

# **Floor Care Training Manual**

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### Notice:

The author has attempted to include all basic procedures for floor care.  
However, no liability is assumed beyond the purchase price of this book.



# ***Floor Care Training Manual***

Maintaining attractive floors requires constant effort. A complete floor care program is necessary to combat tracked in soil, continual traffic and unfortunate spills. This training program will explain how a programmed maintenance approach will keep floors clean and looking attractive.

## **What is programmed floor maintenance?**

Since stripping and refinishing of floors is extremely expensive, it makes sense to prolong the time between required refinishing operations. This is accomplished by using effective cleaning products, up-to-date machines, professional procedures and adequate frequencies. In turn, programmed floor maintenance will ensure the surfaces display maximum cleanliness and shine.



Routine maintenance requires scheduling, plus responsibility and accountability for completing the tasks by assigned maintenance personnel. The basic steps to floor care include: proper matting, dust-mopping, wet-mopping, buffing, scrubbing and recoating with new finish and eventually a total strip out with several coats of finish applied.

If floors are not dust mopped and wet mopped regularly any buffing or burnishing may grind dirt and grit into the floor. If floors are not cleaned and burnished regularly, the scuffs and traffic will dull the shine and allow wear to deteriorate the finish. If the finish is damaged and new finish is applied without a thorough cleaning, soil will be sealed into the floor.

Floors that require stripping often display a yellow, dingy or blotchy appearance. They may turn brown around the edges. A primary cause of yellowed, dingy floors is dirt and soil that has become embedded in the finish, and then permanently sealed in as new coats of finish are applied. Recoating and high-speed floor maintenance can still bring a high shine to the floor, but certainly not a clean shine.

To become a professional floor care technician, additional knowledge and craftsmanship must be learned. Not only must it be learned, but practiced on a day-to-day basis. The purpose of this program is to provide the training materials to take floor care services to the next level.

A new organization that is establishing industry standards for cleaning is CIMS (Cleaning Industry Management Standard). It is a division of the International Sanitary Supply Association in Lincolnwood, Illinois. They offer an inspection and certification process. Their standards include compliance with written **Quality Systems** including cleaning requirements, levels of performance and measurements. Facility inspections and complaint handling must be documented and focused on prevention of cleaning deficiencies.

The CIMS **Service Delivery** aspect requires a written workloading program that addresses professional procedures, frequencies and labor allocations. There should also be a written curriculum for technical training of cleaning personnel and documentation that personnel have been trained.

Regarding safety, CIMS requires that workers are trained on the use of and hazards for all cleaning chemicals. This includes proper labeling and storage, spill containment and waste disposal. The use and scope of PPE (Personal Protective Equipment) must be documented.

Accurate job descriptions must be available along with over sixty major areas of cleaning management that must be addressed.

As a whole, the cleaning industry is making progress in raising standards to reach a new level of professionalism. To help each student master the Floor Care Training Manual, it is subdivided by function along with specific procedures. These training materials, when followed, will allow you to maintain clean, safe and attractive floors.

## Matting

Actually, floor care begins outside the facility with parking lot maintenance and exterior and entrance matting. An effective matting system reduces floor maintenance costs by removing soil and water before they do their damage. Floor covering manufacturers normally recommend fifteen feet of entrance walk-off matting. A superior two or three step soil containment system is recommended. Here are three types of matting:

**Outside-scraper mats** — an aggressive mat that is capable of scraping off debris and mud. Ideally this mat construction allows mud and sand to drop deep into the base of the mat so it does not transfer to the shoes of the next person entering.



**Wiper-scraper mats** — a bi-level construction that provides an upper surface for walking and a lower area where soil and water are stored until removed by cleaning. Mats with at least 1/8" depth, permanently molded into the mat will contain soil and water. Built-in entrance grating, covering the entire vestibule area is another effective soil containment system.

**High-Absorbent mats** — this matting is designed to remove fine dust and dry the footwear as well. These mats are instrumental in preventing slip-and-fall accidents. Usually constructed of olefin/nylon fibers, this matting is the final line of defense.

Industry studies indicate that approximately 75% of the dirt in a facility is brought in on footwear. An effective soil containment system should reduce tracked in soil by 60%. Of course, if mats are not thoroughly vacuumed daily and deep cleaned regularly, they become ineffective.

## Monitoring grit levels

There is more underfoot than meets the eye. Fine silica (microscopic grit) tracked in from outside, creates a damaging sandpaper effect to grind off even the toughest floor finishes.

There are scientific tests available to measure dust/grit residues and effectiveness of removal systems. However, a plain way to gauge dust and grit removal is a simple hand test. By wiping your palm and fingers on the floor and observing the results, some degree of comparison is available.



A hand-wipe observation allows you to test and compare high traffic areas with low traffic. You can compare dust mop and wet mop efficiencies, matting efficiencies and also determine if adequate frequencies are removing damaging grit.

Sweeping with a broom does not remove the fine grit that damages floor finish. It often spreads soil and stirs up dust, negatively impacting the indoor air quality. A treated dust mop head is capable of attracting fine powder. If the floors are dust mopped daily, but show excessive powder on your hand, the floor finish may be deteriorating.

A thorough floor care check-list can be helpful in reducing gloss retention problems.

### **Preventative Maintenance Check list**

- \_\_\_ Sand is never added to salt for winter parking lot maintenance
- \_\_\_ Parking lots are regularly swept to eliminate sand and grit
- \_\_\_ Roofing tar is contained
- \_\_\_ Parking lot sealant is non-tracking
- \_\_\_ Tar or asphalt repair materials are non-tracking
- \_\_\_ Parking lots are regularly power washed - including grease removal
- \_\_\_ Adequate and strategic placement of trash cans
- \_\_\_ Fifteen to forty feet of matting depending upon traffic and size of building
- \_\_\_ Matting at all doors including from warehouse to showroom or office areas
- \_\_\_ Vinyl backed mats that prevent rubber or latex staining of carpet or tile.
- \_\_\_ Frequent cleaning of all mats (vacuum plus deep cleaning)
- \_\_\_ Regular power washing of shopping carts, especially wheels
- \_\_\_ Regular cleaning of wheels on all transport carts, dollies, etc.
- \_\_\_ Matting placed around high traffic display counters
- \_\_\_ Floor protectors are used under heavy racks, desks and the bottom of chair legs to distribute the weight of furniture evenly to reduce indentations and prevent abrasion and scratching of the floor.
- \_\_\_ Use of plastic chair protectors where rolling casters can damage the floor.
- \_\_\_ Over-spray of harsh cleaners around counters, doors and displays, etc. is avoided
- \_\_\_ Dust mop heads are properly treated, but no oily films are left on floors
- \_\_\_ Dust-moping daily or more frequently for high traffic areas
- \_\_\_ Dust mop heads are laundered when soiled
- \_\_\_ Liquid spills are immediately wiped dry to protect the floor finish and reduce slip-and-fall accidents.
- \_\_\_ Spill cleanup kit includes clean tepid water, neutral cleaner and clean mop
- \_\_\_ Pallet jacks are raised to proper height prior to moving
- \_\_\_ Boxes and display materials are not dragged across floors
- \_\_\_ Lunch room, deli or restrooms are not mopped with heavy duty cleaner unless rinse cycle follows cleaning
- \_\_\_ Adequate floor cleaning frequencies (dust mop, spot wet mop, autoscrub)
- \_\_\_ Warehouse floors are regularly cleaned to avoid tracking up front
- \_\_\_ Floor cleaner is neutral and properly diluted with cold or tepid water
- \_\_\_ Scrub pads are not too aggressive
- \_\_\_ Adequate burnishing frequency with pad matched to the finish
- \_\_\_ Top-coat of traffic lanes only follows a thorough cleaning.
- \_\_\_ Floor finish is never applied over discoloration, soil or buildup

Your facility may encounter special conditions that merit adding to this list. The most important factor in superior floor care is a proactive approach instead of reactive. A floor care system, with TLC, will go a long way in keeping floors attractive and shiny.

**Now we will review the proper steps to provide programmed floor care maintenance.**

**Notes:**

# I. Dust-mopping

## Objectives:

Dust-mopping is a critical step in floor care. This process will attract and remove the fine grit and sand that is extremely damaging to any floor finish.

Dust-mopping or vacuuming of the floor must occur on a regular basis. Supermarkets may require dust-mopping every few hours. Active offices may require daily mopping and small offices 1-3 times a week. The important thing is to not let it go too long. Residual grit will begin to damage and scratch the floor. Another approach is to use a vacuum with a wand tool to vacuum the grit and debris from the floor.



Dust-mopping should remove soil, sand, dust, and litter from smooth finished floors, and prepare them for wet-mopping. If large litter is found on the floor, you may need to sweep it with a broom and dust pan prior to dust-mopping. A dust mop should never be used to remove liquid spills. If puddles of liquid are found on the floor, then damp mop first.

## Mastering the Basics:

If the dust mop drags on a finished floor, check the dilution ratio of the disinfectant/floor cleaner to determine if the cleaner is being overused. It is tempting to follow the old formula: "If a little does a good job, then a LOT will clean better". However, the surfactants (wetting agents) in many floor cleaners, if overused, can leave a sticky residue. This in turn causes a dust mop to stick to the floor and even roll. If a concrete floor has never been sealed, the dust mop will roll on the floor, creating the need to use a broom or sweeper.

Always follow use dilution ratios posted on the chemical bottle and double mop food service areas that are naturally sticky. A double mop procedure is as follows: Apply a heavier coat of cleaner/disinfectant mop solution to the food spills. Then, rinse the mop and clean the area a second time. Using a double bucket system is also helpful. One bucket contains cleaner and the other bucket contains fresh water. The dwell time between mopping steps will loosen the food and produce superior results without the need to use extra strong cleaning products.

Dust mop heads may start to drag when heavily soiled. Treated heads pick up the fine grit that destroys floor finish, but treated or untreated heads are normally undistinguishable as far as drag. Once dust mop heads appear moderately soiled, they should be replaced probably once a week). Also, consider dusting floors with an appropriate sized vacuum tool.

## Procedures:

### Five steps to thorough and efficient dust-mopping

#### 1. Pre-plan the approach

- Set up wet floor signs if you plan to wet mop the floor. This gives a warning to everyone that floor care operations are in progress.
- Decide on your overall approach by determining an efficient cleaning flow system. Follow a pre-determined pattern each time floors are dust mopped.
- Normally you can enter the door to a room and start dust-mopping either to your immediate right or left. Then, work your way to the back of the room and return on the opposite side you entered. Decide which method of flow or approach is the most efficient for each area.



## 2. Prepare the right tools

- a. If you are assigned to clean small rooms that are extremely cramped, you might consider an 18" dust mop. Average offices normally require a 24" dust mop. Open areas such as grocery store aisles would require a 36" and larger gymnasiums would qualify for a 48" or 60' mop. Some facilities prefer to use colored heads so they do not display the soil as fast as an off-white head. Select the proper width, so that extra passes are eliminated.
- b. Install a clean, treated dust mop head on the frame. If the pole has a snap on holder, make sure the snap faces up instead of down.
- c. Select the best dust mop head for your facility. The choices can be a laundered and treated head, a disposable head or a microfiber head.
- d. A micro fiber mop is often installed on a flat mop. The special cloth material is superior in holding soil and is often attached to the frame by Velcro or by slipping it over the head.
- e. A freshly laundered head should be sprayed with a light application of a recommended dust mop treatment. Be sure to apply this treatment outside the building, in a storage room, or over a carpet, never over the floor itself. If the dust mop treatment is flammable, you will need to store the treated heads in a metal container. Otherwise, you can store them in a clear plastic bag or spray the head each night after you finish and store the dust mop with the head up or inserted into a wall gripper.
- f. Carry a putty knife, pocket scraper or retractable razor for quick access to remove gum, tar, stickers and litter stuck in corners, doorjamb, etc. If there are numerous stickers on the floor, consider attaching the scraper or razor to a pole and carry it by holding the dust mop handle and pole together at the same time. Always use caution with any sharp object.
- g. If you do not plan to damp mop the floor immediately after dust-mopping, carry an absorbent rag and non-ammonia glass cleaner or all purpose cleaner. Simply spray and wipe up any spills. If there are wet spills on the floor, use a wet mop to blot up liquids before dust-mopping. When you are ready to dust mop, the floor should be dry.
- h. If there are numerous black marks on the floor, consider punching a hole in a white nylon scrub pad and attach to the dust mop frame with a shoe string. Now you have a dry pad on board to scrub out black marks by applying pressure with your shoe. Other approaches include, using the sole of a tennis shoe to scrub out the mark, using a tennis ball installed on a pole or, stepping on the dust mop head and agitating the mark spot with your shoe.
- i. If the area you plan to dust mop contains excessive amounts of paper and debris, either walk the area with a trash bag, or attach a small trash bag to a belt loop and place debris in the bag as you dust mop the floor. If the floor contains contaminated trash, use rubber gloves.



### Required equipment:

- Treated dust mop
- Scraper or putty knife
- Dust pan
- Counter brush or floor broom
- Waste container or plastic bag

(Making a list of needed supplies and equipment can save time in back-tracking to locate them.)



### 3. Starting out

- a. Before mopping, make sure that the mop strands extend both ahead and behind the mop head. Start the mop along the baseboard, close to the wall pressing down with light pressure. Walk the length of the hall without lifting or twisting the mop.
- b. If debris and dust balls are heavy in the corners and around door-jambs, sweep out the hard to reach areas using an angled plastic broom. Push the dust out into an easy to reach area. If you use what is referred to as a “toy broom”, it is possible to hold it next to the dust mop handle so you are gripping both at the same time. This eliminates going back and forth looking for the broom – it is always on board.
- c. Begin this task by pushing the dust mop ahead of you with the handle at a 45 degree angle. Walk straight ahead keeping the mop head straight and do not lift it off the floor. You do not use a dust mop like you would a large broom and you do not stop and back up. The idea is to walk to the end of an aisle or the back of a room and turn around mopping back to the starting area. During each pass, you will overlap by about two inches and keep the mop perpendicular to your body.
- d. The main idea is to prevent debris from falling off either end of the dust mop. When you make a turn, keep the leading edge ahead so scraps do not drop off. When you turn to the right, both hands will be angled toward the right. This takes practice, but you will soon get the hang of it.
- e. If the area is small and congested, there may be certain items such as chairs that must be pulled out from a desk or table in order to sweep under the desk. Then, place the chair back in a uniform and tidy manner.
- f. Don't forget to pay special attention to edges, legs of furniture, underneath furniture and to scrape sticky substances from the floor. Also, make a mental note of spills and smudges so if you wet mop later, you will remember where they were located.



