

# Material Planning: Floors, Walls, and Windows



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**T**his chapter examines the materials used in the construction of floors and floor coverings. The specific properties of appearance, durability, cost, and ease of maintenance for each type of floor are discussed. The treatment of each floor type (methods that are used in the cleaning, sealing, and refinishing of floors) are also examined.

Particular attention is given to carpeting. Carpet composition, construction, and design are addressed, and alternative cleaning methods for carpets are evaluated.

Wall coverings and window treatments are also described. The different types of wall coverings, their durability, relative cost, ease of maintenance, and proper cleaning procedures are explored.

The construction and cleaning of window treatments are presented, as well as materials used in drapes, shades, and blinds.

## Cleaning for Health

For many years, Americans, when asked to consider or describe the environment, would usually visualize it as being forests, mountains, lakes, and oceans. However, the indoors qualifies as the environment as well. They are interconnected—what we do in the built environment impacts the outside environment. When considering matters of human health, the built environment becomes critically important, for it is estimated that the average American spends between 90 and 95 percent of his or her time indoors. We need to choose wisely when selecting materials in the construction of floors, walls, and

## CHAPTER OBJECTIVES

After studying the chapter, students should be able to:

1. Identify the various types of floor coverings and describe the relative advantages and disadvantages of each type.
2. Describe standard procedures and the latest developments in floor cleaning.
3. Identify elements of carpet construction.
4. Describe and evaluate different carpet-cleaning techniques.
5. Describe standard window-washing procedures.
6. Identify materials used in wall coverings and window treatments and describe the relative advantages and disadvantages of each type.
7. Describe the care and treatment of walls, windows, and floors, including the latest developments.

windows, and we also need to choose wisely when determining how we are to maintain those materials.

Cleaning for appearance is important, but it is not primary. Our primary concern as executive housekeepers is to clean for health. This entails a new perspective, not only on the chemicals used in cleaning and maintaining surfaces, but also on the methods we employ to maintain these surfaces in our properties.

For example, for many years we have “pushed the dirt around” but failed to capture it. The standard mop is a prime example of this approach. An employee pushes around a traditional mop and bucket. The mop is repeatedly dipped into the increasingly dirty water and applied to the floor. The act of mopping breaks up the dirt

on the floor’s surface, but does not pick up all or even most of the dirt, which is then left to dry on the floor’s surface. Bacteria and viruses are transported from one area to another by the mop and the dirty water being reapplied to the floor. This is referred to as **cross contamination**, whereby pathogens are carried from one area to another by equipment and workers. Only when the water is perceived by the worker as being too dirty to use, is it changed.

The traditional mop is now being replaced by a flat mop that is made of microfiber (Figure 5.1). The mop heads collect the soil instead of redistributing it. They will even pick up as much as 98 percent of the bacteria on a surface. The mop heads are not dipped back into the



**Figure 5-1** A Simplee Clean™ microfiber mop with a telescoping handle has easy-to-change flat mop heads, as shown in the second photo. The heads are held on by Velcro. (Courtesy of Newport Marketing Group, Inc.)



**Figure 5-2** The KaiVac “no-touch” system for cleaning public areas such as bathrooms has made the traditional mop and bucket a relic. (Copyright KaiVac, Inc., 2003.)

cleaning solution, keeping it clean for the entire operation, and the heads can be instantly changed out when moving from room to room (e.g., from a bathroom to a hallway) to avoid cross contamination. The dirty mop heads can be washed repeatedly (i.e., an estimated 300 washings) and reused.

Consider also the cleaning system from one manufacturer, KaiVac,<sup>®</sup> a “no-touch cleaning system ergonomically designed for greater employee health and productivity. The KaiVac (Figure 5.2) is a two-tank system—a clean water tank and a vacuum tank containing the waste water. It is designed for cleaning such areas as kitchens, public restrooms, and other public areas. When cleaning public restrooms, workers do not have to touch toilet surfaces, and the prospect of cross contamination is virtually eliminated. The company also claims that restroom cleaning is done in one-third the time with its equipment.

These are only two of the new and innovative products that have appeared in recent years. The science of cleaning, which had not changed appreciably for decades, is now undergoing a tremendous revolution. So, how does one become a “green cleaner?” The following article by one of the pioneers of the movement, Stephen Ashkin, gives housekeepers ten easy-to-follow tips for becoming “green.” More examples of green cleaning and cleaning for health appear in this and other chapters to follow.

## Floor Types and Their Care

Whether for a facility under construction or for the remodeling of an existing property, the executive housekeeper is often called upon to assist in the selection of the floor or floor coverings.

There are a multitude of variables that must be considered when selecting the appropriate floor or floor covering. The floor must meet the aesthetic requirements of the architect and/or interior designer. Floors must coordinate with wall and window coverings. They must also coordinate with the room’s furnishings.

Floor and floor covering selection is not predicated only upon design and aesthetic considerations, however; many other factors, such as durability, installation cost, maintenance cost, and ease of maintenance should also be considered in the selection process.

The amount and type of traffic to which a particular floor will be subjected must be determined before selecting the flooring. Next, the durability of the proposed floor materials to be subjected to the expected traffic must be considered. In other words, one must project how long each floor material under consideration can be expected to last when it is subjected to the expected wear.

The executive housekeeper should then estimate the cleaning and maintenance costs for each of the prospective floor materials over the life of the floor. These costs will include labor, chemicals, and equipment.

## 10 TIPS FOR CLEANING UP "GREEN"

### Create a Thorough Green Cleaning Program

A green cleaning program requires a complete overview of the cleaning program—from supply ordering to cleaning equipment and processes.

by Stephen P. Ashkin

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With the recent public interest in health concerns and the role cleaning plays in maintaining indoor air quality and controlling bacteria, building service contractors and facility managers who focus on cleaning for health and "green" cleaning will deliver a healthier and more productive environment for building occupants.

The following are 10 green cleaning tips to follow when cleaning commercial and institutional buildings.

**1) Work from a written plan**

Too many cleaners work without effective plans. Instead, they prioritize tasks by crisis or complaint—the bigger the crisis or louder the complaint the more resources devoted to its solution.

A proper cleaning plan addresses any unique requirements, such as:

- \* Individual occupants with existing health conditions or sensitivities
- \* Geographical settings
- \* Building age
- \* Changes in seasonal occurrences
- \* A stewardship component to involve all building occupants

A helpful guideline for proper cleaning plans can be found in ASTM E1971-98 (Standard Guide in Stewardship for Cleaning Commercial and Institutional Buildings).

**2) Use entryway systems**

A well-designed and maintained entryway system can have an enormous impact on both people's health and cleaning costs. Note: 80 to 90 percent of all dirt enters a building on people's feet.

Use mats, grills, grates, etc.—covering a minimum of 12 consecutive feet—inside and outside to prevent dirt, dust, pollen and other particles from entering the building.

Additionally, design outdoor walkways to eliminate standing water, and be rough enough to help scrape soils off shoes, but not rough enough to create slip and fall hazards.

The first set of entryway systems should be capable of capturing larger particles while the final component should be capable of capturing fine particles and drying wet/damp shoes.

**3) Use a clean, well-vented closet**

Chemical and janitorial equipment storage and mixing areas can have a serious impact on indoor air quality (IAQ) as the items off-gas volatile organic compounds (VOCs).

To minimize the adverse effects from pollutants circulated throughout the building, operate these areas:

- \* With separate outside exhaust vents
- \* Without air re-circulation
- \* Under negative pressure

Also, make sure areas are well organized, and hazardous products are identified and segregated, especially those that are flammable, combustible or reactive.

**4) Adopt a durable floor care system**

One-third of the entire maintenance budget (\$0.35 to \$0.70 per square foot) is typically devoted to the care and maintenance of floors.

The activity of maintaining—burnishing, stripping and recoating—floors can create IAQ problems from VOCs and particles, as well as occupational hazards to custodians and huge environmental burdens.

Using highly durable products that don't contain heavy metals, which are toxic in the environment after disposal, can limit those hazards.

That combined with cleaning and application procedures that extend the period between stripping can reduce the long-term labor costs and liability to cleaning personnel and occupants.

Note: The initial (upfront) cost is typically higher than traditional systems, but offer long-term savings.

**5) Use environmentally preferable cleaning products**



Use of green—environmentally friendly and safe-to-use—cleaning products is a natural step in switching to green cleaning procedures.

Utilize environmentally preferable product specifications, such as those developed by Green Seal (GS 37), to ensure the green claims made by the manufacturers are verified.

**6) Use biobased/renewable resource based cleaning products**

Petroleum, a common building block of cleaning and other chemicals, is a non-renewable and limited resource, making use of these products not a sustainable practice.

Biobased renewable resources—such as corn, soy, coconuts and citrus fruits are now available in cleaning products to replace petroleum.

Not only is their use a more sustainable practice, but generally their production is more benign than their petroleum-based counterparts.

**7) Use concentrated products**

Concentrated cleaning products reduce packaging—boxes, bottles, etc.—and the resulting impacts on the environment from mass transportation of large volumes of products.

Concentrates offer good environmental savings and are a great way to reduce the cost for cleaning chemicals. However, it's important to use the appropriate dilution of the concentrated cleaning products, otherwise the environmental and costs savings can be lost.

**8) Use environmentally preferable supplies**

Utilizing paper containing 100 percent recycled content, a minimum of 30 percent post-consumer recycled content, and that is manufactured without elemental chlorine or chlorine compounds can help the environment significantly.

Plastic trash can and other liners should utilize a minimum of 30 percent post-consumer recycled content to reduce the use of petroleum.

**9) Use efficient equipment**

Carpet care equipment should be capable of capturing 99.79 percent of particulates 0.3 microns in size. In many applications, including hard floor care, backpack vacuums can accomplish this and save time and money.

Carpet extraction equipment should be able to heat the water, reduce the amount of water and chemicals necessary to do the job and remove sufficient moisture so that carpets can dry in less than 24 hours to minimize the potential for mold growth.

Equipment for hard floor maintenance, such as buffers and burnishers, should be equipped with active dust control systems, including:

- \* Skirts
- \* Vacuums
- \* Guards and other devices for capturing fine particles.

Carpet and floor care equipment should be electric or battery powered and durable and should have a maximum sound level less than 70 decibels.

**10) Implement an Integrated Pest Management (IPM) program**

An effective integrated pest management program removes the food, moisture, nesting and entry opportunities that allow pests to enter and flourish in a building, thereby reducing or eliminating the use of pesticides.

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Installation costs should then be added to the maintenance costs. This sum should be divided by the expected life of the floor (estimated in months). The monthly costs for each of the prospective floor materials can be compared, and this comparison can be used in the decision-making process. Certainly, other variables, such as how the intended flooring complements the overall design and the relative ease of maintenance, should be weighed against the cost considerations.

**An Unfortunate Trend**

Top management will often ask department heads to reduce costs, particularly during economically uncertain times. On the surface, deferring maintenance seems to yield an immediate savings; but does it? For example, carpet that is not regularly cleaned will for an extended period of time look none the worse for wear, but not regularly cleaning carpet can reduce its life by several years. When the cost of replacing carpet on a four-year cycle

versus a six- or seven-year cycle is factored into the formula, the dollars saved through deferred maintenance disappear.

**Floor Care Methods**

Floor care is a four-step process, according to Bill Saunders and Rick Mazzoli of Glit Inc. (Figure 5.3). In this section we explore each phase of the Saunders and Mazzoli FPMR floor care model.<sup>1</sup>

**Foundation**

The first phase of the FPMR model is **foundation**. Floor finishes are not permanent fixtures. Periodically, a floor must be stripped of its old **finish** and a new finish must be applied. Saunders and Mazzoli list four reasons to strip a floor of its existing finish:

1. When there is a breakdown in the floor surface and there are definite worn traffic areas that are beginning to show. These areas are indicated by a worn-away finish and/or seal, and the bare floor becomes exposed.
2. A noticeable flaking or chipping of the surface of the finish from too much old finish. This mainly occurs when the wet scrubbing procedure has not been followed.
3. When the “wet look” begins to show definite dark shadowy areas as you look into the surface of the floor. This is usually blamed on burnishing the floor without wet mopping first. The result? Shiny dirt!
4. When there is a staining from spills or from inadequate pickup of the cleaning solutions while mopping the floors.<sup>2</sup>

Once the decision has been made to refinish the floor, the first stage is to strip the floor of its existing finish.

