three-ply plywood for paneling." Flooring manufactures agree, and Tarkett said, "A wide variety of species and grades of Lauan plywood have been imported into the United States and sold for use as underlayment. Many of these panels have caused severe problems such as discoloration, delamination and adhesion failures." Many other resilient manufacturers have similar statements, so if you are using lauan, the word warranty may not be in the conversation.



Plywood or other panel underlayments usually need to be patched before installing floor coverings, although some do not. Check with the underlayment manufacturer to learn what the requirements are and what type of patch should be used. Photos courtesy of Tarkett

Other panel underlayments are available that are much higher quality than lauan. I prefer "real" plywood that is comprised of layers of wood throughout, so there are no voids. My favorite is 5-ply arctic birch, also known as Baltic or Russian birch. These products are made from woods originating from central Europe, and are manufactured using five layers (for the 1/4-inch thickness) of birch, a very hard wood. These products, which are sold under a variety of brand names, perform extremely well even under heavy traffic conditions.

Fiber reinforced panel underlayments are common in the stone and ceramic industry and are starting to gain popularity for resilient flooring as well. These products remind one of drywall in appearance and in their "score and snap" method of cutting, but they are designed to be underlayments so they carry the performance characteristics and warranties for use under resilient.

There are other new products entering the market for underlayment and as time goes on we'll learn whether flooring manufacturers and installers will accept these products. For example a product called "Woodstalk" is a fiberboard derived mostly from the stalk left over after harvesting wheat.

As professional installers, keep up with the flooring manufacturers recommendations and have a look at the latest products to see if they work for you. Although most of these better underlayments cost more than cheaper products like lauan, the warranties and the better performance are worth it so sell it that way! If you're installing the job, the customer is going to get the best installation so why not the best underlayment?

Concrete Substrates



I've talked a lot about concrete here in FCI, especially from the stand point of moisture problems. Before you do anything to cover a concrete floor, make sure it has been tested for moisture, regardless of the age or grade level. You can go to www.fcimag.com and look up a lot of articles that can tell you about concrete floors and the proper testing.



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ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring, is the industry standard for concrete floor prep. It specifies floor patches and underlayments as follows; "Surface cracks, grooves, depressions, control joints or other non-moving joints, and other irregularities shall be filled or smoothed with latex patching or underlayment compound recommended by the resilient flooring manufacturer for filling or smoothing, or both. Patching or underlayment compound shall be moisture-, mildew-, and alkali-resistant, and, for commercial installations, shall provide a minimum of 3000 psi compressive strength after 28 days." Because of this standard, we have an answer to the question of "What type of patch or underlayment should I use?" There have been two formulations for patching and underlayment compounds in use for many years – gypsum based and cement based. The technology for gypsum products has been improved a lot over the years, as manufacturers have made them resistant to mold and mildew, and increased the compressive strength. However, many in the industry still prefer the cement based products, so it is important to check with the flooring manufacturer to see if they have a preference.

Patching compounds are made to be used up to about 1/2-inch thick, and are often used as a "skimcoat" to cover the entire surface, to fill in the embossing on an existing resilient floor, or to coat an asphalt "cutback" adhesive residue. Make sure the product is made for the intended use, because not all patches can be used to seal in cutback or to smooth an embossed floor. Follow the instructions carefully, such as when products need to be mixed with a liquid additive.

While we are talking of adhesive residue, a big mistake many installers make is not properly dealing with adhesive residue before "skimcoating" a floor.

If the residue is black, certain patching compounds can be used over the residue, but only if it is scraped down so that the residue is just a transparent layer, with the trowel notches scraped off. You can't just rip up old VCT and skim over what's underneath.

If the residue is not black, it needs to be completely removed before patching the floor. The problem with skimming over adhesive residue is that the water in the patch can soften the adhesive, and/or the adhesive layer becomes a cushion layer between the patch and the concrete so that the patch may crack or the floor covering may show indentations.

Another major cause of failure of patching compounds is too much water. Adding more water to the mix may make it go further and helps it spread more easily, but it weakens the finished product, and may make it softer and more porous. It is imperative to pay attention to the ratio of water to powder, and don't deviate. Finally, pay attention to drying time because if you cover the patching compound too soon, any excess water is trapped, and may cause the flooring adhesive to soften or lead to air bubbles, soft spots or other failures in the finished floor covering.

Often an installer will do multiple coats of patching compound in order to smooth a very rough floor. A faster and better alternative is to use a pourable underlayment, also known as self leveling underlayment. The term "self leveling" needs to be used carefully, because these products will not always

automatically bring a floor to level. Be careful what you promise, because if someone puts a level down on the finished floor they may be disappointed if you didn't figure the required material and procedure to actually level the floor.

As in patching compounds, gypsum and cement underlayments are available, as well as new category known as "low alkali cement" or LAC, which is described as having better resistance to shrinkage, cracking, moisture, and elevated pH in the concrete surface.

Pourable underlayments are used for a variety of uses such as high rise residential buildings, repair of badly damaged floors, or bringing uneven floors to level.

There is such a demand for these types of products that there are number of contracting companies who specialize in just underlayments.

There are three ways to apply these products. Small batches can be mixed in barrels and poured on the floor, or larger batches can be mixed with portable mixing machines or even pump trucks. For a professional installer that has not done pourable underlayments, there are a lot of training programs available from some of the major producers, so I would suggest you take advantage of these training opportunities before you jump into this type of work.

Like many things in life, the 5 Ps apply when you install resilient flooring: Proper Preparation Prevents Poor Performance. A true professional will spend the time to prepare floors correctly so that the finished floor is smooth and flat and gives the customer many years of good service. An installer well versed in floor prep will always have a lot of work.