### 4. Flowing with momentum

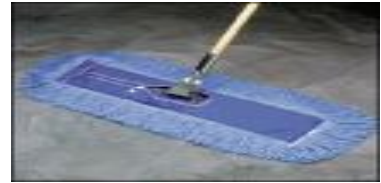
- a. To effectively clean the corners, begin by cutting around the corner and lightly shaking the dust mop. Next, force the dust mop head into each corner to “dig out” dust balls and debris. This is accomplished by poking the end of the dust mop into the corner and repeatedly pulling out all debris. If you leave debris in the corners, management may assume a thorough job was not performed. Finally, make sure all debris is picked up from the corner area as you continue mopping. Or, use a broom to sweep corners.
- b. The objective is to shake the dust mop as little as possible, but as much as necessary. Once you have made a couple of passes, the dust mop may be loaded with debris. Shake lightly in an area that you will come back to each time. Keep the dust mop as close to the floor as possible and try not to distribute dust into the air.
- c. Dust mop behind doors and tightly around furniture. Never leave piles of dust in front of doors or in the middle of an aisle where occupants may walk through it. If a door is opened, air currents may blow the dust throughout the building.
- d. Smaller rooms can be dust mopped with a figure-eight pattern instead of straight down and straight back approach. In those areas you would mop to the back and then back up as you pull the mop left to right in a figure-eight pattern. Again, when you move the dust mop to the right, the front edge must be angled so it is ahead of the back edge.
- e. Once you have strategically placed piles, make one final pass to pick up the piles and push the entire load out the door.



- f. Perform a self-inspection as you leave each area, as you may be the last person to leave the area. Turn back and look one more time for any missed dust-balls or scraps.

## 5. Pick up and Finish Up

- a. Sweep up the final pile of dust and liter with a broom and dust pan. A lobby pan and broom are also convenient to pick up debris. Rubber dustpans are less susceptible to bent corners especially if dropped. One other approach is to vacuum up the pile. If management allows, you could sweep the dust onto the carpet and then vacuum it later. However, some managers frown on this approach.
- b. There may be times when you have a limited area to collect the dust and perform the final shake out of the dust mop. If this is a problem, you can shake the dust mop into a large plastic bag.
- c. At the end of each night, shake the mop vigorously, outside (only if this is feasible). Don't cover vehicles with a cloud of dust. Don't allow dust balls to land on areas that can be tracked in the next day. Abruptly dropping (banging) the head on a sidewalk normally dislodges the impacted dirt. If there is no place to shake the dust mop out, cover it with a large trash bag and shake vigorously. Another option is to brush it with a counter duster or, clean it with a vacuum nozzle.
- d. Consider lightly spraying the dust mop head with a disinfectant for overnight storage. Or, spray the head with a recommended dust mop treatment. By allowing the dust mop treatment to soak in and partially evaporate overnight, it will eliminate the possibility of having oily floors the next day.
- e. Using a trigger-spray bottle, treat the mop head by lightly misting mop treatment over the entire mop head. Normally 3-4 sprays will do the job. Never apply mop treatment immediately before using. Store the dust mop with the head up; so it cannot absorb water from the floor and facing away from the wall.
- f. If using disposable heads or microfiber heads, replace as necessary when they become soiled.



### Follow up tips:

- Back pack vacuums can also be used in place of a dust mop.
- Ergonomically shaped dust mop handles are available that easily twist and swivel as you clean. This reduces strain on the arms and wrists.
- Flat mops with microfiber heads are available that dispense cleaning solution at the same time. This allows a dust-mopping and light wet-mopping all at the same time.
- Tips for environmentally friendly cleaning from Green Seal, a science-based non-profit organization that establishes environmentally friendly cleaning standards.
  - A). Keep outside entryways clean
  - b). Install adequate walk-off matting for 12-20 feet
  - c). Vacuum matting daily
  - d). Vacuum or mop high traffic floors daily with reusable/cleanable collection heads and light traffic areas on a regular basis. (Reference [www.greenseal.org](http://www.greenseal.org)).



## II. WET-MOPPING FLOORS

### Objectives:

The purpose in wet-mopping floors is to apply a cleaning solution to soiled floors and then absorb the soil back into the mop. The process involves detergency and absorption. As the mop head becomes soiled, it must be rinsed and wrung out in the mop bucket. Once a mop head is dirty or the mop water becomes saturated (loaded with dirt) you will no longer be cleaning the floor, you will merely be spreading soil back across the floor.

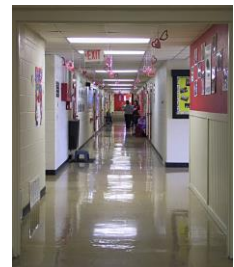


If you have ever washed a muddy car, you likely noticed that the soapy water in the fresh bucket was clean until you placed a dirty rag into the bucket. If the car was heavily soiled, it didn't take long before the cleaning rag was heavily soiled. Now as you dip the rag in the bucket to rinse off the dirt, the mud stays behind in the water. The more you wash and rinse, the dirtier the water becomes. It is possible that the water could become so heavily soiled that the rag offers little help in the cleaning process.

So what is the best way to fix the problem? Rinse out the rag in clean water, dump and refill the bucket and add new soap before continuing. The same holds true with mopping floors. A long-timer in the cleaning business once said that if you can not see a silver quarter on the bottom of the bucket, the water is dirty and needs changing. Keep in mind: changing water does not totally solve the problem unless you first rinse the soil out of the mop head.

### Mastering the Basics:

It's helpful to learn how wet, or how dry to mop any given floor. If the floor is only lightly soiled, then you can wring out the mop tightly in the wringer. One way to do this is to place the mop head in the wringer and then twist the mop handle ½ revolution until the mop head is also twisted.



Next, apply full downward pressure on the mop press handle. It is possible this method causes premature wear on the mop string fibers, but floors that stay damp too long may lose their shine. Consequently, extra labor will be required to restore the gloss. By mopping with a light application there will be fewer tendencies to leave water marks. However, it is possible for a mop to be wrung out too dry and leave streaks and skips in the floor mopping procedure.

The craftsmanship that must be learned is what some experts define as damp mopping verses wet-mopping. Some floors maintained with a high gloss and encountering light traffic and light soil can be mopped with a damp mop containing little water. Heavily soiled floors will normally require a wet-mopping to remove the difficult soil.

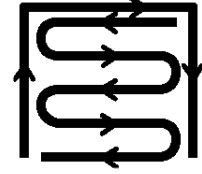
If the floor is heavily soiled, then the mop head should only be lightly wrung out and the floor mopped with a heavier solution. This in turn may leave more water marks on a shiny floor, but it may be necessary to remove the soil. One alternative is to double mop the floor. The first application would be with more solution. The second follow-up mopping is with a drier mop before the floor dries. This will pick up moisture before it evaporates, leaving the floor streaks free.



At this point, you can also chose to use two mop buckets, a dual unit where both buckets are on the same cart or a two compartment mop bucket. The first solution, with a stronger concentration of

all-purpose floor cleaner is applied heavier. The second mop bucket contains a dilute solution of cleaner or clear water and the mop is wrung out tightly for a drier pick-up.

Soiled edges and corners can also present a challenge. In some cases, you will need to mop the edges first to provide a heavier coat of cleaning solution. The mopping pattern would be similar to the one shown on the right. Corners are difficult to scrub with the mop. If they are soiled, you can either use your shoe or your hand to move the mop back and forth to provide adequate cleaning. Or, use a hand-held scrub pad to agitate and clean the corners. The center hole of a buff pad can also be used to agitate any soil build-up.

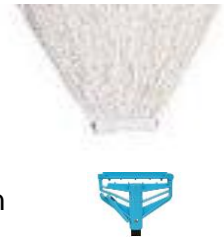


Often, the edges of a room, where there is no traffic may tend to stay clean. This can also include under furniture. In this case, the edges may not require damp mopping. If you find edges to be clean, dust mop first, and then observe the soil condition. You may choose not to mop these areas every time. The exception will be in rest rooms, locker rooms, food service areas and health care facilities. In these situations, a 100% damp mopping would be required each time.

### **Choosing Equipment**

- Mop heads –

Mop heads are usually made of cotton, rayon or a blend of fibers. Cotton is the least expensive, but tends to shed lint. You should thoroughly rinse a new cotton mop head and vigorously shake it out before use. Rayon heads can also be shook out to remove loose strands.



Rayon has been known to absorb eight times its weight in water. Rayon also dries faster and is less prone to souring. Blended fiber mops are more expensive, but tend to last longer than cotton or rayon.

The head band located at the top of the mop holds the fibers together. A narrow headband is usually 1" wide. It is possible to place a 5" X 9" green or white nylon pad under the saddle and over the mop head to provide a floor scrubber.



A wide band is usually 5" wide and is inserted into a gripper handle. Often the wide band material consists of a lightly abrasive scrubber to provide floor agitation.

The end of the mop head usually comes in cut ends or looped ends. A looped end mop head has individual strings or fibers that loop back to the top. Often these mops have a tail-band that keeps the mop strings from separating and causing skips in the mopping solution. The tail-band mop tends to offer a more uniform pattern of coverage, allowing a technician to mop at a faster rate.

Think of the difference this way. If you were to use a paint brush to apply paint to a wall, the strands are close together and overlapping to reduce skips. However, if you tried to paint a wall using a comb, you would see gaps or skips between each tooth of the comb. A mop head with a tail band keeps all the strands together, reducing separation of strands. Looped-end mops with sewn tail-bands reduce separation. "Deplying" is a term that explains this separation. In turn, deplying causes streaks and skips when mopping.





One disadvantage of a looped end mop is that loops tend to get caught or hung up on the legs of chairs, tables and furniture. When this happens it is usually necessary to reach down and manually loosen the strands. Looped-end mops with a tail-band hold up well when machine washed (laundered). Cut end mops are less expensive but do not lend to machine washing, as the strands unravel and then ball up with all the other strands.

Some facilities prefer to use color-coded mop heads. Medical facilities are big fans of these multiple selections. Each type of area such as rest rooms, patient rooms and operating rooms can have their own specific color.

Mop sizes are measured by the ounce-weight of the fiber and range from 12 oz. to 32 oz. Choose the weight that best corresponds with your body size and muscular build. Small, light build cleaners may prefer a 16 oz. head and stocky individuals may prefer a 24 oz. head. Keep in mind the wet weight will be several pounds more.



It's best to wash out a new mop head before use, in order to remove any fiber treatments used during the manufacturing process.

- Mop handles

Handles are usually constructed of metal, wood or fiberglass. Metal handles could be accidentally poked into a light socket causing an electrical hazard. Most mopping technicians prefer a mop handle that is close to their own height or at least comes to their chin level. An ergonomic handle should allow users to work in the correct posture to avoid shoulder and back pain.



With a saddle type mop handle, the screw is moved back so the mop head will fit between the two sides equally. Then the screw is tightened down to secure the mop.

The larger the diameter of the mop handle the more ergonomic the grip. Ergonomic mopping can be aided by a support globe at the top where the palm can rest and be massaged. Average height adults normally prefer a 60" handle.



- Mop Bucket and Wringer

Mop buckets are typically constructed of galvanized metal, stainless steel or nylon. Nylon buckets have become more popular because they do not rust and are available in a bright yellow safety color. The amount of water they hold normally varies from 2 gallons to 35 quarts (8.75 gallons).



A large bucket will allow more floors to be mopped before the water must be changed. However, the larger the bucket, the heavier it will be to dump. Most mop buckets are designed to be filled only 2/3 of the way.



- Cleaning Solutions

Floor finishes can be softened or ruined by using harsh chemicals. Consequently, all-purpose cleaners or neutral floor cleaners were developed to eliminate softening of floor finishes. In addition, extremely hot water can also damage or soften floor finish.

A neutral or all-purpose cleaner in a floor-care system is critical to protect the floor finish. A properly formulated and used product will keep the floor finish from deteriorating and being damaged by soils. Neutral cleaners obtain their name from the pH, which is very close to 7 (about the same as water).

A pH scale is used to measure the acidity or alkalinity of a cleaning product and seven is in the middle and considered neutral. The scale ranges from 0 to 14. The 0 to 6 end of the scale is acidic. The 8 to 14 end of the scale is alkaline. Pure water has a pH of 7. When used properly, a neutral solution should not damage the floor finish, whereas stronger detergents with a pH of 9 or above may soften the finish.

Some facilities are equipped with automatic dispensing stations. The purpose is to dispense the proper amount of cleaning solution mixed at the desired ratio with warm or cold water. The supplier who markets the cleaning solutions or provides the chemical is normally required to set the proper mixing or dilution ratio.

**The old theory that if a little bit works good, then a whole lot works much better does not hold true. When the mixture is too strong, the detergent may leave streaks or a sticky residue.**

Always use a measuring cup or gallon jug dispenser to measure the recommended amount of cleaner. Every chemical container should have a recommended dilution ratio. Often the ratio varies from a small amount for a lightly soiled floor to a stronger concentration for a heavily soiled floor. If the hardness of the water (dissolved mineral content) is excessive, then it is possible that additional floor cleaner may be required.



If Mixing Instructions Read	Mix Concentrate To Water
1 to 4	32 oz. (1 qt.) per gallon
1 to 8	16 oz. (1 pt.) per gallon
1 to 10	13 oz. per gallon
1 to 12	11 oz. per gallon
1 to 16	8 oz. (1 cup) per gallon
1 to 20	6 oz. per gallon
1 to 26	5 oz. per gallon
1 to 30	4 oz. per gallon
1 to 40	3 oz. per gallon
1 to 64	2 oz. per gallon
1 to 128	1 oz. per gallon
1 to 200	2/3 oz. per gallon
1 to 256	1/2 oz. per gallon

Not all situations demand an all-purpose or neutral cleaner. For example, kitchens and automotive shops will require a heavy-duty cleaner in order to dissolve the grease and health care facilities may require a disinfectant cleaner. The improper use and/or dilution of disinfectant cleaners can produce discoloration of a surface.

Greasy floors, as mentioned above, may also require a double mop bucket application or dual compartment system. The first bucket contains a heavier concentration to dissolve the grease. A second mop bucket may contain clear water as a rinse. Both may require hot water if the floor does not have a floor finish applied. As with other wet-mopping operations, the mops must be rinsed when soiled and the mop water changed before it becomes heavily soiled.



Double mopping is also used in rest rooms with ceramic tile and kitchens. The first application is often referred to as “flood mopping”. The mop head can be placed in the wringer for a couple of seconds without pressing down on the handle. Enough solution should be applied to provide a heavy coat without leaving puddles. Then, the second rinse is made with a mop tightly wrung out.

Health care environments will require an EPA (Environmental Protection Agency) registered disinfectant cleaner. It will be important to check with cleaning management to determine the required cleaning agents.

A neutral pH floor cleaner will be safe to use on most any hard surface floor without damaging the floor finish. Add the cleaning solution according to manufacturer's directions. Chemical dilution ratios are important. If the cleaning solution is hazardous, use gloves and goggles.

### **Safety concerns:**

Safety of the cleaning crew and building occupants is important. Over the years thousands of injuries have occurred when someone slipped and fell on a wet floor. Prevention is the best cure and as a floor care professional, you can play a major part in safety.

