

WHITEPAPER

# HOW TO CHOOSE CARPET TILES THAT LAST

Milliken™





Flooring is a crucial investment. Your choice of carpet directly affects the way employees, visitors and customers engage with all areas of your organization. Your choice needs to be durable, comfortable and aesthetically pleasing; and stay that way for years into the future. With such a wide-reaching impact, it's essential to choose the right carpet, the first time around.

With greater design flexibility, quicker installation, less waste and easier maintenance, modular carpet tiles have surpassed broadloom as the most popular type of commercial carpeting. However, with a multitude of carpet tiles to choose from, offering an enormous range of features and specifications, it can be difficult to choose a tile that suits the unique needs of your organization.

To help you make the right decision - and get the most out of your flooring investment - we've created a simple and objective guide to choosing carpet tiles that last. We're looking at the crucial factors that affect the longevity, aesthetic, installation and comfort of carpet tiles - and preparing you with the knowledge you need to make the right choice for your organization.

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We've broken the guide down into 5 key sections:

1. **WHAT FACTORS IMPACT HOW LONG CARPET WILL LAST?**
2. **HOW DOES CARPET TILE DESIGN IMPACT MY ORGANIZATION?**
3. **ARE THERE ANY HIDDEN COSTS DURING THE CARPET TILE INSTALLATION PROCESS?**
4. **HOW DO CARPET TILES AFFECT HEALTH AND WELLNESS?**
5. **QUESTIONS TO ASK CARPET TILE MANUFACTURERS**





A high-angle photograph of a modern lounge area. The floor is covered in a colorful geometric carpet with squares in shades of green, yellow, purple, and grey. Several bright yellow armchairs are arranged around a central glass coffee table. A woman is sitting on one of the chairs, working on a laptop. To the right, there are blue tufted chairs and a large window overlooking a courtyard. In the bottom right corner, a curved white structure with bookshelves is visible.

# 1. WHAT FACTORS IMPACT HOW LONG CARPET WILL LAST?



## WHAT FACTORS IMPACT HOW LONG CARPET WILL LAST?

The longevity of your carpet will be determined by its ability to retain its appearance over time. Your chosen carpet tile's appearance retention is affected by several critical factors, most notable of which are foot traffic, carpet tile backing, stain resistance and patterning. Not all carpet tiles are equal in this regard - and certain types of tile will retain their appearance markedly better than others.

### Foot Traffic

The longevity of your carpet tiles, and their need for maintenance, will vary according to their end use. Foot traffic density levels are sometimes concentrated within certain locations and wear from heavy foot traffic can result in changes to the texture and appearance of your carpet. It's essential to choose tiles designed to cope with the expected level of foot traffic in your intended location.

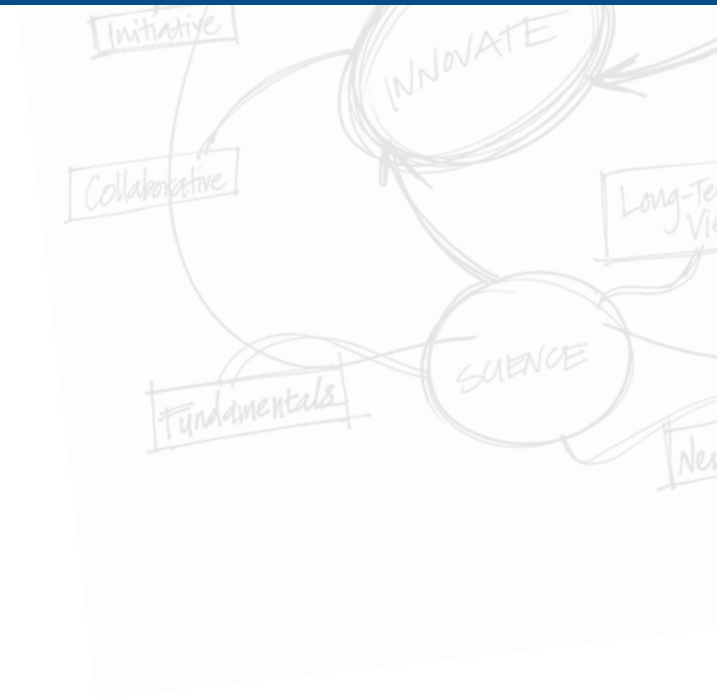
Carpet tiles typically fall into one of three usage categories: moderate, heavy and severe. Each category is designed to reflect a different level of foot traffic and use. As a general rule, the higher end use rating of your chosen tile, the longer the appearance retention, and the lower the costs of maintenance and replacement.



