

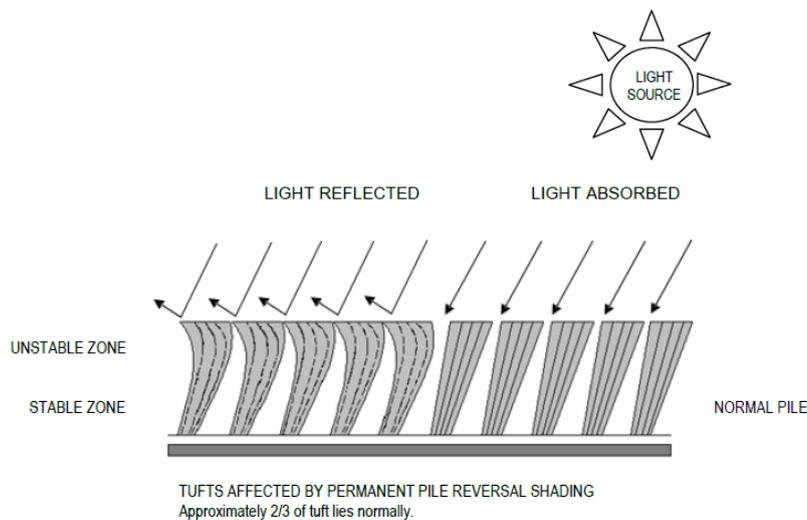
## Statement on Pile Reversal – ‘Shading’

### Basic Definition of Pile Reversal

During use, carpeting often appears to change color in certain areas. This phenomenon does not involve a true color change, but rather a difference in light reflection between various surface areas. Also known as ‘shading’, ‘pooling’ or ‘watermarking’, after a period of use some carpet areas may appear as if water has spilled on the surface.

Pile reversal is not a manufacturing defect and does not affect the durability, performance or longevity of the carpet. Pile reversal is a normal phenomenon for any cut pile carpet made from any type of yarn.

Pile reversal can be defined as a localized change in the appearance of a carpet brought about by pile tufts leaning in different directions. Areas of cut pile leaning towards the observer will appear darker whereas pile tufts leaning away will appear lighter. This may give the appearance of a color change, which is in reality only an optical effect. These effects can be temporary or permanent.



*CRI Technical Bulletin: ‘Pile reversal – Watermarking Shading’*

### Temporary Shading

Temporary shading is a localized effect caused, for example, by footprints or rolling luggage, which can be removed simply by brushing or vacuuming the carpet pile in the direction of its natural lay.

### Permanent Shading

This occurs in two forms:

- **Tracking:** areas of permanent shading relating to foot traffic patterns within a location are referred to as "tracking effects". Turning points in a room and doorways are susceptible to this form of predictable traffic induced shading.
- **Random shading:** areas of permanent shading that do not appear to be related to known traffic patterns are referred to as "random shading effects". These vary in shape, size and position and are caused by local conditions.

Local conditions affect the propensity of a carpet to shade. These are related to the condition of the building climate and sub floor as follows:

- **Moisture**

Ambient or trapped humidity can induce shading. Prior to carpet installation, the moisture level in the floor should be tested. This method uses a hygrometer or probe to measure the relative humidity of the screed or concrete base. The concrete would be considered dry if the relative humidity is below 75%.

- **Levelness or Flatness of the Sub Floor**

The sub floor should be smooth and free from ridges, indentations or high points that may affect the performance of the carpet. When a 3m long straight edge is laid on the floor, no gap greater than 3mm should be visible. Ridges, protrusions or indentations greater than 0.8mm should be filled or levelled.

- **Protective Coverings**

Experience has shown that when carpets are covered with a protective layer, the risk of pile reversal is increased. Two factors contribute to this. One factor is that during the time the carpet is covered, it is not being vacuumed and we know vacuuming/brushing assists the pile recovery following compression. The other factor is that moisture can be trapped beneath the protective membrane, if it is impervious, and may cause a degree of 'set' to the tufted pile direction in its compressed state.

## Recommendations

1. Where a protective covering has to be used, choose a breathable covering if possible.
2. Avoid covering the carpet for long periods of time (above 2 weeks) particularly if it is going to be walked upon.
3. If the carpet has to be covered for extended periods of time the protection should be removed periodically to allow the carpet to aerate and be vacuumed.
4. Where possible, avoid completely sealing the carpet under an impervious covering.
5. Choose a covering strong enough to withstand work traffic; Hardboard can be used where wheeled traffic is likely.
6. When the covering is removed, vacuum the carpet thoroughly with an upright cleaner, which incorporates a gentle brushing action.
7. The appearance of pile shading can be reduced by careful carpet design. Loop pile is not susceptible to shading as the yarn is already in a horizontal position and the irregularity of the surface hides the appearance of shading and crushing.

Medium and dark colors, busy designs, stippled yarns, loop pile and mixed surface textures will all help to disguise carpet shading to a greater degree.