

Carpet and Cushion Selection - Part 1

Carol Lamkins, CID, CMKBD

Carpet, also known as rugs, is a textile floor covering consisting of an upper layer of "pile" attached to a backing. The term "carpet" comes from Old Italian *carpita*, "carpire" meaning to pluck. The pile is generally either made from wool or a manmade fiber such as polypropylene, nylon or polyester and usually consists of twisted tufts which are often heat-treated to maintain their structure. Carpet can be stretched from wall to wall or the ends can be finished to lie upon another flooring material.

There are many different carpets on the market with beautiful colors, surface textures, and varying qualities. Selecting a quality carpet is a challenge as well as an investment for our clients. They look for comfort to walk on, cleanability and a luxurious appearance. Other desirable aspects of the carpet are suitability, longevity and fitting into the investment dollars along with the installation and underlay costs.

One of the most important aspects of carpet quality is the density of the carpet. Density refers to the number of yarn tufts per square inch of carpet. The denser the carpet, the longer the carpet will look new. A long pile height gives carpet a luxurious appearance. However, the longer the pile height, the greater the tendency of the carpet to mat, especially in high traffic areas. An extra dense carpet makes a deep pile carpet.

Face weight is a measure of the total amount of yarn on the front of the carpet. Increasing the pile height and the density increases the face weight. The face weight alone, however, does not determine quality because weight can be increased with just pile height. Two carpets could be the same face weight and yet be quite different in quality and performance.

Asking the following questions will provide a preliminary evaluation in the selection process:

1. Did the carpet fold back upon itself? The tightness of the yards at the fold indicates the density of the carpet.
2. Will the surface design hold up to the amount of projected foot traffic in the room?
3. Does the fiber fit the need for wearability and cleanability?
4. Does the yarn go back into place when unraveled by the fingers?
5. Does the carpet have an anti-static feature?
6. Does the carpet have an anti-soil and anti-stain feature?
7. Does the carpet have an anti-microbial feature?
8. Is the secondary backing made of a synthetic material?
9. If nylon, is the fiber a fourth generation fiber?
10. Does the sample label give detailed information about the carpet?
11. What is the warranty and is a copy available for the client's records?

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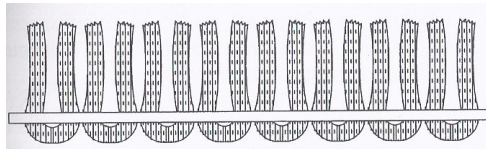
Styles of carpet

Carpet surface textures can be divided into three groups: loop piles, cut piles, and combinations. Within each group there are two or three varieties.

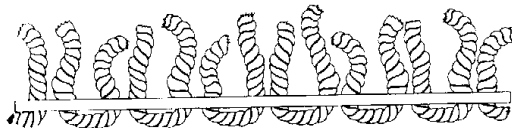
Loop pile consists of yarns that are looped and uncut. During manufacture, most carpeting starts out as loop pile. The major types of loop pile are level-loop pile and multi-level-loop pile. Both wear well in high traffic areas. The level-loop pile is the same height and is uncut, making the carpet surface smooth and level. Levels vary from low and tight construction to a more luxurious high-level loop pile. The multi-level loop pile consists of different height loops, two or three heights being common. This height difference creates a sculptured pattern, which appears to be carved into the carpet surface.

A cut pile carpet consists of yarns that are cut at the ends. The differences in the cut pile varieties are largely due to the amount of twist in the yarns. The cut pile falls into four types:

1. Velvet or plush
 - a. Consists of yarns cut the same height
 - b. Has consistent surface appearance with uniform color
 - c. Long pile plush shows footprints and mats in heavy traffic areas
 - d. Short pile plush resists matting better than the long pile plush
 - e. Both show some nap shading from changing directions



2. Frieze
 - a. Made from tightly twisted heat-set yarns
 - b. Has a nubby appearance in a dense, low-pile construction with short fibers that tend to curl in different directions at the surface to hide footprints and vacuum marks
 - c. It is a very rugged carpet and wears well in high traffic areas