## Appearance Retention Ratings

		Traffic Level		
		Moderate	Heavy	Severe
End Use	Intended for limited use areas, including some conference spaces, private offices and hospitality sleeping areas	■		
	Intended for areas with high foot traffic, including open offices and most corridors		■	
	Intended for areas subject to rigorous foot traffic, like lobbies, entrances, common areas and schools			■
	Intended for public spaces, such as airports and elevators			■

These descriptions are designed as a guide. The ideal end use category for your carpet tiles will vary according to the unique foot traffic and use of your intended installation site. While a conference space in a library may fall into a Moderate categorization, a conference space in an office or hotel may see much greater foot traffic, and require Severe categorization.

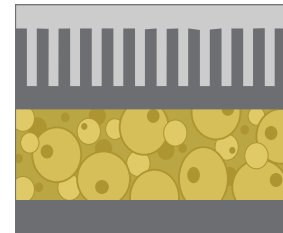


## Cushion Backing

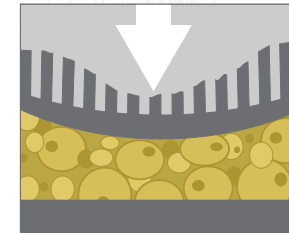
Carpet tile backing has a huge impact on appearance retention. While hard backed tiles are often less expensive and more recyclable, they offer little in the way of resistance to the rigors of regular use. Certain types of cushion backing have been shown to increase appearance retention by as much as 40%<sup>1</sup>, by absorbing the impact of foot traffic on the carpet fibers.

However, not all cushion backings are created equal. Various materials can be used to create foam but open cell urethane foams provide the best combination of durability and cushioning performance. In fact, this is the type of foam used in most athletic shoe insoles.

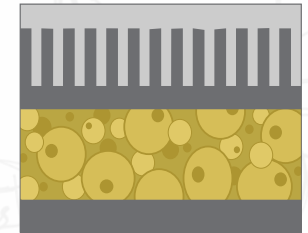
### Open Cell Cushion



Initial Installation

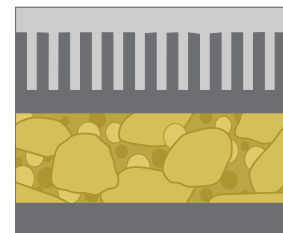


During compression - cushion absorbs impact limiting fiber from wear.

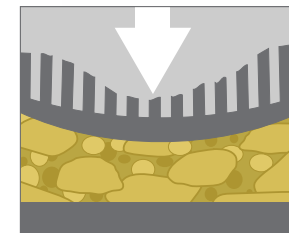


Performance over time - air returns to the open cells, allowing cushion to remain as an effective shock absorber. Thereby reducing fiber wear over the life of the carpet.

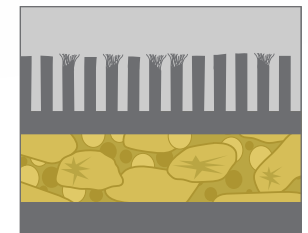
### Closed Cell Cushion



Initial Installation

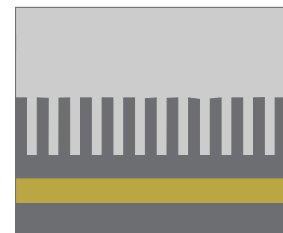


During compression - cushion absorbs impact limiting fiber from wear.