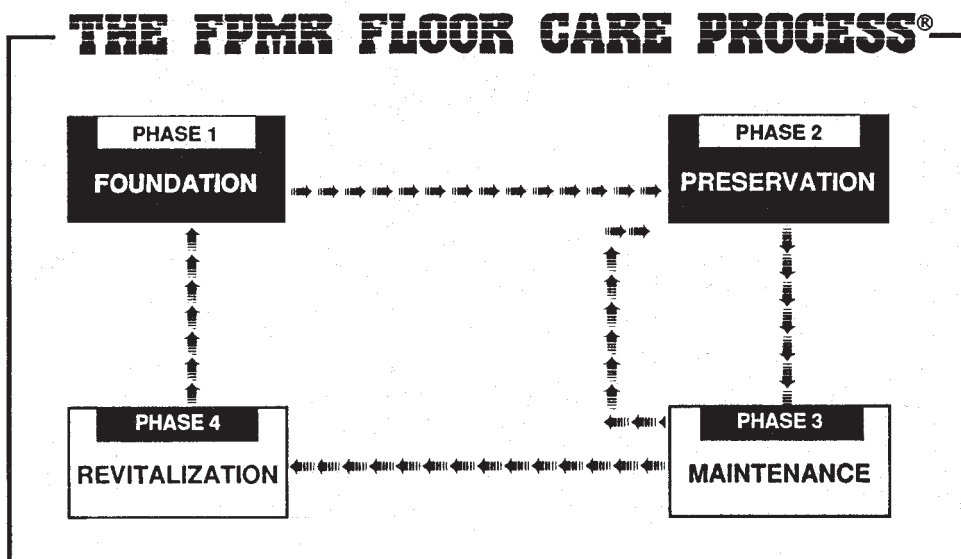
Figure 5.4 lists the equipment required to perform this task.

The purpose of **stripping** is to remove both the old floor finish and all of the dirt that has been embedded in that finish. This is accomplished in the following way: First dust mop the floor to remove all loose dirt and dust. Then get two clean mops and two clean mop buckets and fill the buckets half full with hot water. Add the recommended amount of stripping solution to one of the buckets. Rope off the areas to be stripped and place warning signs at appropriate locations. Place mats at the exits to the area being stripped so that the stripping solution is not tracked to other floors.

Lay down a generous amount of the stripping solution in a small area of the floor and let stand for approximately five minutes. Do not allow the solution to dry. If allowed to dry, the stripping solution, mixed together with the old finish, will turn into a dirty gray paste, and the entire process must be begun again.

After the solution has stood for five minutes, start by scrubbing along the baseboards or in the corners with a scrubbing pad. Then start scrubbing with a floor machine using a black or brown pad. Use a machine that runs between 175 and 350 rpm; do not use a high-speed buffer. Be careful not to splash the walls with the stripping solution. Using the floor machine, scrub in a straight line along the baseboard; then scrub from side to side. When a section of the floor has been covered, go back over the area in the opposite direction.

Once the area has been thoroughly scrubbed, the old finish can be picked up from the floor. The best way to perform this task is to use a wet/dry pickup vacuum, but if one is not available, you must have an additional pickup bucket. The same mop that was used for laying down the solution can be used to pick up the dirty solution.



**Figure 5-3** From Saunders and Mazzoli, *The FPMR Process of Floor Care*. (Used with permission of the authors.)



**Required Supplies & Equipment**

- Clean dust mop
- Dust pan and brush
- Standard speed floor machine with pad drive assembly or stripping brush
- Clean floor stripping pads
- Wet pick-up vacuum
- Set of "Wet Floor" signs
- 2 clean mop buckets with clean wringers
- 2 wet mop handles with clean looped-end banded mops
- Putty knife
- Doorway mats
- Hand pads and holder for edge cleaning
- Floor stripping concentrate
- Stripper neutralizer concentrate

**Figure 5-4** Required floor-stripping supplies and equipment. (Used with permission of the International Sanitary Supply Association, Inc.)

Rinse that mop in the pickup bucket and change the water when it gets dirty.

The next step is to completely rinse and dry the floor using a clean mop and clear hot water in the rinse bucket. Then either pick up the rinse water with the mop, or use the wet/dry vacuum to remove all rinse water from the floor.

Once the floor dries, check to see if there is a gray film on the floor by rubbing your hand over the dried floor. If a film is present, there is still old finish on the floor; the stripping procedure should then be repeated.

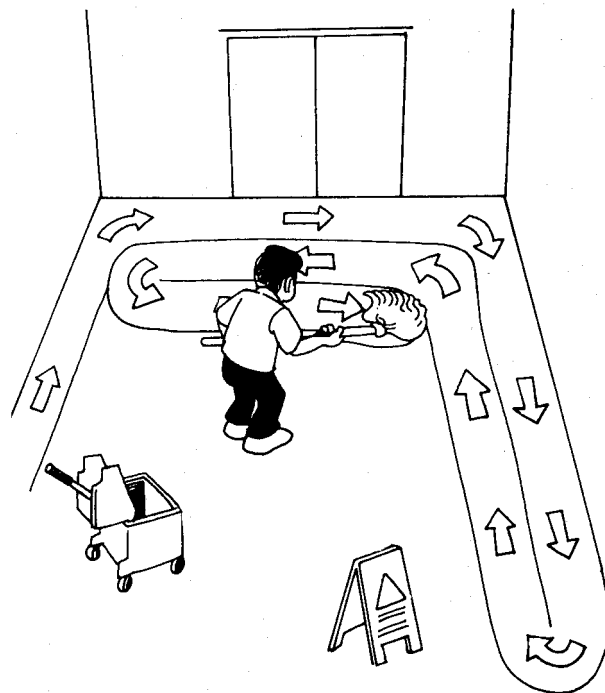
When finished, clean up all buckets and wringers, wash all mop heads, and wash the pad on the floor machine and all other equipment used.

The second phase involves the application of floor finish, or **sealer**. Sealers include the permanent-type, penetrating solvent-based sealers, used on concrete, marble, **terrazzo**, or other stone surfaces. Floor stripping does not remove these types of sealers. A second type is a water emulsion stripper that is placed on certain kinds of asphalt and tile floors. This type of sealer has to be replaced after floor stripping.

On today's market there is quite a variety of floor sealer/finishes, and many of them work quite well on the modern floors for which they were intended. For older floors, however, the application of a sealer, followed by a finish, is the standard approach.

A floor sealer/finish serves three purposes. First, it protects the floor from wear and staining caused by traffic, inadvertent spills, and chemicals used in the cleaning process. Second, it provides a safe surface upon which to walk. The appropriate finish should make the floor more slip-resistant. Third, the finish has an aesthetic appeal. It makes the floor shine, conveying a positive impression to both customers and employees. Today, the buzzword in floor care is the "wet look," which is an extremely high gloss on tile, wood, and stone floors. Floors of today must not only look clean enough to be noticed; they must positively shine. Interestingly, this current trend toward the "wet look" may appear dangerous to the uninitiated, but, in reality, these floor surfaces are often less slippery than a dull surface.

Figure 5.5 shows a listing of the required supplies and equipment to seal/finish a floor. The first step is to inspect the floor and make sure that it is completely dry



**Required Supplies & Equipment**

- Clean mop bucket and clean wringer
- Set of "Wet Floor" signs
- Floor finish
- Clean plastic trash bag
- Clean "Floor Finish" mop

**Figure 5-5** Required floor-sealing supplies and equipment. (Used with permission of the International Sanitary Supply Association, Inc.)

and clean. The International Sanitary Supply Association then recommends that the mop bucket be lined with a plastic trash liner to save cleanup time.<sup>3</sup>

Using either a clean nylon mop, a lamb's wool applicator, or a mechanical applicator designed for the task, first apply the finish next to the baseboard in smooth strokes (see Figure 5.5). Then apply the finish to the center area with figure-eight strokes if using the mop. Be sure that the first coat and all subsequent coats are *thin* coats. Thick coats of finish do not last as long and can make for a very slippery surface. Four thin coats are far better than two thicker coats.

After the first coat is dry to the touch, let the floor sit for at least the length of time that it took the first coat to dry before applying a second coat. Repeat this procedure for each coat.

To avoid finish buildup in corners and along the baseboards, do not apply more than two coats within 12 inches of the walls.

Finally, allow the floor to dry as long as possible before buffing or burnishing, and keep the floor closed to traffic as long as possible. Seventy-two hours is the optimal drying time for most floor finishes.

**Buffing** (or polishing) the floor is done with a floor machine that delivers up to 1½ horsepower and turns at 175 to 350 rpm. **Burnishing** is accomplished with a different type of floor machine that places less weight on the floor, which allows it to turn at speeds in excess of 1000 rpm. This higher speed, which creates more friction, creates the high-gloss “wet look” in floors that has become so popular.

Whichever type of machine is issued, the type of pad used is the same (white in color). There is a universal color code that is adhered to by all pad manufacturers to ensure that the proper type of pad can be used for each application. Black and brown pads are used for stripping, blue and green pads for scrubbing, red for spray cleaning, and white for polishing.

Once the finishing process is completed, all equipment should be washed immediately. Washed mop heads should be segregated by their original use and should not be used for any other application.

A tile or terrazzo floor beginning to turn yellow indicates that too much finish has been applied to the floor, and it then becomes necessary to strip one or two of the layers off the floor in order to restore it to its original luster. One positive note is that the new polymer finishes do not yellow like the old wax finishes.

### Preservation

The second phase of the FPMR model is preservation.<sup>4</sup> This is accomplished through three techniques: sweeping/dust mopping, spot mopping, and the use of walk-off mats.<sup>5</sup>

Sweeping is done only when the floor surface is too rough for a dust mop. Push brooms are used for large ar-

reas, and old-fashioned corn brooms are best for corners and tight spaces. A practiced sweeper develops a rhythm and “bounces” the push broom to avoid flattening the bristles.

Dust mopping is the preferred way to remove dust, sand, and grit from a floor. If these substances are not removed from a floor on a daily basis, they will scratch the surface of the finish, diminishing its luster, and will eventually penetrate down to the floor itself.

Use the largest dust mop that is manageable. When mopping, keep the mop head on the floor at all times and do not move it backward. When you reach the end of a corridor, swivel the mop around, and on the return pass, overlap the area that you have dusted by about 8 inches. Use a dust pan to sweep up accumulated trash, and pick up gum with a putty knife.

Clean the mop frequently by vacuuming the mop in the custodian's closet or by shaking the mop in a plastic bag. The time to treat a mop is at the end of dusting, not at the beginning, so that the mop will have a chance to dry out. Never use oil-based dust mop treatments; these can discolor a stone floor. The mop head should be periodically removed and washed when it becomes saturated with dirt.

When finished, hang the mop up with the yarn away from the wall. Do not let the mop stand on the floor or touch a wall surface because it may leave a stain.

Spot mopping is essential to the preservation of a floor's surface. Liquids and solids that are spilled on the floor's surface, if left for any length of time, may penetrate the finish and stain the floor. Even acids from fruit juices may wreak havoc on a floor if they are not immediately cleaned up. A mop and bucket should be made available to take care of these accidents.

When spot mopping, clean cold water should be used so that the finish on the floor is not softened. Detergents should be avoided unless they become a necessity; that is, when a substance has been allowed to dry on the floor. If necessary, use a pH neutral detergent; avoid abrasives, and dilute the detergent to a level that will accomplish the task but will not harm the finish.

The use of walk-off mats is the third preservation method. Their purpose is to prevent dirt and grit from being tracked onto the floor's surface from outside sources. There are three considerations when using walk-off mats: (1) make sure that the mat is large enough so that everyone will step on the mat at least twice with the same foot; (2) select a mat that correlates to the type of soil that is being tracked into the area; and (3) change out dirty mats. A mat that is saturated with dirt and soils will be a source of floor contamination rather than a cure for that contamination.