The National Floor Safety Institute reports that Americans are paying \$8 million a day for fraudulent slip and fall accidents. They indicate the leading causes of slips; trips-and-falls are as follows:

Walking surface	55%
Footwear	24%
Hazard warning	10%
Training	8%
Fraud	3%

If traffic is heavy, attempt to block off or rope off the areas to keep others from falling. If an area can not be blocked off, then place bright yellow or orange warning signs in easy-to-see locations. These signs can be placed about every 30 feet. If you are mopping  $\frac{1}{2}$  of a busy hall, locate signs so it directs traffic to the dry side. As mentioned earlier, bright yellow mop buckets help notify others that the floors will be wet.

Another important skill to learn is how to identify or hear people approaching you from the back side. When you notice movement coming toward you, remind the visitors or employees that the floors will be slippery.



By minimizing the amount of water or solution applied to the floor, the floors will dry faster. This can also reduce falls and tracking up of the clean floor. Increased air flow will also help speed up the drying of the floors.



**Remember: work safe to protect yourself and others.**

### **Supplies needed:**

1. Wet floor, caution or warning signs
2. A clean mop head installed on the mop handle (optional - A white 5" X 9" nylon pad installed under the saddle assembly. Eventually the pad contours to the mop head and is effective for dried-on food and black marks).
3. Mop bucket and wringer properly filled with cleaning solution
4. Towel or rag to wipe up accidental splashes on doors or walls, etc.
5. Scraper or putty knife to remove chewing gum, stickers or tar

Before getting started, stack any furniture that is easy to move and place it out of the way. By removing chairs and light furniture, it will allow better access to the floor. Once the floor has dried, you can replace the furniture. This also prevents metal legs from rusting the floor if they were to become wet from the mopping operation.



The mop head must be clean before starting. A soiled or detergent laden mop head will cause problems and affect the results. For example, dipping a soiled mop head into a clean bucket of solution will contaminate the solution. The soil in the mop head will re-emulsify with the water (cause it to come out of hiding) and begin to coat the floor.



If someone has previously mopped up a food spill and not cleaned the mop head, expect it to smell or leave a sticky residue on the floor. A dirty mop head will normally leave unsightly streaks on the floor. Never wet mop a floor until the floor has been thoroughly dust mopped or vacuumed.

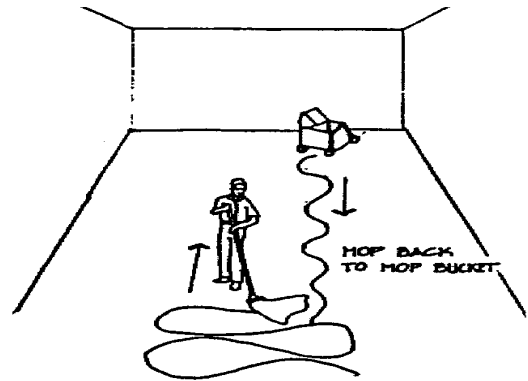
### **Mopping Procedure:**

1. Place "Floor Hazard" or "Wet Floor" signs in easy-to-see locations at entrances to the room or area.
2. Move or stack light furniture that would hinder access to the floor.
3. Dust mop or vacuum the floor and remove chewing gum, stickers, etc.
4. Pre-determine the work flow. Normally, you start in the back of a room and work your way out the door. The general idea is to also start at the farthest point away from the water source and work toward the dump sink.
5. Fill the mop bucket 2/3 or 3/4 of the way with cold or tepid (lukewarm) water. If the bucket has insufficient water, the cleaning solution it will not properly suspend and hold the soil in solution. Accurately measure the proper amount of cleaning solution according to the product label or use a dispensing station. Place the bucket approximately 20' from the desired starting point. Always keep the bucket on the section of the floor that has not yet been mopped. Make sure the bucket is never accidentally turned over and attempt to keep splashing to a minimum.





6. Dip the mop in the bucket and gently agitate the solution to mix the cleaning chemical and saturate the mop head. Place the mop bucket approximately 20–30 feet away from the starting point. Wring out the mop with light to medium pressure. It is safer on the back if you place the wringer handle directly in front of you. Try to hold your arm straight as you pull the handle forward. Then, gently bend your legs (squat) allowing your body weight to apply the pressure. Keep your back straight. Now place the mop on the floor at the finishing point.



7. Pull the mop behind you as you walk to the starting point (back of the room or back of the aisle). This will allow additional liquid to drain out on the floor. It is important to identify how much solution will be required for each given floor surface. Generally, the heavier the soil, the more solution that must be applied. The moisture level is determined by how much pressure is applied to the mop wringer and how far the mop is ran on the floor before it is dampened again in the mop bucket. Moisture levels are critical.

Heavy soil will require a heavier amount of liquid. Light soil will allow a lighter application of solution. Heavy puddles left on a floor will normally dry with a film or water marks from the mop strings. When mopping around table legs (with metal tips) avoid getting them wet, as this often creates rust. Learn to apply the appropriate amount of water to the floor. By not applying enough solution to a sticky spill, the spot will smear and show smudges when dry. However, too much solution can leave puddles and mop streaks.

8. Straddle the solution, or stand to the side of the trail and mop back to the starting point, using a normal figure-eight stroke. The mop movement is not actually a true figure-eight. Instead, draw the mop directly across your path in a straight line. When you reach each side, you make a rounded about-face. At this point the mop will have a “C” pattern when you reverse directions. By pulling the mop in a straight line (except when changing directions) the mop pattern will be easy to observe. Keep your back straight as you mop - do not twist your spine to reduce exhaustion.



Use your arm muscles to move or swing the mop back and forth. Overlap each pass by approximately 1". The solution left by the mop should be without skips (dry areas that were not covered). The mop head will normally pass about one foot in front of your shoes on each stroke.

Some floors stay wet for extended periods of time, interrupting further use of the floor. This is especially a challenge when trying to lay a coat of floor finish. The problem exists because the technician wrings out the mop, carries it to the back of the area, drops it on the floor and starts mopping. The moisture level at the back of the room is twice as heavy as the area adjacent to the mop bucket where the technician finishes mopping.

**The inverse mopping procedure (described above) corrects over-wet floors and ensures a uniform application.**

9. There is one other technique to learn when using cut end mop heads. The individual strands have a tendency to separate or deply. This in turn leaves skips and steaks. When the floor dries, it reflects a ropy pattern. To prevent this condition, rotate the mop handle so the head is at a 45° angle instead of a normal 90° angle to the pulling motion. This applies pressure to the mop strands causing them to crowd together, eliminating mop steaks.



Keep in mind that mopping too fast can cause the mop head to hydroplane and not make full contact with the floor. This in turn will leave skips.

10. As you mop backward to the mop bucket, you will absorb a greater proportion of the solution with each step. At the beginning of the stroke, the mop head is normally wetter than at any other time. Yet, by dragging it approximately 20 feet, a certain amount liquid begins to flow out of the mop head. There should be a 20 foot trail of water. As you mop back, the head dries out but still picks up residue left from the original trail. As you reach the mop bucket, the mop would normally be too dry, but now it has picked up a heavy puddle of clean solution left close to the mop bucket - to be spread across the floor.

The entire section that was just mopped should have a near perfect (uniform) application. Wet or dry spots have been eliminated. This method is a must when applying floor finish. Otherwise, an uneven application occurs by carrying the mop to the starting point, dropping it on the floor and mopping back. The inverse method is recommended for regular mopping, waxing and applying stripper. The only exception to this procedure is when the edges are heavily soiled or contain a heavy wax buildup. Then, you would cut the edges in first.

11. About half way back to the bucket, invert (flip) the mop over to begin using the clean side. As one side of the mop gets soiled, turn it over to use the other side. In all cases, avoid mopping with a soiled mop head. The mop movement should continue so that any debris is carried back to the bucket. If the mop dries out and starts to leave streaks, re-soak and wring out the mop each time - before it starts to streak. If this occurs frequently, then reduce the distance which is being covered. After placing the mop in the bucket, if debris is apparent on the floor, pick it up by hand. At this point it can be placed in a trash can, in a plastic bag which is attached to your belt loop or in a pants cuff.



12. The process described above of placing the mop on the floor and pulling it in the middle of the aisle to the starting point and then mopping back is called the "Inverse Mopping Procedure". It allows the majority of the water or cleaner to be placed in the center of the traffic lane instead of along the edges. In turn, the edges which are normally not soiled (no one can walk within 6" of a wall) are mopped with a lighter application. Polished and glossy edges often show a dull film if they are heavily mopped with solution. However, there is an exception to this process. If the edges have a build up of soil, then you would initially pull the wet mop along the edge to the starting point and then mop your way back to the bucket.

13. Continue cleaning across the entire area. Move the mop bucket back another 20 feet or so to repeat the same process on the next area. When transporting the mop bucket, always ensure the mop head is at the bottom of the bucket and never at the top, in the wringer. Transporting by placing the mop in the wringer is looking for an accident to happen. Since it is top heavy, it can tip over when encountering transition bars. These are the metal or rubber strips that separate carpet from tile. In the case of a large floor area, move "wet floor" signs to block off the next area to be mopped and begin mopping the next section. Always make sure the bucket wheels never contact the wet floor which has been cleaned, and never walk on the clean floor until it is dry.

14. Hardened soils will require gentle agitation with a floor scraper or putty knife. If the mop head has a white nylon scrub pad installed over the head, this pad will provide extra agitation to remove most difficult spots.



15. Change the mop water whenever it becomes soiled. If it appears several shades darker, then soil is probably accumulating. If the cleaning solution reaches a saturation level, a soiled coating may be left on the floor. Soiled mops slung up against walls will leave a dirty residue.

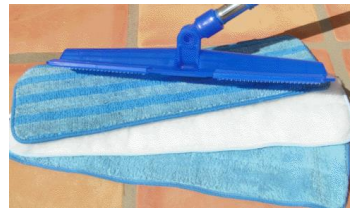
One way to monitor soil level is to notice when the run-off from the mop is visibly dirty. Professionals keep the mop water clean and sanitary. Normally, you will need to rinse the mop under hot water and refill the mop bucket about every 30 minutes. Continue mopping the floor until all areas have been cleaned.



16. Another process to clean heavy soil is to mop the floor twice or use a double bucket procedure. This would be a necessary procedure if the floor is heavy laden with grease, or the cleaning and or disinfection solution must be rinsed. A double mop process is also helpful in a break room, cafeteria or shop setting. By mopping first with a heavier application of water and allowing it to soak about 10 minutes, the difficult soil will be softened. Then mop a second time with the mop dried out (squeeze the mop head as tight as possible). This will pick up the residue and speed the drying process.
17. If possible, allow extra air flow to speed the drying of the floors, or reduce the humidity with A/C. When the floor is dry, pick up floor signs and replace any required furniture.
18. Rinse out the mop thoroughly after each use and hang the mop so it can air-dry. Rinse or clean the mop bucket so there is no residue that could contaminate the next cleaning operation.

### **Using a flat mop:**

Flat mops are wider than standard wet mops (18" to 24" wide) and allow a technician to clean at a faster rate. They are also lighter in weight and reduce back strain. Microfiber heads have been proven to remove a superior amount of soil compared to standard mops. However, some settings do not allow the flat mop to provide enough solution to the floor as well as extra weight required for tough soils.



### **Clean up and care of mops:**

Soil laden or sour mop heads can leave mop streaks and a dull finish. That is why it is important to keep mop heads clean. Wet mops should be rinsed out each time they are used, wrung as dry as possible, and then after shaking the strands apart, hung up to dry. Hot water will clean the mop head better than cold.

Periodically, or whenever the mop head begins to darken it may be time to deep clean the mop head. Pour 1 oz. of degreaser on the mop head (or disperse from fill station) and agitate briskly in the dump sink. Rinse with scalding hot water and wring out (repeating the rinse three times). Several drying methods are acceptable: a). Secure in a wall hanger with the head down b). Drape over a mop bucket or sink c). Store off the floor with the head up and strands flared. The objective is to promote rapid drying to curtail mildew.



Rinse out mop buckets in the dump sink and turn upside down to allow them to dry. Launder or replace mops as required. Special nylon string laundry bags are available that prevent the mops from inter-tangling during the wash cycle. Again, if mops are not properly cleaned and dried they may sour and leave streaks and odors on the floor.

## Troubleshooting

### Causes of dull floors after mopping:

1. Dust-mopping was inadequate – leaving visible debris and soil on the floor
2. Soiled or sour mop – not properly cleaned or dried
3. Mop water was not changed often enough
4. A double mopping operation was required
5. Too much water was applied to the floor
6. Mop was swung too fast, causing improper coating of the cleaning solution
7. Too much floor cleaner was added to the mop water

**Correction:** floors may need to be mopped with a restorer and burnished

### Causes of streaked floors after mopping:

1. Dust mop head was heavily soiled and left a residue that damp mopping was unable to remove
2. Heavy soil on the floor - should have been double mopped
3. Sticky residues should have been scrapped with a putty knife and the floor slightly scrubbed. Instead, if the mop was merely run over sticky substances, then it likely spread the residue
4. Inadequate level of detergency for the existing soil load. May need to add more detergent
5. Skips from running the mop too dry
6. Skips by not picking up overhead light reflections to actually see areas that were missed or need extra attention

**Correction:** floors may need to be mopped with a restorer and burnished

### Causes of slippery floors

1. Floor finish has worn off and floors need recoating
2. Too much dust mop treatment has been sprayed on the dust mop head or the dust mop was sprayed with treatment over the floor
3. Furniture polish, stainless steel polish or WD-40 has drifted onto the floor

**Correction:** floors may need to be mopped with a heavy duty floor cleaner and burnished

## Notes:

### III. Understanding Floor Types

#### *Resilient Flooring*

##### **Vinyl Composition Tile (VCT)**

**Overview** - Vinyl composition tile is the most popular resilient flooring today for commercial applications. It is very common to find this tile in most supermarkets. The tile comes in a variety of colors and usually measures 12" x 12". This tile is designed to be finished with a polymer floor finish.

**General Characteristics** - VCT offers good dimensional stability, durability, impact resistance, UV light stability and heat stability. It comes in a variety of colors and grades. Laboratory tests have shown that some VCT tiles may contain small amounts of asbestos.

**Maintenance** - VCT holds all types and brands of floor finish beautifully due to its porous nature.



Newly installed VCT



VCT normally comes with a factory seal that requires removal and application of floor finish



Finished VCT

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##### **Vinyl Asbestos Tile (VAT)**

**Overview** - VAT was popular from the mid-1950 until the mid-1980. This flooring hasn't been produced for health and safety reasons since mid-1980. Since it contains asbestos, all OSHA requirements must be followed while stripping and burnishing VAT.

**General Characteristics** - VAT was known for its durability, dimensional stability and heat resistance as evidenced by the amount still found in older buildings. Much of it was produced in the 9" x 9" size, though 12" x 12" was also available.

**Maintenance** - This floor accepts finish nicely. Being old and porous, it usually requires two coats of sealer. If it is stripped (follow OSHA and EPA guidelines for stripping). On very old floors, use of high alkaline strippers is not recommended. OSHA also requires that VAT floors never be buffed without adequate floor finish. See OSHA 29 CFR 1910.1001.