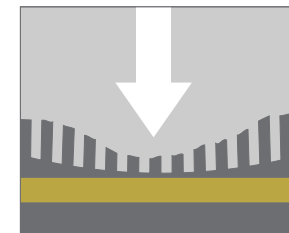


Performance over time - pressure from foot traffic ruptures closed cells over time. Thereby reducing shock absorption leading to fiber degradation.

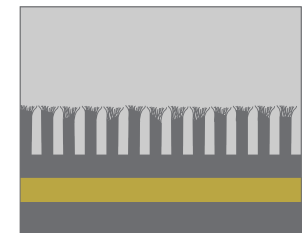
### Hardback



Initial Installation



During compression - Since no cushion backing exists, the fibers absorb 100% of the impact.



Performance over time - fiber degrades more rapidly due to lack of shock absorption.

### Stain Resistance

In addition to the wear caused by foot traffic, carpet tiles will be subject to staining and soiling. Particularly in large facilities, it isn't always possible to immediately identify and act upon these new stains. In these instances, it's important to find a carpet tile that can resist staining and soiling, and be cleaned quickly and effectively.

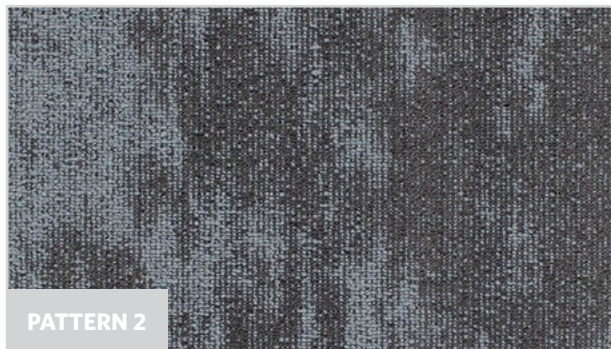
Carpet fibers can facilitate effective cleaning by incorporating three components:

1. Stain repel: allows most spills to be removed before they penetrate the carpet surface
2. Stain resist: prevents stains from bonding with the fibers of the carpet tiles
3. Soil release: stops dirt from adhering to the carpet surface, and aids cleaning

As a result of different types of usage and foot traffic, and different levels of stain and soiling protection, carpet tiles will require varied levels of regular maintenance (such as vacuuming and regular stain removal). It's important to identify these requirements and ensure your chosen tile has achievable maintenance requirements.

### Patterning

The design of your chosen carpet tile acts as your first defense against stains and soiling. Different types of patterning and color choice will be more effective at concealing stains; with light, solid colors (pattern 1) proving less adept at hiding stains than darker, patterned carpet tiles (pattern 2). If stains and soiling are a serious concern for your organization, consider a patterned, multicolor carpet tile.





## 2. HOW DOES CARPET TILE DESIGN IMPACT MY ORGANIZATION?



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## HOW DOES CARPET TILE DESIGN IMPACT MY ORGANIZATION?

In any industry, appearance matters. In addition to reinforcing your brand identity, the design of your carpet can have an impact well beyond aesthetics. Unique, attractive interior design directly impacts the attitudes and experiences of people within your organization - affecting everything from absenteeism in schools, to staff retention in the workplace. With this in mind, it's essential to choose carpet tiles that offer both design longevity and flexibility.

### Design Longevity

With an expected lifetime of several years (and even decades), the longevity of your design needs to be considered as closely as its aesthetic. Many design trends wane in and out of popularity, and there's no guarantee that your current design choice will be met with the same reception several years and decades into the future. For carpet with a long expected lifetime, it's better to play it safe and choose a 'timeless' aesthetic.

### Consistent Design

Continuity is an often overlooked aspect of design longevity. In addition to ordering enough "attic stock" to cover future tile replacements, it's important to consider the likelihood of your specific design and color being available into the future.

Many carpet designs are phased out within five years, making it difficult to match your original design choice. Certain technologies can mitigate this risk, so it's important to ask your manufacturer about ways you can replace carpet tiles if you run out of "attic stock".



### Customized Designs

Customized carpet designs are hugely popular, allowing organizations to use their carpeting to create a unique sense of identity, develop floor-specific design themes, or even enable way-finding between offices and departments.