### Maintenance

The third phase of the FPMR model is maintenance.<sup>6</sup> This involves the periodic removal of stains, dirt, and



scuffs that appear on the surface of the finish. Its purpose is to produce lustrous, shiny, clean floors. Maintenance encompasses damp mopping, spray buffing, and burnishing. These techniques are done sequentially, and each technique is often performed immediately after the preceding one.

Before the floor can be damp mopped, it must first be dust mopped. After the floor is dusted, the equipment listed in Figure 5.6 must be assembled. Add neutral or mildly alkaline detergent to the mop water. The detergent used may be the variety that needs no rinsing. If not, the floor will need to be rinsed after the detergent solution is applied. Immerse the mop in the bucket and wring it out until it is only *damp*. Use the same pattern in the damp mopping of a floor that was used in the application of stripper to the floor.

The solution in the bucket should be changed when the water becomes dirty. A brush or a floor machine may be used for stubborn spots, and a squeegee may be used to help speed the drying of the floor. Baseboards should be wiped off immediately if solution is splashed on them.

As noted in the "Foundation" section, all equipment should be cleaned upon the completion of a task.

**Spray buffing** may follow the damp mopping procedure. Spray a section of the floor (approximately 4' × 6') with the buffing solution, and buff the floor with a floor



#### Required Supplies & Equipment

- Clean dust mop
- Dust pan and brush
- Floor Machine (175-400 rpm) with pad drive assembly or brush
- Clean floor polish pads
- Clean mop bucket with clean wringer
- Wet mop handle and clean looped-end banded mop
- Approved detergent solution appropriate for the area
- Spray buff solution in dispensing container
- "Wet Floor" signs

**Figure 5-7** Spray-buffing supplies and equipment. (Used with permission of the International Sanitary Supply Association, Inc.)

machine using a red buffing pad. Buff the area with a side-to-side motion until the floor begins to shine. Allow the machine to overlap the previously buffed area and change the dirty buffing pads frequently. Figure 5.7 shows a list of the required supplies and equipment needed for spray buffing.

Burnishing, or dry buffing, uses a high-speed machine that produces 300 rpm to 1500 rpm, depending on the particular model. This machine is operated in a straight line rather than a side-to-side motion. The white floor pad is used for dry buffing and should be changed frequently. As with spray buffing, it is wise to overlap completed areas when burnishing to ensure a uniform finish.

#### Revitalization

The fourth phase in the FPMR model is revitalization.<sup>7</sup> Revitalization, or deep scrubbing, involves removing one or more layers of the old finish and applying new finish. The first step is to combine cool water with a neutral or mildly alkaline cleaning solution, which is then applied to the floor and scrubbed with a floor machine using a black pad. The floor machine is passed over the floor once to lessen the chance of removing too much finish, and cool rather than hot water is used because hot water would soften all the layers of finish.



#### Required Supplies & Equipment

- Clean dust mop
- Dust pan and brush
- Automatic floor machine with pad driving assembly or brush
- Clean mop bucket with clean wringer
- Wet mop handle with clean looped-end banded mop
- Squeegee with handle
- Floor pads
- Putty knife
- Approved detergent solution appropriate to the area
- Set of "Wet Floor" signs
- Clean wipers

**Figure 5-6** Required damp-mopping supplies and equipment. (Used with permission of the International Sanitary Supply Association, Inc.)

The dirty water is picked up with a wet vac or mop, and the floor is rinsed using a clean mop and clean rinse water. Once the floor is dry, one or two coats of finish are applied, and the floor can then be buffed to a renewed shine.<sup>8</sup>

In the next section we review the major varieties of floors and the floor care requirements peculiar to each variety. The following suggested floor-care techniques are meant to be only general guidelines for specific types of floors. Readers are cautioned to follow the guidelines of the manufacturer in regard to cleaning supplies and techniques.

## Nonresilient Floors

**Nonresilient floors** are those floors that do not “give” underfoot. Their hardness ensures their durability. Dents are not a problem with these types of floors. However, the hardness of these types of floors is also a major drawback. They are extremely tiring to those who must stand on them for any length of time.

### Brick

Brick is not commonly used as flooring material for interiors, except to convey a rustic theme. Brick floors are normally left in their natural unglazed state and color, but they can be sealed and finished for some interior applications.

Unglazed bricks are made of a highly porous material, and they provide a highly durable, fairly slip-resistant floor, but the mortar used between the bricks can deteriorate rapidly if it is not properly maintained. Deteriorating mortar and loose bricks can quickly become a serious hazard for slip-and-fall accidents.

Another caution is to not use bricks where there may be grease spills: Since an unglazed brick is very porous, spilled grease and oil will be absorbed into the brick and will be very hard to remove. If the floor then becomes wet, the surface of the brick will have this oil and water mixture, making for a very slippery surface.

**CLEANING PROCEDURES.** Brick floors create special problems in cleaning. If the bricks are the specially made type of slip-resistant brick, they will cause cotton mop heads to fray. Also, unglazed bricks tend to become very dusty.

The best approach to cleaning a brick floor is to vacuum it with a brush and, when mopping, use a bristle brush in combination with a wet/dry vacuum.

**SEALING, FINISHING, STRIPPING.** Although the bricks themselves are not always sealed, the mortar between the bricks needs to be sealed and maintained on a regular basis. Be sure to select a sealer that is designed for this application.

Finishes, such as waxes and acrylics, are not normally applied to brick surfaces; because of this, there is no need for stripping.

## Terra-cotta and Ceramic Tiles

Like brick, ceramic and terra-cotta tiles are made from clay that is fired in a kiln. However, ceramic tile differs from brick in that a coating is applied to one side of the tile and the tile is then fired in a kiln, creating a surface that is almost totally impervious to soil and liquids.

Terra-cotta tiles, typically 6 inches square, resemble bricks because they are left in their natural color, and they do not have the glaze coat that is commonly applied to ceramic tile. The color of terra-cotta is traditionally a reddish-brown. One variety of terra-cotta is often used in kitchen floor applications because it is marketed with a rough surface that makes it slip-resistant in greasy conditions.

These tiles can also be classified as completely nonresilient surfaces, and since there is no “give” to the tile, care must be taken not to drop heavy, hard objects on the floor that could pit or crack the surface.

Ceramic tile comes in a multitude of colors and can have either a matte or glossy surface. Care must be taken when selecting ceramic tile because certain solid colors will show dirt quite easily. Ceramic tile also appears on walls and countertops, as well as on interior and exterior floors. Figure 5.8 is an example of imported ceramic tiles used to create a mosaic in a public area for a special effect.

Finally, here is one note of caution regarding ceramic tile and its use on certain types of floors: Unless a special slip-resistant surface is employed, tile surfaces that are wet, greasy, or icy make for a very dangerous floor surface.

**CLEANING PROCEDURES.** The tiles must be cleaned frequently to remove dust and grit that could damage the glaze on the tile. Cleaning procedures might include dust mopping, damp mopping, and light scrubbing when needed. Cotton mop heads should not be used on tiles that contain slip-resistant surfaces, because these surfaces will quickly shred a traditional mop head. Scrubbing should be done with brushes, and the water should be picked up with a wet/dry vacuum.

**SEALING, FINISHING, AND STRIPPING.** The tile does not need to be sealed because it already has a scratch- and stain-resistant surface; however, the grout between the tiles has to be sealed with a sealer that is specifically designed for ceramic tile grout.

Finishes are not normally applied to ceramic tiles, so stripping is not a concern.

## Concrete

Concrete floors were once used for their utility, not for their beauty. They are composed of cement, rocks, and sand, to which water has been added to initiate a chemical reaction that changes the ingredients into a stone-like material. Today, concrete floors are showing up in hotel lobbies as well as in loading docks. Concrete is now



**Figure 5-8** The floor of the Bellagio’s Conservatory is as beautiful as the real flower gardens just a few feet away. (Photo courtesy of Bellagio, MGM Mirage, Las Vegas, Nevada.)

being colored with dyes and stamped with stencils to look like tile, stone, brick, and even wood. Plain old concrete surfaces can be given a new look with concrete overlays and epoxy coatings. Decorative concrete that will last the life of the building is rapidly becoming a preferred material for commercial flooring. Even the mall of the sophisticated Forum Shops at Caesar’s Palace in Las Vegas has decorative concrete flooring.

**CLEANING PROCEDURES.** The cleaning procedures that may be used on a concrete floor range from a daily dust mopping, to damp mopping, to heavy scrubbing to remove grease and soils. Since concrete, and especially unsealed concrete, is so porous, an immediate effort must be made to clean up spilled liquids before they are absorbed into the concrete and cause unsightly stains.

**SEALING, FINISHING, AND STRIPPING.** Concrete definitely requires sealing. An unsealed concrete floor will be constantly dusty and will absorb dirt and any liquid that is spilled on it.

The sealer used on a concrete surface must be a permeable sealer. Moisture and acids in the concrete percolate to the surface as the concrete dries. A permeable sealer is one that allows moisture and acids to evaporate from the surface of the concrete. If a nonpermeable sealer is used, the moisture and acids will be trapped on the surface just under the sealer. As the acids and moisture begin to concentrate, the surface of the concrete will begin to disintegrate.

The concrete must be completely clean before a sealer is applied; if it is not, the sealer will not adhere to

the surface. If the concrete is new, special sealers must be used to allow the concrete to continue to “cure.”

Finishes may be applied to concrete floors, but they should be compatible with porous floors and permeable sealers. Color sealers and paints should be avoided because once they start to show wear, they become unsightly and are almost impossible to repair. However, on a cured floor, epoxy sealers and paints can be applied to help diminish the effects of heavy wear. Finishes can be buffed with a rotary floor machine.

Stripping the finish from a concrete floor normally requires an alkaline stripping agent that has been properly diluted with water. The stripping solution is then applied to the floor surface using a rotary floor machine with an abrasive pad.

After the old sealer is removed and before a new sealer is applied, the floor is often treated with a special acidic solution that will “etch” the surface of the floor, providing greater adhesion for the new sealer.

### Epoxy

The **epoxy** floor is a compound of synthetic resins that provide an extremely durable, seamless floor. These floors are an ideal choice when a floor is required to withstand massive loads. Decorative particles can be mixed into the epoxy resin to provide an attractive, yet highly utilitarian, flooring.

Epoxy floors are ideal for trade show facilities, locker rooms, loading docks, and shower areas.

**CLEANING PROCEDURES.** Exotic procedures and techniques are not necessary when cleaning an epoxy

floor; sweeping, mopping, and scrubbing with an alkaline cleaner diluted with water are sufficient.

**SEALING, FINISHING, AND STRIPPING.** Epoxy floors should be sealed, and they can receive a finish; however, finishing is not necessary to the maintenance of an epoxy floor. Stripping is accomplished with commercial alkaline strippers used in conjunction with a rotary floor machine.

### Stone Floors

Common types of natural stone flooring include marble, travertine, serpentine, granite, slate, and sandstone (see Figure 5.9). All natural stone products share certain properties that must be taken into consideration by the professional housekeeper to ensure the proper care of this type of flooring.

Natural stone flooring may look impervious to the elements, but it is decidedly not as resistant to damage as it looks. Acids and moisture can have disastrous effects on natural stone. Some acids are present naturally in the stone, but even the acid from spilled orange juice can have a deleterious effect on stone floors, causing pitting, cracking, and **spalling**. These floors need to have moisture-permeable sealers applied so moisture and acids do not build up under the sealer and destroy the floor's surface. Oils and grease can permanently stain untreated stone floors because these floors are extremely porous.

**CLEANING PROCEDURES.** To prevent the staining of stone floors, the dust mops should be free of all oil-based dusting compounds. Dusting should be carried out on a daily basis because grit, sand, and other abrasives that are tracked onto a stone floor will quickly mar the floor's finish.

