



THE COMMERCIAL FLOORING REPORT

PLANAR INSTABILITY IN FLOOR COVERING

PLANAR STABILITY is the ability of flooring material, particularly modular flooring, whether soft or hard surface, to lay flat. Planar and Stability as defined by the dictionary;

pla-nar (pĕ-¹nĕr, -nĕr¹) *adj.*

1. Of, relating to, or situated in a plane.
2. Flat: *a planar surface.*
3. Having a two-dimensional characteristic.

sta-bil-i-ty (stĕ-bĭl-ĭ-tē)

n. pl. sta-bil-i-ties

1. The state or quality of being stable, especially:
 - a. Resistance to change, deterioration, or displacement.
 - b. Constancy of character or purpose; steadfastness.
 - c. Reliability; dependability.



What causes planar instability? Planar instability, that which prevents a modular flooring material, hard or soft surface from lying flat, is caused by internal forces generated by materials or layers in the flooring material, that exert forces or stress across or within the material, which create lifting or curling edges. This can occur on all four sides or two sides and is often in the “machine” direction or length, of the material. If, for example, a product is quarter turned the lifted edges will alternate – North South to East West and vice versa with every other tile. Planar stability is influenced by the forces within the flooring material and by changes in heat or humidity. There are tests to detect or prove the condition exists such as the cycled humidity test for carpet tile.

Can planar stability be cured? Sometimes by back rolling the material the stresses within it can be overcome or broken allowing the material to be put back down and lay flat. This would be in the case of carpet tile. This process will not work on hard surface flooring that is already glued down as the adhesive is not releasable, obviously.

Fallacies of planar stability typically include the statement, normally by a manufacturer, that the installer did not use enough glue or the appropriate glue. Adhesive, especially for modular carpet (carpet tiles) is not meant to hold the carpet tile flat to the floor. Carpet tile, out of the box, must be flat, square and stable. It should conform, or drape, onto the substrate on which it is placed, with or without adhesive. Adhesive was

never meant to hold carpet tile flat. In fact, in years past, carpet tile could be installed using the grid or perimeter installation method. With these methods of installation adhesive was only applied around the perimeter of a room or in a grid, like the grids in a suspended ceiling tile, to stabilize the lateral movement of the carpet tile, not to hold it flat to the floor; it did that on its own, as it still should.

The contention held now is that carpet tile or modular flooring material is supposed to be held flat to the floor by adhesive. So if anything, real or perceived, poses a question of the adhesive being compromised in any way, again, real or perceived, the curling of the flooring material is said to be an installation issue. To combat curling, manufacturers are recommending adhesives with so much bond strength that they invalidate the releasable qualities and ease of replacement of carpet tile. This invalidates one of the most compelling benefits and features of modular carpet tile, touted by sales and marketing, that individual tiles can be taken up and replaced for whatever reason. Not anymore. With the aggressive adhesive being suggested to hold down inherently curling flooring the bond is so strong that it takes two men and a winch to pull the stuff off the floor.

In a recent case a hard surface flooring material was installed and within 24 hours it exhibited curling on the edge. The job was stopped, rightfully so, the manufacturer contacted and a representative sent to the site. The installation naturally was questioned. Mind you the installation contractor and his installers have had years of experience installing this product. The manufacturer attempted the installation with the same results. This scenario repeated itself three times. Wouldn't you think that if the same parties all had a problem installing the product that the product should be called into question and not the installation? Unfortunately, the obvious reasoning, logic and common sense seemed to escape this case as it was contested. When it was explained why this happened in court the judge even stated, "isn't the glue supposed to hold the flooring edges down?" The answer, or course, is no. Despite the argument to the contrary, words do not change the laws of physics. This is all too often overlooked or, more to the point, ignored. If an object generates enough force across the plane, whether flooring material or steel, due to instability in the material, glue will certainly not hold it flat, nor will nails, bolts or welds at the edges. Further, to the judge's question, "you mean there's enough force in the flooring material to pull the edges up from the glue?" The answer is absolutely. Again, the glue only holds the material in place, it is not meant to hold the material flat. The forces are too great combating the tacky adhesive. It just amazes me when people can't grasp this concept thinking that adhesive will hold the product flat. And, if the adhesive does hold the product flat, it will have so much grab that it will be a long day trying to get the stuff off the floor.



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Lew Migliore - President and Owner

LGM Enterprises, LLC

P-(706) 370-5888 - F-(706) 270-0482 - Email: lgmtcs@optilink.us

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Let me share another real case scenario with you as follows from a flooring contractor as it relates to the inappropriate removal of existing multipurpose adhesive being the reason the carpet tile installed is curling. This argued excuse is being used increasingly as you'll read here.