It's important to choose carpet tiles that maximize design freedom, and allow for a broad range of colors and high-definition patterns. The type of dye method used impacts how color and pattern is applied to the carpet which affects your ability to easily customize designs. Most carpet tiles use one of these primary dye methods:

- Solution Dyed Nylon (or SDN) is the most common dye method, used primarily for large one-color designs. The SDN process creates color that is resistant to bleach solutions of up to 10% concentration, which can be useful for some organizations in a healthcare setting.
- Yarn Dye - white yarn dyed before being tufted into carpet. It is commonly mixed with SDN fibers to allow multicolor patterns. Yarn dye can also help match custom colors.
- Digital Dye Injection offers maximum design flexibility, using computer-aided design to create accurate, high-definition patterns and a refined level of color gradation. This process allows for extremely short lead times, and can be made as bleach resistant as SDN with the addition of an extra coating.



### 3. ARE THERE ANY HIDDEN COSTS OF CARPET TILE INSTALLATION?





## ARE THERE ANY HIDDEN COSTS OF CARPET TILE INSTALLATION?

Flooring installation can be a costly and time-consuming process. The longer your chosen carpet tiles take to install, the greater the disruption to your organization. Considering the negative impact a bad installation can have on the durability and longevity of your chosen carpet tiles, it's essential to choose tiles that are quick, easy and environmentally friendly to install.

A word of caution: some manufacturers require very specific floor preparation and testing procedures. In the event of a legitimate warranty claim, manufacturers will sometimes use these requirements to claim that installation instructions weren't properly followed – voiding your warranty in the process.

There are typically four hidden costs associated with carpet tile installation: moisture, sealants, mold/mildew and adhesives.

### Moisture

Moisture in the sub-floor can cause serious problems, slowing the installation process and breaking down the adhesives used to affix your carpet tiles. These issues can be amplified when carpeting is laid on curing concrete, or in areas with a fluctuating water table. With the construction industry working to a faster pace

than ever before, growing numbers of organizations are having to contend with the costs of moisture damage. If moisture is a concern, it's important to choose tiles capable of withstanding a high relative humidity threshold. These are tiles that are rated on their ability to withstand differing degrees of moisture; and by choosing a tile with a high relative humidity (RH) and/or alkalinity (pH), you can reduce the impact of sub-floor moisture.





### Sealants

Most hardback carpet tiles require the sub-floor to be pre-treated with a sealer. While sealers prevent existing adhesive from reacting with certain carpet tile backings and prevent moisture from permeating through the sub-floor, they pose their own set of problems:

- Floor sealants are an additional cost, both to purchase and install.
- Sealants require time to dry, adding time and expense to the installation process.
- Many sealers use volatile organic compounds (VOCs) which are detrimental to air quality.

Certain types of cushioned carpet tiles use moisture wicking as an alternative to sealers. These carpet tiles utilize a special backing designed to draw moisture away from the sub-floor, reducing (or eliminating) the need for a pretreated sealer. Instead of trapping moisture and organic matter underneath the carpet's surface, moisture wicking will carry it out of the carpet tile. This makes it easy to remove through regular cleaning and maintenance, and inhibits mold and mildew growth in the process.

This type of moisture wicking is also designed to prevent the breakdown of the carpet tile's adhesive, and prevent potentially unpleasant chemicals from leeching out into the environment.

