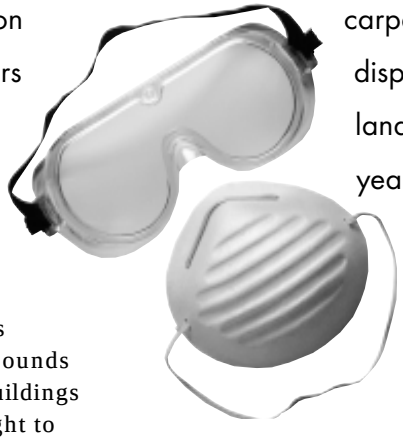
FLOOR COVERINGS

EPA studies have found that pollutant levels inside can be 2–5 times higher than outdoors. And some activities such as painting or installing carpeting can raise indoor air pollution levels to 100 times higher than those outdoors. Now consider that most people in the U.S. spend as much as 90% of their time indoors.

A 1989 EPA study estimated that poor IAQ may cost the nation tens of billions of dollars each year in lost work hours.

Approximately 5 billion pounds of used carpet are disposed of in landfills each year!



Building efficiency has increased by leaps and bounds over the past century. Buildings have become more airtight to conserve energy. Methods such as installing storm windows, insulation, weather-stripping or applying caulk have helped to keep warm or cool air out. Homes heated with kerosene, wood, coal and natural gas are apt to have pollutants trapped within these well-insulated walls. Office buildings are constantly being cleaned with chemical solvents or have frequent changes in paint, wall or floor coverings. Each of these actions contribute to the chemical pollutants trapped within the building. Carpeting is specifically known to emit up to 200 different Volatile Organic Compounds (VOCs) within the first 72 hours of installation. These VOCs come from the carpet pile, from backings and from adhesives. Studies have not shown a definite health hazard from these fumes associated with carpets but VOCs from other sources are known to have serious health effects.

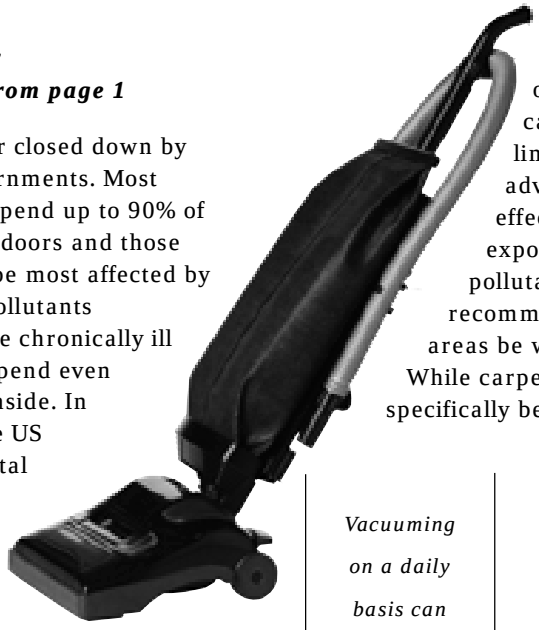
Indoor Air Quality

For these reasons IAQ has become much more of a concern to businesses, workers, building owners and tenants . A phenomenon in which occupants of a building repeatedly become ill has become more publicized in recent years. This has led to a growing concern in the general public. These “Sick Buildings” have, in some cases, been

Continued on page 2

Air Quality
Continued from page 1

evacuated or closed down by county governments. Most Americans spend up to 90% of their time indoors and those who would be most affected by indoor air pollutants (children, the chronically ill or elderly) spend even more time inside. In response the US Environmental Protection Agency (EPA) has set up a department specifically dedicated to understanding the complexities of indoor air quality.