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## **Sheet Vinyl**

**Overview** - This flooring is produced in sheet widths from 6' to 15', making it easy to install and eliminating seams which can trap dirt and moisture. Sheet vinyl is not often found in commercial buildings since VCT is more durable.

**General Characteristics** - Similar to VCT but contains more vinyl resin and less limestone filler, giving it greater flexibility. Sheet vinyl can be produced with a variety of designs and colors

**Maintenance** – Most sheet vinyl is naturally dull and will hold a nice gloss when finished with a polymer floor finish. Some grades are produced with a high gloss protection known as “no wax” floors. Clean with neutral detergent.



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## **Linoleum**

**Overview** - linoleum is tough, natural ingredient-based flooring that has enjoyed a slight resurgence with homeowners recently due to its positive environmental profile. It is still used in commercial applications because of its high durability. It is nearly impossible to tell sheet vinyl from linoleum once installed.

**General Characteristics** – Linoleum is produced with linseed oil mixed with powdered wood and/or cork, ground limestone, resins, drying agents and pigments applied to a jute backing.

**Maintenance** - Linoleum should be kept finished at all times since it is quite porous. New installations may be difficult to finish for a few weeks since it off-gases linseed oil vapors. Stripping with highly alkaline strippers is not recommended since bleaching and fading can occur. Use only linoleum safe strippers (pH 10 or less). Clean regularly with neutral detergent.

## **Man-Made Stone Flooring**

### **Terrazzo**

**Overview** - Terrazzo flooring offers high durability and deep beauty. Its initial cost is considerably higher than resilient flooring but when viewed long-term, it can actually be less expensive.

**General Characteristics** – Terrazzo consists of marble, granite, quartz and/or glass chips mixed with Portland cement, or epoxy resin and poured into place.



**Maintenance** - Some pure epoxy-based floors are difficult to finish due to its ability to resist liquids. Avoid using high pH cleaners and acid-based products on terrazzo. It is best to apply a penetrating sealer approved for terrazzo. Until it has been sealed, terrazzo is unfinished material and, as such, should be carefully protected from possible damage. Floor finish can be applied over the penetrating sealer, but will not adhere well when used without a sealer. Resealing is necessary only when regular cleaning and polishing fails to restore the soft sheen or when neglect has resulted in staining or heavy build-up of soil.

## **Unglazed Ceramic (Quarry Tile)**

**Overview** - Quarry tile provides an attractive floor that is durable and easy to maintain. These tiles are usually red in color and 6" x 6" in size with a ½" thickness. Quarry tile is often installed in foodservice areas.



**General Characteristics** – Quarry tile is made from a mixture of clays that are fired at high temperatures (approximately 2200 degrees).

**Maintenance** - Quarry tile can be finished with standard floor care products although this is not generally advised in foodservice or other wet areas. A non-skid traction enhancer can be applied to help produce a non-slip surface. For a high gloss appearance in non-wet areas, the tile can be sealed with a penetrating seal and then top-coated with a standard floor finish.

## **Glazed Ceramic**

**Overview** - Glazed ceramic tile creates a durable surface that is easy to clean, resists stains and scratches, doesn't fade and is slip-resistant. However, the grouting may be subject to soil accumulation and staining.



**General Characteristics** - Identical to unglazed except a liquid glass is applied to the tile at very high temperatures. This creates a hard, non-porous surface.

**Maintenance Characteristics:** Glazed ceramic tile will NOT hold floor finish. The surface is too smooth for proper floor finish adhesion to occur. Sealing the grout with a permanent seal is preferred.

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## **Brick Pavers**

**Overview** - Similar to quarry tile but larger in size and thickness.

**General Characteristics** - **Similar** to quarry tile.

**Maintenance** - Similar to quarry tile.



## **Mexican Tile (Saltillo)**

**Overview** - Saltillo tiles are natural clay tiles, hand-made in Mexico. Similar to terracotta tiles, Saltillo tiles are rustic in appearance. The beauty and character of each tile comes from variations in size, color and texture. It is extremely popular in Mexico and throughout the Southwestern United States.



**General Characteristics** – it is manufactured from unprocessed clay.

**Maintenance** - The high alkalinity and porous nature of this tile requires sealing and then top-coats of standard floor finish can be applied. Clean with a neutral detergent.

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## **Concrete**

**Overview** - Concrete is universally used for commercial building slabs. Most are covered with another flooring material such as tile, carpeting or wood. Concrete floors that are not covered with another material are gaining popularity in retail stores and other commercial buildings since it provides a low cost yet highly durable flooring surface. To prevent dust and powder residual, concrete is normally sealed. Retail applications are beginning to use a stain to enhance the appearance.



**General Characteristics** – It is made from Portland cement, stone aggregate, sand and water.

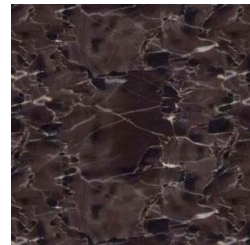
**Maintenance** - Concrete can be challenging to finish with acrylic-based coatings. High alkalinity, high moisture, grease and oils, and unknown curing compounds and sealants can make finishing difficult. Normally concrete is sealed with a polyurethane sealer. Once sealed, it can be top-coated with a standard floor finish.

## **Natural Stone Flooring**

### **Marble**

**Overview** - A beautiful floor surface that is not suited for large commercial areas or heavily trafficked areas due to its soft nature (scratches easily), high absorbency (stains easily) and acid sensitivity.

**General Characteristics** – Marble contains a combination of calcite and calcium carbonate.



**Maintenance** - Penetrating sealers perform best on marble. Acrylic-based finishes can be used as a top-coat, but do not allow the marble to “breathe”. Marble should only be cleaned with neutral cleaner – avoid acid-based products, and high alkaline products.

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### **Slate**

**Overview** - Slate is a smooth, soft, natural stone available in a wide variety of textures, colors and sizes. It offers good durability and stain resistance due to its semi-porous nature.

**General Characteristics** – Composed of shale and clay quartz.

**Maintenance** - Slate is generally not finished with acrylic-based or polymer floor finishes although, if used, they will usually adhere. Penetrating sealers can be used if desired and are often recommended for areas exposed to food and liquid spills. Clean with neutral detergent.





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## **Granite**

**Overview** - Granite is used sparingly in commercial buildings due to its high cost. It is hard, doesn't easily scratch and is stain-resistant – making it well suited for residential flooring.

**General Characteristics** – comprised of quartz and feldspar mixture.

**Maintenance** - Granite's hard and smooth surface makes it unsuitable for finishing with acrylic-based or polymer floor finishes. It can be sealed with a penetrating sealer. Clean with neutral detergent.



## **Laminate**



**Overview** - Laminate floors come in either planks or square tiles. This flooring material imitates real flooring materials such as: wood, stone or ceramic tiles.

**General Characteristics** - Laminate floors are actually several different layers of various materials such as high-density fiberboard that are pressed together to form each plank. A printed film gives the floor the look of a real wood or tile and is protected by a tough, durable wearlayer that goes on top of the print layer. The resins used in the wearlayer are resistant to wear and extremely stain resistance.

**Maintenance** – Vacuum or use a dust mop or wipe with a damp cloth. For spills, use a damp cloth or wet mop wrung out tightly. Do not use soap-based detergents, as these may leave a dull film. Do not use abrasive cleaners, steel wool, or scouring powder, which can scratch the floor or "mop and shine" products. Do not wax or polish. Laminate flooring, like other types of smooth floors, can become slippery when wet. Allow time for floor to dry after cleaning. Immediately wipe up wet areas from spills, foreign substances, or wet feet.

## **Wood**

**Overview** - The manufacturing of prefinished hardwood flooring has dramatically improved the finish, durability and ease of maintenance of hardwood flooring. Prefinished floors and floors that are sanded and coated with polyurethane no longer require paste wax.

**General Characteristics** – oak, maple, hickory and ash are the most common wood sources in North America. Wood planks come in a variety of sizes and colors. In addition, wood species are also imported from around the world including Australia, Africa, Brazil and the Far East. Exotic hardwoods offer unique wood graining and more uncommon colorations.



**Maintenance** – Avoid mopping with a saturated mop. Standing water can dull the finish, damage the wood and leave a discoloring residue. Wipe up spills immediately with a slightly dampened towel. Do not over-wax a wood floor. If the floor dulls, try buffing instead. Avoid wax buildup under furniture and other light traffic areas by applying wax in these spots every other waxing session.

**Notes:**

## IV. Burnishing and Buffing Procedures

### Objectives:

When a floor has just been refinished, everyone hopes it will stay that way. But, that is only possible if there is no traffic or soil present. In the real world, foot traffic brings in grease, oil and dirt. Spills happen. Items are all too often pushed across the floor causing scuffs and scratches. So the answer to keeping floors looking great is an ongoing maintenance program.



The overall frequency of floor care is determined by the budget that is available for labor, equipment and supplies, the amount of use or abuse of the floor and the desired level of shine or gloss that is expected. Even within a given building, use of the floor will vary from location to location. Main halls often experience the highest traffic. Special counter areas and around desks are also prone to heavy foot traffic. All of the above items must be considered in order to establish the proper frequency for dust-mopping, wet-mopping, burnishing, scrub and topcoat and finally a deep strip and refinish of the floors.

Burnishing is an excellent process to restore the gloss to a finished floor. This process normally extends the life of the floor finish and lengthens the time between labor intensive recoating or a total strip and refinish operation.

A more technical definition of burnishing might include: an interim maintenance process for hard surface floors requiring a high-speed polishing machine passing over a buffable floor finish or finish treated with a polishing compound that removes micro abrasions and produces a high gloss capable of reflecting light.

The process normally requires: a). High-speed floor machine known as a burnisher, capable of 1,000-3,000 rpm's b). Burnishing pad, normally nylon composition capable of thermo activity c). Either a buffable floor finish or a polishing compound applied to a floor finish that is capable of producing a high gloss. Results can be measured by a gloss meter.

There is another standard for floor appearance that is being used. The ASTM (American Society for Testing and Materials) recently developed a new test standard ASTM D4935 for measuring Distinctness of Images (DOI).

What is Distinctness of Images? If the surface reflection of an object appears sharp and clear-like, being able to see the clear outline of an overhead light bulb or read the text in a reflected sign-then the surface is said to have a high DOI; conversely, if the reflection appears blurry, it has a low DOI.

The values obtained by the measuring procedures given in these methods generally correlate well with visual ratings for DOI (image clarity). DOI is quickly becoming the new measure for hard floor quality and appearance. The scale values obtained with the measuring procedures of these methods range from 0 to 100 with a value of 100 representing perfect DOI (image clarity). The DOI (image clarity) scale value does not of itself, indicate any specific cause for reduction in reflected image sharpness. Surface irregularities such as haze, orange peel, and wrinkle, when present, may be cited as causes for reduction of image sharpness.

It is generally unsafe to buff, spray buff or burnish a floor with less than three to five coats of polish. Without three to five coats of polish, the pad or brush may make contact with the actual flooring surface, most likely marring the flooring material with burn marks and swirls. Operators of ultra-high-speed floor machines should be well-trained. Careless or improper use of these machines can result in severe and expensive damage to the floor.

A professional floor care technician should maintain floors properly so there is never an artificial shine. This is what happens when the finish wears thin and the continual buffing only provides a sheen, and not a gloss. Lack of gloss retention occurs when the finish has worn below its critical covering or thickness.

A burnishing program assumes the floor contains adequate floor finish to protect the surface and enough depth of finish to produce a gloss. Careful observation by a trained eye will identify when the center of the traffic lane does not match the glossy edge. Part of a floor maintenance program includes a scrub and recoat when necessary. Once a scrub and recoat frequency has been established, it can be scheduled on a calendar for programmed PM (Preventative Maintenance).

Newer burnishers are designed so the entire pad contacts the floor. Older designs often contacted the floor on the front middle portion and not on the sides or back of the pad. This often created a gloss in the center, but not on the edges.

A streaked appearance caused the operator to overlap each pass, slowing down the job. It is possible for most burnishers to become off-centered and place more weight on one side than on the other. Some burnishers, including propane buffers, have wheel adjustment capabilities. An uneven gloss is often referred to as pathing and should be corrected by a trained machine maintenance person.

Some burnishers also have an amp draw gauge or a red light indicator to display when the pad pressure is excessive. The objective is to notify the operator of an excessive amp draw that could cause a building breaker to trip. The red light or amp needle could indicate an overdraw when first starting the machine, but it may back off as the machine reaches full rpm.

### **Mastering the Basics:**

Most modern day floor finishes are designed for high-speed buffing, which is referred to as burnishing. A burnisher moves only straightforward and backward on the rear wheels (similar to a lawn mower). Most of the newer electric burnishers today rotate at 1,500 to 2,500 rpm.

Floors can be buffed with a standard (175-300 rpm) floor machine, but the gloss will not approach what is called the “wet look”. A standard floor machine is unable to generate the friction and heat to produce an ultra-high-gloss.



Floor buffing with a 175 rpm machine can be performed dry after mopping on a restorer, or by spraying a light amount of buffing compound ahead of the machine. The first pass normally distributes the spray buff material and the next pass buffs the floor to a moderate sheen. Since this is a standard floor machine, the buffer will be moved across the floor left to right and right to left.

It is important to identify the type of floor surface that you will be working with. The most common floor types include VCT (vinyl composition tile) VAT (vinyl asbestos tile, sheet vinyl, terrazzo, marble, slate and stone just to mention a few. Each flooring type is maintained differently, and maintaining all of them the same way could cause damage to some. Consult with the floor manufacturers maintenance recommendations and do not attempt maintenance without proper training.

For example, VAT must be buffed and stripped with caution because hazardous asbestos can be released into the air. OSHA has strict safety standards that must be followed when working with asbestos floors. Terrazzo is composed of marble and cement, and it can be treated the same as marble floor. However, many floor experts prefer to use a sealer and then top-coat with a standard floor finish much like VCT. Linoleum is back in style, and many facilities are installing more of it.

While linoleum might look like a vinyl floor, it is made mostly of wood resin, so it requires a different maintenance system than vinyl.

Stone floors are among the most challenging of all flooring types to maintain. What might be the general practice for maintaining resilient floors might not work for stone floors. Natural flooring has its own unique properties based on the stone itself. Acid based cleaners can severely damage marble.

Many hard-floor experts recommend sealing stone floors with a penetrating sealer. Some recommend using water-based sealers because silicone can attract soil. An impregnator protects the floor from stains and allows it to breathe. It does not produce a gloss but instead is applied for protection, and it leaves the floor looking almost natural.

Polished stone requires more dust-mopping to protect it from sand and grit, which can scratch it easily. Even water can discolor polished stone. Dust-mopping or vacuuming of these floors should be done several times a day if possible. It is best to use an untreated dust mop because using a treated mop might leave a residue that the stone will absorb.

There are a wide range of chemicals available for the burnishing process. Some are diluted in a spray bottle and lightly misted on the floor just ahead of the burnisher. Another process involves a specially formulated “restorer” or “rejuvenator” that is mopped on the floor to clean it prior to burnishing. Some restorers add a small quantity of replacement finish. When the restorer dries, the burnishing process should immediately follow.