A pH-neutral detergent is recommended to clean all natural stone floors. Highly alkaline cleaners, as well as acidic compounds, will damage stone floors. When mopping stone floors, do not let water or chemicals remain on the floor. A final rinse of clean water should be applied and then immediately picked up with a mop or a wet/dry vacuum.

**SEALING, FINISHING, AND STRIPPING.** Most stone floors need to be protected with a moisture-permeable sealer. Finishes normally should be applied in one or two thin layers and buffed. Applying heavy layers of finish does not work well, because it causes stone floors to become slippery.

When stripping the finish from a stone floor, make sure that the stripping agent is either neutral or mildly alkaline. Acids and strong alkalines can damage virtually all types of stone floors.

### Terrazzo

A terrazzo floor is a mosaic flooring composed of portland cement that has been embedded with marble and/or granite chips. See Figure 5.10, in which a terrazzo floor is being burnished with a high-speed burnisher. Once the floor has set, it is then ground by progressively finer grit stones until a perfectly smooth and polished surface is obtained. The chips used in a terrazzo floor can differ in both size and color, creating a variety of colorful and attractive floors.

With proper care, a terrazzo floor will hold its original luster and will last indefinitely. What destroys most terrazzo surfaces is not use, but improper maintenance.

**CLEANING PROCEDURES.** Terrazzo should be dusted daily to remove harmful grit and sand that can wear down the surface, but dust mops should not be treated



**Figure 5-9** Agglomerate marble, a fabricated marble composed of natural marble stones blended with polyester resins, from Dal Tile Corporation. (Used with permission of Jacqueline & Associates, Las Vegas.)





**Figure 5-10** Burnishing a terrazzo floor. See also Appendix I. (Used with permission of the Advance Machine Company.)

with oil dressings because oil is the archenemy of a terrazzo floor. Once oil or grease penetrates a terrazzo floor, it is virtually impossible to remove.

Steel wool should not be used on the surface of a terrazzo floor because the steel wool may put rust stains on the marble chips.

When selecting detergents and cleaners for terrazzo floors, stay away from acid cleaners, abrasives and scrubbing powders, and preparations that have an alkalinity above pH 10. Always rinse a freshly scrubbed floor, and do not allow water or cleaners to remain on the floor surface.

**SEALING, STRIPPING, AND FINISHING.** All terrazzo floors must be sealed with a sealer designed for this particular type of floor. The sealer must be water-permeable so that moisture can evaporate from the surface of the terrazzo but will also help to prevent the absorption of oils and chemicals into the terrazzo.

When deep scrubbing or stripping a terrazzo floor, avoid highly alkaline strippers.

Since the floor has a natural sheen, finish is often thought to be unnecessary, but if a mirrored finish is de-

sired (often referred to as the “wet look”), one or two thin coats of finish burnished with a high-speed buffer will produce the sought-after result.

## Resilient Surfaces

**Resilient floors** have various degrees of “give” to their surfaces. This degree of resiliency ranges from asphalt floors, which are almost as hard as a concrete or stone surface, to carpeted and padded floors. Under this classification we have included asphalt tile, cork, **linoleum**, rubber, vinyl, vinyl composition tile, and wood. Because the care and maintenance of carpet is such an involved and complex topic, the treatment of carpet has its own section in this chapter. Finally, some universal precautions to take with all resilient floors is to limit static loads to no more than 250 pounds per square inch, remove those little metal domes from furniture legs, and use rubber rollers on chairs.

### Asphalt Tile

Asphalt tile is one of the lowest-cost resilient floor coverings available, and it is quite durable under most normal conditions. It will, however, become brittle when exposed to prolonged periods of low temperature and will also dent when heavy objects are present on its surface, particularly when the ambient air temperature is above 80° Fahrenheit.

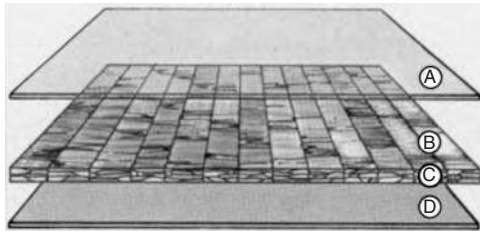
Asphalt tile is also fire-resistant; in fact, it is one of the most mar-resistant of all floorings in regard to cigarette burns.

**CLEANING PROCEDURES.** Dust mopping, damp mopping, and scrubbing, as described in the “Floor Care Methods” section, will maintain and preserve the asphalt tile floor. One important item to remember when wet mopping is to never let water stand for any length of time on an asphalt tile floor. Standing water will attack the adhesive cement and will cause tiles to curl and loosen.

**SEALING, STRIPPING, AND FINISHING.** Asphalt tile is normally given several thin coats of finish and burnished or buffed with a floor machine. Never let stripping solution remain on the floor; always pick up the dirty solution immediately after scrubbing with a floor machine to avoid curling or loose tiles.

### Cork Tile

Cork tile is made from the outer bark of cork oak trees grown in Spain and Portugal. The cork is ground into large granules, mixed with synthetic resins, and pressed into sheets, which are then cut into tiles. Contemporary cork tiles for floors usually have a top layer of clear vinyl applied to them (see Figure 5.11). This vinyl layer protects the cork from staining and wear.



- A. Pure transparent vinyl-bonded wear surface
- B. Natural cork
- C. Edges sealed against moisture
- D. Bonded vinyl moisture barrier

**Figure 5-11** How a vinyl-bonded cork floor from Permagrain Inc. is constructed. (Used with permission of Jacqueline & Associates, Las Vegas.)

Cork tiles traditionally have had limited application in industrial or institutional settings. One reason is that cork is susceptible to staining because it is one of the most porous of all floor coverings. Another limitation is that it is not durable; it is highly susceptible to abrasion. Cinders, sand, and gravel tracked on to a cork floor will severely shorten its life span. Finally, it is expensive. Cork rivals ceramic tiles in cost and does not have nearly the useful life of ceramic tile.

Although the use of cork has its drawbacks, it has three favorable properties that make it a desirable floor covering in limited settings: It absorbs sound, it is attractive, and most important, it is the most resilient of all floorings. This resilience has one drawback: Heavy objects resting on small weight-bearing surfaces will easily dent cork tile floors.

**CLEANING PROCEDURES.** Natural cork tile floors are among the most expensive of all floors to maintain. Cork tile floors should be swept daily, or more often, depending on usage. Natural cork tiles should only be damp mopped without detergents on infrequent occasions.

Vinyl-coated cork tiles can be wet mopped, providing that detergent solutions are not allowed to remain on the tiles for any length of time.

**STRIPPING, SEALING, AND FINISHING.** To remove the seal from a natural cork floor and repair any staining or discoloration, a special solvent is first applied and removed along with the seal and finish. Then the floor is sanded to remove surface stains. This is followed by successive coatings of seal followed by several thin coats of finish. The floor is then buffed.

Vinyl-covered tiles need not be sealed but can be given a few thin coats of finish and buffed with a floor machine.

### Rubber Floors

All modern rubber floors are made from synthetic rubber, such as **styrene butadiene rubber** (SBR). Rubber

tiles are cured or vulcanized by the application of heat. Rubber floors are nonporous, waterproof surfaces. One major advantage is that they are quite resilient and will remain resilient over a considerable temperature range.

Rubber flooring is susceptible to alkalines, oils, grease, solvents, ultraviolet light, and ozone in the air. When attacked by these components, a rubber floor will often become tacky and soft. It will then become brittle and begin to crack and powder.

Rubber tiles often have knobs on the surface or a tread pattern to improve traction, especially if liquids are frequently spilled on the surface.

**CLEANING PROCEDURES.** Highly alkaline cleaning solutions should be avoided; it is best to use pH-neutral detergents whenever possible. Cleaning solvents such as naphtha and turpentine should never be used on a rubber floor.

Rubber floors are fairly easy to maintain. Daily dust mopping and an occasional damp mopping are all that is needed to maintain the floor.

**STRIPPING, SEALING, AND FINISHING.** Rubber floors need not be sealed, so the task of stripping is not necessary. A water emulsion floor polish can be applied, but it also is not necessary. The rubber floor will buff to a nice shine without the use of hard finishes. If a finish is used, it should be the type that is tolerant of a flexible floor surface and will not be susceptible to powdering. A high-speed floor burnishing system is not recommended because it may leave abrasion or burn marks on the floor.

### Vinyl Floors

There are several types of vinyl floorings and tiles. The major varieties include vinyl asbestos tiles, vinyl composition tiles, homogeneous or flexible vinyl tiles, and laminated vinyl flooring.

Vinyl asbestos tiles are no longer made and have been removed from numerous commercial and residential settings because the **asbestos** in the tile is a known **carcinogen**. Improper cleaning of vinyl asbestos tile can release deadly asbestos fibers into the air and present a very real health hazard.

Laminated vinyl flooring is less expensive to manufacture than vinyl composition or **homogeneous** vinyl floors. The low initial cost may be deceiving, however, for once the top wear layer is worn through, the floor will have to be replaced. Some laminated floorings are guaranteed for only three years with moderate use. The cost of laminated vinyl flooring will vary in proportion to the thickness of the top vinyl wear layer.

In addition to the vinyl resins, vinyl composition tiles contain mineral fillers such as asphalt and pigments. Homogeneous vinyl tile may be either flexible or solid, and it has become the preferred standard for resilient tile flooring. It is practically unaffected by moisture, oils, and

chemical solvents. The wearability of top-grade vinyl tile is in direct proportion to its thickness, as the colors and patterns of the tile are present throughout the thickness of the tile. Less expensive vinyl tiles will carry the pattern and color only on the surface of the tiles.

Today, vinyl tiles come in a wide variety of colors and textures. They are made to resemble wood, marble, granite, travertine, brick, and ceramic tiles. Some of these faux tiles are extremely good facsimiles, and they sell for far less than the actual product. Bruce is a flooring manufacturer that has set the stage for using different types of vinyl inlays in commercial traffic zone areas. (See Figure 5.12.)

**CLEANING PROCEDURES.** Modern homogenous vinyl needs only to be dusted and damp mopped to restore its luster. Daily dusting to remove sand and grit is extremely important to the care of vinyl because most types will scratch under heavy foot traffic. Some tiles are specially treated with a scratch-resistant seal that is applied at the factory.

Modern vinyl is unaffected by alkaline detergents, but pH-neutral detergents are recommended over heavy alkaline products.

**STRIPPING, SEALING, AND FINISHING.** Sealing, finishing, and stripping are not recommended for “no-wax” vinyl floors. Vinyl is nonporous, so sealing is not necessary and finish does not adhere well to no-wax vinyl



**Figure 5-12** Bruce vinyl flooring made to look like a stone and wood inlay in a commercial traffic area. (Photo courtesy of Tile and Carpet Gallery, Las Vegas, Nevada.)

flooring. No-wax vinyls are particularly susceptible to abrasion and should be used only in areas where the foot traffic is light to moderate. Purchasers of no-wax vinyl should look for “scratchguard” or other similar claims of protection.

On regular vinyl tile, finish is applied in thin coats and buffed. The finish is stripped by using recommended detergent strippers as described in the previous section on floor maintenance techniques.

Never allow a vinyl asbestos floor to become dry when stripping. Always keep the surface of the floor wet when operating the floor machine, and use the least abrasive strip pad possible. Also, never buff or burnish a vinyl asbestos floor that does not have a protective coat of finish. Dry stripping or buffing without a finish will release the harmful asbestos fibers into the air, which then can be inhaled and cause lung disorders.

#### Change Agent

#### Michael A. Berry

AUTHOR AND RESEARCHER

Michael A. Berry has more than 25 years of experience in the fields of management and public health. His professional interest in public health began in 1963 when he studied Arab refugee camps in the Middle East. He served as an Army Engineer officer in Vietnam, 1967–1968, where he dealt with many public health issues related to the civilian population and refugees. Since 1969 he has worked in environmental management and research programs related to air pollution, the assessment and management of toxic substances, and indoor environments.

