## Beaulieu Residential

## "Tek" Newsletter

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## Site Conditions: Moisture, Humidity, and Alkalinity

Strict adherence to site acclimation and proper floor prep is an essential component of successful carpet installation. This is particularly true in areas where there is a potential for noticeable fluctuations in ambient relative humidity (RH) since increases in RH can cause carpet to absorb moisture and expand, pop off the tack strip, wrinkle and buckle, and decreases in moisture can cause carpet to shrink, seams to open, and the carpet to pull away from the wall. Pre-conditioned carpet installed in a properly maintained environment will not be swayed by moisture loss or gain. It is not unusual to see and hear of these developments when site conditions are not controlled.

The installation of direct glue-down carpet can be deterred by higher humidity, since "flash-off" time (tack time) of the adhesive can be slowed coniderably, and this can also impede adhesive tranfer from the floor to the carpet's backing. When this occurs carpet will be more prone to the inluences that can cause either shrinkage or expansion. In these cases one generally does not need to look any further than the carpet's backing to see that inadequate amounts of transfer occurrence and what amount did transfer was insufficient and would not hold the carpet securely to the floor.

Whether one opts to install carpet by the direct glue-down or the tackless method it is recommended that site conditions (temperature and humidity) be maintained at or very near to normal conditions of use for at least 48 hrs. prior to installation, and the carpet be allowed to relax and acclimatize to these or similar conditions for at least 24 hrs. prior to installation. Recommended site conditions allow for a range in temperature of 65 to 95 degrees Fahrenheit, and a relative humidity not in

excess of 65%. If you are installing by the direct glue-down method you should also be sure the subfloor is no less than 55 degrees Fahrenheit. Cooler floor temperatures tend to retard adhesive dry times and reduce adhesive grab characteristics. Radiant heated sub-floors should not exceed 85 degrees Fahrenheit.

Moisture's deleterious effects on carpet can also result from an unforeseen and unanticipated source. such as moisture migration or ground water through on-grad and below-grade concrete slabs, which typically becomes laden with alkaline as it passes through the slab. This emission is very destructive to both multi-purpose latex adhesives and carpet latex, and serves also to provide an ideal medium for mold and mildew growth. Our industry recommends the use of anhydrous calcium chloride, utilizing test method ASTM F 1869 (Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Calcium Chloride) when installing carpet over slab to insure that the moisture emission rate is within the acceptable range of 3 lb./1000 sq. ft./24 hr. (measured in pounds of moisture emitted over a 1000 sq. ft. area during a 24 hour period) for most carpets. Slabs that display moisture emission rates in excess of this amount can be dealt with by the use of liquid and sheet membranes, and while these type products work well they do have their limitations and may of these products can only inhibit moisture emission rates up to 5 lb/1000 sq. ft./24 hr. There are certain higher end moisture emission sealers, such as AAT's 1185 (a urethane acrylic spread) that will withstand moisture emission rates up to 8 lbs. (and a floor alkalinity up to pH 11), and an new, incredibly strong two-part urethane epoxy (made by Koester) that will withstand moisture emission rates up to 12 lbs (and floor alkalinity up to pH 14) that can be used for almost

every moisture/pH concern, and without question are the type products that must be used when moisture emission ranges and floor alkalinity exceed the maximum. Keep in mind also that the installation of carpet over tile that is already installed over a slab also requires moisture emission testing, and because the tile may skew the test reading it is recommended that a tile be removed in each test area, the adhesive scraped, and the slab scarified prior to emission testing. The tile then can be reinserted prior to the carpet installation.

Another site consideration with slab floors is alkalinity. This is probably the most carpet debilitating installation failure related concern with direct gluedown, since slab alkalinity in excess of 9 pH can literally "burn up" (oxidize) multi-purpose latex floorcovering adhesives by attacking the carbon chains and synthetic rubber resins, reducing the adhesive to a white powder. Here again our industry has a means to test slab for alkalinity using the ASTM f-710 test method (Practice for Preparing) Concrete Floors and other Monolithic Floors to Receive Resilient Flooring). Slabs that display pH reading between 7-9 are considered acceptable for most floorcoverings. When floor pH exceeds 9 pH, an acid etch will be required to restore the sub-floor to a more neutral pH (or the use of suitable sealer).

A final word in regard to floor preparation needs to be mentioned pertaining to chipped, cracked, and unlevel floors. All sub-floors must be properly prepared prior to carpet installation. This includes the use of cementitious skim coats on craggy floors (typical coverage rate of 250 square foot per 10 lb bag), embossing self-levelers on un-level sub-floors and over cracks, and joints between tiles (typical coverage of 50-60 square foot per 55 lb bag).

Information on proper floor preparation and site conditioning, as well as all other industry approved installation practices can be obtained from the Carpet and Rug Institute's CRI 104-2002, and CRI 105-2002 Standard for Installation Specification of Commercial (CRI 104) and Residential (CRI 105) Carpet.

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