"I am emailing you in search of information about a growing issue in my market. I've been in this business for 20 years and seem to be having more conversations about the removal of existing multipurpose adhesive when installing carpet tile than ever before. To keep this email short and specific these are my issues:

1. Every manufacturer seems to have a different version of what they recommend be done i.e. Sand, completely remove, prime, etc.
2. This is a new issue to the General Contractors in my market and some see this as a ploy by the manufacturers to "CYA" and sell primer (God love the GC)
3. My competitors are not addressing the issue on their bids for renovated work so I have to be careful not to price myself out of a job. (We are currently listing glue removal as an option)
4. There is a lot of confusion as to why this is even now an issue since multipurpose adhesives have been water based for years and so many backings are non-pvc now. We used to knock the head off the trowel ridges with a sander, spread releasable adhesive and roll with it.....

My questions are:

1. Is this a real issue Nation Wide in our industry?
2. Why is this happening?
3. Are there any articles or white papers about this issue I can reference?
4. Why am I the only one in my market that seems to be worried about it? Am I making a big deal out of something I should not?"

Thanks for any help you can lend.



Our response is as follows:

You are not making a big deal out of nothing. And it is a manufacturer's CYA ploy because there are so many curling carpet tile issues. We received two emails this morning, different people and different tiles, both curling on the floor. I'm going to forward this to Sim Crisler, VP at LGM and let him elaborate just a bit on this and on what you should do. We also have a couple of CFR issues which address this issue. Sim by the way spent 33 years with one of the largest carpet tile manufacturers in the industry and is arguably the most knowledgeable individual in the industry on this subject. Sim's reply follows: The GC's – God Bless 'Em – are right. I am 100% for good and thorough floor preparation. That said, the adhesive removal and floor preparation being called out today for the installation of modular carpet is a CYA ploy from the manufacturers who continue to believe that a flawlessly prepared floor coupled with a film of adhesive so thick and aggressive that the entire concept of the carpet being modular is destroyed will solve curling. As has been proven on literally thousands of occasions, glue does not solve curl.

I was recently working with a large insurance company who are as knowledgeable about modular carpet – they use 300 to 500 thousand yards a year – as any end user in my experience. The facility people at this company challenged a major manufacturer that their "new" and draconian floor prep and adhesive requirements doubled their cost of using modular carpet, didn't work, and basically caused the carpet to no longer be modular. This company basically said that it was obvious to them that the manufacturer was attempting to shift responsibility for creating a flat product to the installer and end user. This insurance company told this manufacturer that unless a way to install their modular carpet using the procedures that had been successful for the last 25 years could be found; there would be no purchase of product without a reduction in price to cover the increased prep costs.

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I think you are going down the correct road. Position adhesive removal and the additional prep work necessitated by this removal as an extra making sure that everyone understands that the extra costs associated with this are driven by the manufacturer and not the industry. As Lew says, this has been and continues to be an ongoing and huge problem for modular carpet manufacturers.

And I will add for other modular flooring hard surface products as well, even wood. Why so? Because the green movement has forced manufacturer's to use alternative materials in the products which can be, obviously, unstable which creates planar instability. This is a problem being encountered by almost all carpet tile manufacturers. There is no intention to create this problem, in fact it is a battle fought daily. It is being driven by the green movement and we're working with materials not used before and methods and techniques either untried or commonly used that don't mesh with the new materials. This is a learning curve. In the case of hard surface flooring, and how that product could have planar instability, it too is undergoing a greening. Not only by components used in the makeup of the product but by separate applied backings being laminated onto the back of the flooring that are not part of a monolithic, solid or homogeneous blend. They are an addition to the product and therefore have their own forces, those of either expansion or contraction, which will pull on the plane of the material and lift the edges. Remember this, Newton's law of motion, "for every action there is an equal and opposite reaction." I'm not going to argue with Sir Isaac Newton and neither should anyone else. This is what's happening and eventually we, as an industry, will come up with a balance in the products to prevent planar instability. Until that time comes, there will be a roller coaster ride of problems. This is not intentional and it is being hard fought to contain. But until then let's not lose site of the fact that the problem exists and words, substrate conditions, residual old adhesive, super sticky adhesive or someone's opinion is not the reason for planar instability. It's the product.

LGM and Associates
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519 Oxford Street Dalton, GA 30720 P (706) 370-5888 F (706) 270-0482

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