Berry received his Ph.D. in Public Health from the University of North Carolina at Chapel Hill. He holds a graduate degree in management from Duke University’s Fuqua School of Business. He has many years of teaching experience and is currently an adjunct associate professor in the School of Public Health and in the Kenan-Flagler Business School at the University of North Carolina. He is particularly interested in environmental education for professionals who manage businesses that affect the quality of indoor and outdoor environments. His book, *Protecting the Built Environment: Cleaning for Health* (Tricom Twenty-First Press, January 1994), is considered to be a seminal work in the field, and he is credited with originating the term “cleaning for health.” Berry is seen as the founder of the modern cleaning industry.



### Wood Floors

There is nothing quite as attractive as the warmth and richness of wood floors (see Figure 5.13). Most hardwood floors are made from oak, but other popular woods include ash, beech, birch, hickory, maple, teak, and walnut. In addition to their attractiveness, hardwood floors are extremely durable if they are properly finished and maintained.

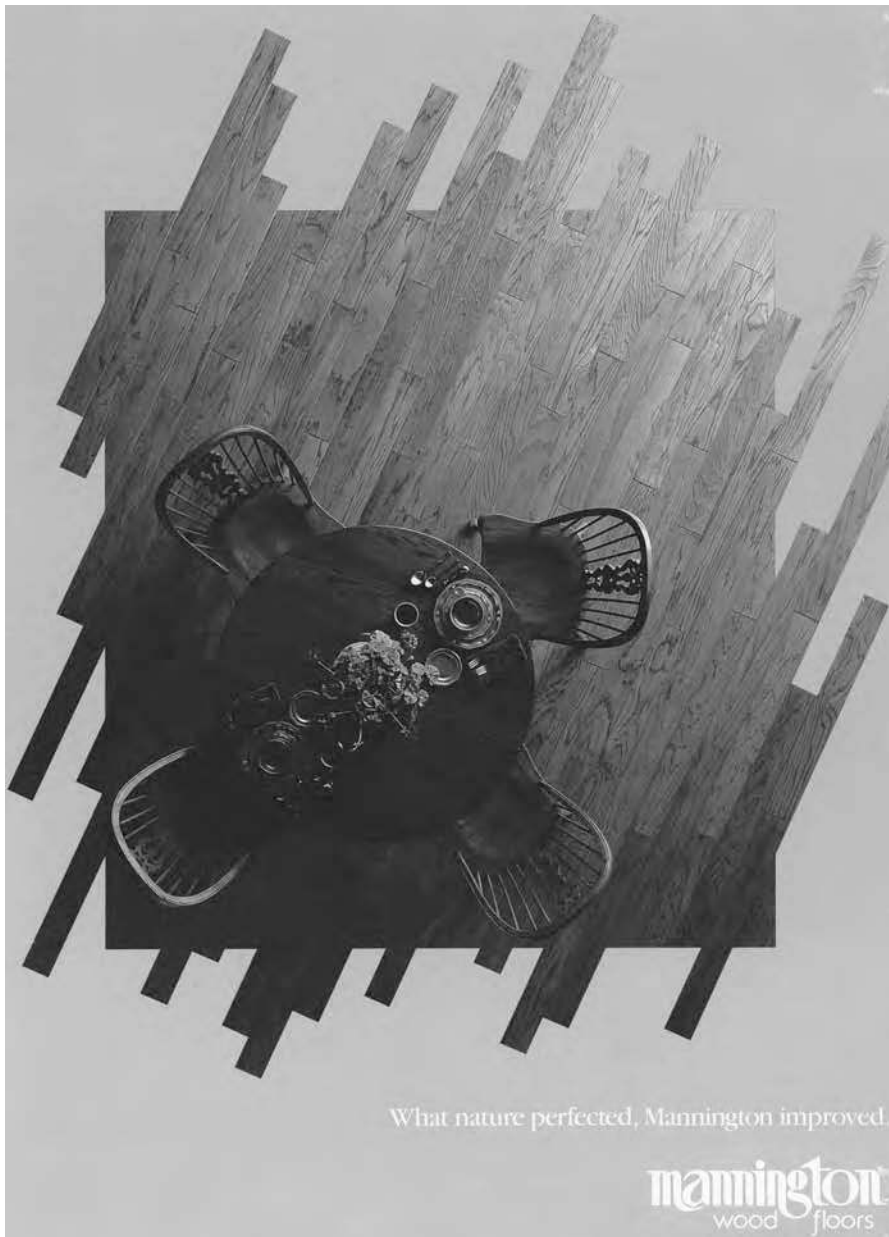
Unfinished wood floors will quickly deteriorate under even light use, as wood is an extremely porous surface. Unfinished woods are susceptible to dirt lodging in the grains, splintering of the wood fibers, abrasions caused by normal foot traffic, and, of course, moisture, the bane of wood floors. Too much moisture will cause a

wood floor to warp, and too little humidity will cause wood floors to shrink and crack.

To help forestall damage, most wood floors made today receive a factory-applied finish. In some instances the wood is heated to open its pores. **Tung oil** and **car-nuba wax** are then applied to seal the wood.

In another process, **polyurethane** is used to seal the wood. One firm uses liquid **acrylics** that permeate and protect the wood. Another company even sells a wood veneer floor that is sandwiched between layers of vinyl to make it impregnable to water and as easy to install and maintain as a pure vinyl floor.

Because there is a degree of resiliency in even the hardest of hardwood floors, precautions should be taken



**Figure 5-13** A Mannington wood floor. (Used with permission of Jacqueline and Associates, Las Vegas, Nevada.)



to protect the floor from furniture legs that may dent the flooring. Wood floors are particularly susceptible to metal or hard plastic rollers and to those small metal domes that are often found on the legs of office furniture.

**CLEANING PROCEDURES.** Preventive maintenance is the key to attractive and durable wood floors. One of the best prevention techniques is to use walk-off mats at exterior entrances, and rugs and carpet runners in high-traffic areas.

Wood floors should be dusted, but do not use an oily dust mop on a wood floor. The oil from the mop head may darken or stain the floor. Water is one of the most deleterious substances to a wood floor; consequently, it should not be used to clean most wood floors. Dusting, vacuuming, buffing, and, on limited occasions, a light damp mopping is all that is necessary to maintain a wood floor on a daily basis.

**STRIPPING, SEALING, AND FINISHING.** When a wood floor becomes badly stained or damaged, it is sanded to remove stains and marks. A sealer is then applied to the floor. There are many commercial wood sealers on the market today. Types of wood sealers include oil-modified urethane sealers, moisture-cured urethane sealers, the “Swedish-type” sealers, and water-based sealers. In most instances, the same sealer that was initially used on the floor must be used for subsequent applications. Repeated applications of certain types of sealers will darken the color of the floor over time. Sanding and sealing a floor should not be done frequently; most modern wood floors can tolerate a maximum of only three to five sandings before the entire floor must be replaced.

Surface finishes such as urethane, **varnish**, and **shellac** are not recommended for many modern wood floors. Most require only an occasional waxing and buffing, and certain modern treated wood floors may never require refinishing.

Again, it is always wise to follow the manufacturer’s recommendations regarding the maintenance of any flooring or floor covering.

As we have previously stated, carpets and rugs are unquestionably the most resilient of all flooring materials and it is to this area that we now turn our attention.

## Carpets and Rugs

The use of carpets and rugs can be traced back three thousand years to the Middle Eastern kingdoms of Babylon, Sumeria, and Assyria.

Carpet is typically installed wall-to-wall to eliminate the maintenance of hard flooring surfaces around the edge of a carpet. Rugs, on the other hand, are often used to accentuate a tile or wood floor. In areas where there

is heavy foot traffic, rugs can be used to equalize wear and to help prevent tracking onto other floor coverings.

Carpet offers a number of benefits over hard and resilient flooring materials. Carpet prevents slipping; it provides an additional source of insulation—thus making it less expensive to heat an interior in winter; it has acoustical properties that can effectively lower noise levels; and it is the most resilient of all floor coverings, which is a major benefit to individuals who must remain on their feet for extended periods.

## Carpet Components

Generally, carpet is composed of three elements: **pile**, **primary backing**, and **secondary backing**; it is often accompanied by a fourth element, **padding**.

Pile is the yarn that we see and can readily touch. The fibers can be either synthetic or natural in composition. Pile density is one hallmark of carpet quality; the greater the density of the pile, the better the carpet. Carpets with greater pile density hold their shape longer and are more resistant to dirt and stains. One common test of density is to bend a piece of carpet, and if the backing can readily be seen, the carpet is of an inferior quality. Density of pile is measured by the number of pile ends or tufts across a 27-inch width, called the *pitch* in woven carpets or *gauge* in tufted varieties. Another indicator of durability is the carpet’s face weight. The **face weight** is the weight of the carpet’s surface fibers in ounces or grams per square yard. The greater the face weight, the higher the quality. The height of the pile is a third measure of carpet quality; longer fibers are better than shorter fibers. A fourth measure is the amount of twist the pile fibers have received. The tighter the twist, the better the carpet.

The backing is on the underside of the carpet; it secures the tufts of pile and gives additional strength and stability to the carpet. Most carpets have a double backing: a primary backing, to which the yarn is attached, and an outer backing called the secondary backing. A layer of latex adhesive is sandwiched between the two layers to seal the pile tufts to the primary backing.

Types of backing include **jute**, a natural fiber imported from India and Bangladesh, **polypropylene**, a synthetic thermoplastic resin, and foam rubber. The foam backing is often attached to the primary backing to provide a carpet with its own built-in padding, thus eliminating the need for separate padding. This is often done with less expensive carpeting. With more expensive carpeting, rubber-covered jute is the preferred material for the secondary backing. However, synthetic backings are more resistant to mildew, odor, and dry rot, and are non-allergenic.

Padding can be placed under carpet to provide extra insulation, deaden sound, add comfort, and extend the life of the carpet by serving as a “shock absorber.” Com-

mon types of padding include foam rubber, urethane foam, and natural materials such as jute and hair blends. The natural paddings are firmer than the synthetic materials. The choice of padding depends on the type of carpet being used, the level of comfort sought, and the amount and type of wear that the carpet will be subjected to under normal conditions.

Some experts recommend that no padding be used and that the carpet be glued directly to the floor in high-traffic areas or where carts with heavy loads will be used. Heavy padding is thought to increase friction and cause buckling and ripping, thus prematurely wearing out the carpet.

There are three sizes of carpets available on the market. Broadloom carpets are normally 12 feet in width, but they can be ordered up to 15 feet in width. Carpet runners come in widths from 2 feet to 9 feet. Carpet squares or tiles are 18 inches square. Carpet tiles are becoming quite popular for public areas such as halls, lobbies, and meeting rooms. New adhesives for carpet tiles make tile removal less of a chore than it has been in past years. Standard rug sizes vary from 3' × 5' to 10' × 12'. Custom sizes may be even larger.

Eventually, all carpets become worn and need to be replaced. However, old carpet can be recycled instead of being taken to a landfill. This is a win-win proposition for both the property and the environment. For the property, the cost associated with transportation and landfill charges can be severely reduced or eliminated entirely. For the environment, that carpet can come back in the form of a number of new products. It is estimated that 3.5 billion pounds (1.75 million tons) of carpet end up in landfills every year. This constitutes approximately 1 percent by weight (2 percent by volume) of the total municipal solid waste generated in the United States, according to the National Association of Home Builders. One use for old carpet is its manufacture into new carpet pad. Every effort should be made to reuse or recycle this valuable resource.

## Carpet Construction

Carpet construction describes the method by which the carpet is manufactured. It involves how the face yarns are anchored in the backing and the type of backing that is used. Today, well over 90 percent of all carpet produced is tufted carpet. Tufted carpet is produced by forcing needles, threaded with pile yarn, through the primary backing (usually polypropylene) to form tufts. A coating of latex adhesive is then applied to the backing to secure the tufts. The tufting process can be used to produce a multitude of carpet textures, including:

- **Cut loop:** The carpet yarn is tufted into islands of high-cut tufts and lower-loop tufts to form a sculptured pattern.

