

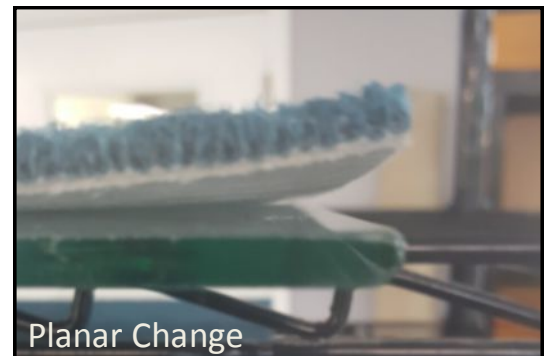
# The Difference Between Dimensional and Planar Stability

Let's start with the explanation of each of these descriptions for modular flooring material be it in the form of a carpet tile or hard surface luxury vinyl tile or plank with our focus being on Luxury vinyl plank and tile.

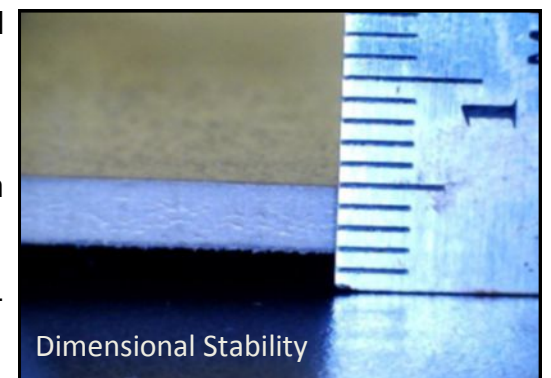
Dimensional stability is the ability of the material to hold its shape. Dimensional stability means the product will not grow or shrink – expand or contract. It will stay the same size as when it was made whether a 24" x 24" inch carpet tile or a 12" x 12" vinyl tile or a 6" x 48" vinyl plank or a board of wood or WPC or laminate. Staying the size as specified by the manufacturer is what it should do.

Planar stability is the ability of the material to lay flat and level, that is, not curl up on the ends or the sides. When the material is installed on the floor it should stay there without lifting up at all. In the case of vinyl planks which are long the material will have a great deal of "drape" the product will conform to the surface it is installed on which itself should be flat and level. All modular flooring material especially Luxury vinyl plank or tile which is basically a vinyl flooring material – the luxury part has to do with the look – should stay flat on the floor. Unfortunately that doesn't always happen and it's creating havoc in the industry, failures of the flooring and claims and complaints that reach massively large losses.

I wrote about planar stability in the CFR in 2013 but both of these issues have reached epidemic proportions especially Luxury vinyl plank. The installers, adhesive and acclimation are being blamed for what is often the inherent inability of these products to lay flat or remain dimensionally stable. Having said this there are certainly issues relative to the installation, environment, acclimation and levelness that can affect the material. Lest you think vinyl flooring



Planar Change



Dimensional Stability



Radiant Heat Test

in pieces can't be affected by anything, hey it's basically plastic right? Well it can but we'll qualify these issues for you so you can place them in the correct and corresponding column to the concern.

Some definitions for Dimensional Stability are:

- ⇒ The ability of a flooring material to maintain its essential or original dimensions while being used for its intended purpose.
- ⇒ The degree to which a material maintains its original dimensions when subjected to changes in temperature and humidity.
- ⇒ The ability of a material to retain its size and shape in the conditions in which it is used.

As flooring material one has the reasonable expectation that it will maintain its shape and size once it's installed and forevermore stay that way. Nothing wrong with that at all. Unfortunately that doesn't always happen because the material may have ideas of its own and the conditions of installation may not be conducive for avoiding problems.

With imported Luxury vinyl flooring which 82% of the product is, it's difficult to control what's in the mix for "recycled" products. Materials like bamboo dust, wood dust, clay and maybe even some other PVC product material may be in the material. We've seen architectural specs call for up to 45% of recycled content presumably for the sake of being green. Being green can get you into trouble when you have recycled content whose uniformity and consistency can't be controlled which means the product may be hard to control. If there is moisture and there's a high mix of natural materials in the flooring the product can expand and contract making it dimensionally unstable. These are things one never thinks of when buying or using this flooring and knows nothing about. Even some of the manufacturers who distribute these products may not know this. Yet when there's a claim on the material their response is that you did something wrong. Even if the expansion and contraction of the material is minimal it can equate to what appears to be extreme amounts when viewed throughout the entire installation and you're asking yourself what could cause this.

