

THE COMMERCIAL FLOORING REPORT

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Moisture Resistant Adhesives and De-Contenting Adhesive Quality

Flooring adhesives are challenged far more than ever to perform and provide maximum bond strength for every flooring product made to be glued down. Flooring adhesives are required to perform over wet concrete sub-floors that have elevated pH/Alkali content. Often these issues far exceed the calcium chloride test levels for moisture vapor emission specified by flooring manufacturers' and the pH factor of 9.0 as specified in resilient and carpet installation standards. Moisture in concrete will always elevate the pH. Flooring adhesives must bond wood, vinyl, laminate, pure vinyl tiles and planks, carpet tiles with a vast number of backing systems, broadloom carpets with latex unitary, action-back, urethane foams, urethane unitary and every other type of backing and flooring material in use. Flooring adhesives must also meet new industry specifications such as Leed Specifications and State and Federal environmental specifications for volatile organic compounds (VOC) all while being able to perform in today's ultra-fast track construction industry. These requirements are putting more demands on the performance of flooring adhesives which also require more knowledge and awareness by installation firms, installers, general contractors, architects and end users.

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Furthermore, adhesives in use today have to be more resistant to concrete substrates that are wet, green and laden with high moisture content which also contain millions of parts of adhesive destroying alkali's (sodium and potassium hydroxides) in concrete. In addition adhesives must resist relative humidity levels in concrete as high as 95% along with pH/alkali values as high as 12 pH which are currently being demanded by distributors, contractors, flooring installers and even flooring manufacturers.



So what are the adhesive companies doing to meet and counter these ridiculous demands? A tremendous number of new products are hitting the market to meet and solve the requirements set forth by the floorcovering industry. Adhesives are now being made and promoted to successfully bond carpet tiles, vinyl composition tiles (VCT) luxury vinyl tiles (LVT), vinyl planks, rubber tile and even hardwood flooring with a single acrylic pressure sensitive adhesive (PSA).

Broadloom carpets with a multitude of different backings are now being bonded to concrete, wood, epoxy, terrazzo and natural tile products, such as cork and to a variety of padding products in double stick installations and over a vast variety of moisture emission control systems which are applied to concrete substrates, many of which can be bond breakers. The challenges to sticking to all these substrate materials and to agents that are known bond breakers are daunting.

There is no doubt that adhesives are far better today than in decades past, despite what some may think. Changes in adhesive have been made since the 1990's due to the advent of much stricter VOC standards and the elimination of solvents and other odor causing chemicals which had been considered essential for a quality adhesive.

Many of today's adhesives contain more solids which means more "stick" which means better performance but it also means that more adhesive per square foot of flooring has to be applied in many cases. Trowel sizes have gone from the old 3/32" U for broadloom carpet to the current 3/16" deep by 1/8" wide trowel for many carpet constructions. The amount of applied adhesive has gone from 15 yards per gallon to 5 – 7 yards per gallon. That said, there are many new adhesives that tout a thin application of adhesive that will go further, allow more "open" or working time and bond better.



Acrylic tile adhesives in the 90's were 45-50 percent solids and were mostly plasticizer, alkali and moisture resistant and had fair to good pressure sensitive tack for the tile products of that day. Today acrylic PSA polymers which are designed to remain tacky after drying, are 70 percent solids, extremely plasticizer resistant, essentially water-proof but not completely so and they have much better resistance to alkali degradation. Interestingly, some of these adhesives, especially those of many carpet tile manufacturers, have been designed with even more "grab" and tenacity to help hold down curling carpet tiles. This is a task acrylic carpet tile adhesive was never meant to perform but one that carpet tile manufacturers have called for due to planar stability issues which occur with carpet tile from time to time. There is so much stick to this adhesive that it's near impossible to get the tile off the floor. And carpet tile adhesives job is not to hold the tile flat to the floor, only to hold it in place; yet another task forced on the adhesive.

Now, figuring that the trowel or method of applying PSA adhesives are the same as years ago, still more adhesive per square yard is being applied to any sub-floor and one should expect better performance.



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Adhesive cost for the past ten years have remained generally stable, even though their raw materials cost and performance demands have grown dramatically. The price increases have come from higher chemical and raw material costs. Many of the flooring products have not changed that much. On the other hand the increase in new backing varieties, including recycled content, has necessitated changes in floor covering adhesives. So what are all these high performing adhesives and their manufacturing companies to do, to keep and maintain the ever increasing properties and low pricing demanded by the flooring industry?

In a recent industry publication there appeared an article in which various adhesive manufacturers were quoted having made statements about “de-contenting” their adhesives to maintain profits, since they were not able to raise prices with the ever increasing raw materials prices. What could they have meant by “de-contenting”? Does that mean changing current adhesive formulas, and reducing their manufacturing cost? What about all these RH and pH and performance claims? How can you make those if you are “de-contenting”? And what does “de-contenting” mean? It means you are taking something out. What is that something and how will it affect the product?




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A current trend by some manufacturers is to reduce the adhesive solids, the sticky stuff, by adding water. It is extremely difficult to tell the difference between an adhesive with 60 plus percent solids versus one with 50 percent, if the pail is full with a thick adhesive. The big difference is in performance and long term warranty protection of a successful flooring installation. We recently found this to be the case when consulting on a large broadloom carpet installation. All indications were that the failure of the carpet to stay stuck down was an installation related issue. But when the adhesive used to install the carpet was tested the results showed that it had far less solids than what this otherwise high quality adhesive historically had. Thinking this was a fluke we obtained more of the same adhesive from a different batch and the tests yielded the same results. This was one of the “de-contented” adhesives. This should concern you because now you have to be paranoid about actually getting what you paid for and if an installation fails due to de-bonding we have to look more closely at the adhesive itself.

On the other hand, the vast majority of adhesive today are better performers when used according to their specified installation requirements, whether they are new generation, water-resistant, acrylic fortified or other proprietary chemical additives. For an adhesive to fill the needs of the flooring coverings of today they must be made specifically for the flooring and sub-floor requirements, they must be applied as specified by the flooring manufacturer and all other trades must provide an equal quality sub-floor (moisture, pH, surface conditions) and a stable floorcovering material has to be installed. And, as with flooring materials themselves, you have to know what adhesive to use with what product and on what type of substrate so that gluing the flooring down will not be compromised. Adhesive are made to hold flooring materials down and keep it there for the life of the product. And by the way, the cheaper the adhesive the less effective it will be. This is one of the reasons flooring manufacturers insist you use their adhesive because it has been formulated for the products they are selling. Make sure you don't deviate from that requirement.

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Adhesives are actually the least expensive component in a flooring installation so the best adhesive made for a particular application should be purchased and used as specified by the flooring and adhesive manufacturer.

The increased demands of fast track construction have been answered by the adhesive manufacturers employing improved technology, polymers and formulations that will do a better job of adhering all flooring materials securely.

Reducing or stabilizing pricing by lowering solids and quality either by “de-contenting” or water, does not, nor will it address today’s demand for quality. One other thing to remember is that words do not change the laws of physics or chemistry and marketing spin can employ terminology that must be interpreted for what it really says or doesn’t say. Make sure you read the warranties to see what they actually cover and how they cover it. Moisture resistant may mean the adhesive integrity will not be compromised but not necessarily that moisture will not affect the flooring material. And be leery of “sound deadening” qualities of adhesive. It’s adhesive, not a sound deadening insulator. Adhesives don’t deaden vibration which is what sound is.

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