- **Level loop:** A simple loop pile with tufts of equal height, it is appropriate for high-traffic areas.
- **Multilevel loop:** A loop pile carpet with two or three tuft levels.
- **Plush:** The loops of the pile are cut, which makes for a relatively plain, clean, and formal effect. Pile that is ½ inch or less in height is called Saxony plush, and pile with a height above ½ inch is called textured plush.
- **Frieze:** Straight tufts are mixed with tufts that are given a built-in curl. The carpet does not show footprints and can be classified as being informal in texture.
- **Random shear:** A mixture of cut and uncut loops. This approach creates a highly textured appearance.

Needle-punched carpets are produced by a manufacturing method that punches the fibers into a structural backing and then compresses the fibers into a feltlike fabric. It is used mainly in indoor-outdoor carpets.

Flocked carpets are produced by electrostatically embedding short carpet fibers into a backing, producing a velvety-look cut pile surface.

Knitted carpets are produced by a method that uses a specialized knitting machine with different sets of needles to loop together the pile, backing, and the stitching yarns.

Weaving is the traditional way of making carpet on a loom. Interlaced yarns form the backing and the pile. Lengthwise yarns are called the *warp* and the yarns going across the carpet are the *weft*. Pile is part of the warp. There are three basic types of looms: the velvet, the Axminster, and the Wilton.

Woven and knitted carpets are the two most expensive types of carpet to construct.

## Carpet Fibers

Wool is the standard by which all synthetic carpet fibers are judged. Independent studies have shown that wool effectively outperforms fourth-generation nylon in soiling and appearance.<sup>9</sup> Wool is extremely durable and resistant to soiling, but it does have its share of negative properties. Since it is a natural material, wool provides a better breeding ground for bacteria, molds, and mildew. It is also more susceptible to damage from harsh or abrasive cleaners. Wool has very poor abrasion resistance. In low humidity, untreated wool generates more static electricity than synthetic fibers. Finally, it is quite costly. Not only is the wool itself more costly than synthetic fibers, wool carpets are normally woven or knitted, processes that are much more costly than tufting.

The most widely used carpet fiber is nylon; more than 90 percent of all carpets made today are nylon carpets. The fourth-generation nylon fibers in use today are quite resilient, fairly soil-resistant, and easy to clean, and they come in a variety of colors and textures. Nylon

fibers can also be protected by fluoro-chemical treatments, as in the case of Dupont's Stain-master carpets, which are treated with Teflon to improve their soil and stain resistance.

Another synthetic in use today is polypropylene (olefin), which wears very well and is not susceptible to sun fade, but it is not as comfortable underfoot as nylon.

Other minor synthetic fibers include acetates, acrylics, polyesters, and rayons. Although each of these has outstanding positive qualities, they do not possess all of the positive features shared by wool, nylon, and Olefin.

### Selecting the Appropriate Carpet

Different settings suggest different carpet specifications. Color, texture, pattern, and padding requirements will vary from location to location. What follows is a series of carpet specifications based on aesthetic considerations.

- Solid colors magnify the effects of dirt, litter, and stains.
- If you wish to project excitement, use warm colors; if relaxation is your aim, use cool colors in the darker shades.
- Avoid precise geometric patterns in dining rooms; use organic, free-flowing designs. These hide the dirt.
- Using low-level loop pile carpet tiles with no padding is the preferred approach for high-traffic areas.
- Multilevel loop and cut loop carpets are more difficult to clean.
- Use big patterns in big rooms and small patterns in small rooms.

Figure 5.14 shows a representative sampling of modern geometric carpet patterns.

### Carpet Installation

Executive housekeepers should resist all temptation to install new carpet. Laying carpet, resilient flooring, and hard floors is a job for professionals. An installation performed by amateurs often ends up costing the facility far more than was saved by not hiring professionals.

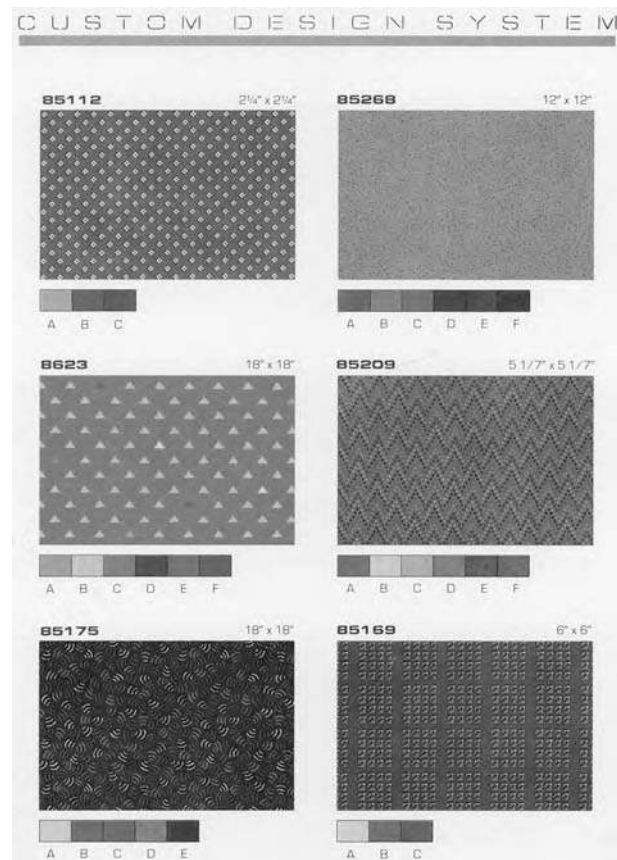
The installers should be brought back on the premises six months after the original installation to correct any buckles or bulges that have appeared in the carpet.

### Carpet Maintenance

Carpet maintenance is actually four related procedures that occur at intermittent times during the life cycle of the carpet.

### Inspection and Prevention

The most frequent activity is carpet inspection, which should occur on a continual basis. Carpets need to be in-



**Figure 5-14** Modern geometric carpet patterns. (Used with permission of Jacqueline & Associates, Las Vegas.)

spected for spills and stains, which are far easier to remove if they are treated before they have a chance to set. Staff in all departments, from engineering to food and beverage, should be instructed to report all carpet and floor spills to housekeeping as soon as they are discovered.

Prevention includes the use of mats to absorb dirt and spills around food preparation areas and the use of grates, track-off mats, and carpet runners to absorb dirt and grit and control wear at entrances and in high-foot-traffic locations.

### Interim Cleaning Methods

Interim cleaning methods include carpet sweeping, vacuuming, bonnet cleaning, and spot stain removal. Interim carpet care is absolutely necessary to remove gritty soil and spots before these elements become embedded in the carpet, causing the pile to wear prematurely. According to John Walker and L. Kent Fine, there are three sources of soils: tracked particulate soils from the exterior; spots, spills, and settling dust from the interior; and animal and vegetable oils, which are by-products from the dining room and kitchen areas.<sup>10</sup>



Soil buildup occurs at three levels of the carpet. At the top are light soils, dust, gummy sugars, and oily soils. In the middle are the heavier particles of dust and organic matter. At the base of the pile are the heaviest particles, such as sand and grit. Although the sand and grit are not necessarily seen, they do the greatest damage to the pile because they actually erode the pile fibers.<sup>11</sup>

It is estimated that an average of 79 percent of all soils can be removed by regular vacuuming.<sup>12</sup> However, the gummy and oily substances will continue to build up while binding the dry particulates to the carpet fibers, causing carpet erosion. Although vacuuming is the most critical factor in extending the life of the carpet, vacuuming alone is not enough. All carpet must be subjected to restorative cleaning methods on a periodic basis.

Standard vacuuming with an upright machine or hose vacuum is begun by plugging the cord into the electrical outlet. The plug should be a grounded three-prong plug. Inspect the cord and plug for wear. Begin vacuuming at the wall where the machine is plugged in, and work away from the plug to prevent cord entanglement. A three-foot-long push-pull stroke should be employed. Normally, only two passes over the carpet are necessary. Care should be taken not to vacuum too fast; the beater brushes and suction should be allowed to do their job. Overlap strokes slightly and vacuum so that the nap (fuzzy side) of the carpet is laid down by the pull stroke. Move furniture as little as possible, and avoid bumping both furniture and the wall.

When finished, inspect and replace worn brushes and belts if necessary, and empty the filter bag.

Vacuuming should be done after furniture has been dusted.

Traditionally, guestrooms are vacuumed daily. However, other areas in the hotel may demand different schedules. In the article *Vacuuming Carpet: Applying the Pareto Principle* (on pages 102–103), author David J. Frank explains how to set up an effective vacuuming program.

**Bonnet cleaning** is often categorized with other restorative cleaning methods, but it should properly be categorized as an interim cleaning method.

Figure 5.15 shows an example of bonnet cleaning using an all-purpose floor machine. Bonnet cleaning utilizes a standard floor machine equipped with carpet bonnets, bonnet shampoo, a sprayer, clean water, and a bucket and wringer.

First vacuum the area to be cleaned, and then spray a 4' × 8' area with the shampoo; also spray the bonnet with the solution. Then pass the machine, with the bonnet attached, over the area. This procedure is repeated until the entire carpet is cleaned. Once the bonnet begins to show dirt, it should be turned over to the clean side. When the entire bonnet is dirty, rinse it in the bucket and wring it out with the mop wringer.



**Figure 5-15** Bonnet cleaning using the “All-Purpose Matador” from Advance. (Used with permission.)

When finished, completely rinse all of the equipment, then wash the carpet bonnets and hang them up to dry. Do not replace furniture until the carpet is completely dry.

Bonnet cleaning does cause a modest amount of wear on the carpet fibers, therefore to reiterate, it should not be viewed as a restorative cleaning method.

Finally, carpet sweepers are used to clean up dry soils and particulates on rugs before they have a chance to penetrate the surface of the carpet and lodge in the carpet’s pile. They are especially handy in dining room areas where the waitstaff can use them for touch-ups under tables and in the aisles.

### Restorative Cleaning Methods

Interim cleaning methods do not remove the gummy, sticky residues and the dry particulates that have become stuck to them. Deep cleaning methods must be employed to restore the carpet to a near original condition. There are four restorative carpet cleaning systems: water extraction, dry foam, dry powder, and rotary shampoo. There is quite a bit of disagreement in the industry as to which of these four systems is the single “best” method. However, all would agree that it is best



## VACUUMING CARPET:

### Applying the Pareto Principle

**ProTeam** (This article is presented through the generosity of ProTeam Inc., a Boise, Idaho, manufacturer of backpack vacuum systems, and sponsor of Team Cleaning Seminars.)

The Pareto principle of 80/20 suggests that 80% of your vacuuming time be spent vacuuming 20% of the carpet, and 20% of your time be spent on the other 80% of the carpet. To do this intelligently means setting up an effective vacuuming program.

Applying the Pareto concept to vacuum cleaners implies that 80% of the effectiveness of a vacuum derives from 20% of its performance traits. Applying this intelligently means understanding suction and filtration—that is, how vacuum cleaners remove dirt and retain it—and how those critical factors integrate in a good vacuuming system.

According to the Carpet and Rug Institute (CRI): “Vacuuming is the most important and most cost-effective element of an efficient [carpet] maintenance program.” Effective vacuuming preserves the life and appearance of carpet, while keeping the environment cleaner and healthier for building occupants. The Pareto rule suggests that 80% of carpet care planning be spent defining the vacuuming program; the 20% of carpet maintenance that produces 80% of the value. This means blueprinting vacuuming to achieve the right “architecture” or program structure to get desired results.

#### Planning Strategy for Scheduled Maintenance

According to CRI: “Because carpet disguises soil so very well, carpet has often been cleaned in public facilities only when it shows soil. Oftentimes, there is already damage to the carpet because embedded dirt abrades the fibers.”

Since carpet tends to hide dirt and its potentially harmful effects, cleaning based on appearance is short-sighted and ineffective. Developing a good carpet cleaning strategy involves three main steps:

1. Analyze how specific areas in a facility are used.
2. Determine the frequency of vacuuming needed to prevent soil buildup in those areas.
3. Set up a vacuuming schedule that is strictly followed.

