Cleaning Preserves Carpets and Protects Our Health

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Carpets and indoor air quality

It is commonly believed that carpet contributes to dust and other indoor air-quality problems. This claim has been recently challenged by research indicating that carpet can actually help improve indoor air quality in several ways. Because carpet has many millions of fibers, it can trap dust, allergens, and other particles before they become airborne. These particles will remain in the carpet until the carpet is disturbed and re-releases them into the air. This trapping mechanism allows for the easy extraction of the particles through vacuuming and cleaning. Hard floor coverings like vinyl tiles or composition tiles, on the other hand, do not have these fiber pockets so they cannot trap dust or allergens. These particles will simply settle to the floor and collect there. Walking over the area where the particles have gathered might stir them up, making them airborne and more likely to get into people's lungs. (See Vol. 1, No. 2, "Carpets and Indoor Air Quality," of this series for a more detailed discussion of the relationship between carpet, indoor air quality, and health.)

Proper maintenance of carpet is essential not only for the appearance of the carpet but for human health as well. The fibers used in today's carpets are designed to hide soil by reflecting light. So soiling in carpets is not as readily visible as on hard floor coverings where the soil collects on the surface and is easily seen. This lack of apparent soil, however, does not eliminate the need for regular cleaning. If poorly maintained and allowed to remain wet for long periods, carpets can become polluted with microorganisms. If this contamination becomes airborne, it may cause headaches, eye, nose, and throat irritation in some people exposed over extended periods. Studies have shown that preventive and routine maintenance can easily remove and control microorganisms in carpet dust. Properly and regularly cleaning carpets is easy and inexpensive, and it can improve indoor air quality.
Regular maintenance also prolongs the life of the carpeting. If carpet is allowed to remain soiled, it will be harder and more expensive to clean. In addition, it will begin to appear dingy and worn out more quickly, thereby needing to be replaced more frequently. The chart above illustrates how carpet appearance is affected by a regular maintenance plan.

Carpet maintenance

A maintenance plan is important for all carpets whether they are in homes, schools, or commercial facilities. Cleaning means removing apparent soiling. But because the fibers used in today's carpeting trap many kinds of particles, soiling may not be as apparent on carpeting as it would be on hard floor coverings. A maintenance plan will ensure that dirt and other particles trapped in the carpet are removed regularly, thereby preserving the appearance of the carpet.

1. Take preventive steps. Clean sidewalks and parking lots regularly. When necessary, shovel snow and avoid using chemicals that can be tracked inside the building. Select a proper surface sealer for parking lots and walks.

2. Develop a maintenance plan. Divide your carpeted area into zones. The greatest concentration of soil tends to be in three zones:

   - **Wipe-off areas.** These are areas where traffic flows from hard surfaces to carpeted areas. These can include entrance ways from the outside or other hard floor areas in the home, school, or office. Walk-off or entry mats in these areas can trap much of the soil and moisture, thereby limiting the amount spread through the rest of the home or facility. The mats should be large enough so that at least two or three steps can be taken before stepping on another surface. The larger the mat, the better. The mats must be cleaned regularly to ensure proper performance.

   - **Congested areas.** These are areas where foot traffic is narrowed through a concentrated area including doorways, elevators, stairs, and areas in front of copiers and vending machines. Congested areas average 10 square feet on either side of door jambs and 10 feet in front of elevators.

   - **Major traffic areas.** These are areas with the greatest amount of foot traffic including hallways, corridors, aisles between desks, areas in front of bookshelves and file cabinets, in cafeterias, in break areas, and in schools near drinking fountains and pencil sharpeners.

   These target zones where most of the soil is trapped should be vacuumed often. This can mean at least twice a week in homes and as frequently as daily (or more) in schools or commercial facilities. The zones that receive less traffic can be vacuumed less frequently—in some cases, once a week or every other week. Schools and commercial facilities should use a floor plan to designate the specific areas so that maintenance
resources can be appropriately distributed. In addition to making a floor plan, schools and commercial facilities should prepare a schedule indicating when specific areas should be cleaned and which staff members are responsible.

3. Provide appropriate ventilation. The ventilation system in schools and commercial facilities should be properly maintained to reduce airborne soil and contaminants. To prevent the build-up of microorganisms, temperature should be maintained at a constant 68-74 degrees F, and indoor relative humidity levels should average 40-60 percent. This may mean that ventilation systems should be kept on even when the facility is not occupied. Maintaining appropriate indoor climate conditions will help prolong the life of the carpet and ensure the health of the building occupants.

Carpet cleaning

Vacuuming

In addition to frequent vacuuming, the type of vacuum used is important. Vacuum cleaners with brush or beater action are the most effective in removing soil. The action of the brush loosens the soil particles from the carpet fibers. A vacuum should also have strong suction to remove the particles. Thorough vacuuming requires from three to five slow passes over an area.

The vacuum should also have high-efficiency filtration, so that dirt particles removed by the suction action do not pass through the vacuum and become airborne. Vacuum bags should be disposable and replaced whenever the bag becomes half full. Allowing the bag to become completely full reduces the efficiency of the vacuum cleaner. Brushes on vacuums also should be kept clean and in good condition.