What they have discovered is that thousands of products produce chemical compounds which can result in symptoms such as eye, nose and throat irritation; headaches; skin irritations; shortness of breath or cough; and fatigue. Some sources of these indoor air pollutants include biological contaminants such as molds, pollen or bacteria. Or the pollutants can be chemical such as tobacco smoke, automobile emissions, toner emissions from copier machines, wall coverings or even carpeting. To limit any adverse health effects from exposure to these pollutants it is recommended that areas be well ventilated. While carpets have not specifically been proven to cause these health effects manufacturers have taken steps to produce carpets that emit less VOCs and other pollutants. These carpets are specifically marked with a Carpet and Rug Institute (CRI) green label. All of the carpeting products reviewed in this issue of the *Choose Green Report* meet the requirements for the CRI green labeling program. The Green Seal criteria also specifically requires some recycled fiber content (except when using natural materials) as well as repairability and recyclability.

Vacuuming on a daily basis can remove more than 80% of dry residue.

Not Simply a Cover

Carpets are much more than just a floor covering. Carpets act as insulation, noise reduction, slip safety, glare reduction, and as an aesthetic property. Carpet can be used in various places including corridors, waiting rooms, lobbies and offices as well as patient rooms in hospitals and throughout classrooms in elementary schools. Carpets can serve to make a company statement, calm emotions or even separate corporate team areas.

Before purchasing a carpet, several factors must be considered to fully evaluate the total use costs of a carpet. These factors include initial cost of carpet and installation, useful life based on wearability, maintenance and upkeep labor costs, cleaning supply costs, cleaning machine repair costs and end-life removal costs. When these factors are evaluated a purchaser can more accurately specify a carpet which will meet an institutions needs without worry about needless repairs or early replacement. Prevention of early replacement is one key way to protect the environment by limiting the amount of carpet that is burned or sent to the landfill.

The ***Choose Green Report*** is published for Green Seal Environmental Partners. To become an Environmental Partner, or to receive a copy of this report, contact Green Seal at (202) 872-6400 x 21 or greenseal@greenseal.org.

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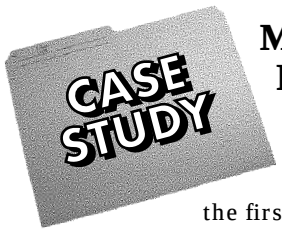


Milliken Carpet's Earth Square Program

The United States General Services Administration (GSA) has given Milliken Carpet the first ever Evergreen Award for their Earth Square program. Recently Milliken Carpet launched a unique renewal program. Their Earth Square program is a take-back and rejuvenation process. When older carpets are removed from a customer's facility Milliken uses a patented process to clean and rejuvenate the carpet. Next a patented coloring system is used to apply new color designs to produce a renewed modular carpet with modern day aesthetics. This process reduces carpet waste going to the landfill, eliminates the costs of hauling and disposal and costs approximately half as much as a new carpet purchase. These carpets also come with a 7-Year Fiber Wear warranty and a 1-Year Latent Defects warranty.

Carpet Terms

Carpet Construction

Most carpets produced in the U.S. are tufted and have three main components: a pile (the fiber you see), a primary backing and a secondary backing. The following terms are necessary when specifying a carpet.

Pile Height — The height of the yarn from the backing to the surface.

Loop-Pile — A continuous string of yarn is worked into the backing in one of the forms described below. These carpets are more luxurious and commonly found in offices or homes.

Cut-Pile — A carpet which has been cut at the end of the loop during the integration process with the primary backing. This carpet is more commonly found in entranceways or corridors.

Tufted — Machines similar to sewing machines stitch hundreds of rows of pile yarn tufts through a primary backing fabric. If loop pile carpet is being manufactured the yarn is held in place by hooks and the machine continues to sew the yarn into place. If cut-pile carpet is being produced large blades cut the fabric held in the hooks. After the stitching is done a secondary backing is usually applied by lamination with latex. A cushion can be added to the back to add resilience, insulation and comfort.

Woven — Huge looms take both face and backing yarns and weave them together to form a finished product. Usually a latex coating is applied as the backing to provide extra stability. A separate cushion is commonly used to provide additional comfort and insulation.