### Mold and Mildew

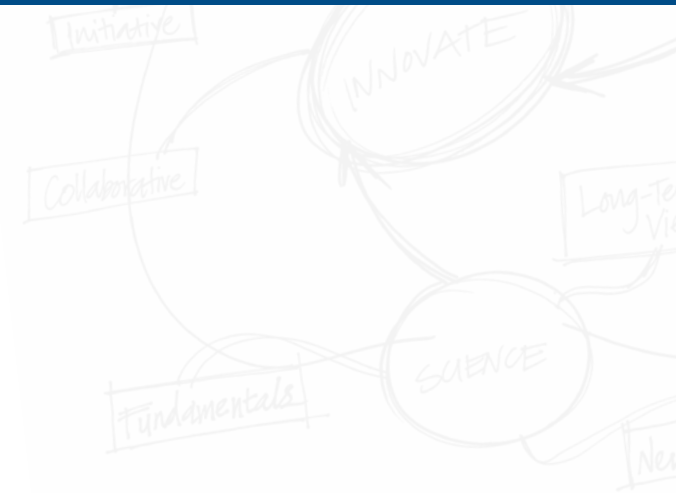
Issues with moisture can trigger the growth of mold and mildew, making it important for carpet tiles to inhibit its development, particularly in hospital or school environments.

Though moisture wicking is helpful in preventing mold and mildew growth, some carpet tiles go a step further, using an antimicrobial agent in their backing. These tiles use the same type of technology found in shampoo, footwear and gym mats, in order to reduce the product deterioration and odor caused by mold and mildew.

### Adhesives

Traditionally, carpet tiles are installed with adhesive. In addition to increasing the time and labor costs of installation, adhesives are liable to leave behind residue. This residue can cause the sub-floor to become uneven and, in some instances, can react with certain carpet tile backings - causing a phenomenon known as plasticizer migration which can be detrimental to health.

Issues with adhesives can be avoided by choosing tiles with PVC-free backing and looking for adhesive-free installation methods - especially ones that allow tiles to be lifted and replaced multiple times, without losing traction or leaving residue. Though peel-and-stick options exist, they can be difficult to install over large areas. Instead, it may be more time and cost-effective to look for adhesive-free tiles that provide a non-slip, non-skid solution right out of the box.



# 4. HOW DO CARPET TILES AFFECT HEALTH AND WELLNESS?







## HOW DO CARPET TILES AFFECT HEALTH AND WELLNESS?

The health of the people within your organization is of paramount importance – and your choice of carpet tile can have a dramatic impact on their wellbeing. In addition to the benefits of working in a well-presented, attractive and professional environment, your choice of carpet tiles can impact the acoustics of the work environment, and the comfort of those using it.

### Comfort

Underfoot comfort is a concern for many organizations, especially with the growing trend towards sit-to-stand working. A recent study into the physical discomfort experienced by bank tellers revealed that 80% of the workforce found it most comfortable to use a combination of sitting and standing throughout the working day<sup>6</sup>.

Carpet tiles with open cell cushion backing have been shown to significantly increase underfoot comfort, making it easier to facilitate sit-to-stand working. An independent study by the University of Pittsburgh revealed that this type of cushion backing decreases muscle strain by 24%<sup>7</sup>. Carpet cushioning also improves flooring insulation – helping to lower energy costs by reducing HVAC load.

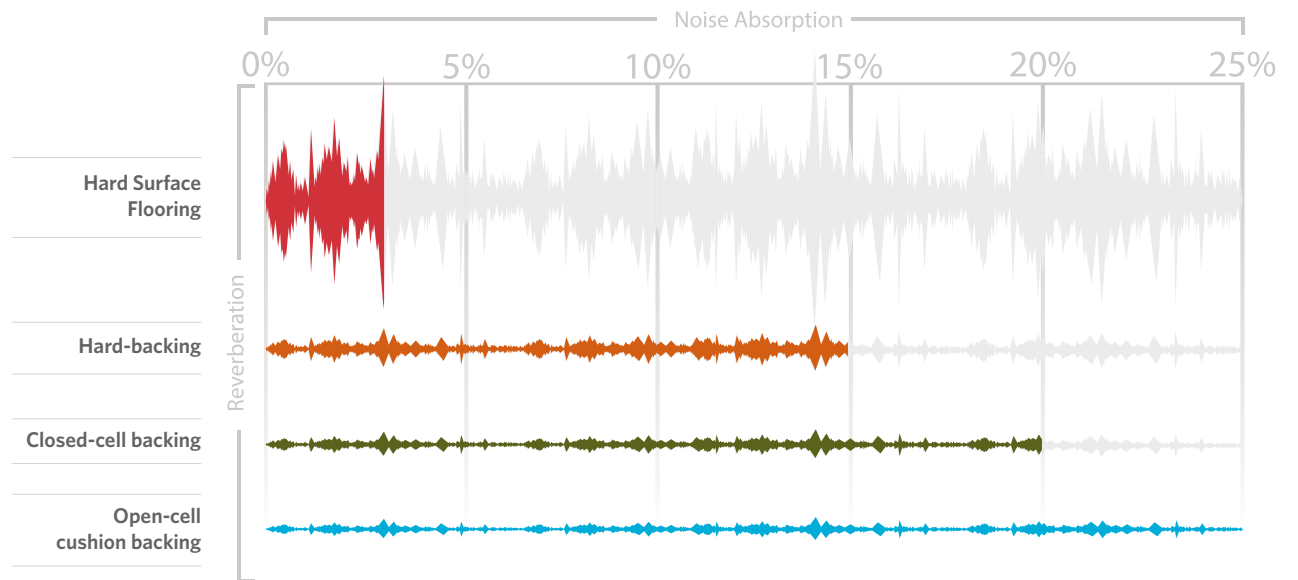
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### Noise and Acoustics

