



# Bulletin

## CARPETS AND INDOOR AIR QUALITY

*From Indian Green Building Council, CII-Sohrabji Godrej Green Business Centre*

Used by millions of people world over for years, Carpets have been favored for several benefits. Some of the benefits in using carpets are:



- Carpets provide insulation against extreme heat or cold. In colder climates or seasons, they retain warm air longer and in warm climates, insulate against invasive heat
- A stable and non-slick walking surface is possible by using carpets. By cushioning footsteps, carpets prevent slips and falls and resulting injuries
- Carpets are very effective as insulation against airborne sounds. With the addition of carpet, sound is absorbed rather than bouncing off onto the walls and furniture
- Carpets hold dust particles until they are extracted by vacuuming
- Aesthetic appeal is another quality which makes carpets the most popular element in interiors

### Indoor air quality

Indoor air quality is affected by volatile organic compounds (VOC's) emitted by most interior products. The extent of this impact depends on the combined emissions from products such as paint, cleaning materials, building materials, furnishings, fabrics, etc.

Apart from products, activities such as tobacco use, pets, and inadequate ventilation also add to poor indoor air quality.

### Carpets and Indoor Air Quality

Carpets and other floor coverings are often cited as primary contributors to indoor air contamination.

When a new carpet is installed, it is glued to the floor with an adhesive. These adhesives are derived from a variety of different chemical compounds. Chemical compounds are added to improve stain resistance and adhesive properties.

Some of the chemical compounds release VOCs and other emissions contributing to poor indoor air quality.

Emissions can also be due to the type of fibers used in carpet making. Synthetic fibers in particular release toxic chemicals over a period of time.

During the manufacturing process, carpets are treated using chemicals to make them stain resistant, flame resistant, soil resistant and to keep them from fading. These chemicals also add to poor air quality.



### What is VOC ?

VOC's (Volatile Organic Compounds) are a group of organic (carbon-containing) compounds which evaporate (volatilize) readily at room temperature. Some familiar substances containing VOCs are paints, sealants, adhesives, thinners, paints, solvents, gasoline, and nail polish remover.

## Better indoor air quality is possible!

With the right choice of carpet, installation procedure and effective maintenance, emissions can be minimized leading to healthier indoor environments.

## Maintaining carpets for a better indoor environment

### Installation

- Install a carpet which has been tested for low VOC emissions
- When the carpet is to be glued down, insist on using a low VOC adhesive
- When installing a new carpet, vacuum the old carpet and cushion prior to removal. Before laying the new carpet vacuum the floor to minimise airborne dust and other particulates
- Ventilate with fresh air up to 72 hours after installation with windows open and by running a fan



Carpet installation

## Routine maintenance

- Regularly clean carpets with an effective, well-functioning vacuum cleaner that has strong air flow
- Quick removal of spills is important to avoid stains and fungal growth

- Clean more often in high-traffic, commercial areas. Ensure that there is adequate ventilation during the cleaning process
- If a wet method of cleaning is used, be sure to dry quickly



Appropriate carpet maintenance contributes to a good indoor environment

## Environmentally responsible carpets

Considering the huge amount of carpets used worldwide and the environmental impacts that occur throughout their lifecycle, it is important to choose a carpet with a minimum ecological footprint.

Environmental impacts of carpets include chemical emissions from manufacturing, installation, disposal operations and solid waste impacts.

Moreover, carpets have a relatively short useful lifetime and need to be replaced continually. This results in increased stress on existing resources for the manufacturing of new carpets.

## Carpet choices we make can play an important role in mitigating environmental impacts. Some useful practices are listed below

- Ensure that the new carpet and its accessories have high recycled content and are also recyclable

- Carpet tiles are a better choice over carpet rolls as they aid in spot replacement and have a longer life
- Check if the new carpet meets indoor air quality standards
- Ensure that you buy a certified carpet Leasing a carpet is a better option as compared to buying a carpet.
- Leased carpet will have the lowest first cost and the carpet is typically recycled at the end of its lease period. (This practice is yet to catch up in the Indian market)

### CRI and Carpet Certification

The Carpet and Rug Institute (CRI), based in Dalton, Georgia, USA is a Trade Association representing the carpet and rug industry.

The institute promotes use of environment friendly carpets through information dissemination and a certification programme.

The LEED Green Building Rating System of US Green Building Council recognizes and awards points for CRI certified carpets.

CRI's Green Label Certification Programme established limits on VOCs for carpets, cushion and adhesives as summarized in the following table:

| Emission Factor Limit          | mg/m <sup>2</sup> h |
|--------------------------------|---------------------|
| <b>Carpets Total VOCs</b>      | <b>0.50</b>         |
| 4-Phenylcyclohexene            | 0.05                |
| Formaldehyde                   | 0.05                |
| Styrene                        | 0.40                |
| <b>Adhesives Total VOCs</b>    | <b>10.0</b>         |
| Formaldehyde                   | 0.05                |
| 2-Ethyl-1-Hexanol              | 3.00                |
| <b>Cushion Total VOCs</b>      | <b>1.00</b>         |
| 4-PC(4- phenylcyclohexene)     | 0.05                |
| Formaldehyde                   | 0.05                |
| BHT (butylated hydroxytoluene) | 0.30                |

### Carpet Tiles:

- Carpets are available in the form of tiles and have significant advantages over carpet rolls
- In the event of wear and tear, individual tiles can be replaced instead of replacing the entire roll. This results in decreased stress on landfills because of used carpets
- Product wastage while laying carpet tiles is also minimal
- Laying a carpet roll results in product wastage of 10% and more. With tiles, product wastage drops to around 1% or 2%
- Lifetime costs of Carpet tiles are much lesser than that of rolls. These include maintenance, material wastage, product and installation costs
- Carpet tiles pose little difficulty in handling
- Water resistance of carpet tiles is very high. Because of the solid vinyl back, water penetrates only into the surface of the tile. Each tile may then be separately washed and reinstalled which is not possible with a carpet roll
- Installation of tiles is also easier and more user friendly as compared to carpet rolls



Floor covered with Carpet Tiles

### Do you know?

- New carpet's emission level will drop significantly within the first 24 hours of installation; with fresh air ventilation, the emission level will dissipate to an undetectable level within 48 to 72 hours
- The cost of a carpet's maintenance during its lifetime (10-15 years) is higher than the carpet's actual price
- Globally, about 2.1 billion kg of carpet is annually dumped in landfills

## A Few Useful Carpet Terminology

### **Bioaerosols**

Are microorganisms or particles, gases, vapors, or fragments of biological origin that are in the air. In indoor environments, these can cause infections or allergies

### **Flame resistance**

Describes material that burns slowly or is self-extinguishing after removal of an external source of ignition.

### **Stain resistance**

Is the ability of a carpet fiber to resist the absorption of stain and maintain its original appearance.

### **Foot traffic unit**

One foot traffic unit is described as a pedestrian walking across a measured section of carpet, one time. Foot traffic is classified as follows:

|                    |                       |
|--------------------|-----------------------|
| <b>Light</b>       | less than 100 / day   |
| <b>Moderate</b>    | 100-1000 / day        |
| <b>Heavy</b>       | 1000-10000 / day      |
| <b>Extra heavy</b> | more than 10000 / day |

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## If you are constructing a building, Go Green!!

CII-Godrej GBC offers Green Building Advisory Services in India to achieve the green building rating awarded by USGBC, under their LEED Rating Programme.

The services offered include feasibility study to evaluate the realistic ratings achievable, quantify benefits, estimate investments and handholding till the rating is achieved.

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