

Carpet Fundamentals

Overview

Carpeting provides a number of benefits to a space, including acoustic absorption, underfoot comfort and a warm aesthetic. Although not appropriate in laboratory and most clinical settings, carpet can be used in administrative areas, conference rooms, and other support spaces where liquids, chemicals and biologics are not used and decontamination, aseptic conditions and low particle air quality are not required.

Carpet Types

Two types of carpeting are used in commercial and institutional facilities: broadloom and carpet tiles.

Broadloom, as its name implies, is woven on a broad loom. It is commonly available in rolls up to 15' wide, and is installed on a pad and secured at the room perimeter. Advantage of broadloom include relatively quick installation, few seams and the ability to cover minor imperfections in the underlying floor. A disadvantage is the difficulty of repairing or replacing sections of carpet.

Carpet tiles are individually installed tile modules, typically 18" to 36" square, which collectively create the carpeted floor. Carpet tiles have an integral resilient backing which adheres directly to the floor. An advantage of carpet tiles is the ability to replace sections that are damaged or worn. Disadvantages are higher first cost and the visibility of substrate imperfections.

Construction and Installation

Most carpeting is constructed with one or a blend of petroleum-based synthetic fibers: nylon, or one of a number of thermoplastic polymers (polyester, polypropylene and polytrimethylene terephthalate). Each fiber has distinct characteristics which determine the performance of the carpet. All synthetic fibers are stain-resistant and cleanable. In addition, treatments can be applied to increase stain resistance.

Nylon is used for both cut and loop pile carpets, and has very good performance characteristics, including strength, durability, resilience and stain resistance.

Thermoplastic polymers have good stain resistance and texture retention properties but are not as strong or resilient as nylon. Thermoplastic polymers generally costs less than nylon, and can be an economical option for low-traffic areas.

Broadloom carpet is typically installed on a pad which provides cushioning and increases durability. Pads can be natural fiber, rubber or polyurethane foam. Padding is available in a number of weights, and should be specified appropriately for the anticipated amount of traffic. An impermeable padding can be specified to function as a secondary moisture barrier, but should not be used as a primary barrier in damp locations.

Carpet tile fibers are manufactured directly to a resilient backing which adheres directly to the floor. The backing is typically natural

or synthetic rubber, which provides cushioning and an adhesive surface for installation.

Other Considerations

Durability: Carpet tiles are generally not as durable as broadloom, and will wear at the seams in high-traffic areas. Worn areas of carpet tiles can be relatively easily removed and replaced as needed. Adequate 'attic stock' carpet tiles should be purchased and stored for replacement purposes.

Installation: Installation of both broadloom and carpet tiles requires proper floor preparation, material acclimation and skilled installers for a successful application. Broadloom is generally quicker to install since it is delivered in wide rolls and has fewer seams. Broadloom requires that all furniture be removed from a room while carpet tiles can be installed in sections by working around furniture.

Waste: The nature of broadloom installation results in more waste, and a carpet tile installation may have a longer life if worn areas are replaced.

Design: Both broadloom and carpet tiles are available in a wide range of colors and patterns. Continuous and linear patterns are less successful with carpet tiles, due to the visibility of seams, mismatched dye lots and replacement tiles. These issues can be minimized with random or checkboard pattern designs.

Sustainability

All synthetic materials have sustainability concerns from their manufacturing. A number of manufacturers recycle carpet and non-carpet material (including plastic bottles) in their manufacturing processes. Low volatile organic compound (VOC) carpet, pads and adhesives are available. Recycled content and VOC varies by manufacturer so third party verification and certification should be specified to ensure sustainability goals are met. These include:

NSF/ANSI 140¹, Sustainability Assessment for Carpet, a widely recognized standard for sustainability evaluation and certification of carpet products.

Carpet and Rug Institute (CRI) Green Label², which tests carpet, cushions and adhesives to identify products with low VOCs.

Underwriters Laboratories' Standard 2809 Environmental Claim Validation³ verifies the recycled content by identifying all materials in a product.

References

¹NSF/ANSI 140 <http://www.nsf.org/services/by-industry/sustainability-environment/sustainability-standards-protocols/carpet>

²CRI Green Label <http://www.carpet-rug.org/green-label-plus.html>

³UL 2809 <http://ulstandards.ul.com/standard/?id=2809>

