



Carpet Traffic and Wear Patterns

As I travel the world inspecting, repairing, cleaning and teaching others how to care for the carpet, one of the biggest concerns I see on a regular basis is traffic or wear patterns. The following is my opinion based on 30 plus years of working with carpet on how carpet traffic and wear patterns are created.

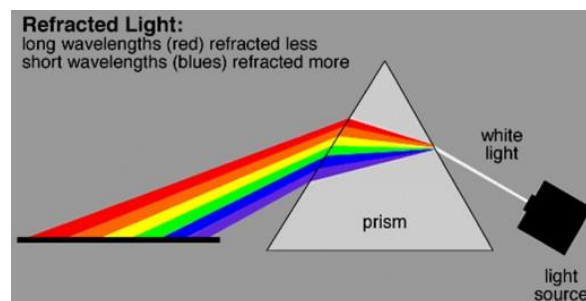
Wear patterns are created as people walk back and forth in the same path. The carpet in the path is walked on more than the carpet along the edges. The uneven amount of wear in one area alters the way the carpet looks compared to carpet along the edges. For example, in commercial facilities areas like hallways, the pivot points at intersections and around corners, under office chairs or in front of the copier, water cooler and vending machines get more traffic than the edges of the rooms. In residential applications the path down the center of a hallway, areas in front of the sofa or next to the beds are often more worn than the edges of the rooms.

There are two different conditions created by wear:

1. Color change caused by pile or nap variance known as “Watermarking, Pooling or Rivering”
2. Color change caused by pile or nap distortion known as Traffic Lane Gray or Ugly-Out

Understanding what creates wear patterns can help you determine the type of carpet to select and better understand the life cycle expectation of the carpet in your home or facility. Carpet fiber, construction, backing, design, maintenance and several other things affect the way a carpet will look and wear, which we will discuss in another paper on carpet construction and performance.

We often work with property owners and facility manager who confuse wear patterns with soiling and think the cleaning crew is not keep the carpet clean. In most cases even if you cleaned the carpet every day it would not change the appearance of the carpet. Often the carpet will still look dirty after being properly cleaned. It is not dirty; it is the color variance in the appearance of the carpet. This change in the carpet alters the way the carpet fibers magnify the light that passes through the fibers. Carpet is engineered to magnify color as light passes through the fiber. This is called light refraction. This illustration is an example of how the principle of light refraction works. (Source: myweb.cwpost)

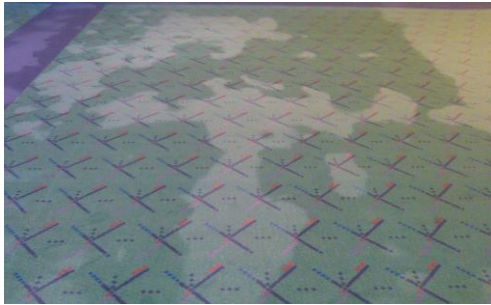


Any modification to the way light is refracted through the fiber will alter the way the carpet looks. Distortions in light often create shadows which make the carpet look splotchy and darker and the effect is often confused for soil.

1. Color change caused by pile or nap variance known as “Watermarking, Pooling or Rivering”

Watermarking, Pooling and Rivering often confuse people because one section of the carpet will look lighter and other sections of the carpet will look darker. Looking across the carpet the dark side will look dirty and the lighter side seems to be clean. Usually customers think the dark side is dirty and should be as light as the light side. When a carpet cleaner cannot make the carpet the same color the customer thinks they did not do a good job and that the dark side is still dirty.

When you talk to carpet experts about pile variance, most are familiar with the Portland Airport carpet which provides a clear example of the light refraction effect. I took these pictures while in the Portland Airport and you can see from one angle the pile is light and when you look from the opposite direction the spot looks darker.



This color variance in this carpet is not soiling, the carpet fibers are laying in different directions affecting the way the light is refracting through the fibers.