#### Analyzing Usage: Defining and Maintaining 80/20 Areas

Defining high-use areas for daily maintenance is not difficult, but follow-through vacuuming is often lacking since carpet in well traveled corridors can mask embedded dirt, tempting maintenance personnel to skip places that “look clean.”

Setting up and following a plan based on actual use rather than appearance is vital. Pay particular attention to “20%” locations such as:

Track-off or wipe-off areas (exterior entrances, and areas where carpet and hard/resilient surfaces meet). Track-off regions average 90 square feet (6 × 15 feet) at building entrances, 10 square feet (2 × 5 feet) at main internal doorways and 40 square feet (5 × 8 feet) in main corridors six feet wide.

Funnel areas or congested channels. Foot traffic often converges on a doorway or elevator, creating a soil area averaging three feet around a doorway to 10 feet around elevators. Other locations are also critical, e.g., in front of water fountains and main building directories.

Central activity areas, busy corridors, traffic lanes.

Also note the “80%” floor space, lesser used areas such as executive offices, board rooms, utility rooms, etc. These areas should be spot-checked daily, and vacuumed on a schedule that reflects actual usage. Remember, too, that dust settles on all surfaces, including carpet, and regular cleaning even in low-usage areas is important.

#### How Much Vacuuming?

The general recommendations for vacuuming frequency are as follows:

Heavy traffic areas: Daily

Medium traffic areas: Twice weekly

Light traffic areas: Once or twice weekly

CRI says: “Daily maintenance is the most valuable and cost-effective element in the maintenance strategy. Adequate vacuuming on a regular schedule will lessen the frequency of the more intensive cleanings and will keep soil from becoming embedded in the carpet.”

### Preventive Maintenance

Preemptive measures that reduce or prevent soiling include:

- Walk-off Mats: Walk-off mats placed in entry ways and elevators will collect dirt before it reaches the carpeted area.
- Keep approach areas to outside entries clean to prevent unnecessary tracking onto walk-off mats.
- Extra matting in inclement weather.
- Trash and ash receptacles located conveniently both outside and inside the building.

### 80/20 Vacuuming: Understanding Suction and Filtration

Vacuum cleaner suction and filtration are the “20%” issues that affect 80% of your ability to properly vacuum and maintain carpet. It is important to understand a little practical science to appreciate their role.

#### Suction Variables

Suction is a product of several variables. Ideally, a vacuum’s internal fan is powered and proportioned to create “vacuum” for moving or suctioning a desired volume of air (measured as CFM—cubic feet per minute) in relation to the size of the tool head, the diameter and length of the airflow conduit (hose and internal air channel), and the type, size, and configuration of filter media.

Of course, proper air volume and suction would be simpler to achieve and maintain if filtering the air and retaining the dirt were not necessary. Without filter media (cloth and/or paper filters, HEPA, ULPA, and secondary types) to screen and hold particles of various sizes, air passing through a vacuum cleaner would meet little resistance—suction would remain constant. The room environment would also be dirtier than ever, since dust entering one end of the vacuum would simply be blown out the exhaust end.

#### Effective Suction—A System Approach

Effective suction is a product of an intelligent system—one that permits constant airflow with practi-

cal filtration to trap particles of soil, large or small. The key component (Pareto’s 20%) in a vacuuming system is the relationship between airflow and filtration—and the two are somewhat at odds.

#### Suction and Filtration: Tips for Success

Excellent suction and excellent filtration sometimes form an uneasy alliance. High-efficiency filters that trap more fine particles sometimes tend to clog more rapidly, choking airflow and suction, and lowering cleaning ability. Good filters, unless *cleaned* or replaced regularly, reduce vacuum performance.

Filter efficiency, filter access, and filter maintenance are important issues related to suction. Since indoor air quality affects both health and house-keeping concerns, consider four-stage filtration that captures at least 96% of dust one micron and larger—most airborne dust falls into the one to ten micron range. For more demanding applications, inexpensive high filtration disc media which increase efficiency to 99.79% at .3 micron are available. Secondly, look for a vacuum that permits easy filter maintenance (if filters are difficult to change, operators will tend to allow them to clog, reducing suction). Third, train operators to clean vacuum filters regularly (after every few hours of vacuuming or more often as needed to maintain optimum airflow and suction).

Following the Pareto dictum, vacuuming programs succeed when operators understand that effective vacuuming is achieved through a combination of the right machine and the right scheduled carpet maintenance—that is, the right *system*—to maximize cleaning when and where it’s needed most.

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to remove dry soil by vacuuming the carpet before a restorative cleaning method is attempted.

**Water extraction**, also referred to as hot water extraction or “steam cleaning,” is a system that sprays a solution on the carpet and then picks it up with an attached wet/dry vacuum. The term “steam cleaning” is really a misnomer, as live steam is never used, only hot or cold water. The machine normally has two storage tanks, one for the solution to be sprayed on the carpet and one for the dirty picked-up solution.

Recent studies conducted by John Walker at Janitor University compared self-contained extractors with high-flow extractors. His findings showed the soil removal rate of high-water-flow extractors to be 2.5 times the rate of the conventional low-flow extractors. Of course, the unit must also remove most of the water that is applied, or mold problems are sure to follow. The operator should also use soft water if possible. Hard water leads to premature soiling and carpet wear, and prevents carpet cleaning solutions from working. The operator

should overlap two to three inches on each pass. On problem spots the operator may need to presoak the area for a few minutes before using the pick-up vacuum. All carpet should be totally dry before the furniture is replaced or it is opened to foot traffic.

Many experts consider this system to be the best approach to deep cleaning. However, hot water extraction can have a number of negative effects if improperly done. Wet carpet can shrink, and seams can split if the water used is too hot or if too much solution is applied. The temperature of the water should never be over 150° Fahrenheit and when cleaning wool carpet, it is best to use cold water. Most of the extractors on the market can be used with either cold or hot water. Although water extractors minimize problems associated with other wet shampooing techniques, such as mildewing and the presence of other bacteria, growth can happen in a humid environment. Use fans and the building's air-reconditioning or heating system to speed carpet drying time. Ideally, carpets should be dry within one hour, and walk-off mats should never be placed on damp carpet. They form a moisture barrier that keeps the carpet from drying and gives mold an ideal environment in which to grow.

**Dry foam** is another method used in carpet restoration. The foam is brushed into the carpet and taken up almost immediately with a wet/dry vacuum. After the carpet is completely dry, it is vacuumed once again to remove more of the residue.

Dry foam is often used in high-traffic areas on even a daily basis to remove tracked-in soil. The biggest negative factor with dry foam is that it leaves the highest amount of detergent residue behind on the carpet, which

will cause the carpet to become prematurely dirty. If the carpet is not rigorously vacuumed after laying down the foam, the carpet can, in a few days, look worse than it did before the treatment.

**Dry powder** has the advantage of minimal downtime for a carpeted area. Once the procedure is completed, the area can reopen for use. Since water is not used, the problem of mildew, odor, carpet stretching, and seam splitting is not present.

Dry powder cleaning is done by laying down a powder or crystal on the carpet; this binds with the dirt, which is then removed through vacuuming while the carpet is agitated with a beater brush (see Figure 5.16).

Dry powder may leave some residue behind in the carpet, and it may not remove all types of soils from the carpet.

**Wet shampooing** is accomplished through the use of a rotary floor machine, which normally has a tank attached that contains the shampoo solution. A special brush attachment agitates the carpet as the solution is dispersed onto the carpet. The carpet is then vacuumed with a wet/dry vacuum that contains a defoaming agent. Once the carpet is dry, it may be vacuumed again with a dry vacuum.

With this system, the danger exists of overwetting the carpet, causing mold, mildew, and other bacterial growth. The carpet may also stretch and then shrink, causing seams to split, and the brushes from the floor machine may damage the carpet pile if they are allowed to remain on one spot for too long. Rotary shampooing is thought by many experts to cause the most wear to a carpet.

**Figure 5-16** The Host Dry Powder System. The powder applicator is on the right; the dry cleaning machine on the left brushes the powder into the carpet. (Used with permission of Racine Industries.)



### Spot Cleaning

Spots and spills call for immediate action. If allowed to set, many substances can permanently stain a carpet, especially one that is made of nylon or wool. The following are a few general procedures that should be followed regardless of the type of stain, carpet, or cleaner:

1. Carefully scrape away excess soiling materials such as gum and tar from the carpet.
2. Blot the excess liquid that is spilled before it has a chance to soak into the carpet. Do not rub the stain; this action may actually force the stain into the fibers. Use only clean rags to blot the carpet.
3. Apply the cleansing agent to the carpet. If the spot remover is a liquid, remove the excess spot remover by blotting with clean rags or a clean sponge.
4. After the spot remover has had an opportunity to work, vacuum up the spot remover and dry the treated area.

When treating spots, it is important to identify the source of the spot and also understand the type of carpet you are trying to treat and how it was dyed. A good rule of thumb is to use the same process to remove the spot as was used to apply the spot. If a spot was cold and water-based, treat it with cold water and a water-based spot remover. If a spot was hot, you might need heat to remove the spot; and if the spot was oil-based, a solvent may be called for.

Many reputable companies have developed some remarkable spot removers that can effectively remove dozens of different types of spots.

Finally, certain harsh chemicals, such as chlorine bleaches, should not be used on spots because they will often remove the dye from the carpet along with the offending stain.

## Ceilings and Wall Coverings

The selection of materials to cover walls and ceilings should be predicated on the following five considerations: cost of maintenance, appearance, fire safety, initial cost, and acoustics.

Although the product and installation cost of ceiling materials or wall covering materials must be within budgetary guidelines, consideration also must be given to the other four factors. For example, the maintenance cost of a wall covering must be part of the cost equation. Daily maintenance costs may make the product prohibitively expensive, even though the initial costs are within budget.

The ability of a wall, floor, or ceiling material to reduce sound is a major factor when considering guest comfort, whether it be in a conference room, dining room, or guestroom. Most commercial materials have a

rating, called the noise reduction coefficient, that can be used in material selection. However, improper maintenance may adversely affect a material's acoustics, such as when acoustical ceiling panels are painted, destroying most of their noise reduction ability.

Fire safety is a major concern, especially in high-rise hospitals and hotels. Many communities have passed stringent laws concerning the use of fire-resistant materials. In fact, many fire codes specify the use of only Class A materials in hotels and hospitals. Manufacturers have responded to this fire safety concern by manufacturing wall coverings and ceiling panels that will emit harmless gases, which will trigger smoke detectors when heated to 300° Fahrenheit.

There are wall materials on the market that will emit toxic gases when burned. Many city fire codes forbid the use of these materials in guestrooms and public areas in hospitals and hotels. The National Fire Protection Association (NFPA) sets standards on fire retardancy and the toxicity of burning materials. The astute housekeeper should become familiar with these specifications.

Finally, hotels and even hospitals are concerned with the image they project. Wall coverings, ceilings, and flooring materials should be selected to enhance that image. It could be said that these materials are indeed some of the hotel's most important marketing tools.

### Types of Wall and Ceiling Coverings and Their Maintenance

The maintenance of wall and ceiling coverings resembles floor maintenance in that there are three distinct approaches: interim maintenance, restorative cleaning, and spot removal.

Interim cleaning methods include daily or weekly dusting and vacuuming. Restorative cleaning encompasses the use of detergents and solvents, which is done on a periodic basis, and spot removal, which is performed as the need arises.

The following sections examine the advantages and disadvantages of the most common wall and ceiling coverings and their specific maintenance requirements.

#### Cork

Cork has excellent sound-absorption properties and has a rich and luxurious appearance, but it is a delicate surface material that can be easily damaged by improper cleaning methods. Today, it is often bonded between sheets of clear vinyl, which serve to protect it from wear, but the vinyl does impair its acoustical ability. Natural cork may be vacuumed using a soft brush attachment. Natural cork walls should never be washed with water. Spot removal may require light sanding to remove stains. It is sometimes easier to replace a damaged cork tile than to attempt to restore it to its original condition.



### Fabrics

Although linens, silks, and leathers may initially provide an extremely attractive wall surface, as a rule, they should not be used for wall coverings because of the difficulty involved in their cleaning, particularly in the case of spot removal. If fabrics are used, they must be fire-resistant, and it is also advisable to use only stain-resistant materials.

