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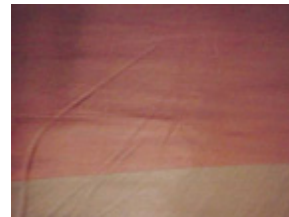
The Importance of Using a Proper Trowel

Christopher Capobianco



The proper trowel, used correctly, is the most important tool in a glue-down floor covering installation.

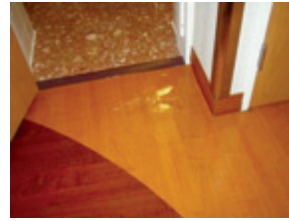
It seems such a simple thing – that piece of metal with a handle that we use to glue flooring down. But the adhesive trowel may be the most misused tool in the floor covering industry. Too much or not enough adhesive can ruin any adhered floor covering adhesive installation. It continues to astonish me that many experienced installers don't pay attention to this detail; dealers often leave it up to the installer; and most distributors and manufacturers accept orders for floor coverings and adhesives without saying a word about trowels. Now don't get me wrong – there are exceptions to what I am saying, such as installers who actually do follow trowel recommendations, manufacturers who sell or give away trowels, and dealers who supply trowels to the installers. However, the trowel continues to be an overlooked tool in the installation equation in many cases.



Too much adhesive caused this floor to show roller marks when the customer moved the furniture into the room.

As a resilient manufacturer's rep, I often saw the results of too much adhesive - sheet vinyl with indentations, tile with adhesive oozing between the joints, lumpy, bumpy cove base, stair treads that shifted because the excess adhesive didn't dry, and epoxy that doesn't cure. The idea that "more is better" is a huge mistake to make with resilient flooring products. On the other hand, "More is not better, and less can be equally as bad," according to Tim Cole, Director of Support Services for Forbo Linoleum. "The first thing a manufacturer checks for and asks about when inspecting an installation is what notch trowel was used." For this reason, many manufacturer's reps and professional inspectors often travel with a trowel showing the recommended notch pattern when they inspect installation related failures. If a floor is opened up and the wrong trowel notch is found, the inspection is over and the installer is found to blame.

Andrew Aufiero of Atlas Carpet (also president of CFI, the International Certified Floor Covering Installers Association), agreed with this from the carpet side, saying "Correct adhesive selection and use is the most common issue I see in the field." The correct amount of adhesive is determined by site conditions, carpet backing, old adhesive on the floor, smooth or rough concrete, new or old or dusty concrete, what sealer can and should be used if the floor is too porous, and don't forget temperature, humidity or our best friends moisture and alkalinity in the slab. And that's



Not enough adhesive caused this vinyl installation to let go in the traffic lanes, causing the bubbles seen here.

not to mention the general contractor who needs the job done yesterday and the rest of the trades who are in the area while we are working." So, with all these conditions to consider, he concluded, "Selecting the correct adhesive and trowel notch is not always as simple as chop it and drop it if you want a job that will satisfy the end user for a long time." It seems daunting, but he feels strongly that "Problems can be eliminated with proper training. We, as an industry, must strive to change and educate the installers, the sales force, general contractors, architects and design firms." So, this issue is just as much of a concern on the carpet side as it is for resilient.

The crux of the problem is that many in our industry fail to realize that a trowel is a "2 in 1" tool. Of course, it's an application device that gets the adhesive from the can to the floor. But in addition, Cole explains, "The trowel is a measuring device that the manufacturer has determined will spread the proper amount of adhesive for their product." Having been involved in testing to determine bond strength of various trowel sizes, I can assure you that the trowel notch recommendations are not arbitrary numbers plucked out of thin air. Often I have talked with a skeptical installer as he looked at a fine notched trowel and argued it was too small. In fact, the high performance adhesives today are so strong that they actually work better with less rather than more. This can benefit the installer because of faster setup time and stronger bond.

So, what is the big deal? If a little is okay, why is a little more such a problem?

Pete Austin, Technical Manager for Lonseal, has had a lot of experience dealing with trowel notch issues under vinyl backed commercial sheet goods. "Too much adhesive actually becomes a form of substrate, which is obviously not acceptable under today's thin PVC resilient flooring," Austin explains. Since most adhesives are flexible by nature, the adhesive actually forms a soft bed under the flooring material when too much is used. So, it's like putting a vinyl floor over a cushion layer. "When the correct amount of adhesive is used," Austin continued, "problems like adhesive telegraphing, track marks and indentations are significantly reduced."