Pile brushing

To remove dry, deeply embedded soil from high-traffic areas, periodic pile lifting may be necessary. A pile lifter may loosen caked solids and opens crushed pile. This action precondition the carpet to sufficiently remove the soil.

Cleaning

Regardless of the efficiency of the vacuuming schedule, carpet will require regular cleaning. In schools and commercial facilities, carpet should be cleaned a minimum of two to three times a year and in the home every 12 to 18 months. Some areas may require more frequent cleaning. Cleaning should be done before the carpet appears dirty to preserve its appearance. The cleaning method used should be based on the manufacturer's recommendations. There are five basic cleaning methods:

- absorbent compound (dry extraction)
- absorbent pad or bonnet method
- dry foam extraction
- hot water extraction (steam cleaning)
- rotary shampoo

Absorbent compound and absorbent pad methods: Both of these are minimum-moisture cleaning methods. The compound method applies a dry absorbent cleaning compound to the carpet and works the powder into the pile with agitation. The pad method uses a cotton/rayon/polypropylene absorbent spin pad. A cleaning solution is applied to the carpet and the soil and the soil are removed from the carpet by rotating the absorbent pad.

Dry foam extraction: A solution that has been whipped into a foam is applied to the carpet using a reel-type brush action. Once the foam application is complete, the soils are removed by wet vacuuming. This method is considered a low-moisture method.

Hot water extraction: Hot water and a cleaning solution are injected with high water pressure onto the carpet. The solution, soil, and residual moisture are thoroughly extracted immediately from the carpet to avoid overwetting and to reduce the drying time.

Rotary shampoo: A shampoo solution is injected onto carpet with specially designed brushes. Extraction is then required to remove suspended soils and cleaning solutions. The shampoo solution dries to a crystalline residue which must be removed by dry vacuuming.

It is important to follow manufacturer's recommendations as well as to make sure that any residual soil and solutions are extracted from the carpet. Be sure to allow sufficient drying time—a minimum of six to eight hours but up to 24 hours for some areas and methods. Carpet can be cleaned by facility staff, professionals, or individuals in their own homes.

Spot removal

Even though most carpets available today have a stain-resist treatment, it is best to act quickly when a spill occurs. The majority of spots can be removed if immediate action is taken. The longer the delay, the higher the
probability that the spill will become a permanent stain in the carpet. Here are some tips on spot removal:

- Blot liquids with a dry, white absorbent cloth or white paper towels with no printing on them.
- Do not scrub the area. Scrubbing can actually cause pile distortion in the affected area. It is best to continue to blot until the area is completely dry.
- Select a spot removal agent.
- Pretest the selected spot removal agent in an inconspicuous area to make sure that the solution will not bleach the dye or damage the fiber. To test the agent, apply several drops to the affected area and hold a white cloth on the wet area for 10 seconds. Examine the area for any discoloration or damage to the fiber.
- Apply a small amount of the agent to a white cloth and work in gently. It is best to work from the edges of the spill to the center. This will prevent the spill from spreading.
- Continue using the agent until the spill has completely transferred to the cloth. If the transfer stops, but the spill remains on the carpet, try a different spot removal agent.
- Rinse the affected area thoroughly with warm water after the spill has been completely removed. Blot the area with a white cloth until all of the cleaning solution has been removed. To accelerate drying, put a half-inch stack of paper towels over the affected area and weigh them down with a heavy object.

**Detergent Solution:** Mix one teaspoon of a liquid dishwashing detergent per every cup of lukewarm water. A stronger concentration is not recommended.

**Vinegar Solution:** Mix one cup of white vinegar for every two cups of water.

**Ammonia Solution:** Mix two tablespoons of household ammonia for every two cups of water.

Professional spot removal kits are available. If these kits are kept in a handy place and individuals are taught how to use them, spots can be removed quickly to preserve the appearance of the carpet. Professionals can be called to remove stubborn stains and to deal with odor problems.

**Conclusions**

Carpet has both aesthetic and practical qualities. Carpet lowers noise levels, provides a nonslip, cushioned walking surface, adds warmth and comfort, and can be less costly to maintain than other floor coverings. Carpet can be cleaned effectively and efficiently by following a regular maintenance schedule and acting quickly to remove spots. Such a schedule will enhance the appearance of the carpet, preserve the life of the carpet, and aid in maintaining a healthy climate for the building occupants.

**Additional questions?**

If you have additional questions about the cleaning and maintenance of carpet, contact the Carpet and Rug Institute at 800-882-8846.

Markel Velez is gratefully acknowledged for his work on this edition of *Facility Planning and Management Notes*.

**References**

*Carpet and Rug Care Guide*, the Carpet and Rug Institute, Dalton, Ga., 1996.


*Floor Covering Maintenance for School Facilities*, the Carpet and Rug Institute, Dalton, Ga., 1996.

**Future topics**

In *Facility Planning and Management Notes*, we would like to address the concerns of readers involved in the planning, design, and maintenance of facilities. Let us know what topics you'd like to see in future issues.

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