Restorers or rejuvenators are used with thermoplastic polymer finishes to create a longer-lasting and better-looking floor. Eventually, even the best floor finish will start to look dull, even with excellent care including regular dust-mopping and high-speed burnishing. Rejuvenators actually bring new life to a floor finish by softening its hardened surface so the high-speed equipment can refurbish it. It is important to have a rejuvenator that fits into the system; if it is not formulated for a specific type of floor finish, problems can arise.

As in all cleaning operations learn to modify overall cleaning formulas to employ T.A.C.T. (time, agitation, concentration, temperature). If you short one of the four elements, you will need to compensate by adding an offsetting correction to one of the others.

### **Pad Selection:**

There is an extensive selection of buffing or burnishing pads. Originally, the white pad was developed to buff a floor with a standard slow speed buffer. As spray buffing compounds were next introduced, many technicians buffed with a red pad. However, once high-speed burnishers (over 1200 rpm) were introduced; technicians learned that red pads could readily leave red burn marks.

Modern floor pads are a blend of polyester and/or nylon fibers, which are bonded together with synthetic resin and then impregnated with abrasives. The aggression level of a pad depends on the type of fibers and abrasives used to produce it. The open web construction of floor pads allows for greater soil removal and easy cleaning. Pads can be used on both sides and then cleaned.



Several manufacturers produce floor buffing or burnishing pads and distinguish the aggression level by color coding. You can find burnishing pads in grey, beige, champagne, aqua, peach and plum just to name a few. Some more aggressive pads contain natural hair from hogs or horses which can also help hold the pad together and keep it from fraying at high-speeds. Each pad is designed to produce





different results, depending on the formulation and hardness of the floor finish. You should check with the pad manufacturer and floor finish manufacturer to determine the appropriate colored pad.

You may need to pre-test, to match the appropriate pad for the floor and the hardness of the floor finish. This may require some trial and error, to fine tune the overall aggression level and the resulting shine. Selecting the proper aggression level and color from the color scale is critical. Black pads used for stripping are the most aggressive, and white buffing pads are the least aggressive. All the other pads will fit somewhere in the color range between the two. The goal is to choose a pad that removes black marks, scuffs and minor scratches along with producing a high gloss - without being too aggressive and dulling or wearing the finish.

Floor pad selection, in regard to aggressiveness, is also determined by the hardness, durability, and scrub-ability of the floor finish. Red and green pads are designed for scrubbing, while white often lacks the aggression to remove scratches and black marks. A red pad when “heeled” on a dry floor can burn a red mark into the finish. A cost-saving tip is to recycle the gray or tan high-speed burnish pads. When they begin to wear, clean them up and use them for scrubbing.

High-speed buffing pads must be installed correctly to eliminate excessive vibrations. If the pad is off center, a wobble may develop. The protrusion of the pad beyond the pad holder can allow it to catch on a desk leg and pull the pad off or destroy the pad. An uneven wobble can also cause the pad to eventually fly off the machine.

One problem with constant floor scrubbing is that some finishes will begin to dull. Scrubbing can be followed with a high-speed burnishing. When areas are smaller and floor usage is light to moderate, a thorough mopping followed by burnishing may suffice for maintaining the gloss and appearance.

If a floor has been neglected for a period of time, the floor may require a good cleaning with a scrubber or automatic scrubber. This will help remove imbedded dirt and soil. High-frequency maintenance with an autoscrubber requires a different approach. You may want to consider a white pad to reduce premature wear of the floor finish.

High-speed burnishing is not meant to be the only approach to keeping floors looking good. It will be necessary to scrub and top-coat the traffic lanes whenever the finish shows wear. The goal of a regular scrub and top-coat is to prolong the time required between strip operations.

### **Pad Drivers for standard (175 rpm) machines:**

Pad drivers or drive block assemblies are holding devices that secure a buff pad to the bottom of the floor machine. There are several methods by which this is accomplished.

Some machines have a Velcro type grip on the bottom of the drive pad. If this is the case, merely place the pad on the floor and position the machine squarely on top of the pad. Or, tilt the machine back on the handle (make sure it is not plugged in) and then carefully center the pad on the bottom of the machine. Make sure the pad does not protrude unevenly or the machine may wobble when being run at high-speeds. Other machines may have a plastic center-hole screw on cup (retainer cup) that holds the pad in place over a stiff nylon drive brush. Some machines merely have a stiff nylon brush to hold the pad in place.



To install a pad driver or drive block assembly, —————→ tilt the machine back to rest on the handle. Make sure the machine is unplugged. Place the drive block so it inserts into the drive shaft that is protruding from the bottom of the machine. Normally a drive block has a large diameter hole to which is installed a clutch plate. The clutch plate has three notches that correspond with three knobs found on the machine drive shaft.



Once the drive brush is fitted onto the machine, turn the drive block tightly to the left (counter-clockwise) when facing the machine to lock it into position. When storing the machine, if you experience difficulty removing the drive block from the machine, stand in front of the machine, with your back to it. Then, with your heel, firmly kick the left side of the drive brush in a downward manner.

Never try to place the machine over a drive block which is on the floor then start the machine. This could prove dangerous and damage the drive block. Before using an electrical buffer, make sure the cord and plug are in good condition. If wires are exposed, or the machine will not run, place a service tag on the machine and notify your supervisor.

### **High-speed burnisher drive brushes or pads:**

Most high-speed burnishers come equipped with a center plastic retaining cup. The cup either snaps in or screws in. The machine should be tilted back on the handle so the brush assembly is vertical. The pad is carefully centered and the retaining cup is placed into position. Some burnishers have a flexible or floating drive pad to allow access into low spots on the floor.



Most buffers have handle-grip controls that you squeeze to activate the motor. Always be braced when starting a machine. One brand has handle-grip controls that are rotated clockwise to activate the machine. In all cases, the machines are designed so that when you let loose of the handles, the machine stops. Many buffers and burnishers have a safety lock button that must be depressed prior to starting the machine.

### **Work objectives:**

The goal should be to burnish a clean floor, so that soil is not glazed into the floor finish. The high rpm produces heat and attracts debris into the burnishing pad, requiring regular cleaning of the pad or replacement. It is critical to thoroughly clean the floor before burnishing or buffing. This will prevent stirring up dust throughout the building. It will also keep from trapping grit under the pad resulting in scratching of the finish and producing unsightly swirl marks. Swirl marks that display a buff-pad pattern are caused by using a pad that is too aggressive or a pad embedded with finish and debris.

Never polish or burnish dirt into the floor. Dust mop, scrape residue with a razor or putty knife and thoroughly clean the floor. Trying to buff or burnish sticky residue such as tar, will only smear the substance across the floor.

Wet mop the floor with a floor finish restorer and allow it to dry, or use an automatic scrubber to clean the floor. Fold back the edge of area rugs, so the burnisher pad does not unravel carpet edges. A burnisher with a positive vacuum and filter has the advantage of reducing airborne dust generated by the process. Many facilities are now using air filtration units in order to



improve the overall indoor air quality (IAQ) of the building.

To reduce burn marks, learn where the high spots occur in the floor and push the burnisher faster as you slightly press down on the handle. This reduces pad pressure. Burns are normally caused when the burnisher hangs up on a high spot. The other option is to buff around a high spot. To repair a burn mark, shave off the noticeable burn with a razor scraper, pulled toward you while holding at a 45° angle. Clean the spot with a nylon pad and detergent. When thoroughly clean and dry, apply floor finish to the damaged area using paper towels.

Carefully maneuver around floor drains, door thresholds and rest room wall partitions. Obstructions can easily tear up a pad. Carry an extra pad and change when soiled. The minute you start to notice circular streaks in the floor, stop and change pads. Sheet vinyl floors often contain low spots (dips) that fail to burnish out. Before moving to a new area, repeat the burnishing from a 90-degree angle (perpendicular). This will normally bring a shine to the low areas.

If you only have a standard floor machine, sometimes referred to as a swing buffer, it can be used to produce a clean and shiny floor. Since standard floor machines normally rotate at 175 rpm, they do not produce the ultra high gloss appearance.

Never buff a dirty floor as it will only grind soil deeper into the finish. The object is to clean the floor first, so the buff pad can agitate and transfer the chemically loosened gritty soil into the pad.



### **Buffing a floor with a standard (175 rpm) machine (single disk rotary):**

First, make sure you have been properly trained to operate a floor machine (buffer) by an experienced operator or supervisor. Without proper experience, this can turn into a dangerous situation. The buffer runs left to right by raising or lowering the handle. The motor is activated by squeezing levers normally located on the underside of the right and left handle. Slightly brace yourself prior to starting the machine, as it will tend to push back toward you.

1. Move any required furniture. Prepare the area for buffing by placing wet floor signs. Dust mop the floor and scrap any chewing gum or sticky residue. Damp mop the floor using a restorer floor product.

2. Install the appropriate buff pad on the bottom of the floor machine while the machine is still unplugged. Tilt it backward until the operating handle rests on the floor and then secure the pad to the machine. Unwrap the cord and plug it into the electrical outlet where you plan to start.



3. Adjust the handle to the proper height (slightly below waist level) so it is comfortable and allows adequate control. A right handed person may prefer to twist his or her torso so the right leg is leading. Then, adjust the handle so it fits in the crease where the leg attaches to the torso. Tightly lock the handle in place. Be sure you have a good grip on the floor machine as it is easy to lose control. If the machine has a safety button, depress it prior to squeezing the power grips or activation lever. Move the buffer side-to-side covering approximately 6-8 feet of floor with each pass using a fanning motion. By lifting the handle slightly upward 1-2 inches, the buffer will move to the right. By moving the handle slowly downward 1-2 inches, the buffer will move to the left.

4. Start in the back of the room and initially buff along the wall where the cord is plugged in at. Then you can move the cord on top of the freshly buffed area to keep it out of the way. Pay close



attention; so you never run over the buffer cord. You may choose to place the cord over your shoulder, or use a cord belt attachment. (Photo to the right shows improper cord management.)



5. If a buffer is 18" in diameter, then make overlapping passes each 9". Inspect the floor appearance as you proceed. If spots or areas do not produce a shine, consider spraying the area lightly with a small stream of spray buff material. Then make two more passes over the area.

Note: When spraying a buffing compound on the floor, the first machine pass will tend to grab and slow down the machine. Make sure you keep a firm grip and do not lose control of the machine.

6. Buff the baseboards parallel with the wall. This will prevent accidentally running the buffer into the wall, causing damage.

7. Check the buff pad at set intervals (at least every 100 feet) and rotate, invert or flip dirty pads. Replace with a clean pad when both sides are dirty. If the pad leaves swirl marks, immediately stop the machine and invert or replace the pad.

7. After buffing the entire floor area, use a clean, treated dust mop to pick up dust left from the buffing operation, or vacuum with a wand canister or backpack vacuum and floor tool.

8. Prior to storage, place the handle in an upright position. Wrap the cord, remove the pad driver or brush and rinse it off if necessary. Clean the buffer and cord with cleaner and towel. Clean the pad and store all items in the designated area.

9. Maintenance observations – notify supervision of any cuts in the cord or a missing ground plug. Check the wheels, bumper and any other parts that appear damaged or missing.

**To spray buff a floor** – follow the procedure listed above, but add these steps to the process:

1. Select an approved buff pad and install it properly on the bottom of the machine.

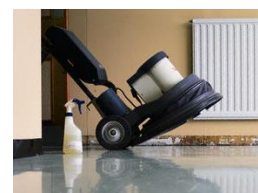
2. Select and dilute the spray buff solution (rejuvenating liquid) in a spray bottle according to the label directions. Adjust the spray bottle so that a stream comes out of the tip.

3. Spray a straight line of solution beginning at the front of the machine and approximately three feet ahead of the floor machine. Usually just one spray from the spray bottle is sufficient. Do not over spray the floor as this will make it more difficult to dry and polish the floor. Do not spray solution too far ahead of the machine or it may dry on the floor. The floor must be buffed while the solution is still wet.



4. Make the first pass side-to-side to distribute and buff in the solution. This will spread the stream of solution across the floor and display a dull appearance. It should take approximately five seconds to make an entire pass from left to right or from right to left. A normal buffing width will be approximately six feet wide.

5. Move the buffer ahead the same amount of distance as the diameter of the pad. Buff the solution again into the floor surface.



6. Move back to the starting point once the spray buff has been buffed into the floor and make a polishing pass. This would include a five second pass when moving left to right or right to left.

7. If any areas do not respond to the polishing pass, spray a second time with the spray bottle and buffing solution. Make the first pass to distribute the solution and the second pass to produce a shine. Do not overuse the buffing solution.

## High-speed burnishing

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1. Prepare area for spray buffing by moving any furniture, mats, rugs or other obstacles in the work area. Place "Floor Hazard" or "Caution Wet Floor" signs at easy-to-see locations near the entrances into the area being burnished. Make sure there are at least 3-4 coats of floor finish and that it is formulated for burnishing. To provide an on-going burnishing program, 6-8 coats of finish will last much longer.

2. Dust mop the floor with a treated dust mop or vacuum the floor. Scrape stickers, gum, or labels with a putty knife. Dust mop and then wet mop the floor with a neutral cleaner or a suitable restorer, thermoplastic conditioner or maintainer designed for burnishing. Use a measuring cup, safety glasses and gloves if desired. Remove black heel marks by applying pressure to the mop head. Or, with a previously installed white nylon pad placed over the mop head, use this to agitate and remove difficult soil. Note: some black marks will easily buff out. So there will be no need to remove them prior to burnishing. A floor tech should learn how to identify easy-to-remove black marks and not waste time on scrubbing them out with the mop.

3. Once the floor has dried, select the appropriate high-speed burnishing pad and install it on the machine. Make sure the pad is well centered to prevent wobble. Use a pad that is matched for the floor finish and the traffic conditions. Make sure you are completely familiar with all safety precautions in operating the machine including checking the power cord for electrical shorts and proper handle adjustment. If you are burnishing an occupied hall, start on the left side of the hall to observe passer-bys.



4. If the burnisher has a pad pressure gauge and/or a regulator adjustment knob, adjust this so the burnisher starts to lightly grab the floor, but does not pull down the full rpm of the machine. Usually a 10% drop in rpm is acceptable. The pad must make full contact in order to perform the polishing action without tripping an electrical breaker or overheating the machine. Some pad drivers are made of flexible nylon, allowing the pad to adjust to the contour of the floor.

5. After the machine is plugged in, slightly press down on the handle to reduce pad pressure and depress the handle grips to start the machine. Gradually lower the machine as you start to push it forward. Starting at the farthest corner from the entrance or at the beginning or end of a hall, make straight passes the entire distance of the room or hall, or until you run out of cord. Walk slowly in a straight line. Keep the cord close to the baseboard and under control at all times. Turn the machine around and buff back to the starting point overlapping each pass by at least 1-2 inches. Keep a steady work pace, but slow enough to produce a gloss by the process.