Ambient noise can have a huge impact on the working environment. In hospital settings, noise can be detrimental to recovering patients, increasing stress and hindering sleep. In libraries and schools, noise impedes both teaching and learning, with 90% of teachers preferring carpeted classrooms to those with hard flooring<sup>2</sup>.

In office environments, noise has been shown to impair employees' ability to recall information, and perform basic arithmetic<sup>3</sup> – a problem that's worsened in open-office locations. A study conducted by Cornell University showed that workers in an open-office environment had heightened levels of stress hormones and were likely to become less motivated and creative as a result<sup>4</sup>.

If ambient noise is a concern, consider a cushion-backed carpet tile. Cushioned carpet tiles offer significantly more noise absorption than both hard surface flooring and hard backed carpet<sup>5</sup>. With lower levels of noise and reverberation, it's easier to talk, hear and work effectively.





# 5. QUESTIONS TO ASK MANUFACTURERS





## QUESTIONS TO ASK MANUFACTURERS

This guide is designed to provide a clear and objective look at the factors that affect the longevity of your chosen carpet tiles.

Armed with the information here, you'll find it easier to understand the differences between carpet tile types, and the situations which call for them. You'll be able to choose carpet tiles that last – in terms of longevity, durability, aesthetic and comfort – and you'll be able to make the most of every dollar of your flooring budget.

To help you use this information as effectively as possible, we've condensed the guide's key takeaways into a handful of crucial questions to ask manufacturers:

### How Long Should Carpet Tiles Last?

- What traffic rating do these carpet tiles have?
- How well will these tiles maintain their appearance?
- What type of backing do they use?
- Do these tiles have stain resist, stain repel and stain release properties? What type of maintenance do these tiles need?

