

Adhesive concerns surface in all types of situations. Often, we believe that the only role an adhesive plays is to hold down a piece of material. But frequently, circumstances arise to create problems. The following are several of the more common adhesive-related concerns and their possible causes.

Bleeding of adhesives can occur for a variety of reasons.

- Excess adhesive*, from a trowel notch that is heavier than what was specified by the manufacturer of the adhesive or resilient material, can leave a film of adhesive that is simply too thick. This thick film tends to migrate when subjected to foot or rolling-load traffic.
- Open time* of the adhesive was not honored. With few exceptions, adhesives are designed to have open time. Open time allows the adhesive to lose some of its moisture and develop body. The professional installer must know how to judge the proper open time in accordance with individual job-related variables, such as temperature, humidity and substrate absorbency.
- Moisture problems* can impact adhesives within days of their application. The emergence of a moisture condition can cause the adhesive to re-emulsify and ooze.
- A maintenance problem*, often the result of either stripping the floor or starting the floor maintenance regimen too soon, can cause adhesives to bleed. New floors should not be stripped immediately. Strippers are highly alkaline, and their alkalinity attacks the adhesive - especially when the adhesive is new. Subjecting newly installed resilient materials to excessive moisture, perhaps by aggressively mopping the floor, will create the same effect as a moisture problem if the adhesive has yet to fully cure.

Compatibility of adhesives with the substrate

Residues on the surface of the substrate can cause de-bonding, discoloration and adhesive deterioration issues. Any residue left on the surface of the substrate introduces one more variable that can cause adhesive failure. Some common residues, and the concerns they create, are as follows:

- Oily residues* create bonding and discoloration issues.
- Sealers and curing compounds* create bonding and adhesive compatibility issues.
- Parting compounds* create bonding issues.
- Overspray of paint* creates bonding and adhesive compatibility issues.
- Gypsum wall textures/taping compounds* create bonding issues.
- Solvent spills* create discoloration and adhesive deterioration concerns.
- Heating oil spills* create discoloration and adhesive deterioration concerns.
- Existing adhesives* can create compatibility problems with the new adhesive.

Bonding failures

The causes of adhesive bond failures are varied. Some of the more common situations are detailed below.

- Dirt and dust* on the surface of a substrate can create enough of a barrier to negatively impact the adhesive's bond and cause installation failure once the floor is placed into service. Dusty surfaces can also cause adhesives to "ball-up," which creates a show-through problem in the finished floor.

- *Residues* from sealers, curing compounds and parting compounds serve as just one more layer of a substance that can fail.
- *Insufficient open time* for adhesives usually leads to bubbling, indentation of the material's surface and adhesive migration.
- *Excessive open time* usually results in a poor bond between the resilient material and the adhesive. This is usually the case whenever there's a lack of adhesive transfer to the back of the material.
- *Moisture damage* to an adhesive manifests itself in two ways: either in re-emulsification, or in a poor bond of the adhesive to the substrate. Either condition tells you that the adhesive was not allowed to cure. Adhesives that re-emulsify were exposed to moisture prior to the adhesive's cure, meaning the substrate was too wet to install over. Adhesives that initially cured but were then subjected to moisture will usually de-bond from the surface of the substrate, leaving most of the adhesive stuck to the back of the flooring material
- *Alkalinity damage* appears in two ways: the adhesive will have a crystallized appearance and be somewhat brittle, or it may virtually disappear and leave only a few traces of residue. Alkalinity attack on an adhesive can create the impression that too little adhesive was used. In reality, the adhesive was just eaten up by the alkaline salts.
- *Adhesives that dry too soon* due to the effects of an overly absorptive substrate can cause the adhesive to appear chalky and somewhat crystallized.

Excessive adhesive application

Excessive adhesive application is usually the result of the installer using an improper trowel notch for the job. In fact, the trowel is the installer's single most misused tool. All adhesive manufacturers specify the trowel notch requirements for their adhesives and for the type of substrate to which the adhesive is used on. So, why is there a problem? If your using a trowel with 1/16" wide and 1/16" deep notches spaced 1/16 " apart, and the specifications for the adhesive required a trowel with 1/16", 1/16" deep notches spaced 3/32" apart, you'd probably question what harm could come from using the trowel that had notch spacing a mere 1/32" smaller what was specified. How could such a small difference affect an adhesive? The answer is almost 20% more adhesive will be applied to the substrate.

Excessive adhesive applied can be responsible for indentations in resilient material caused by static loads and rolling loads. Ridges may also develop in the adhesive during the rolling of the floor. Other problems caused by the application of excessive adhesive include oozing of adhesive, and bubbles in the floor covering.

The *substrate's porosity* often dictates the type of adhesive to use and the amount of open time it requires. Many times, a floor in a renovation project is assumed to be porous when, in fact, the substrate is non-porous.

Rolling flooring into the adhesive

I hear a lot of comments regarding the use of a roller. To get excess air out from beneath the freshly laid floor covering, some installers use a broom, a wet towel wrapped around a piece of lumber, a wall roller, their hands, and any number of other means. The bottom line is they are too lazy to carry in the appropriate tool - a roller - to complete the installation in the specified manner.

Why do you think a manufacturer would specify the use of a 100-lb. roller if a 25-lb. one would do the job? The reason is application of a specific, straight-line static load is necessary to force the material down into the

adhesive while maintaining a uniform pressure on the surface of the material. Do you think that could be accomplished with a broom?

Adhesive removal

Removal of adhesives must be done with the greatest of care. Some adhesives must be completely removed, while others may be removed to a thin residue. In no case should a new adhesive be applied over the trowel notches of an old adhesive.

Adhesives should be removed mechanically, not by chemical means. Pay careful attention when dealing with old cutback adhesive, as it did contain asbestos. Consult your local authorities on the proper ways to safely remove it.

Chemical adhesive removers are not recommended by flooring manufacturers. The problem is that chemical adhesive removers are made to dissolve old existing adhesive, and will impregnate the subfloor that will eventually work its way back out of the subfloor. If moisture is present in the substrate, which it always is to some degree, and the new flooring material is non permeable, either hard surface flooring or carpet tiles, a reaction is most likely inevitable that will cause a failure. Beware of adhesive abatement companies that are not familiar with the flooring industry and its standards. These firms can leave you with what appears to be a clean substrate even when it is loaded with adhesive remover residues that are not readily identifiable.

Other problems

Trowel notch show-through. How many times have you walked into a supermarket and gasped at the trowel notch show-through you see in the floor? This occurs when the installer either uses a trowel with the notches spaced too far apart for the adhesive to be used, or his trowel had worn down and was improperly re-notched so that several notches were made deeper than the others. I have seen instances of this so bad that the vinyl composition tile (VCT) was cracked over the ridge the trowel left in the adhesive.

Material subjected to traffic too soon. Sometimes, after an installation is completed, other tradesmen working at the job site are allowed onto the floor too soon. When the entire job is completed and the floor is cleaned and polished with a high-gloss polish, a host of indentations and rolling-load marks immediately become apparent all over the new floor. This occurs because the adhesive was never allowed to cure before being subjected to traffic.

Manufacturers specify that a newly installed floor should be protected from foot traffic for 24 hours and from rolling-load traffic for 72 hours. It doesn't matter whether the applied adhesive is latex, acrylic or an epoxy - they all need to be protected while curing. Adhesives generally take 5 to 7 days to cure at proper conditions.