N E W S
L E T T E R

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Delamination Claims

Avoiding Claims for Delamination, Wrinkles & Buckles

Delamination in carpet is due to the separation of the primary and secondary backing. As simple as this sounds, there are several reasons why delamination can occur. In most cases the cause for delamination is not related to manufacturing.

In manufacturing the cause of delamination can be due to the amount of filler load used in the latex formulation. The filler used in SBR latex is generally calcium carbonate. The purpose of the filler is to extend the latex by adding more bulk. Typical filler loads generally range between 400 and 500 parts filler to 100 parts rubber. Higher filler loads tend to make the latex more brittle, provide weaker laminate strengths, and generally will not hold a stretch. In additional efforts to achieve more aggressive laminate strengths the latex is frothed to allow it to better penetrate into the secondary backing. Of equal importance are the time and temperature of the oven during the coating (i.e., backing and baking) process. In this regard there is style dependency, since carpets with heavier face weights and latex applications require slower coater speeds to achieve proper curing of the latex. Regardless of the construction all carpets with a laminated secondary backing should provide a minimum of 2.50 pounds inch/width delamination strength. The ASTM D 3936 test method provides a means to accurately assess the laminate strength of carpets. (re: HUD/FHA UM 44D, Table 1 Minimum Carpet Requirements and Test Methods). The ability of the carpet (latex) to hold a stretch can be measured by testing using the Dimensional Stability by Mechanical Action test method.

In many cases' delamination, wrinkles, and buckles can be traced to installation or on-location conditions. It can stem from inadequate site acclimation, improper stretch, incorrect choice of pad, non-sealed seams, the tack strip pulling away from the floor, shifting of improperly fastened cushion, failure of the installer to adequately engage the carpet onto the tack strip, loss of initial stretch due to cut outs in the floor, and failure to achieve full contact and transfer of the floor adhesive to the carpets backing.

In many cases', acclimation of the carpet to the installation site is overlooked. While this may not be quite as critical during the warmer and drier months it certainly can create problems during the cooler and wetter months. If a carpet is installed "cold" it can appear to be adequately stretched, however; once it acclimates to its new, warmer environment it will relax, creating wrinkles and buckles which can cause the carpet to move. This movement can result in split seams, pulling the carpet off the tack strip, and delamination. According to the CRI's Standard for Installation of Textile Floorcovering Materials, it is recommended that carpet be unrolled and allowed to condition to the environment for 24 hours prior to installation. This procedure is also vital from the standpoint of humidity. A newly installed carpet can appear to be tightly stretched; however, if the new environment is more humid than what the carpet was previously conditioned to, the increase in moisture can cause it to expand, creating wrinkles and buckles, which left untreated, can result in delamination. This action is particularly true with nylons, which can gain more than 4% of their weight in moisture. Ideal relative humidity conditioning is 10-65% for at least 24 hours prior to, during, and for at least 48 hours after installation. Though often overlooked, the importance of on-site acclimation cannot be overstated.

The need for power stretching has been tested, proven, published, and preached for so long now that it is sufficient to say that a knee kicker simply cannot provide the amount of required stretch for proper installation. There is not one exception to carpets having to be power stretched in tackless installations. With the exception of stair installation, a knee kicker is a positioning tool, not a stretching tool. Todays woven synthetic secondary backings generally require a stretch of 1- 1 ½ % in both length and width direction. Failure to properly stretch a carpet can lead to wrinkles and buckles which will weaken the latex with continued use. Here it is important to stress that restretching is not a process of chasing wrinkles. Proper handling of wrinkles and buckles requires a carpet to be restretched as if it were a new installation. Prior to restretching the pad must also be replaced if it's damaged.

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One final note here, when stretching an area of considerable length it is also possible to pull the carpet out of shape and beyond recovery and thus cause permanent wrinkles, buckles, and delamination of the carpet at the head of the stretcher where the maximum torque of force is encountered.

The proper choice of cushion cannot be overstated. Setting aside performance characteristics, cushion thicknesses greater than 7/16 of an inch tend to impede the carpet's ability to properly engage the pins on the tack strip which can cause the carpeting to move both laterally and vertically. Additionally, thicker cushions tend to allow undesired vertical flexion of the carpet. In both cases the forces imposed on the carpet with normal use can cause it to move excessively, creating wrinkles, buckles, and eventual delamination if left unchecked.

Cushion movement is another concern. Cushions must be fastened to the subfloor with cushion adhesive, staples, or duct tape. Failure to secure the cushion to the subfloor can lead to shifting, wrinkling, and dimpling of the cushion and elevation changes in the carpet. Cushion seams should always run at right angles to carpet seams to allow these areas adequate traffic resistance. Delamination can occur due to the placement of cushion seams directly under carpet seams.

Failure to properly seal seams may be the most commonly overlooked or disregarded fundamental of installation and one of the most frequent causes of delamination. Again, it is a tested, proven, published, and preached installation standard to apply a minimum of a 1/8 inch continuous bead of seam sealer to all cut edges of a carpet to be seamed. This procedure reanchors the primary to the secondary backing, preventing fraying, raveling, and delamination. Claims for delamination that are isolated to the seams are in almost all cases due to lack of seam sealer.

For unforeseen cut outs in tackless installations such as floor outlets it may be necessary to remove the carpet from the tack strip, install tack strip around the cut outs, and then restretch and re-install the carpet, otherwise initial stretch may be lost and wrinkles, buckles, and delamination may occur.

Improper floor adhesive transfer, including improper adhesive spread rate and trowel notch size is perhaps the leading cause of direct glue down installation failures. Without adequate floor adhesive transfer the direct glue down method is not much better than a loose lay installation. The carpet is subject to expansion and shrinkage from changes in heat and humidity, as well as split seams, wrinkles, buckles, and delamination from the stress of normal traffic and use. Both carpet and adhesive manufacturing guidelines for adhesive type, trowel size, and spread rate must be observed. Recommended adhesive open time is also crucial; however, this is more of an art than a science since ambient temperature and humidity also exert an influence.

When wrinkles and buckles occur due to improper floor adhesive transfer, they can often be remedied by slitting the affected area and reapplying adhesive, or by injecting adhesive with a hypodermic needle, or by reactivating the adhesive by applying steam to the carpet and rolling the area with a small hand roller (if the buckles reoccur after steaming and rolling it generally indicates there is not enough adhesive).

Other factors that influence delamination are moisture. Presence of moisture in concrete will interfere with the curing and performance of the floor adhesive in direct glue down installations and can solubilize the back coat laminate of the carpet (which is a water emulsion of rubber). It is imperative to conduct moisture tests in concrete (including suspended concrete) prior to installation. Tests such as the anhydrous calcium chloride or calcium sulfate method, the sealed glass method, or the uses of a hygrometer are recommended. Other causes of latex solubilization can occur from spills, from over wetting during cleaning, and from excessive use of solvent spotters.

In the area of use, wrinkles, buckles, and delamination can often occur from heavy gurney traffic and from the use of chairs equipped with roller casters without using chair pads.

Storage and handling also deserve mention here. Bending and folding carpet should be avoided whenever possible since it can stress the carpets laminate strength. Bending or folding should be limited to circumstances such as on-location transit of the carpet from room to room, and floor to floor. Carpet should NEVER be stored in a bent or folded condition.