6. Lightly spray any black marks, heavy scuffs or embedded soil with a spray buff trigger sprayer and move the burnisher over the area until the desired shine or gloss is accomplished. Adjust the spray tip so a light stream comes out of the trigger sprayer instead of a mist.

Observe the results by catching the reflection of overhead lights or day time sunlight. Proper reflection will help identify dull spots. Re-spray or re-burnish those areas.

Do not hold the machine in one spot, as burns may occur. Do not run the machine over protrusions such as floor plugs, thresholds, etc. as pad and/or machine damage will occur. Change or clean pads as required.



7. Dust mop floors after burnishing replace furniture or mats and then remove “Caution” signs. Properly clean and store all equipment and supplies.

Note: some newer burnishers with high-tech filtration devices may eliminate the need to dust mop the floor. A hand-wipe across the floor will detect if the on-board filter is adequate. If the burnisher does not have a filter, you may need to feather dust furniture and rest room fixtures.

## **Cleaning of burnishing pads**

It is always best to check the condition of a burnish pad before each use. Eventually, they will collect residue and floor finish, causing a build up. Since the floor type, floor finish, burnish pad density and machine conditions all vary; some pads will run longer than others. A pad with a heavy build up will cut swirls into the floor finish.

One way to clean buff pads is with a hot water hose using as much pressure as possible or even a high pressure washer. Allow pads to dry before using. Most pads can also be soaked in diluted stripper, thoroughly rinsed and then paced vertical for drying.

Excessive wet cleaning of natural hair pads can damage the fiber. An alternative is to use the center hole of the pad to gently brush and agitate and then either blast with an air hose or aggressively impact the pad against a concrete wall.

## **Propane Buffing**

Propane burnishing or buffing is best suited for large areas. It can be up to ten times faster than electric and normally produces a superior gloss. This is possible because the pad pressure is normally double that of an electric machine and the rpm can approach 2,500 rpm. The propane fueled engine is normally 18 horsepower and produces the necessary torque to buff an ultra-high gloss.



Propane burnishers are difficult to use in small areas. They generate considerable dust, noise and can pose safety issues. In congested areas it is easy to run into objects, which can become dangerous projectiles. Make sure that an experienced supervisor has approved the use of a propane buffer for that particular building.

Due to the fact that propane buffers rotate at twice the speed with twice the floor pressure, it is easier for a floor to be damaged. Never stop a propane buffer on a floor without pushing down on the handle to raise the pad off the floor. Be careful of high spots that can stall the machine causing it to hang up and burn the floor. You must be prepared to handle the extra weight of operating a propane buffer.

Never attempt to operate a propane buffer without adequate training by either a trained operator or supervisor. Spend time reviewing the owners manual to learn about the dangers of toxic emissions, fire and explosions, proper storage of propane cylinders, damage from flying projectiles and burns from hot mufflers. In addition, there is an extensive list of preventative maintenance items that are required.



Here are some common safety regulations:

1. The propane buffer must be serviced in accordance with the manufacturer's

recommendations. Failure to adjust the equipment properly may result in incomplete combustion of the propane and produce hazardous levels of carbon monoxide.

2. Most buffers produce a noise level over 90 decibels. Always wear hearing protection while operating.

3. Always operate propane-powered equipment in well-ventilated areas.

4. DO NOT tamper with the tank valve or safety relief valve.

5. DO NOT smoke in the vicinity of propane-powered equipment.

6. DO NOT change pads or make machine adjustments while the machine is running.

7. If you ever smell propane gas during operation, shut off the engine and move it outside.

Determine the source of the leak and repair if authorized, before restarting.

8. The pad is spinning very rapidly so keep your hands, feet, hair, arms and clothing away from the spinning pad.

9. Do not buff over severely cracked tile, as the pad can catch a corner and cause the tile to disintegrate before you can shut down the machine.

10. Do not leave the machine unattended.

11. Do not tip the machine fully upward while the engine is running.

12. To stop the engine, close the service valve on the propane tank by turning clockwise and allow the engine to run until it stops from lack of fuel, and then shut off the key switch.

13. Disconnect the fuel line from the tank, remove the tank from the machine, and then store the propane tank in a secure area.

14. A propane tank can be transported either on or off the machine. In either case, it should be secured to the vehicle in its upright position with the service valve closed. Never leave a tank in a vehicle unsecured or lying on its side.

Here are common instructions to operate a propane buffer (consult manufacturer's instructions):

1. Only use a propane buffer that has been properly serviced and with a clean and secure pad. Make sure the engine has an adequate oil level and that the propane tank is not empty.

2. Attach the propane hose to the engine and turn the fuel tank knob counter-clockwise to turn on the propane flow. Make sure the electrical start cord contains no exposed wires and the electrical plug is not damaged.



3. Tip the buffer back on the wheels so the pad is not touching the floor, or disengage the pad drive by using clutch if so equipped. Pull the choke and throttle to the start position and activate the starter until the engine fires. Do not hold the starter button in for more than 10 seconds at a time. Once started, push the choke knob back in and move the throttle to the idle position. Unplug the electrical cord and secure it around the holder.

4. Slowly lower the buff pad to the floor as you accelerate the engine and begin pushing the machine ahead. Regulate the machine rpm to match the floor finish resistance and pad pressure aggression. Most floors will require at least a  $\frac{3}{4}$  quarter throttle.

5. Follow a set movement through the building much like mowing grass. This process should be pre-planned such as starting on the side furthest from the water supply and working across the building back to the water supply. If two floor techs are assigned, the first one would normally dust mop and scrap and the second person follow with wet-mopping. Then the first person would start propane buffing as soon as enough area has dried. Finally, the second person who was wet-mopping will start dust-mopping by following behind the buffer.

6. When finished, turn LP tank valve off and allow the engine to run; until, it runs out of fuel. Store the buffer in the tilted position to keep the drive brush off the floor. Clean the buff pad if it is soiled.

## Battery operated buffing or burnishing machines

### Purpose and use

1. Charge all machine batteries fully, according to manufacturers instructions.
  2. Install pad driver and pad. Adjust pad pressure to appropriate level.
  3. Operate machine without running into objects, high spots on the floors or any other objects that could cause damage.
  4. Change pads when soiled or when rpm dip is noticed.
  5. Clean machine and pads when finished and recharge batteries.
- Remember: if you run a burnisher over a severely damaged tile, it can catch an edge and cause the tile to break apart.



## Automatic Scrubbing machines

Automatic scrubbing machines apply the cleaning solution, scrub the floor and then vacuum up the soil and dirty solution all in one pass. The larger the cleaning path, the more square feet per hour of floor space can be cleaned. Two limitations are size and weight. If a machine must be transported daily to other locations, the weight will be a major concern. The second limitation is the width of the machine and its ability to pass through narrow doors.



Brush driven machines require the operator to push the machine across the floor. Since the pad pressure will be much less than self-propelled machines, they may not be suitable for a deep strip operation. Self-propelled models include another motor just to move the machine forward, making it easier for the technician.

Autoscrubbers are extremely heavy and challenging to operate. Make sure you are fully trained before attempting to operate. Set the speed on low until you get the hang of it. If the tanks are full or tires slipping it may affect your ability to maintain control. A large machine will be harder to run and can easily damage a wall or surrounding equipment. Running an autoscrubber too fast can cause ineffective scrubbing and picking up of the solution. It takes concentration to apply the proper amount of solution, observe the results and safely steer the machine.

The size of the solution and recovery tanks can also make a difference. The larger tanks provide a longer run-time and increased productivity for large open areas. Electric cord units are available as well as propane and battery powered units. Electric corded models cost less in purchase price and provide a good entry level machine to move up from traditional buffers to auto scrubbing. Propane models are still evolving but certainly have limited usage due to noise, dust and fumes. Battery models offer “cordless” flexibility and high productivity.

These machines are designed to scrub and recover the floor cleaner on the same pass. Most machines have a leading edge where the brushes protrude past the side of the machine. This is normally on the left side of the machine and allows the operator to cut in closer to the edge. Which ever side protrudes, use that same side to cut in the initial edge. Remember to use clean, non-aggressive pads. Rinsing may not be necessary if the floors are cleaned regularly and the machine picks up all of the solution. Do not use excessive pad pressure, which may remove floor finish. Change scrub pads when soiled.

**How to use an autoscrubber:** (note: since autoscrubbers vary in operation, always consult the manufacturer’s operation manual)



1. Make sure batteries are charged according to manufacturer's instructions. This should be done in well ventilated areas. Power cords must be free of cuts or breaks, and plugs must have three terminals in place.
2. Check periodically the battery fluid level on a regular basis. Use goggles and rubber gloves to open the battery caps and add distilled water. Do not charge batteries that are low on fluid. Apply wheel bearing grease to the battery terminals to inhibit corrosion that can cause batteries to not charge properly.
3. Make sure the machine is being lubricated in the various areas as required by the manufacturer and that tires are properly and evenly inflated.
4. Check vacuum hoses and squeegees for excessive wear or damage.
5. Make sure drive brush or brushes are clean before installing. Attach the appropriate scrub pads to the drive brush making sure they are secured and centered. Pads should be clean so they do not scratch the floor and matched to the floor conditions, traffic and floor finish hardness. Install the drive brush or brushes.
6. Check to make sure the solution recovery tank is empty and clean. Make sure the filter is clean and the vacuum motor makes a tight seal.
7. Fill the solution tank with warm water and the appropriate measured amount of cleaning solution, normally a low-foaming, all-purpose or neutral cleaner.
8. Lower the cleaning head to the floor; begin dispensing solution and activate the machine to run forward.
9. Adjust the brush pressure and lower the vacuum squeegee and turn on the vacuum motor.
10. Establish a set pattern through the area to be cleaned. Start close to the edge and work across the room. At the end of each pass, swing the machine to make a U-turn. Overlap each pass by 3"-4" and allow adequate room to circle the machine when making a U-turn. Otherwise cleaning solution may leak out past the floor squeegee.
11. Once the recovery tank is full, shut off the water, brush and vacuum. Raise the brush and vacuum head. Move to the empty and refill location and then return back to the job.
12. Keep a wet mop handy for mopping any streaks, under furniture, along edges and in corners.
13. When finished, empty and rinse the recovery tank and leave the lid off for proper drying. Check and clean the brushes, pads and outside of machine. Store the machine with the brushes and squeegee up.
14. Charge the batteries with the proper charger for the correct amount of time. Check the owner's manual for proper care of batteries.
15. Perform regular maintenance on the machine as recommended in the owner's manual.

Here are tips for environmentally friendly cleaning from **Green Seal**, a science-based non-profit organization that establishes environmentally friendly cleaning standards.

A). Notify building management prior to burnishing operations B). Only buff or burnish a floor containing adequate floor finish C). Use a mop-on or autoscrub application for any chemicals rather than spray methods D). Use a burnisher with a filter system  
(Reference: [www.greenseal.org](http://www.greenseal.org)). Green Seal also has a report on floor care products at - [http://www.greenseal.org/resources/reports/CGR\\_floorcare.pdf](http://www.greenseal.org/resources/reports/CGR_floorcare.pdf)

## Troubleshooting

### Burnishing did not produce a high gloss

1. Floor finish is worn and tile reflects an artificial shine that does not hold up  
**Correction:** scrub and top-coat floors
2. Buff pad is not aggressive enough  
**Correction:** test burnishing with a more aggressive pad
3. Buff pad is too aggressive and grinding into the finish causing wear and powdering  
**Correction:** Test burnishing with a less aggressive pad.
4. Buff pad was heavily soiled  
**Correction:** Clean or replace pad with a clean one
5. Floor was buffed too soon after refinishing  
**Correction:** burnish again in a few days as many floor finishes require 3-4 days for total curing prior to burnishing
6. Low spots on the floor are not responding with a shine  
**Correction:** burnish floor at a 90 degree angle the second time
7. Soil load was too heavy and floors did not respond with a shine  
**Correction:** Clean floors on a more regular basis or use a scrubber or autoscrubber to clean prior to applying restorer and burnishing.
8. Floors mopped with a heavy-duty degreaser or bleach  
**Correction:** Mop with a neutral all-purpose cleaner or approved restorer
9. Floors mopped with a sour or dirty mop  
**Correction:** Only use clean mops and change mop water regularly
10. Floor finish was not designed to hold up under high-speed burnishing  
**Correction:** Use a floor finish, restorer and buff pad all designed for regular burnishing
11. Natural hair pad has worn out  
**Correction:** Replace with new pad

### Marks and scuffs did not buff out

1. Floors received heavy damage or let go too long before they were burnished, tar marks not removed  
**Correction:** Burnish floors more often, scrub floors prior to burnishing, use a solvent for tar marks and try a more aggressive pad

### Uneven shine or shinny strips running lengthwise

1. Burnisher wheels are not level, causing pathing  
**Correction:** Adjust wheel balance or check for worn casters, axels or wheels

### Circular swirls in the floor finish

1. Pad has become loaded with soil and old finish  
**Correction:** replace pad, spray floor with buffing compound and re-burnish. May need to re-mop with white nylon pad and re-burnish to remove swirls. If floor is damaged, it may require a deep scrub, razor scraping and re-finishing

### High gloss does not last

1. Floor finish is too soft for heavy traffic conditions  
**Correction:** Try a harder, more durable finish
2. Floor finish has worn off  
**Correction:** Scrub and top-coat is required

## **Slippery floors**

1. Excess furniture polish, stainless steel polish or dust mop treat was sprayed over the floor.

**Correction:** Wet mop and machine scrub the floor and then burnish

2. Fine dust left on floor after burnishing, now becomes slippery

**Correction:** Floors should be dust mopped with a treated dust mop

## **Finish begins to powder when buffed or burnished**

1. Finish not designed for buffing or too aggressive of a buff pad

**Correction:** Only use floor finish designed for burnishing and a pad matched to the floor finish and traffic conditions

2. During the winter in cold climates, floor finish may freeze and deteriorate

**Correction:** Replace finish

3. Failure in floor finish due to it being over-plasticized and now fragmenting

**Correction:** Replace finish

4. Floor was not thoroughly rinsed when previously stripped or floor temperature was below 50 degrees

**Correction:** Floors should be thoroughly rinsed and all alkaline residue removed prior to applying finish and temperature should be above 50 degrees.



**Notes:**

**Notes:**

## V. Scrub and top-coat – maintenance

Eventually the traffic lanes will begin to lose their gloss. An artificial shine occurs when floors are continually burnished, but the shine does not last. This indicates the finish is worn from the traffic lanes. A combination of heavy traffic and repeated buffing eventually wears off the finish. When this happens, it is time to scrub the floor and apply more finish.

The top-scrub operation removes the top layer of finish where dirt has become embedded or the finish has deep scratches. Following a top-scrub, normally two coats of floor finish are applied to replenish the protective layers removed by constant traffic, regular buffing and top-scrubbing.