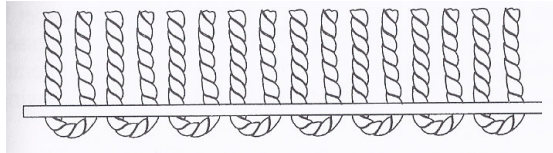


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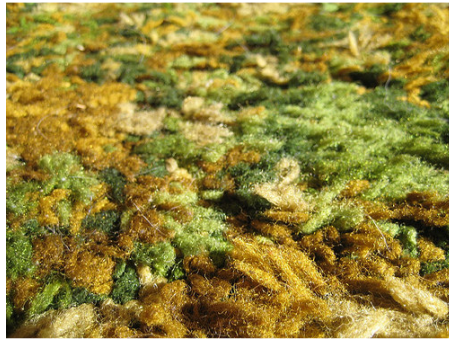
3. Saxony

- a. Consists of dense cut pile made from heavy yarns that have been specially treated to make each tuft appear separate



4. Shag

- a. Made of long twisted yarns cut at the same length
- b. The longer the shag, the greater the tendency to mat
- c. Surface texture variations
- d. Appropriate for an informal atmosphere and light traffic areas.



There are also many different surface textures, which are combinations of cut pile and loop pile. For example, tip-sheared carpet is made by cutting the high loops to the level of the uncut lower loops. With this type, dense construction and heat set yarns are needed to resist matting in heavy traffic areas.

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Construction of Carpet

The three most common types of carpet construction techniques used are tufted, woven or fusion bonded. Broadloom carpet, manufactured 54” or wider, is tufted or woven. Carpet construction also includes the way the yarn is put together and what is applied to the back of the carpet.



Tufted carpet construction



Macro shot of Berber carpet

The majority of carpet constructed today is **tufted**. Tufted means that hundreds of yarn-threaded needles punch tufts through the back of the primary backing fabric using a device that extends the entire width of the finished carpet. The loops are either cut or left in loops. Berber is an uncut style loop. Then the secondary backing is glued to the primary backing to hold the yarns in place and make the carpet stable so it will not stretch out of shape. Berbers can have thicker yarns than other level loop pile carpets for high durability. These loops can retain dirt and may be damaged from snags. Loop pile carpets are renowned for being hard wearing and lend carpets great texture.

The second most common type of carpet construction is called **woven**. It requires a loom and is slower and more labor intensive. The pattern is usually intricate. This construction is easy to identify because the carpet rolls only in the direction that it is woven. Woven carpets are uncommon today because of the higher cost due to slower construction. The three basic types of weaving processes are velvet, Wilton and Axminster.



Courtesy of Axminster Carpets

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The third type is **fusion-bonded** carpet used for cut piles. It is a thermoplastic process whereby the yarns are attached to a backing material by means of adhesion. The yarns are implanted into the adhesive backing material and embedded between two parallel backings that must be sliced apart. Cutting looped carpet fibers at the top creates cut pile with yarn bundles standing straight. Pre-shearing the cut pile several times creates a luxurious appearance. Cut pile is less resistant to crushing than other types of carpet. Cut pile is more expensive than tufted carpet and yields greater pile densities.

Carpet construction also includes the yarn and how it is constructed. Yarn twist is important in determining quality carpet. Yarn twist affects a carpet's appearance, durability, and resistance to matting. If the yarn is tightly twisted and heat set, the carpet resists matting and is more durable than the loosely twisted yarn. Generally, tightly twisted yarns are denser than loosely twisted yarns because when the yarn is tightly twisted, the diameter gets smaller, which necessitates using more yarns per square inch. The yarn twist must stay twisted to be effective. If the yarn twist unravels, the carpet loses some of its ability to resist matting. Heat setting makes the yarn less likely to unravel.