Arguably the "standard" floor covering trowel, if there is such a thing, is the 1/16-inch square notch. Millions of square feet of vinyl composition tile adhesive are applied with this type of trowel, and I have seen a lot of carpet installers use this same size trowel. Dealers often keep a supply of "throwaway" trowels on hand, and the 1/16-inch notch is thought of as a "one size fits all." However, this trowel applies way too much adhesive for certain resilient products that require a 1/32-inch notch and may not be large enough for many carpets that can use a 1/8-inch notch. That's not to mention wood and ceramic whose trowel requirements can be up to 1/4-inch and even

larger! As for those little tiny trowels, a 1/32-inch notch is just right for high performance adhesives such as reactive adhesives like as epoxy or polyurethane, some solid vinyl tile adhesives, and most vinyl backed or rubber sheet goods adhesives.

So, when is it acceptable to vary the notch pattern from the published guidelines? The answer lies, as Aufiero said, in the substrate. The ASTM definition of substrate (per ASTM F 141) is the underlying support surface upon which the resilient flooring is installed. The first rule with any substrate is, don't assume it's porous! Many plywood underlayments are fairly non absorbent, so you don't necessarily need more adhesive over plywood. I have used the recommended 1/32-inch notch for a solid vinyl tile over plywood and it works great. As far as concrete substrates, treat them as non porous unless testing proves otherwise. Because of the way concrete is finished to a smooth surface, the surface is very "tight" so it is not absorbent. And, today's polymer modified patching compounds also have a strong, tight surface when they are mixed properly and not over watered. To test for porosity, sprinkle a small amount of water on the substrate and see if it is quickly absorbed. Most concrete surfaces and even patching compounds will hold most of the water on the surface and not absorb it. If you do find the concrete is porous, make sure there is not another problem with the concrete surface. If you can easily scratch into the surface of the concrete with a screwdriver, it may be a sign that the surface is weak and additional preparation or even removal of the top layer is needed. If your patching compound is overly porous, it was probably mixed with too much water so that is a problem too. So a little testing can go a long way before you even get started.

Assuming the surface is solid and the concrete just happens to be porous, it may be wise to step up to a slightly larger trowel notch. On the other hand, if the recommendation calls for a larger notch, a nonporous surface (such as very smooth concrete, existing resilient flooring such as old VCT, or a terrazzo floor) may require you to step down to a smaller notch and/or leave a longer open time. To be sure, do an adhesive bond test to be sure the adhesive transfers to the back of the flooring and that you have a strong bond to the substrate.

What about the cost of having a special trowel for each installation? Over concrete floors, the average trowel will last about 1,000 – 1,500 square feet, so a \$15 trowel (and that's on the expensive side) costs less than 2 cents a square foot. Nobody can tell me that this is too costly an item. The main thing is to plan ahead so you have it when you need it. As far as re-notching the trowel, that is definitely a bad idea. Talk about penny wise and pound foolish! Tim Cole said, "Don't think that you can file out the proper notches in a trowel on the job site." Too large or two small a notch and you may have a failure. Remember, a good trowel costs less than 2 cents a square foot. It is a waste of time to try to re-notch a trowel. "It may save you a few dollars" Cole added, "but it could cost you a lot in the long run."

Cooperation from the dealer you work for is also necessary. It helps if you know well ahead of time what you will be installing on a given day so you can get the right trowel. I encourage dealers to order the right trowel for the job at the same time as the adhesive. They certainly can pass along that two cents a square foot cost without too much trouble. With so many failures being caused by the wrong trowel, a true professional installer owes it to the customer to do the right thing.

It's really quite simple, folks. Think about the trowel as a measuring device and think about other measuring devices. If your mechanic uses the wrong feeler guage to set your spark plugs, your van runs like you knew what. If your dentist uses too large a drill to fix a cavity, you'll be jumping out of the chair. And if the baker making the roll for that egg sandwich uses too much flour, then you don't have bread - you have concrete. You owe it to your customers to use the right tools to install floors, and for glued down floors, the trowel is a very important tool. The important thing, when you are not sure, is to pick up the phone. The flooring and/or the adhesive manufacturer can help you analyze the situation and make the right decision as to what size

to do when you run into a situation you are unsure of. Just don't take it for granted.

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