



Fundamentals of Working with Underlayment Systems

“Without a solid foundation,” as the saying goes, “you will have trouble creating anything of value.” That is true in spades for the successful installation of flooring, which can only be achieved if issues with the subfloor—the foundation of the flooring—are addressed using the proper underlayment products and procedures.

Unfortunately, the installation of flooring over poorly prepared subfloors occurs far too often in today’s fast-paced construction environment. In fact, some flooring experts believe that in more cases than not, flooring underlayment products are not used correctly and in accordance

with manufacturers’ recommendations or guidelines. Much of this is due to tight budgets that require less expensive flooring system alternatives that sacrifice quality, as well as unrealistic timelines and the use of inexperienced flooring installation contractors.

When this results in the flooring having to be replaced, the consequences can be significant in terms of expensive and unnecessary remediation costs, lost time and damaged reputations for everyone involved. Importantly, many of the problems associated with using underlayments to prep a subfloor could be eliminated if flooring contractors focus on three fundamentals to help determine a positive outcome.

Fundamental #1: Follow the Instructions. An often-overlooked rule of thumb when installing underlayment systems is as simple as it is important: Always read the manufacturer’s instructions in three key areas and follow them to the letter to pave the way for a successful flooring installation.

First, mix proper amounts of water or liquid additive to powdered underlayment systems. Manufacturers do extensive research to determine proper mixing ratios of product to liquid.

Above: Subfloor surfaces should be free of surface dirt and debris, curing compounds, sealers and any other contaminants before they can be prepped using underlayment products.



Adding too much water to a powder may break down its strength, making it unstable and susceptible to powdering, cracking or not bonding properly to the substrate below. In addition, excessive water in the adhesive may soften the patch or underlayment, causing trowel marks or ridges in the underlayment. Not adding enough liquid may lead to difficulties spreading the product properly. In addition, the chemicals in the product may not activate, impairing its ability to set up properly, which can result in cracking and de-bonding.

Second, allow proper drying time. Drying times are established to ensure that the product makes the necessary chemical reactions to harden and bond to the substrate properly. Failure to

allow proper drying time can result in the formation of cracks and the product could release from the subfloor when adhesives are applied.

Third, apply the product based on the manufacturer's recommendations for thickness. If it is necessary to achieve a higher thickness level than the product is designed for, there are two options: either pour the product in layers to achieve the desired results, or use a one-pour product better suited to the task.

Fundamental #2: Properly Prep the Subfloor. The successful use of underlayments depends on the subfloor being sound and solid, with no hollow areas or loose debris breaking away. The surface should be examined visually for small cracks that look like a spider web.

Following manufacturer's recommendations regarding drying times will ensure that underlayment products will not release from the subfloor when adhesives are applied.

If this is an issue, it can be addressed by using a buffer with 12- to 20-grit sandpaper to sand the subfloor.

Rubbing the subfloor by hand or with a scraper can determine whether there is loose debris or surface areas that are breaking away. Tapping the subfloor with a hammer will often determine hollow areas, which must be filled to ensure a strong bond between the subfloor and the underlayment.

Subfloor surfaces must be free of surface dirt, such as sheetrock mud, curing compounds, sealers, wax or any other contaminants that may de-bond the substrate from the underlayment. In most cases, these products must be removed using a scarifying disc attached to a low-speed buffer. The disc's six to 12 carbide-tipped blades will scratch the old paint, epoxy and/or adhesives off the surface of the concrete, leaving it contaminant free. In cases where the epoxy is too thick or hard for this removal method, bead blasting may be necessary.

A complicating factor is that contaminants (such as old adhesive, grease and oil) can get down into the pores of the concrete and cannot be properly removed by surface cleaning. These situations require bead blasting the surface, which removes the top layer of concrete and the contaminants in it, resulting in a clean surface that is free of bond-breakers.

When prepping a concrete subfloor, the expansion joints used to reduce buckling or cracking must be honored. They enable the slab to expand or contract freely due to heat or cold and must not be filled in or covered by underlayments. For example, if an expansion joint is filled with a patching compound and the slab swells due to heat or movement, it will push the patch out, causing a hump or ridge in the floor. Likewise, if the expansion joint is not honored and the subfloor contracts or shrinks due to the cold, it will cause a depression, resulting in an indentation in the floor.

Fundamental #3: Use the Right

Underlayment Products for Addressing Any Subfloor Issue

The range of underlayment products to address virtually any subfloor issue include:

- **Moisture control systems**, which reduce moisture emissions in the substrate to levels that meet the requirements of flooring manufacturers.
- **Patches**, which have sand in them, and act as fillers for deeper and bigger cracks and depressions, typically 1/4" to 1/2" deep. They are usually more economical to use for larger areas.
- **Primers**, which improve the bond of underlayments and seal the

substrate. Standard primers are used over absorbent dry concrete, wood or other porous substrates. Non-porous primers are suitable for non-absorbent substrates such as ceramic, terrazzo and metal.

- **Self-drying concrete** eliminates the need for excess water in the subfloor to evaporate prior to the installation of flooring.
- **Self-levelers** are for subfloors that are significantly out of level or have depressions or holes more than 1/4" deep. Self-levelers are commonly used

to fill trenches that have been dug for plumbing pipes.

- **Skim coats** are typically used to address minor imperfections in floors, such as small cracks, divots or rough surfaces. They may also be recommended to cover old adhesive residues on the subfloor. Skim coats are basically a fine powder with no sand so they can be thinly spread—generally no thicker than 1/8".
- **Toppings** perform as self-levelers or patches, but act as the actual finished floor.



Expansion joints enable concrete subfloors to expand or contract freely and must not be filled in or covered by underlayments.

gypcrete substrates. Either gypsum-based or Portland-based products are suitable for wood subfloors. Non-porous substrates such as ceramic, quarry tile, metal or terrazzo are best suited to Portland-based products.

Distributors Offer Expert Advice.

Selecting the right underlayment products and using them properly to address subfloor issues can be challenging for even the most experienced flooring installation contractors. A complicating factor for installers is keeping pace with the steady stream of newer, more advanced underlayment technologies being introduced into the marketplace. A valuable asset in simplifying the complexities of selecting the best products to remediate subfloor problems is often the distributors of flooring installation products (such as Fishman Flooring Solutions, lfishman.com). Most are well versed on the range of underlayment systems on the market and can recommend the best products to address virtually any substrate problem efficiently and effectively. **FCI**

Underlayment Product for the Substrate Involved. It is important to remember that the type of subfloor will dictate what underlayment products

to use. A concrete subfloor requires a Portland-based underlayment, which is gray in color. A gypsum-based product, which is typically white, is used on

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