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Linoleum: Call it Right, Install it Right

Christopher Capobianco



With proper installation and maintenance, linoleum is a beautiful and durable flooring material.

Every time I hear an installer say he is going to do a "linoleum" job, I cringe. I feel the same way when he says he will install a new "subfloor" on the job, or when he says the job is being installed over "cement." Usually when an installer, a consumer, or a retailer uses these words, they are using the wrong word. The correct words and definitions can be found in the "dictionary" for resilient flooring, an ASTM document known as F 141, Standard Terminology Relating to Resilient Floor Coverings.



Proper adhesive and trowel selection are critical when installing linoleum.

I would bet that in many cases, you could walk into a floor covering store, ask for linoleum and they would show you vinyl. As sheet vinyl started to gain in popularity compared to natural linoleum in the 1960s and 1970s, the term "linoleum" or "lino" continued to be used for all sheet goods, and even a

lot of tile products. Even today, sheet vinyl is regularly called linoleum and vinyl composition tile (VCT) is sometimes called linoleum tile. However, these are two totally different products. Linoleum is defined in ASTM F 141 as “a surfacing material comprised of a solidified mixture of linseed oil, pine rosin, fossil or other resins or rosins, or an equivalent oleoresinous binder, ground cork, wood flour, mineral fillers, and pigments, bonded to a fibrous or other suitable backing.”

That mouthful of language describes good old fashioned natural linoleum like my great grandfather used to sell, and my grandfather used to install. It is still around today, and it is definitely not vinyl. There is no vinyl in linoleum.



The yellowish "drying room film" is visible in the right portion of this photo, and will go away once the floor is exposed to light.

The installer who mentions installing a “subfloor” actually means underlayment. The subfloor in a building is the base structural layer – the very bottom of the flooring system, which could be wood or concrete. This surface, if it’s in good shape, could be a good substrate for a resilient floor covering installation. If it’s not in good shape, it needs to be covered with an underlayment such as plywood or self leveling underlayment. There are three different terms:

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.

To make it simple, you are always installing the floor over a substrate. If the building has a good subfloor, then it can be the substrate. If not, then an underlayment is installed to create a suitable substrate.

Finally, the term “cement” is misused everywhere. It is impossible to walk on a cement floor because cement is a powder that is one of the ingredients in concrete, which is a floor you can walk on. Cement is mixed with water, sand and rocks to make concrete, which is defined as “a strong, hard material made by mixing a cementing material (commonly Portland cement) and a mineral aggregate (as washed sand and gravel or broken rock) with sufficient water to cause the cement to set and bind the entire mass.”

Okay, please forgive the English lesson. Let’s talk linoleum, which was invented in England by Frederick Walton in 1864. He named it after its main raw material, linseed oil. Linoleum incorporates the environmentally friendly ingredients of linseed oil, cork powder, wood powder, organic pigments, limestone and jute. If you are asked to install linoleum, and it turns out to be “real” natural linoleum and not the vinyl you have installed a hundred times before, you had better be ready because there are some differences between the two products. To identify these differences, I researched a number of different sources, starting



The bump in this flooring material is a stove bar mark. With proper installation technique this condition is not a problem.

with past issues of Floor Covering Installer. Ray Thompson of Armstrong covered “lino” in two articles here in 2000 and 2001. “Linoleum is a lot different to seam than sheet vinyl,” Ray said. “Linoleum tends to shrink in length and grow in width. Seams should be cut slightly open on side seams and not on cross (end) seams.” So, your seaming technique on linoleum will be different than other flooring materials where the seams are cut “net.” Pay attention to this detail and refer to the manufacturer’s guidelines. Specialized tools are available for trimming linoleum, so make sure you are ready by having the right equipment. Another difference Ray explained is in the product itself. If you are asked why the color doesn’t match the sample, Ray’s explanation of the chemistry of linoleum might help. “When linoleum is in its final curing stages of production, it is hung in ovens (drying rooms) for several weeks. During this process, a yellowish film may develop on the surface of the product. This film is common on all linoleum products, and is part of the normal curing process of the linseed oil found in the product. This yellowing goes by several different terms: “stove yellowing,” “seasoning bloom,” or “drying room film.” These describe the same phenomenon that affects all linoleum. This yellowing will disappear; depending upon the amount of natural light, it can be gone in a few hours to a few days. This is why it is common for the new material not to match the old sample.”

