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Carpet 101

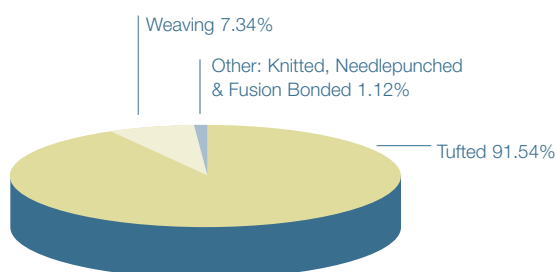
A PRIMER ABOUT CARPET CONSTRUCTION FOR END USERS

What are some of the performance components that make carpet perform well? Although you needn't be an expert on all carpet matters, a basic understanding of construction will help you choose a carpet that meets the physical and aesthetic needs of your space. Plus, a working knowledge about construction will help everyone on the project — manufacturers, designers, contractors and end users — ensure that the carpet delivers on everyone's expectations.

Construction Considerations

A carpet's construction method has a critical impact on cost, performance, aesthetics, maintenance, and in many cases, installation. For commercial applications, here's what you should know:

- Over 90% of **commercial broadloom** carpets are made by tufting because this method produces a durable product with a wide variety of textures. Tufted carpets are made by sewing machines that push the yarn through a primary backing fabric. Style options include cut pile, loop pile and cut and loop.
- **Carpet tiles**, or modular tiles, are made by tufting yarn into a nonwoven primary backing and laminating the structure using PVC or another thermoplastic before being cut into squares. The process produces a modular carpet that features a variety of patterns, colors, textures and densities. Carpet tile meets the needs of most commercial applications.



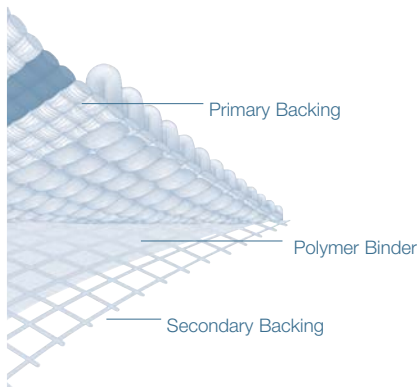
Backings

All tufted carpets have some type of backing that keeps the tufts in place and provides stability to the structure. The type of backing system you choose depends upon the end use of the carpet and the type of space where it will be installed.

- **Primary Backing** is a component of tufted carpet consisting of woven or nonwoven fabric into which pile yarns tufts are inserted by the tufting needles. It is the carrier fabric for the pile yarn, providing some dimensional stability and durability.
- **Secondary Backing** is a reinforcing fabric laminated to the back of tufted carpet, usually with latex adhesive, to enhance dimensional stability, strength, stretch resistance, lay-flat stiffness and hand. It can be made from a woven or nonwoven fabric, or a cushion or non-cushion polymer.

Primary and secondary backings work as a system to Resist Edge Ravel, Delamination, Zippering, Pilling and Fuzzing.

- Backing systems with **Moisture Barriers** prevent spills from penetrating the backing and seeping into the sub-floor. They also help eliminate stain wick-back, which is the resurfacing of the stain on the floor as it rises back through the fibers. The moisture barrier of the carpet itself and the sealing techniques for the seams may provide lower long-term maintenance costs.



Adhesives

Adhesives must be compatible with both the carpet backing and the subfloor. There is an increasing selection of environmentally safe adhesives that have high performance and no negative effects on indoor air quality.

Dye Methods

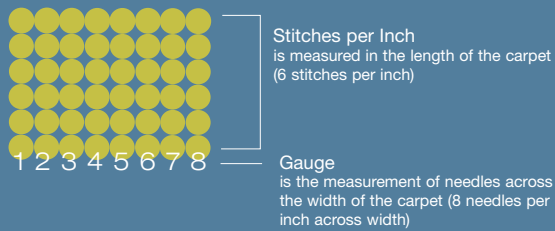
When it comes to colors and patterns, your choices boil down to two options: Carpets made with yarn that is dyed prior to tufting or, carpets that are dyed after the tufting process. Each method has its pros and cons:

- **Solution Dyed** fiber has excellent colorfastness to light, atmospheric contaminants and harsh cleaning chemicals, in addition to excellent color clarity. Solution dyed yarns and fibers are precolored by the fiber manufacturers by introducing pigments into the molten polymer before extrusion into fiber.
- **Space Dyeing** is a type of yarn dyeing that is often used for its aesthetics and color flexibility. One yarn can have up to 6 colors creating a multi-color look that is easy to coordinate with interior furnishings. The tweed effect of the multi-color look helps to hide soiling.
- **Beck Dyeing or Piece Dyeing** refers to a batch or piece-dyeing method in which unfinished carpet or greige goods (pronounced “gray goods”) is submerged in a large vessel or tank. Fibers and yarns can also be beck dyed. Hallmarks of this process include good color saturation and color uniformity. It is also excellent for custom colors and for small dye lots.
- **Printing** involves the application of colored dyestuffs using screens, rollers or inkjets onto the face of the carpet. Printed carpet is available in a wide variety of patterns or textures that can simulate woven patterns at a much lower cost
- **Continuous Dyeing** is an economical process of dyeing carpet in a continuous production line, as opposed to piece dyeing in batch lots. This fast process is highly cost effective and uses little water, so it is environmentally friendly. However, continuous dyed carpet sometimes has side match issues.

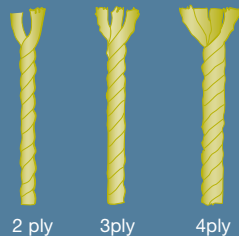
Yarn Weight

It's easy to tell if you like the "hand" of a carpet, but, do you know what contributes to that feeling? It's a combination of factors, usually listed on sample labels or sample folder specs. Here's a short explanation for some commonly used terms:

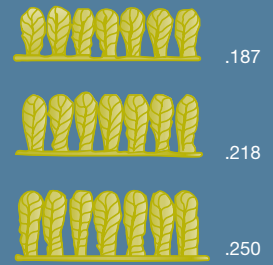
- **Stitches per inch** indicates the number of stitches that a machine tufts in a one inch distance. The more stitches, the thicker and more dense the pile.



- **Yarn size**, or yarn count, is a number identifying yarn size or weight per unit length.



- **Pile height** measures the distance from the primary backing to the top of the pile. Pile height should conform to performance requirements, for example, a lower pile height is more suitable for a high traffic area.



- **Denier** is a yarn-count unit system for expressing linear density, equal to the weight in grams per 9,000 meters of yarn. Denier is a direct numbering system—the higher the denier, the larger the yarn or fiber.
- **Density** describes the weight of pile yarn in a unit volume of carpet expressed in ounces per cubic yard. In the formula
$$D = \frac{W \times 36}{t}$$
 "D" is density, "W" is pile yarn weight in ounces per square yard, and "t" is pile thickness in inches.

Fiber Selection

99% of the total face fiber market for today's commercial carpets is composed of synthetic fibers. These fibers are durable, resilient, resist abrasion, easy to clean and can resist stains. Natural fiber is used in a small percentage of carpets for its unique characteristics. Each type of fiber has its own set of benefits.

- **Nylon** (polyamide) is durable, resilient and resists abrasion. This versatile fiber offers endless color possibilities, is wet-cleaning friendly, has excellent colorfastness and excellent color clarity.
- **Wool** is a natural fiber from sheep. It is inherently resilient, durable and has a luxurious "hand." It is an expensive fiber for high-end applications, and is sometimes blended with nylon for axminster products.

- Other beneficial treatments that can be added in the manufacturing process include **Stain Resistors**, **Soil Resistors** and **Anti-Microbial** protection.
- **Olefin** (polypropylene) resists fading, generates low levels of static electricity, is chemical, moisture and stain-resistant, and is less expensive than nylon. However, it is only appropriate for light traffic spaces, as these fibers have a tendency to crush or "ugly out," sooner than anticipated.
- **Polyester** (polyethylene terephthalate) has excellent color clarity, excellent colorfastness, is resistant to water-soluble stains, and has a luxurious "hand." But it is only appropriate for low-traffic commercial applications, as it will mat down under high traffic. Environmental sustainability is also a positive attribute of the polyester value chain.

Learn More

As the global economic situation and commercial construction forecast continue to put pressure on the flooring industry, it's good to know that carpets are still one of the smartest investments you can make for your interior. Another smart choice is taking relevant CEU courses that enhance your facility management or design expertise. Starnet has partnered with CRI to provide CEU courses about various carpet topics. It's a more in-depth look at the topics touched on in this *Starlog*, and more. These courses have been approved by the Interior Design Continuing Education Council and/or the American Institute of Architects. Contact a Starnet member to find out how you can learn more about the slate of CEU course options.

Call your local Starnet member for advice, direction and expertise.

**“An ounce of prevention is worth a pound of cure.”
- Benjamin Franklin**

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