Recently my son Matson and I looked at this carpet which is the best example of “Rivering” I have seen in the thirty-something years I have been in the carpet industry. You can see how the carpet pile changes direction right down the middle of the hallway.



Several years ago I looked at a carpet because the Interior designer on the project thought the carpet was defective. The project used carpet tiles and the installers’ quarter turned the carpet. The designer envisioned the carpet tile would look like broadloom but the installation method recommended quarter turning the tiles. The facility was upset with how the carpet looks and thought the carpet should be replaced.

Because one of my specialties is fixing carpet issues including manufacturing related problems, the carpet manufacturer and the facility owners wanted me to determine what the issue was. It was surprising to the

designer and facility management that there is not a color issue with this carpet. The carpet dye of each tile is the exact same color, the only difference is the direction the carpet is laid.



The color difference is caused by the way the light is refracting off the carpet nap that is laying in opposite directions. It is common for owners or facility managers to think the carpet is dirty, when in reality it is how the carpet looks. This type of wear is not considered a manufacturing defect; it is “the natural characteristic of a luxurious carpet.”

2. Color change caused by pile or nap distortion known as Traffic Lane Gray or Ugly-Out

As carpet is stepped on, the foot twists and turns which can cause fibers to unravel, flair and bloom. The more the fiber bundle is damaged or altered the more obvious the wear pattern will be. There are a lot of factors that determine how quickly the fiber bundles will distort. Some of the main things affecting performance are fiber type, denier, twist, heat-set, number of ply's per bundle, traffic level, maintenance etc.



These pictures show how the fiber bundles can be damaged. As the bundles unravel, it alters the way the light passes through the fiber making the wear patterns appear darker, soiled and dirty.

These pictures show how the appearance of the carpet changes as the carpet wears. You can see how the worn section looks dirty when compared to the unworn area, it is obvious where the sofa was in this house.



These pictures were taken right after my son cleaned this carpet. He pre-treated, power scrubbed and rinsed this area six times and the carpet still looked soiled. The carpet is not dirty. This is a perfect example of how wear and tear and fiber distortion change the appearance of the carpet. If you look at the close-up photo you can see how the fibers on the right side of the picture are flatter, lying down and pointing to the left. The fibers on the left side of the picture have not been walked on and you see how they are still fairly round and upright.

The worst condition is a combination of both fiber or nap variance and distortion. We have seen situations where the fibers lay in different directions as they are also unraveling and blooming. In all three of these situations there is not a lot that can be done to reverse the change. Selecting a carpet that is manufactured with better components and engineered for your application combined with proper maintenance is the best way to avoid premature replacement due to appearance.



These before and after pictures are among the best examples I have seen. It is hard to believe this is the same carpet. Look closely at the picture on the right, you can see how thin the fibers look and that the fibers are pointing in all directions. This carpet was in bad shape; the wear patterns were so noticeable that the homeowner was going to have to replace the carpet because it looked so bad.

Hopefully this information is helpful and provides answers you have been looking for. Please call us if you have any carpet related questions or need help resolving installation, performance, warranty or maintenance problems.

You No Longer Have To Live With Carpet Problems; Cary and His Team of Carpet Experts Are Ready To Help



Cary Woodfield started his carpet career in 1978 when his family bought a carpet cleaning franchise. As his career advanced he became a leading expert specializing in understanding and solving carpet problems. Cary was the LDS Church's carpet expert for 10 years and has served as a member of the Utah State and WSCA-NASPO Carpet Committees.

As his reputation grew Cary started traveling around the world teaching, specifying, inspecting, cleaning and fixing problems. Cary enjoys working with clients like Carpet Manufactures, Facility Managers, Schools and Universities, Government Agencies, Hospitality and the Health-Care Industry. Cary's main focus is lifecycle expectations, total cost of ownership, RFP's, specifications, carpet performance and maintenance.

You can reach Cary or Matson Woodfield at The Carpet Consultants
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