Fusion-bonded — Machines start with a primary latex backing and implant the yarns into it. A cut pile rug is produced by slitting two parallel sheets of this carpet down the middle of the pile. Another backing made from polymeric material is usually used to add stability.

Fiber Types

Natural fibers include wool, cotton, sisal, choir, hemp and jute with ***wool*** *being the most widely used material. Natural fibers are usually produced from renewable resources, are biodegradable and they wreak less havoc on the environment during production. Unfortunately these fibers can be more expensive and sometimes less durable. These carpets also have a greater allergenic dust potential than synthetic fibers.*

The most common synthetic fibers are nylon, olefin, and polyester. Each has good durability, but nylon maintains the longest lifetime. All are petroleum based and have the environmental drawbacks associated with petroleum refining such as high energy consumption and pollution. However, many manufacturers are now producing these carpets with some recycled fibers as well as recyclable materials. Green Seal recommends choosing a carpet that has some recycled content. This action will eliminate some carpet waste either heading for the landfill or the incinerator. Some carpet manufactures have extremely innovative renewal programs that rejuvenate old carpet and place it back into its originating facility. This process eliminates wastes as well as much of the hidden costs of carpet disposal. However, because of the nature of these programs the carpet contains little or no recycled content fibers. The carpets listed in the tables, which do not contain any recycled nylon content, are part of a program that rejuvenates old carpets.

Nylon is a very common fiber which has excellent wearability as well as a reasonable price. It is both lightweight and can easily be cleaned.

Olefin is a fiber that is commonly used in areas where sunlight fading or static electricity is a concern. It is less expensive than nylon however, it often has a more frequent replacement cycle.

Polyester is very commonly manufactured in some part from the plastic packaging we recycle every day. These carpets are best for residential or light commercial traffic.

Dyeing Methods

Because dyeing has such huge environmental impacts it is important to choose a dyeing method that minimizes energy and water use as well as wastewater production and dye releases. Carpet mills in the early nineteen hundreds were built around streams. The mills would use the stream to wash the excess dye off the carpets, resulting in multicolored water downstream. While the pollution is not that obvious today, the amount of wastewater coming from carpet mills is still enormous. Because the large amounts of energy and wastewater were becoming a concern for many in the industry methods of dyeing have been developed to minimize waste production. One such preferable method is solution dyeing where the color is added directly to the liquid from which the fibers are formed.

Solution/Stock dyeing — the color is applied during manufacturing of the yarn but before it is spun.

Yarn dyeing — the finished yarn is dyed before it is woven into the carpet.

Printing — color is applied after the carpet has been tufted.

Piece dyeing /continuous dyeing — after the secondary backing is applied, dye is injected into the face of the carpet in a continuous process.

Maintenance, Maintenance, Maintenance!

The most important action you can do to keep your carpet looking good for as long as possible is frequent and quality maintenance. It is recommended that commercial areas with heavy traffic be vacuumed daily. In fact, vacuuming can remove more than 80% of dry residue on a daily basis. Medium and lighter traffic areas should be vacuumed at least twice a week. The vacuuming equipment used should have powerful suction and an enclosed HEPA filtration bag. Every 6–12 months, depending on traffic, the carpet should be extraction cleaned. This will remove soil that has not been removed by regular vacuuming. The most recommended method is **Steam or low VOC solvent cleaning.** Some methods such as dry foam or dry extraction use chemicals that can emit fumes and cause indoor air quality problems.