The ideal objective is to prolong the time between deep stripping operations. Stripping is labor intensive. When four coats of finish are applied after stripping, it may not be enough to produce the “wet look”. As you begin to burnish regularly and scrub and recoat periodically, the floor will start to build a DEPTH to the finish. **The gloss level will improve after the floors are burnished.**

A scrub and recoat is not meant to replace stripping, just prolong time between strip-outs. Programmed maintenance must include regular inspection of floors for uneven layers of wax, heavy scratches, imbedded black marks, wax build up and general discoloration including yellowing. If you find these conditions, a deep strip may be required. If the finish is still in fair condition, with no serious damage or deterioration, a good scrub and recoat will suffice.

To test for recoat-ability, scrub a small section displaying the heaviest wear. Squeegee and rinse with a heavy coat of water. Carefully inspect the results while the floor is wet. Is there a perfect color match between the just scrubbed area and areas with sufficient finish? There must be a perfect color match and no uneven or rough layers protruding. The appearance you see while the floor is wet should be the same look you will achieve after applying two coats of finish.

Red, green and blue pads are designed for scrubbing; however white often lacks aggression to remove scratches and black marks. A red pad when “heeled” on a dry floor can burn a red mark into the finish. A cost saving tip is to re-use your gray or tan high-speed burnish pads. When they begin to wear, clean them up and use them for scrubbing. Daily maintenance with an autoscrubber requires a different approach. You may want to consider a white pad to reduce wear.



Again, the best approach is to scrub and top-coat the traffic lanes whenever the finish shows wear. Once the finish wears, burnishing will provide an “artificial” shine. It looks good for a short time, but easily dulls under traffic. The goal of a regular scrub and top-coat is to prolong the time required between strip operations. A black strip pad is too aggressive for this operation.

A scrubbing crew normally consists of two or three people. On small areas of 1,000 sq. ft. or less, a crew of two is usually adequate. For larger areas, three are needed. The use of the autoscrubber will eliminate the extra manpower needed for floor care maintenance; this equipment/procedure is recommended when possible. Keep airflow at a minimum while scrubbing, until you are ready to rinse and lay finish. This ensures the cleaning solution does not dry prematurely.



Before



After



## Required equipment and supplies:

Wet Floor Signs

Dust Pan, Dust Mop and Counter duster

Putty knife or razor scraper

Clean Cloths

Autoscrubber or, Rotary Floor Machine

Wet Vacuum with squeegee floor tool

Two mop buckets

Blue or green scrub pads

Pad Holder with Handle and Blue Pad (Doodlebug™ type or similar)

Neutral Chemical Cleaner or heavy duty floor cleaner that does not require a rinse

## Process for scrubbing the entire floor with a floor machine:

1. Place wet floor signs around the area to be scrubbed to block off all traffic.
2. Identify the traffic lanes showing the most wear so a heavier coat of finish can be applied to those areas.
3. Remove all furniture possible from the area to be scrubbed. Before moving, make a mental note where everything belongs so it can be returned to the proper place after the job is finished. If necessary, draw a map or take a photo of the area prior to moving things out. If furniture is to be stacked, be sure to place a cloth, cardboard or plastic bag down to protect the surface from being scratched.
4. Dust mop the entire floor to remove all surface dirt and debris. Use a counter duster or radiator brush and dust pan to sweep out corners and remaining litter. Or, use a vacuum to prepare the floor for cleaning.
5. Mix a neutral cleaner according to the manufacturers directions listed on the container. It is important at this point to decide if the job requires light or heavy scrubbing. The procedures involved are identical. The only difference is the strength of the cleaning solution and amount of agitation required.
6. Person #1 should start applying the solution in a corner away from the door. Be careful not to splash furniture or baseboards. If this occurs, wipe off immediately with a damp cloth. If using a mop bucket for the cleaner, dip the mop in the bucket, place in the wringer for two seconds without wringing and then place on floor for laying the cleaner. The fastest method is to apply a diluted heavy-duty floor cleaner with a shower feed solution tank mounted on the scrubber handle. Work an area approximately 6 feet by 30 feet and cut in the edges from left to right to minimize splashing.
7. The machine operator begins by scrubbing in a left to right motion while moving backwards. The combined process of the detergent action of the cleaning solution and the abrasive action of the scrubbing pad breaks up the dirt that is embedded in the floor. That same dirt is now held in suspension within the solution, together with the upper layer of the floor finish that was damaged and now removed by the scrubbing pad.
8. Next, person #1 scrapes black marks, build up and soil. It is best accomplished with a 5" razor scraper that has a 12" handle. Apply pressure on one side and then carefully scrape black marks with that edge. Stand the scraper at a 45-degree angle pointing toward you, and pull over the mark. Repeat carefully until the mark is gone. You are actually shaving off a minute layer of the floor, but it may be required to remove the mark.
9. After the scrubber moves on, the second person proceeds over the same area and picks up the soiled solution with a wet vac, or large foam squeegee (24"-36"). Once a large section of the floor has been squeegeed and a puddle has formed, this puddle can be wet vac'd to pick it up. This person should carry an abrasive pad that can be used to remove any marks the scrubber missed. The dirty solution



must be picked up quickly before it dries and has to be scrubbed again. If the wet vac leaves any residue behind, it should be mopped up as soon as possible.

10. The first rinse should now be applied. Fill the rinse bucket with warm water, squeeze the mop out lightly in the wringer and apply a fairly heavy rinse. While rinsing, carefully inspect the floor again and scrape any imperfections. Learn to blend and “feather” worn, discolored or uneven areas. Blending is required because eventually a wax buildup or uneven layers over time will begin to show. This happens from moving equipment, failing to tape off rooms that are not waxed and wasted stripper running under a door, etc. If a section shows an uneven or discolored condition, it must be firmly scraped and cleaned. Again, a 5-inch razor scraper works best.
11. The final rinse can now be applied. The mop should be wrung out tighter to lessen the amount of water and shorten the drying time. Again, the final rinse mop must include a detailed inspection and touch up of any imperfections. The rinse water must be changed often enough to keep the rinse water clean.
12. While the floor is drying, equipment can be cleaned and moved to the supply closet. Wash out the pads and mops, and clean the scrubbing machine, wet vacs, and mop buckets. Prepare a finish applicator or a clean damp finish mop and the amount of floor finish you will need to cover the area.
13. Once the floor has dried, use a clean dust mop head to dust mop the floor to remove any grit or dust. If desired, you may also apply 6-8 trigger sprays of floor finish with a spray bottle to the dust mop head. This produces a tack rag effect used by furniture and auto refinishing professionals. Re-spray every 10-15 minutes. This process picks up minute dust particles that would normally be waxed into the floor.
14. If you have a very small area to refinish, you may want to pour the finish directly on the mop and apply. For large areas, you will need a clean mop bucket and wringer. A trash liner inserted into the mop bucket will protect it from dried floor finish. You may also choose one of many flat mop applicators. Apply the first coat heavier and in the worn traffic lanes. After approximately 30 minutes drying time, apply the second coat thinner over a larger area of the floor. A thinner coat will show less of a start and stop line when it dries.
15. If possible, replace the furniture the next day. If not, be careful not to scratch the finish. It will be dry to walk on but not sufficiently cured and hardened to resist scratches.



### **Autoscrubber adjustments -**

If using an autoscrubber, follow the basic instructions previously explained. In addition, you must determine if the floor is lightly soiled, or is experiencing a heavier use. For light soil, make one pass over the area with the solution valve or switch open and the squeegee down and vacuum on.




For heavier soil, make an initial pass with the solution feed dispensing cleaner. On a large area you can dispense and scrub up to three passes. Then, return to the starting point and scrub a second time with the squeegee down and vacuum on. This provides extra contact time and a double scrub.

Follow with a trail mop and dust mop to pick up grit and dust prior to applying floor finish.

### **Important Scrub and Recoat Tips:**

1. **Use a Squeegee** - A foam rubber squeegee works best to remove floor cleaner from the low spots in the floor. Cleaning solution should not be mopped from the floor, as it leaves excessive residue and quickly soils the rinse water.

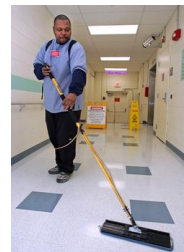


2. **Determining results** - There is a simple, yet effective method to determine if the floor has been thoroughly cleaned and is ready for finish. After squeegeeing, apply a moderate to heavy rinse coat. **INTENSELY** inspect the floor. Is there any discoloration? Does the water appear perfectly level, or does it show obtrusions or unevenness? Remember: if there are any imperfections at all, **THIS IS HOW THE FLOOR WILL LOOK WHEN FINISHED**. If the floor (under the coat of water) is not perfect, clean it one more time, or be prepared to strip it.
3. **Burnish to improve the gloss level** - If the floor passed inspection, you must now determine if you want to burnish the floor prior to laying finish. It takes longer, but produces a higher gloss.
4. **Finish application** - A moderate or heavy application on the traffic lanes will show a stopping and starting point for the applied finish. In other words, if a 3-foot wide application of moderate to heavy finish is applied to a 6-foot wide hall, the next day you will see where the finish application stopped. To solve this, memorize the exact width or area that was dull before you started and after you buffed. Apply the first coat moderately on the worn area only. When dry, apply a second light coat over the wider area so it blends more fully, but do not coat the edges.
5. **Shower feed to save time** - A solution-feed tank attached to the floor machine is handy to shower feed the cleaner. It eliminates the need for an extra mop bucket and mop and it doesn't matter if the floor dries. Just shower feed additional solution to the floor. Usually double-pass scrubbing produces superior results. 
6. **Burnish instead of scrub** - If you or someone else has considerable floor care experience, you may try substituting high-speed burnishing for the scrub operation. The main concern is keeping the floor as clean as possible. **Never apply floor finish over soiled, discolored or uneven floors.**  
Make sure the floor is perfectly clean, by mopping first with an effective floor cleaner. High-speed burnish slowly. Then, scrape any and all imperfections, dust mop and apply finish. Don't attempt this process until you become proficient at evaluating floor conditions.
7. **Track wear levels by using Red, Yellow and Green wax markers** – You can purchase peel off china markers and mark the top base coat with a red dot. Then put down another coat of finish and mark it with a yellow marking pencil next to the red. Put down another coat and mark it with a green marking pencil. Put down as many additional coats as necessary. Always monitor the 3 dots as the floors are burnished or scrubbed. As long as the green dot is apparent, there is sufficient protection on the floor. If the green dot is gone and you see a yellow dot, be cautious because more finish is needed. If only the red dot appears, stop and alert supervision that finish needs to be applied immediately.  
By marking the traffic area in several areas you can tell if you only need to apply finish to key areas or over the entire area. Various wear areas throughout the facility will dictate the required treatment and coverage.

## Finish Application

Polymer floor finish should be applied only to a clean floor and in thin layers. It protects the floor from scrapes and wear, and reflects an attractive gloss. Floor finish is primarily made up of polymers, waxes, solvents, plasticizers, and surfactants.

Polymer is a synthetic compound from the plastic family. The solids content of the floor finish usually contains 50% polymer - this is what forms the film on the floor, and gives the finish its durability and shine.





The wax emulsion consists of anywhere from 5 - 20% of the floor finish, and is what enables the floor to be "buffed". Synthetic waxes have now replaced natural waxes because of their slip resistance, black mark resistance, and durability. Emulsions or modifiers can improve the floor finish by increasing gloss, clarity, hardness, buffability, and scuff and scratch resistance. Plasticizers are added to floor finish to keep it soft and pliable; otherwise the finish would tend to crack. Plasticizers allow the chemicals to work together to form a film without flaws and imperfections. They also help the finish to be impact resistant. An inadequate amount of plasticizer can cause a floor finish to powder.

Surfactants are used to increase the contact of two or more materials, sometimes known as wet-ability. Small amounts of these surface active agents prevent the finish from pulling apart and puddling during the drying process. This allows the floor finish to flow out and more easily cover the floor.

A clean, dry floor should always be thoroughly dust mopped prior to waxing to remove fine grit and powder. You can also scrape any residue and wipe the blade on the inside pocket of the dust mop head. When applying 1-2 coats on a scrub and top-coat, try to remember where the original wear occurred. Apply the first coat to the worn traffic lane only. On the second coat stay back from the edges, yet wax closer than the first coat.

Use the Inverse Mopping Procedure (IMP) explained earlier. With the bucket 20 feet from the starting point, wring or twist the mop once in the wringer, drop on floor, pull to starting point, straddle the strip of finish, or stand next to it and mop back to the bucket. It doesn't matter if you walk on the strip of finish as you are mopping backwards. Wipe your shoes before stepping on carpet or another dry floor.

**DO NOT dribble floor finish** on the floor during and after, pulling the mop out of the bucket. It dries in protruding droplets and looks unprofessional. Apply an even stroke, often pulling the mop over the same area twice to deliver a uniform coat. Carry a razor scrapper to remove any specks missed while rinsing. Wipe debris on a paper towel and place in a pocket.

**Each coat must be thoroughly dry before applying the next.** Normal drying time is 30 minutes. By adjusting the heat or air conditioning you can speed up the drying time. Humidity is the biggest obstacle hindering drying times. A/C will pull out the humidity quicker than heat. If it is raining outside and the temp is 72 degrees, you may need to turn the heat up to 80 degrees. When the temp reaches 80 degrees, switch to A/C to 65 degrees. Turn the furnace blower switch to continuous.

An air handler/blow drier used to dry carpet can greatly speed drying times. Some floor finish manufacturers do not recommend speed drying a floor. However, with the **PROPER technique** you should not experience any break down in the floor finish.



Wait until the floor finish begins to flow out or skim over (normally about 10 minutes). At least wait until the finish has leveled and the mop streaks are gone. Hold the air handler two feet above the floor and turn it on low, blowing the air current 6 feet ahead of you. After a couple of minutes, slowly lower the unit to the floor. Make sure ripples are not blown into the finish, or re-stripping will be required.

As the floor dries to the touch, move the air handler across the floor, as you are able. One person can normally pour finish and move the dryer, while the other person mops on the finish. Work a loop throughout the building or area. You will be able to start and end at the same place, reducing waiting time. This process can cut drying time in half and save 1-2 hours on a large job.

The second coat should be applied wall to wall. Work the finish so the mop is dry whenever wiping near the edges. This keeps edge build up to a minimum. The bulk of the finish should be applied in the middle. Again, blow dry and then move back the furniture. Tell the customer: whenever you apply finish, you prefer to leave the small furniture such as trashcans etc. on the carpet until the next day. If the furniture is not being replaced, mop your way out the door and lock up.