Another important part of carpet construction is the back of the carpet. Carpet backing consists of two layers, a primary and secondary backing. The primary backing is found just under the carpet yarns. Some manufacturers color the primary backing the same as the surface yarns so that the carpet looks denser. The yarns should be firmly attached to the primary backing. The secondary backing is generally made out of polypropylene, jute, sponge rubber, urethane or foam, and glued to the primary backing. One disadvantage of jute is that it mildews if damp for a period of time. Therefore, carpet with a jute backing should never be put on a concrete floor.

Polypropylene (olefin fiber) provides an excellent secondary backing because it is unaffected by moisture, resists mildew growth, and is strong and durable. The secondary backing can also be made out of sponge rubber or urethane. On some carpets, like kitchen carpets, the padding is attached to the back of the carpet.

Popular Carpet Fibers

Carpets are often classified by the type of fiber used to make surface yarns. The carpet sample has the generic fiber name used for surface yarns. Following is a summary of the advantages and disadvantages of the generic fibers.

Advantages of acrylic:

- Wool-like appearance and feel
- Low moisture absorption – dries quickly
- Resists static electricity
- Cleans easily
- Good stain resistance

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- Resilient and bulky
- Resistant to moths and mildew
- Resistant to sunlight damage
- Fairly difficult to dye

Disadvantages of acrylic:

- Not as strong as other synthetics – wears out faster in high traffic areas
- Produced in short fibers and crimped
- Poor resistance to matting - shows vacuum tracks and footprints
- Stained by oil and grease
- Not suitable for commercial application

Advantages of nylon:

- Easy to clean
- Extremely strong
- Excellent resistance to matting
- Available in a wide price range
- Good abrasion resistance
- Absorbs little moisture
- Resists moths, mildew and fungi
- Good stain resistance when treated
- Third and fourth generation fibers are anti-static
- Fibers modified to hide soiling
- Maintains dye color

Disadvantages of nylon:

- Stained by oil and grease
- Degrades and fades in sunlight
- Melts in extreme heat

Advantages of polypropylene (olefin fiber):

- Easy to clean
- Colorfast
- Strong fiber
- Soil and water resistant
- Good stain resistance
- No static problem
- Resistant to moths and mildew
- Makes good short pile indoor/outdoor carpet

Disadvantages of polypropylene (olefin fiber):

- Depending on construction, tends to mat and/or crush
- Does not dye well
- Grabs onto oil and grease
- Dry-cleaning solvents degrade fibers
- One of the most inexpensive fibers

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Advantages of polyester:

- Soft luxurious feel
- Color clarity and retention
- Excellent resistance to abrasion
- Excellent resistance to mildew
- Good stain resistance
- Less expensive than nylon

Disadvantages of polyester:

- Prolonged exposure to sunlight weakens fiber
- Does not hold fiber height under traffic
- Can fade in sunlight
- Grabs onto oil and grease

Advantages of wool:

- Softest, most luxurious
- Crush resistant maintaining fiber height
- Easily dyed
- Limited pilling problems
- Durable
- Hides soil better than synthetic fibers
- Naturally flame resistant

Disadvantages of wool:

- Soils easily
- Imported because domestic fibers are finer and weaker
- Fades in sunlight
- Attracts moths, beetles and other types of bugs
- Expensive

Blends are typically made from nylon and olefin. This blend is resilient but the different fiber types often resist stains unevenly. Stains will often stand out prominently with these blends.

Some carpet is made from recycled material. [PET](#) (Polyethylene Terephthalate) carpet is made from recycled plastics of consumer packaged goods (typically soda and other rigid containers). PET carpet is durable, water resistant, and static resistant. It accepts bright colors and comes in many textures. It is also less expensive than nylon and wool. However it may attract only soil, shed and may squeak or gleam.

Treatments and Finishes

Carpet treatments and finishes can increase carpet performance. Application to the carpet and the way in which the fiber has been modified can reduce soiling, staining, and a buildup of static electricity. Some fibers called fourth generation fibers have been modified to offer extra soil resistance, anti-static properties, and stain resistance.