### How Important is Carpet Tile Design?

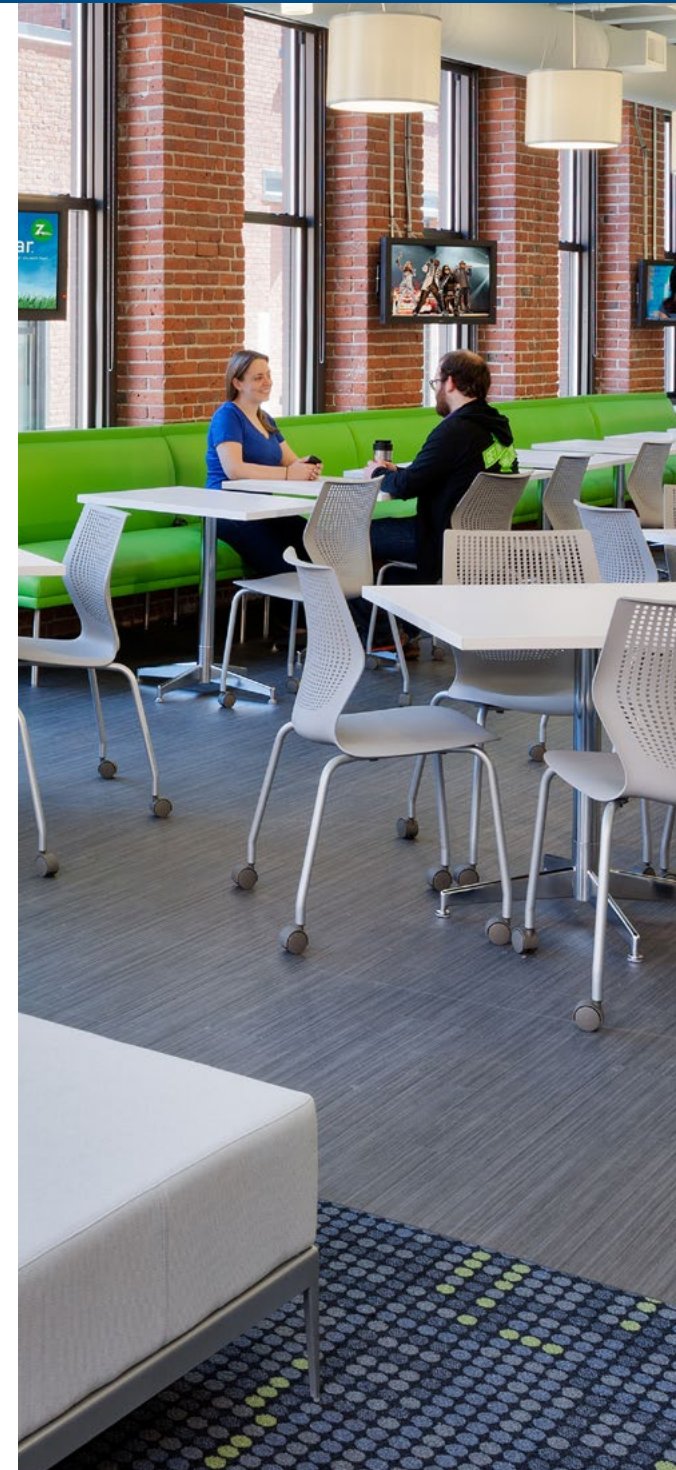
- How will this carpet pattern handle staining and soiling? What's the lead time on these tiles?
- Can these tiles be replaced or reordered in the future?

### How Easy Are Carpet Tiles to Install?

- What relative humidity can the carpet tiles withstand?
- What kind of preparation work needs to happen before installation? Are there plasticizers in the backing or VOCs in the sealer?
- Is the backing hardback or cushioned?
- Does the backing wick moisture?

### How Do Carpet Tiles Affect Health and Wellness?

- Does this tile reduce ambient noise?
- Does the carpet tile use open cell cushioning?





If you'd like to find the answer to any of these questions, connect with a Milliken sales rep. They'll use their experience and knowledge to help you choose the perfect carpet tiles for your organization, and ensure you maximize every dollar of your flooring investment.

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## References

1. Milliken & Company, internal testing.
2. Beth Schapiro & Associates (2001), National Survey of Public School Teachers
3. Banbury, S., Hidgetts, H. and Perham, N. (2013), Mental arithmetic and non-speech office noise: an exploration of interference-by-content, *Noise Health*, 2013 Jan-Feb
4. Evans, G.W. And Johnson, D. (2000), Stress and open-office noise, *Journal of Applied Psychology*, 2000 Oct
5. The Carpet and Rug Institute (2014), CRI Technical Bulletin: Acoustical Characteristics of Carpet, 2014 October
6. Roelofs, A. and Straker, L. (2002), The experience of musculoskeletal discomfort amongst bank tellers who just sit, just stand or sit and stand at work, *Ergonomics Journal of South Africa*, 14
7. Redfern, M. and Cham, R. (2000), The influence of flooring on standing comfort and fatigue, *American Industrial Hygiene Association Journal*, 61, 700-708