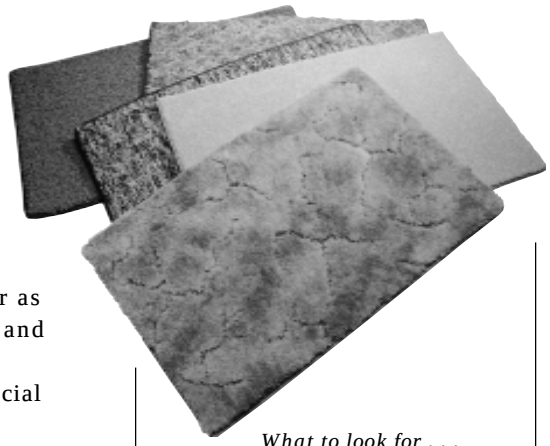
To hinder unnecessary soiling any number of preventative measures can be used. **Track-off** regions should be established approximately 90 square feet around major entrances. A walk off mat should be used near entranceways to prevent excessive dirt collection on nearby carpets.

Choose a color similar to local soil conditions for high traffic areas that will collect dirt more often.

Use area rugs which can be taken up and washed often.

Look for stains on the walls, floor or carpet as evidence of previous flooding or moisture problems.

Clean up spills immediately. Quick removal will prevent both stains and fungal growth. If necessary, have the carpet steam cleaned making sure to remove all of the moisture, soil and cleaning agent. If the carpet has been wet for more than 24 hours it should be removed and disposed of properly.



What to look for . . .

- ✔ *CRI green labeled carpet*
- ✔ *CRI green labeled adhesive for installation*
- ✔ *CRI green labeled cushion*
- ✔ *Some recycled fiber content (unless natural fibers)*
- ✔ *Repairable carpet*
- ✔ *Recyclable carpet*
- ✔ *Manufacturer who codes the materials used on the backing*
- ✔ *Manufacturer who maintains a take-back program*

Repairing and Recycling

In the unfortunate instance where a serious spill occurs on a carpet, no one wants to have to purchase a whole new carpet. In the event of an accident replacing a carpet is both expensive and wasteful. Thus repairability becomes a key issue. Depending on the backing on the carpet, it can often be easily repaired. Many backings however, cannot be cut into without jeopardizing the

Installation Terms

It is important that whatever type of installation is chosen, low-emitting (non-solvent) adhesives should always be specified. These adhesives should show the CRI IAQ Adhesive Testing label. If a carpet cushion is installed it should also bear the CRI IAQ label. One low VOC option for installation is hook tape that is laid around the perimeter of the carpet and at seams and bonds directly to the loop material of the carpet. Another option is a releasable adhesive coating on the carpet back that sticks directly to the floor.

Before installation the carpet should be unrolled and aired-out off site for 72 hours. Also, fresh air ventilation should be maintained for at least 72 hours after installation. This can be done by opening windows and doors and using exhaust fans. The ventilation system should be operated at full volume however, it should be segregated from the rest of the building.

Stretch-in — This option uses a power stretcher to apply tension to the carpet over a cushion. Once the carpet is held tight it is mounted to tackless strips around the edge. This type of installation is best in areas of light traffic. This method has limited VOC emissions.

The installation methods listed below involve spreading adhesives across the back of the carpet and increase emitted VOCs during the installation and drying processes. Depending on the flooring material one of these options may be required for proper installation. In this instance a low VOC adhesive should always be specified.

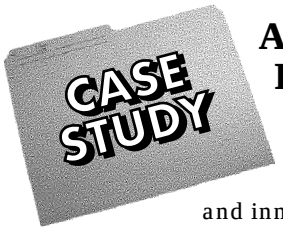
Glue-down — In this method glue like adhesives are used to install the carpet over an optional cushion. This method is more appropriate for commercial sites where heavy foot and wheeled traffic are common. This option is specifically appropriate for any ramp areas or for sites that need access to under floor electrical or telephone lines.

Double Glue-down — This is a combination of both the stretch-in and the glue-down installation types. It offers the stability of the glue-down while providing the cushion of a stretch-in. This is appropriate for both foot and wheeled traffic.

quality of the rest of the carpet. For this reason a backing must be chosen carefully with repairs in mind. Carpet manufacturers can make suggestions based on your flooring needs. Another option is carpet tiling. Tiles can be easily removed for under floor work or replaced in the event of damage. Carpet tiles were once an unknown product. Currently both large and small office buildings, as well as airports, hospitals, and schools, are discovering how convenient they can be.