Aside from not acclimating the material properly prior to installation nothing done during installation will cause the flooring material to expand or contract, curl, cup, dome, shrink or grow regardless of what anyone tells you. If installation is the cause for these issues then I want to talk to you about some other magic tricks you may be able to perform.



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Some issues that can affect the flooring material are:

- ⇒ High amounts of natural products included in the core material affected by changes in relative humidity in the slab and ambient air space.
- ⇒ Uncontrolled environment (cold going to hot and vice versa)
- ⇒ High amounts of passive solar heat directly on the floor – a further comment about this later
- ⇒ Aftermarket radiant heating systems generating high amounts of heat equating to compressed edges
- ⇒ Underlayment not properly acclimated, either too wet when installed or high variance in the sub-floor...again high swings in heat and humidity which can affect the substrate material and hence the flooring or the underlayment itself being unstable or moving.
- ⇒ Uneven tension in the flooring material is common and can be created by the core material, the print layer (decor' paper), wear layer, and urethane if applied.
- ⇒ And let's not forget chemical adhesive removers or abatement chemicals which can affect the flooring whether glued direct or floating.



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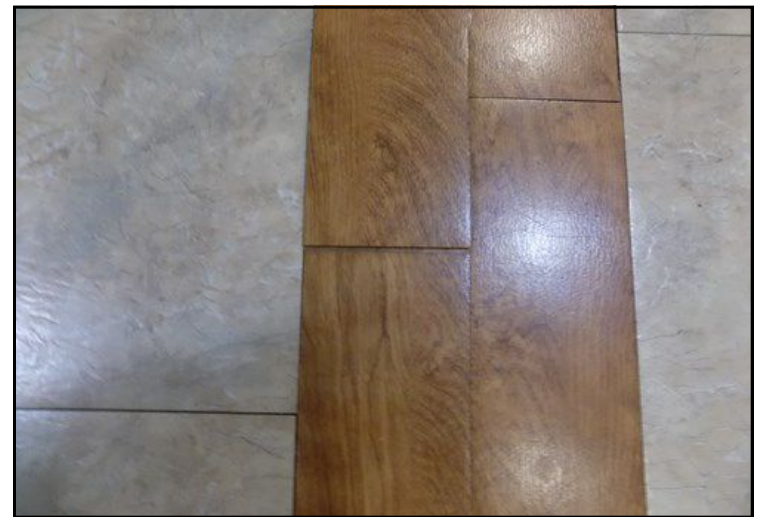
If the substrate is not level and flat it will cause the flooring material to run off and can result in gaps or spaces especially with plank material. I don't care if you're gluing it or floating it. If the substrate isn't flat it will affect your installation of these materials. And this statement goes for any modular flooring material. I know some manufacturer/suppliers will tell you

the substrate doesn't have to be flat and level to install their products but it does. If it isn't, as mentioned, the material can run off, be distorted, have hollows beneath it, squeak, creak, flex, crack and maybe do some things we haven't thought of yet; who knows.

Gluing unstable flooring direct to the substrate will not hold it stable or flat; that is not the purpose of adhesive. It's laughable to hear someone say that pressure sensitive adhesive once applied will make the flooring material and substrate one unit. Not going to happen. If the material is unstable it's going to move and adhesive, nails, screws or bolting it aren't going to stop it. The stresses being relieved in the material are going to react and nothing is going to stop them. Sooner or later an unstable product will manifest an inherent stress. It may be in days or months but if its unstable it will happen.