Fabrics are also highly susceptible to mold, mildew, and other odor-causing bacteria.

A recommended alternative to fabrics are the new vinyl wall coverings that have fabric sandwiched between sheets of vinyl. They have the beauty of fabrics but are far easier to clean and are much more durable.

Standard fabric wall coverings may be vacuumed to remove dust. Water should never be used on fabrics because it may cause the fabric to shrink and split. Spots and stains should be removed only with chemicals recommended by the fabric's manufacturer. Some cleaning solutions will adversely affect the fire-resistant characteristics of the fabric.

### Fiberglass

Fiberglass walls are often made to resemble other construction materials, such as brick. Fiberglass can be vacuumed to remove dust, and it can be deep cleaned using water and a neutral detergent.

### Painted Surfaces

Paint is still one of the most popular wall coverings because of its relatively low initial cost and the wide range of colors available.

When selecting paint, the housekeeper should consider drying time, odor, and durability. The objective is to reduce costly downtime caused by these factors.

Painted surfaces can be dusted, vacuumed, and washed using a mild detergent and water. Scrubbing and use of chemicals such as trisodium phosphate will remove the paint as well as the dirt.

### Plastic Laminate

One of the easiest materials to maintain, plastic laminates come in 4' × 8' panels that are nailed directly to the wall studs. Plastic laminate often has a wood grain effect or a faux tile appearance. All that is required to maintain its appearance is periodic vacuuming with a soft brush.

### Tile

Tile walls demand the same care as the tile floors previously covered in this chapter. Most manufacturers carry two grades of tile, tile for wall applications and tile for floor applications. Tile walls are most often found in bathrooms and kitchens. Ceramic tiles are also used to accent stucco walls.

### Vinyl

Next to paint, vinyl is indisputably the most popular form of wall covering. It can be purchased in a wide variety of colors and textures that can fool even the trained observer into believing that the wall covering is not vinyl, but marble, rubber, fabric, metal, or even ceramic tile.

Vinyl is easy to clean and is considered to be four times more durable than paint. It is also easy to install and remove. According to government specifications, vinyl is divided into three categories by weight per square yard. Type I is normally reserved for noncommercial applications. Type II is the category most often selected for guestrooms, halls, and lobbies. Type III is the most durable and the best choice for heavy-wear areas, such as elevators and other high-contact areas. Vinyl can tear, so it is wise to purchase extra rolls for installation. With practice, it can be restored.

The most negative aspect of vinyl has only recently been discovered. Vinyl is waterproof, and it serves as barrier to any moisture trapped between the vinyl and the drywall to which it is attached. Glue is used to attach the vinyl, and the drywall has a paper sheathing. Where there is high outside humidity and the building has an inadequate vapor barrier or a water leak, mold will start to grow between the drywall and the vinyl. The glue and the paper serve as food sources for the mold. When the vinyl is removed, thousands of mold circles can often be found growing between the vinyl and the drywall. Vinyl use is so common in some lodging properties that the mold has been given the name "Marriott's dots." Mold can lead to a host of respiratory-related illnesses and, in some extreme cases, death.

### Wallpaper

Vinyl has made old-fashioned wallpaper obsolete. Vinyl wall coverings can duplicate the effect of wallpaper while providing a surface that can be easily cleaned with mild detergent and water, which is not an option with wallpaper.

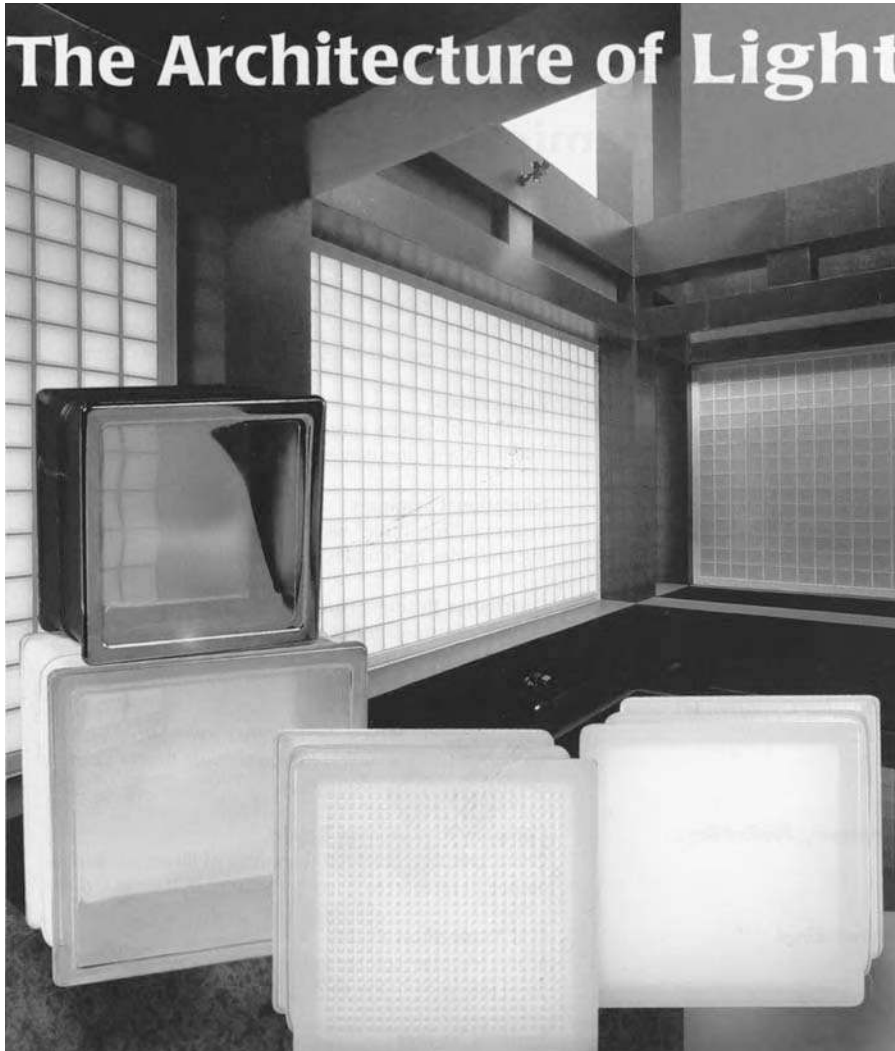
Wallpaper should be vacuumed to remove dirt and dust. Some types of stains can be removed from wallpaper using dough-type cleaners, and a few wallpapers can be damp mopped with a sponge.

### Wood

Wood or wood-veneered walls demand the same treatment afforded wood floors. Water should not be used on a wood-surfaced wall. Dust frequently and when needed, and oil and polish wood wall coverings according to the manufacturer's recommendations.

### Glass Walls

More often, architects are now using glass walls to enrich certain areas of interior living, and to introduce light into interior spaces. Glass block used in place of masonry has



**Figure 5-17** Glass blocks of a type used to replace other forms of masonry allow light to enter a space. (Photo courtesy of Tile and Carpet Gallery, Las Vegas, Nevada.)

the ability to introduce light while requiring little, if any, maintenance. Figure 5.17 shows a selection of glass block that may be used to construct light walls.

## Windows and Window Treatments

### Window Cleaning

Window cleaning is one of the easiest tasks to perform if the housekeeping crew has the proper tools at its disposal. What is needed is a synthetic lamb's-wool window-washing tool, a bucket that will accommodate the tool (approximately 12" × 24"), a squeegee, and a clean lint-free cloth. The better squeegees have quick-release mechanisms and angled heads. The new microfiber cloths designed for the cleaning of windows and mirrors are simply amazing. The author witnessed a demonstration in which Vaseline was applied to a mirror, and with one wipe of a microfiber cloth (see Figure 5.18) the mirror was spotless.

A low-sudsing cleaning solution, often containing a little ammonia, is prepared with cold or warm (never hot) water. The first step is to remove all window coverings to facilitate the cleaning and to avoid the possibility of spilling cleaning solution on the drapes and curtains.

Begin by applying the cleaning solution to the top of the window, working the dirt toward the center of the window from the outside edges. Do not overwet the window and cause the excess solution to run and pool on the sill or floor. Before the window has a chance to dry, squeegee the window, starting at the top corner. Make one pass across the glass, and angle the blade so that the dirty solution runs down onto the dirty part of the window rather than back onto the cleaned portion. Wipe the blade clean with the cloth after each pass of the blade.

Finally, never attempt to clean windows in the hot sun. The sun will cause the window to dry before it can be squeegeed, causing streaking.

Exterior window cleaning, especially on high-rise buildings, should be left to professional window washers.



**Figure 5-18** A microfiber cloth designed for glass and mirrors. These may make the squeegee obsolete. (Photo used with permission of Newport Marketing Group, Inc., Costa Mesa California.)

## Window Treatments

When selecting window treatments, function and appearance should both be considered. The appropriate window covering provides privacy to the guest and insulation; it is a significant design element.

Window treatments can be divided into three categories: drapery, shades, and blinds.

Drapery and curtain fabric should be fire-resistant, soil- and wear-resistant, resistant to sun damage, resistant to molds and mildew, and wrinkle-resistant. Delicate fabrics and loose weaves will quickly lose their shape, will snag and wrinkle, and will wear prematurely. One increasingly popular style of drapery is vinyl-lined fabric, because of its increased durability.

Drapery should be vacuumed daily. Dry cleaning is the preferred method of restorative cleaning. Most experts agree that dry-cleaned drapes will hold their shape better than laundered fabrics.

Shades are available in a multitude of styles and materials. Their purpose is to provide a customized look to the window while affording privacy to the guest. Shades should also be vacuumed daily. Restorative cleaning methods will depend on the material composition of the shade.

Popular blind styles of today include the mini-horizontal blind and the vertical blind. The verticals are much easier to maintain and provide greater control of glare and light into the room. Cloth panels can even be inserted into some types of vertical blinds to add additional color and texture to the room.

## Summary

The maintenance of floors, floor coverings, wall coverings, and windows consumes an overwhelmingly large portion of any housekeeping department's budget. For this reason, the astute housekeeper must develop a comprehensive understanding of these materials and how they are to be maintained. This knowledge must also be communicated to the department's staff so that they may responsibly carry out the policies of the department and see to it that standards of cleanliness and repair are maintained. Vendors who know their products will be your best experts.

### KEY TERMS AND CONCEPTS

Cross contamination  
Foundation  
Finish  
Stripping  
Sealer  
Terrazzo  
Buffing  
Burnishing  
Damp mopping  
Spray buffing  
Nonresilient floors  
Epoxy  
Spalling  
Resilient floors  
Linoleum

Styrene butadiene rubber  
Asbestos  
Carcinogen  
Homogeneous  
Tung oil  
Carnuba wax  
Polyurethane  
Acrylics  
Varnish  
Shellac  
Pile  
Primary backing  
Secondary backing  
Padding  
Face weight

Jute  
Polypropylene  
Cut loop  
Level loop  
Multilevel loop  
Plush  
Frieze  
Random shear  
Bonnet cleaning  
Water extraction  
Dry foam  
Dry powder  
Wet shampooing

**DISCUSSION AND REVIEW QUESTIONS**

1. When contemplating the installation of a new floor, what concerns should an executive housekeeper take into consideration?
2. Explain the relative advantages and disadvantages of the different approaches to restorative carpet care.
3. Given the following areas in a hotel—ballroom, lobby, dining room, kitchen, laundry, executive office—make recommendations for appropriate floor coverings for each area.
4. Describe the steps in the FPMR model.
5. Assume that the decision has been made to carpet the hotel's main ballroom. What suggestions would you make as to the type of carpet to use in the ballroom?
6. How would you ensure the cooperation of other departments in the hotel to report spots and spills on carpet and floors to the housekeeping department?
7. The rooms division manager wants to install an "accent wall" in each guestroom. This wall would have a wall covering that is unlike the other painted walls in the room. What wall coverings would you suggest for this accent wall?

**NOTES**

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