Manufacturers have recognized the need to limit the amount of waste materials making their way to incinerators and landfills. Because separating the yarn material from the backing in such a wide variety of materials can be difficult, some manufacturers have developed a coding system. A bar code will be stamped on the back of the carpet to identify all of the materials used in it. Currently, recycled carpet fiber content can be used in such end-use products as lumber, marine plywood, and automotive parts. Some parts can be used in concrete or road materials to extend the lifetime and stability.

Several manufacturers are developing their own take-back programs for the end of the life of the carpet. This is a way to insure that carpeting materials are used again through rejuvenation or reprocessing. A twist on this program is carpet leasing, a popular option with carpet tiles. Leasing allows consumers to easily maintain good carpet condition, are a sure way to insure proper maintenance and guarantee responsible disposal at the end of the carpet's life. Leasing programs are often more expensive in the short term than purchasing, however, the benefits often outweigh the initial monetary costs.



Allied Signal's Evergreen Nylon Recycling LLC

A joint venture with Allied Signal and DSM Chemicals North American has resulted in a new and innovative carpet recycling plant that will start production in September 1999. This plant will handle approximately 230 million pounds of disposed carpet each year. To support this facility, Allied Signal initiated a program in January 1998 to collect post consumer carpet. Through an innovative process nylon 6 carpets will be converted to caprolactam; the monomer for nylon 6. A special engineering process eliminates the need for separation of the backing and the fibers; instead the carpet is processed as a whole. The 100 million pounds of caprolactam produced annually will be polymerized into nylon 6 to be used again as carpet fibers. Thus converting a recycling process into a true closed loop system.

Reprocessing of caprolactam, instead of original production will save approximately 4.4 trillion BTUs of energy each year. This is equivalent to the energy needed to heat 100,000 average single family homes for one year. The process will also reduce the amount of pollutants released during the production process; in fact, it will reduce green house gas emission by 67%! If you have a large facility operation such as a corporate office or a hotel and are planning to dispose of large amounts of carpet please contact: Michelle Isom at Allied Signal: 1-804-520-3589.

WHICH CARPET WILL DO THE JOB?

The quality of the carpet often depends on the density of the fibers of the carpet. This is affected by many factors including the gauge (the stitches per inch across the carpet), yarn thickness and pile height. For areas of extremely heavy traffic, a density of 5000 to 7000 is recommended. One such carpet is a high density, low pile height carpet in loop pile form. For areas with less traffic a cut pile or even a loop pile/cut pile combination is appropriate. For executive offices or meeting places a wool rug will be appropriate. Any carpet used should carry the CRI green label. These carpets have specified lower emissions in the following categories:

Emissions	**Mg/m²-hr**
Total Volatile Organic Compounds	0.5
4-Phenylcyclohexene	0.05
Formaldehyde	0.05
Styrene	0.4