Gaps from tile shrinking over a hot substrate



New plank laid over a shrunken plank. Shrank over 1/8 inch

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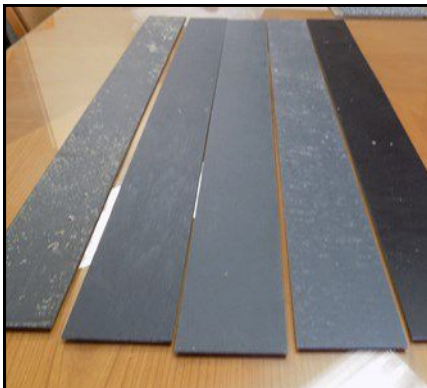
Sometimes you'll see the condition when you take the material out of the box and lay it out to check it which you should do. Take a few random pieces from several boxes, lay them on a glass flat surface, allow them to acclimate in a controlled space for 48 hours and examine them for any edge, end or corner lifting. If you see any of these conditions it's inherent in the material and it's going to occur when installed. While doing this check for squareness, equality of length, thickness, squareness of the cut (not beveled) and the back to make sure it all looks the same. Any deviation in the product indicates an issue with it during manufacture.

Make sure you understand these products and who you're buying them from. Familiarize yourself with the product, take what you hear from sales reps with a grain of salt and follow the suppliers instructions for installation to a "T", including using the adhesive they tell you to so you cover your assets if there's a problem. Do this regardless of whether you think there's a problem with the product or not.

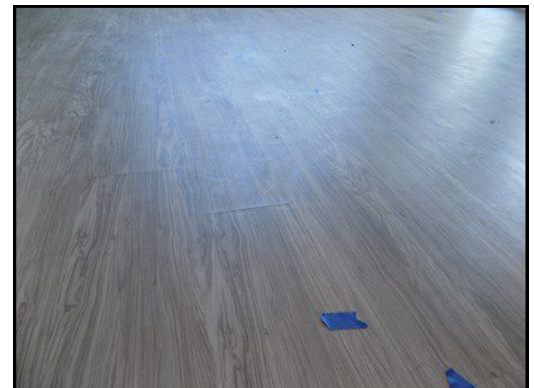
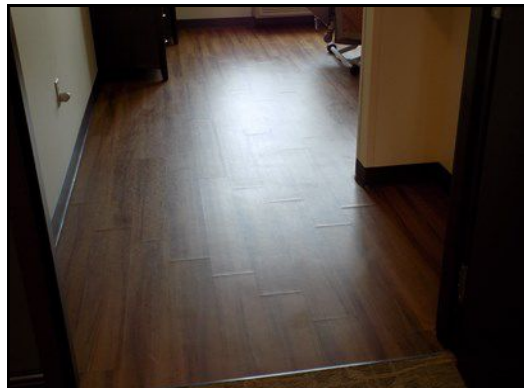


Luxury vinyl tile and plank are not new. I was selling luxury vinyl tile in 1971 when I got into the industry. They were however much different back then – thicker, only in 12 x 12 tiles, very stable and with looks of stone or marble and some even with carved patterns. Today's product comes in different sizes, patterns, thicknesses and qualities so it can vary greatly. Unfortunately, LVT and LVP have become so popular so fast that everyone wants to jump on the band wagon to get a piece of the pie. Many people don't understand the product, the dynamics of it and frankly get a bit delusional when there's a problem. I'll share something with you, again, that I learned from a very wise man and one of my mentors in the flooring manufacturing industry years ago. He used to tell me, "either you control the product or the product controls you." With a lot of what we're seeing in the market place with LVT/LVP instability issues, the product is out of control.

Remember two things I keep repeating, "The flooring never lies; it will always tell you what's wrong if you know how to interpret what its saying." And "words do not change the laws of physics." We can always determine what the problem is whether with the material, installation or something else. If you have a flooring problem we can help you determine what went wrong, why, who is at fault and how to resolve it. If you want to avoid a flooring problem, which is actually a better idea, we can help you with that too.



These planks are all from the same job with varying backings in each



Ends Lifting

In the meantime if you need help with any flooring problem, concern or issue or help with a spec, let us know so we can help you. One thing you should know is that we can always and I mean always, determine what the problem is, why it exists, who or what is at fault and what can or has to be done to correct it or resolve the issue. Over the last 46 years we've helped thousands of clients, we can help you too.

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