Another unique characteristic of linoleum is known as “stove bar marks.” Forbo’s installation instructions explain how these occur and how to “butter” the back of the material to eliminate them: “When drying linoleum, the product is suspended in large loops in the drying rooms. The top loop known as a pole mark is cut off and recycled. The bottom of each loop is called a “stove bar mark” and will appear approximately in the center of a roll. When installing the stove bar mark area, simply spread adhesive with the flat side of the trowel on the backside of the sheet across the material and then spread the adhesive on the floor, in order to double stick the material. Remember you must place the material directly into the wet adhesive. Be sure that when you place the stove bar mark into the wet adhesive that you massage the material down and push the material flat. Roll the material in all directions, starting across the width of the material. Be sure that the stove bar mark is rolled first to avoid trapping the tension on the material. Place weights on the stove bar area until the adhesive has set up.”



Conducting a bond test is a good idea for all resilient installations, especially if there is any question about the suitability of the substrate.

It is important to note that linoleum gets installed into wet adhesive, so your adhesive open time is very important, as is the type of adhesive and the trowel you use. Do not use anything other than the recommended adhesive, and make sure the floor is rolled immediately after setting the material into the adhesive. Be sure the trowel notch is appropriate, or even better, buy a new trowel before starting the job. To make sure you have it all right, conduct a bond test.

“The most common cause for failure in any flooring installation is not having proper adhesive transfer,” Tim Cole of Forbo explained. “This is one of the main reasons we recommend adhesive bond tests. This gives the installer the opportunity to determine what the working time is with the adhesive as well as the best open time for the job site conditions.”

Another difference in Linoleum is maintenance. If it is done correctly, the

floor will be beautiful. If not, there can be problems, as explained by Stan Hulin, who wrote about linoleum floor care in the December 2004 issue of ICS Cleaning Specialist Magazine.

“The question is often asked whether there is any difference between maintaining vinyl-type products and linoleum,” Hulin said. “Although similar methods of maintenance are used, there is some concern and special care that should be taken when maintaining linoleum floor coverings. Linoleum floors are more sensitive to chemicals and abrasives. Maintenance of linoleum should be strictly in accordance with the manufacturer's recommendations. The use of high-pH strippers and cleaners may damage any floor surface, but the effect of strong alkaline cleaners on linoleum is much more apparent. Frequent use of these types of chemicals without rinsing can cause cracking, shrinking and possible discoloration. Aggressive stripping chemicals can leave the surface rough to the touch and very porous because the chemical has etched into the binder of the linoleum. Linoleum floors have a tendency to be susceptible to damage due to over-wetting. Water can attack the oils in unsealed linoleum, or seep into the backing, causing it to rot. If the floor is properly sealed, these problems will be minimal unless the floor is completely saturated and left to stand for long periods of time.”

In closing, am I afraid of linoleum? YES! But it's not the product. Linoleum is a fantastic, beautiful, durable, environmentally friendly product. What scares me is that this amazing product that has been around for generations is so misunderstood. Failures abound because of a lack of understanding of installation and floor care. The manufacturers have done a great job of creating training programs but dealers, installers, and floor care technicians need to make it a priority to create the time for training and education. If the right methods are specified and enough time is allowed, then everyone makes money, the job gets done right, and the customer has a beautiful floor that will last a lifetime! It's not difficult, it's just different!

*For more information about ASTM publications, go to www.astm.org or call 610-832-9500.

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