Carpet Manufacturers and Recommendations

MANUFACTURER	FIBER TYPE	RECOVERED FIBER (%)	DYEING PROCESS	RECOMMENDED ADHESIVES	TRAFFIC	REPAIRABLE/ RECYCLABLE
Brintons U.S. Axminster Stock	80% Wool 20% Nylon	0	Yarn	Chapco Safe-Set 5 Parabond – M-4098 W.W. Henry #251: Next Generation Chapco Safe-Set 2 Parabond M-4277 W.W. Henry #630: Next Generation	HC/ EHC	Yes/ No
Brintons U.S. Axminster Custom Wool Blend	80% Wool 20% Nylon	0	Yarn	Chapco Safe-Set 5 Parabond – M-4098 W.W. Henry #251: Next Generation Chapco Safe-Set 2 Parabond M-4277 W.W. Henry #630: Next Generation	HC/ EHC	Yes/ No
Collin Campbell and Sons Nature's Carpet	Wool	0	None	Low VOC	LR/MR/ LC	Yes/Bio-degradable
J&J Commercial Carpet Carrara	Nylon	50% Min.	Piece	Commercialon 600	EHC/ HC	Yes*/ Yes**
J&J Commercial Carpet Colours Supreme 32	Nylon	50% Min.	Beck	Commercialon 600	EHC/ HC	Yes*/ Yes**
J&J Commercial Carpet Colours Supreme 38	Nylon	50% Min.	Beck	Commercialon 600	EHC/ HC	Yes*/ Yes**
J&J Commercial Carpet Colours Supreme 48	Nylon	50% Min.	Beck	Commercialon 600	EHC/ HC	Yes*/ Yes**
J&J Commercial Carpet Crosshatch	Nylon	50% Min.	Beck	Commercialon 600	EHC/ HC	Yes*/ Yes**
Lees Carpets Unibond Broad Style: Faculty IV	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes
Lees Carpets Unibond Broad Style: Check-Up	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes
Lees Carpets Unibond Broad Style: Pebbleweave	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes
Lees Carpets Unibond Broad Style: Accord	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes
Lees Carpets Tile Style: Attribute	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes
Lees Carpets Tile Style: Lineage	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes

NOTES

LR = Light Residential
MR = Medium Residential
LC = Light Commercial
HC = Heavy Commercial
EHC = Extra Heavy Commercial

* These carpets are repairable only when the following backings are used: Endure, Endure HPP, Lifespan /HPP-11 or Thermaloc

** Programs are available to assure that the carpet is not disposed of by using a landfill. In some cases this may mean disposal through energy recovery activities.

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Carpet Manufacturers and Recommendations

MANUFACTURER	FIBER TYPE	RECOVERED FIBER (%)	DYEING PROCESS	RECOMMENDED ADHESIVES	TRAFFIC	REPAIRABLE/ RECYCLABLE
Lees Carpets Tile Style: Gulfstream	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes
Lees Carpets Tile Style: Medical Arts	Nylon	20%	Yarn	Burlington Industries Pressure Sensitive Adhesive or Burlington Industries Wet Set Adhesive	HC	Yes/ Yes
Mannington Commercial Carpets Broadloom Carpet Lines Six-Foot Vinyl Carpet Lines Vinyl Carpet Tile Lines	Nylon	Some	Solution/ Yarn	MC411 MT711	EHC/ HC	Yes/ Yes
Milliken Carpets Earth Square/Movements	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Colorweave	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Midnight Sparkle	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Design Rhythms	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Sisal Style	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Artistry	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Attitudes	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Nuances	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Milliken Carpets Earth Square/Explore!	Nylon	0	Millitron	Milliken 100V	HC	Yes/ Yes
Richmond Carpet Mills Beacon Hill	Nylon	Some	Solution	Varies	EHC/ HC	Yes/ Yes
Richmond Carpet Mills Brookfield	Nylon	Some	Solution/ Yarn	Varies	EHC/ HC	Yes/ Yes
Richmond Carpet Mills Mesa Valley	Nylon	Some	Solution	Varies	EHC/ HC	Yes/ Yes
Richmond Carpet Mills Regency II	Nylon	Some	Solution	Varies	EHC/ HC	Yes/ Yes
Richmond Carpet Mills Sisal Elite	Nylon	Some	Solution	Varies	EHC/ HC	Yes/ Yes

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MANUFACTURER CONTACT INFORMATION

Brintons U.S. Axminster Inc. 1-601-332-1581
Collin Campbell and Sons 1-800-667-5001
J&J Commercial Carpet 1-800-241-4586
Lees Carpets 1-336-379-2572
Mannington Commercial Carpets 1-800-241-2262
Milliken Carpets 1-706-880-5622
Richmond Carpet Mills 1-800-241-2278

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