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Many different treatments and finishes are used to make carpets perform better. The anti-static, anti-soil, anti-stain, and anti-microbial are the most common. Anti-static features are applied during manufacture or after manufacture as a coating on the carpet surface. Antistatic sprays can be applied after installation, but these are not as effective as those applied during manufacture.

The anti-soil and anti-stain features of a carpet can be achieved by modifying the carpet fiber so it does not show or cling to dirt and stains. Treatments are applied in two ways: during manufacture and after the carpet has been made. During manufacture anti-soil and anti-stain features may be incorporated into the production of the carpet yarns. After the carpet is made, anti-soil and anti-stain finishes are applied to the carpet surface. Not all of these finishes last forever. Some wear off and some breakdown when the carpet is cleaned.

The anti-microbial treatments prevent growth of bacterial organisms that cause odor. This treatment is applied during the manufacture of the carpet fibers.

The Textile Fiber Products Identification Act of 1960 requires that the carpet label must list: (1) Manufacturer's register number; (2) Pattern and color names of the carpet; and (3) Generic fiber name of all surface fibers, in percentages listed according to weight predominance. When the fiber quantity is less than 5%, the label lists "other fibers."

It is important to remember that the Textile Fiber Products Identification Act requires the labeling of carpet pile, not the backing or padding. There may be additional labeling information on the back of the store's sample concerning backing, padding, and other carpet features. The dealer is permitted to replace the original label with the store's label if the same information is on the store's label.

Labels may also contain additional information such as: special treatments; anti-soil, anti-static, and anti-stain finishes; type of traffic for which the carpet is intended whether heavy, moderate, or light; and whether the yarn is heat set.

Some of the better quality fiber manufacturers have quality control programs the carpet manufacturer must follow in order to use their fiber. If you are aware of this, the fiber producer's trademark indicates that the carpet manufacturer has met its quality standards. These standards generally include pile density, yarn quality, and in some cases backing quality and construction method. The label may also indicate that the carpet meets certain standards established by agencies such as the American National Standards Institute and the Carpet and Rug Institute or government housing agencies such as Housing and Urban Development, Federal Housing Administration, and Farmer's Home Administration.

The Flammable Fabrics Act requires that all wall-to-wall carpets meet government flammability standards in order to be sold. It is not required that carpets be labeled since they must meet this standard or they cannot be sold. Scatter and area rugs must

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also be tested for flammability. If they fail the test, they can still be sold if they are labeled "flammable."

A good warranty available on a carpet is a limited warranty for five years. On some carpet warranties, if the wear of the carpet exceeds 10% in five years, the carpet will be replaced. Other warranties indicate that if the carpet shows 10% wear in any one area, the carpet will be replaced. The manufacturer determines this from a sample of your carpet, which is analyzed for wear. Some of the less expensive carpets do not have any warranty.

Resources:

Dr. Leona Hawks, Home Furnishings & Housing Specialist

The U.S. Department of Agriculture, Robert L. Gilliland, Vice President and Director, Cooperative Extension Service, Utah State University. (EP/05-95/DF)

"What Makes A Rug Good", February 1946, Popular Science] detailed article on carpet and manufacturing of figured Wilton carpeting.

McGowan Maryrose, Specifying Interiors

"How Carpet is made". <http://www.axminster-carpets.co.uk/all-about-carpet/how-carpet-is-made/http://www.carpetbuyershandbook.com/carpet-basics/carpet-padding/>

http://extension.usu.edu/files/publications/factsheet/hi_05.pdf

<http://en.wikipedia.org/wiki/Carpet#Etymology>

http://books.google.com/books?id=btgLVQUVL0C&dq=lansdowne+group+axminster+carpets&source=gbs_navlinks_s

<http://en.wikipedia.org/wiki/Carpet#Etymology>

http://www.carpet.org/types_of_fiber.htm