### **Refinishing tips**

1. **Watch for Bubbles** - Some finishes generate excessive foam. If bubbles are excessive on the floor, dried rings may appear when the finish is dry. Decrease foam by reducing up-and-down motions of the mop head in the bucket and rapid pressing of the mop in the wringer. In some cases it's better to sprinkle the finish on the floor. Special dust mop heads are also available to fit over a 24" frame to uniformly apply the floor finish.
2. **Protect the mop buckets** - If you work from a mop bucket, place a trashcan liner over the bucket to protect it from wax buildup. Rinse the wringer immediately after use.
3. **Correct roping** – As mentioned earlier, often mop strings separate causing streaks in the finish. Special finish mops with a tail band are available from Jan/san suppliers. If the mop does not have a tail band, correct any mop streaks by twisting the mop head to a 45 degree angle (mop head is angled slightly from the normal side to side pull). This forces the strands together producing a smooth application. The new backpack, flat mop finish applicators have a definite advantage in speed and the ease of application and smoothness of the finish.
4. **Workloading a Crew** - A two-person team has advantages. One pours finish and moves the air handler (if used) and the other mops on the finish. If pouring finish directly on the floor, drill several holes in the gallon jug cap and sprinkle the finish across the floor. Carry a scraper to continue removing hairs and debris from the finish.
5. **Coverage** - Applying heavy coats can leave ridges and mop streaks. Light to moderate coats have proven to hold up better. Periodically shake the mop vigorously outside to remove embedded debris.
6. **Speed-drying with an air handler** - Some manufacturers discourage blow-drying the finish. However, if performed correctly, it can cut the drying time in half. You must keep the fan away from debris and hold it or aim it 2-3 feet above the floor until the finish has started to dry. Then you can lower it to the floor. If you place the dryer directly in front of freshly laid wax, it will blow permanent ripples (waves) into the finish. If the ripples cannot be scraped out, the floor must be re-stripped.
7. **Make sure each coat of finish is dry** - Each coat must be thoroughly dry before applying the next. By using the inverse mopping procedure, you should have no puddles. With accelerated airflow, most finishes dry and are ready for recoat in 20 minutes. To test dryness, gently rub the back of your hand (fingers) across the floor. If it grabs at all, allow longer to dry.
8. **Traffic** - If possible, allow floors to dry overnight before replacing furniture. If furniture must be replaced before leaving, consider removing your shoes. Do not drag furniture. Ask customers not to drag boxes, etc., across the floor for 48 hours.
9. **Automatic wax applicators** of various types can be used for large areas. There are different systems. One requires pouring the finish on top of the head, another dips in a special tray or bucket and some automatically feed finish to the head from a backpack.



10. **Pouring finish on the floor** - Some crews prefer to have one person sprinkle, and the other spread the finish. With this system, both crewmembers continue to work. The person mopping never has to stop and re-apply more finish to the mop. Also consider a 24" floor finish applicator that pulls across the floor. Floor finish is poured on the top of the applicator and the technician spreads it while walking. Flat mops designed for floor finish are also excellent choices.
11. **Blending areas** – is accomplished by touching up the overall floor by scrubbing and applying finish only to the worn areas. The key is to only apply a top-coat of finish to the traffic areas that will in turn wear off in a reasonable period of time. Apply the new finish to traffic areas and feather out to the sides of the room or hallway edges. Before starting a scrub operation, memorize where the heavy traffic lanes occur, because after scrubbing, it will be difficult to view those areas. Noticing the heavy traffic wear areas will help when applying finish, so it can be applied heavier to those areas.

Follow this procedure whenever one area is worn and you want to refinish it, but not the adjacent area:

Attach cardboard or sheet plastic to the floor that will not be deep scrubbed with masking tape. This will prevent the cleaning solution from splashing onto the adjacent tile. If you don't use cardboard, plastic or tape then machine scrub two feet beyond the area to be refinished, to give yourself a clean surface to match, and to prevent later splashing your scrub solution onto the newly refinished surface.

Use matting to prevent stripper or heavy-duty cleaner from being tracked onto the adjacent tiles as you work. After scrubbing the intended area, remove the masking tape and scrape or mop the edge to provide a clean, smooth surface. The line of demarcation can be taped a second time to produce a clean edge for the fresh floor finish. Do not leave the same tape in place for both scrubbing and refinishing as it may leak out stripper and damage the new finish.



Carefully apply coats to the freshly scrubbed area until it closely matches the clean adjacent tiles. If you use masking tape, remove it when the finish has dried and lightly scrape the line smooth with a razor blade angled 45 degrees and pulled toward you. When finished, scrub the remaining floor and apply however many coats you need to reach the desired appearance. Using a flat microfiber finish mop will simplify the finish application along edges and the line of demarcation.

## Troubleshooting:

### Areas that were refinished do not match the gloss level found on the edges

1. Not enough finish was applied to the traffic lanes

**Correction:** If only one coat was applied, next time apply two coats. The first one is heavier in the center where the most wear occurs and the second coat lightly across a more expanded area. However, do not apply finish where there has been no traffic and the shine is still high.

### Areas with fresh finish contain marks and soil

1. Floor was not thoroughly cleaned prior to applying finish

**Correction:** Spend more time detailing the floor, razor scraping and mopping with green or white pad installed over mop head. After scrubbing or burnishing the floor, apply a heavy first rinse. Carefully inspect the floor and correct all imperfections.

### **Floors show a heavy coat of finish where application was stopped**

1. Need a better blending technique

**Correction:** Finish should be applied very lightly on the edges when the finish mop is dry. Or, lightly cut in along a straight line following tile edge. Burnishing may be required to even out the areas.

### **Finish has dried with noticeable debris**

1. Dirty finish mop was used

**Correction:** Burnish three days later, razor scrape bumps and possibly re-apply light coat of finish

2. Fans or air-handlers picked up debris and blew it on the floor

**Correction:** Do not place fans near debris or allow debris to be blown into the area from the outside.

3. Floors were not thoroughly dust mopped prior to applying finish

**Correction:** Floors should always be dust free prior to waxing. If imperfections are quite noticeable - razor scrape, burnish and re-finish.

### **Blotches in the floor finish**

1. All soil was not removed prior to applying finish

**Correction:** Use a more heavy duty approach with stronger cleaner and more aggressive scrub pad

2. Some areas of the floor may still contain sealer and reflect a higher shine.

**Correction:** Burnish and apply 1-2 more coats of finish

3. A hard finish was applied over a soft finish

**Correction:** May need to strip off or deep scrub soft finish and then use a harder finish for all coats and touch ups.

### **Notes:**

## VI. Stripping and Refinishing - Restorative Maintenance

### Objectives:

After a period of time, dirt and soil begins to scratch the finish. Heavy traffic causes the finish to wear thin in the traffic lanes. Periodic recoating can cause the floor finish to build up around the edges and next to equipment. When regular burnishing or periodic scrubbing and recoating fail to restore the floors to the desired appearance, you will need to strip the floor. Hopefully with proper maintenance procedures, this will not be required more often than every 24 months or longer.



Programmed and regular maintenance including dust-mopping, wet-mopping, scrubbing, burnishing and scrub and top-coat of floors should prolong the time between a required strip out. Since stripping is labor and chemical intensive the goal is to prolong this operation as long as possible. However, at some point the floors will no longer retain a shiny and clean appearance and will require a complete strip out.

The stripping process should remove existing layers of sealer and finish and any buildup. It is only performed when routine daily/periodic procedures are no longer effective. Once the floor has been stripped, new finish is applied to protect and beautify the surface. The procedure for stripping a hard surface floor is similar to scrubbing.

The same equipment and supplies are needed as in the scrubbing operation, with a couple of exceptions: 1) A stripping solution is required; 2) black or brown stripping pads (check with manufacturer as some companies only approve use of green or blue pads) will be required (You may also use an abrasive stripping brush if you have one); 3) Additional rinsing may be required.

Understanding floor care chemicals is helpful. Up until this point you have learned how to use floor cleaners, buffing compounds or restorers and floor finish. Now a floor finish stripper will be required to dissolve the floor finish.

Most stripping chemicals are extremely alkaline with a pH usually between 10 and 14. The strong chemical formulation is required to remove polymer (thermoplastic) floor finishes. Strippers are formulated to work with specific types of floor finishes; therefore, the stripper should be specific to the system it is being used with. Often you are uncertain about the type of floor finish that has been applied. Floor finish stripping products can be pre-tested to determine if they will satisfactorily complete the job. Once new finish has been applied, the stripper should always fit the system.

Most floor strippers contain high levels of VOC's (Volatile Organic Compounds), anywhere from 10% to 30%. These can be harmful chemical ingredients to breathe and harmful to the environment. There are now "greener" alternative floor strippers, which contain lower levels of VOC's (as little as 2%), if your program is oriented toward green cleaning.

### Chemical Safety:

Most chemical strippers come in a highly concentrated form and must be diluted before use. Some are placed in dispensing systems that dilute automatically. Always read the instructions and the material safety data sheets for each product. The following safety rules are for your protection; however, they will not be of any help if you don't heed them.



1. Ensure that Material Safety Data Sheets (MSDS) are accessible and that all crew members are aware of their location. Periodically review the MSDS sheets to ensure that they are current and reference the chemicals that are being used.
2. *KNOW THE PROPER FIRST AID PROCEDURES FOR ALL CHEMICALS USED THAT HAVE THE ABILITY TO CAUSE HARM TO BUILDING OCCUPANTS AND WORKERS.*
3. Know where the closest eye wash or rinse station is located
4. Know what you are using. Do not use chemicals from unmarked bottles or containers.
5. Always read the label and follow the instructions.
6. Measure all chemicals. If the directions say to use eight (8) ounces in one (1) gallon of water, measure the water and the chemical correctly. A solution may not provide the proper cleaning power. A solution that is too strong will not only waste supplies, but can damage the surface on which you use it. It may also have the potential to cause injury to yourself or others.
7. Do not substitute chemicals. Many chemicals are made only for specific applications.
8. Never mix chemicals. You can easily destroy a chemical's usefulness or possibly create a poisonous gas or solution by mixing it with other chemicals.
9. Do not get in the habit of smelling chemicals as a means of identification. A deep breath of the fumes from some chemicals can and will injure you.
10. Protect yourself with the appropriate personal protection, i.e., safety glasses, rubber gloves, or protective clothing, if the solution you are using is a strong acid or alkali.
11. Always secure bottle caps and lids before the container leaves your hands.
12. Take notice of the Hazardous Material Information Sheet (HMIS) label that reflects product name, health and hazard information, and required personal protection equipment.
13. Do not store harsh or liquid chemicals on overhead shelves.
14. Do not store heavy containers on overhead shelves.
15. Use proper ventilation at all times.
16. Store all flammable products in flammable, ventilated cabinets.
17. Select a floor stripper that minimizes unpleasant odors, removes the finish correctly the first time, and provides a clean foundation for several coats of durable floor finish.
18. Avoid if possible floor finish strippers that contain 2-butoxyethanol - commonly known as "butyl". They can be highly corrosive to the skin and eyes. Butyl strippers also can cause serious and sometimes permanent damage when inhaled or ingested. In addition to the contact hazards, butyl strippers can emit an odor that causes a burning sensation to those exposed to the fumes, particularly in poorly ventilated areas.

Note: Do not bring chemicals from home and do not purchase chemicals from anyplace other than from vendors prescribed by supervision.

## **Mastering the Basics**

### **Preparation:**

Pre-planning the job is always the first step. The floor needs to be partially or completely closed including locking access doors if possible. You will need adequate lighting and proper equipment. Safety is a major issue, for both the maintenance crew and especially for any passers-by. In an occupied area, leave a traffic lane for building occupants to walk through the area.

Consult with all involved as to what equipment and furniture gets moved. On some jobs, moving all the furniture can be a challenge. There are some items that are dangerous to move such as large cupboards and soft drink machines. It is usually safer to work around any object that weighs over



100 lbs. Do not unplug and move computers unless special permission is granted. High-speed switching equipment and some medical equipment should not be moved. Equipment can be elevated and placed on Styrofoam blocks to allow access without damaging the equipment. Always pull any cords (such as electrical and phone cords) tight so they do not touch the floor.

Consider using a four-wheel furniture-moving dolly or a two-wheel cart. It is much safer and easier for two people to perform the moving. It is always best to remove all the furniture from the floor. Don't try to slide each piece of furniture and strip and wax under it as you go. Sliding may damage the floor and trying to wax a floor piecemeal can be a nightmare. Start and stop overlap lines are bound to show up.

If the furniture arrangement is extensive and you must move it back, consider either taking photos of each room or sketching a map. You can number each piece with a pencil and masking tape, and then draw it on the map. This will help you replace all furniture when finished. It shows professionalism when you can move everything back to its original location.



If a room is half carpeted, a straight shift can be employed. Move the furniture so it is arranged on the carpet just as it was on the tile. Of course the furniture on the carpet will be compacted and stacked. If you must strip  $\frac{1}{2}$  of a room at a time because there is no other place to move the furniture, stay back three feet from the edge of the stripped area with the finish application. This safety zone allows you to splash stripper when doing the other half without ruining your fresh finish.

Liquid containment devices, such as water wedges can be placed in doorways and other boundaries, separating areas that you do not plan to strip. These non-strippable areas may include carpets, marble, wood or previously finished floors. Use masking tape and plastic sheeting or cardboard to create barriers and zones between the work area and areas that are not to be stripped. Follow tile joint lines to create a clean division between the work area and areas not being restored.

Try not to get the cardboard wet. Be careful not to track stripper onto waxed floors. Also, consider placing a walk-off mat next to the work area for protection. Before rinsing, pull up the tape. Hand blade the line of demarcation (the area under the tape). Make sure there is a good blend by skillfully shaving off any uneven ridges. Mop the area with a green nylon pad attached to the mop head.

### **Pretesting for heavy buildup**

It's difficult to determine if the floors will require more than one stripping operation. Occasionally, a floor may require three strip-outs to remove the wax build-up. There are a couple of tests you can run to help determine the difficulty of the challenge in removing the finish. A pre-test can also determine if the most effective stripping solution is being used.

**Test Method #1** – Mix the stripper at the minimum concentration recommended by the manufacturer and mix a second solution with the maximum dilution ratio. Apply both solutions separately to a one foot square tile and allow them to set 5-10 minutes, or the dwell time shown on the label. Use a black or brown 5" X 10" strip pad under foot and agitate the tile three or four times with heavy pressure. Squeegee and pick up the solution and rinse twice.

Observe the test result to see if there is any shine left on the floor and if there are any discolored areas or ridges. All of these conditions indicate the floor finish or sealer has not been totally stripped. Notice if the minimum dilution ratio removed 100% of the finish or if a maximum

concentration will be required. You may choose to strip a second time to see if a second operation removes all finish.

## Test Method #2

Mix the solution the same as in Method #1 and apply liberally, allowing adequate dwell time. After a few minutes of dwell time, scrape the floor with a putty knife or a razor blade scraper to see how much finish is present. On the other hand, if only a small amount of finish is visible on the end of the scraper that is an indication there is very little sealer or finish present on the floor.

From these tests you can take the appropriate measures to address the amount of finish present, ensuring a productive operation. Hopefully you will also identify the proper dilution ratio and approximate staffing to complete the job in the right amount of time. One word of caution: Most tile manufacturers discourage **the use of No Scrub/No Rinse type strippers if the floor is less than two years old. Otherwise, the stripper can cause adhesive failure.**

## Proper dilution and handling of stripping solutions

Technicians should wear long pants and long-sleeved shirts to prevent contact with splashed chemicals. Eye goggles or face shields and waterproof, chemical-resistant, nitrile gloves should be used. Footwear must protect the feet, ankles and lower legs and should be waterproof and chemical resistant. Traction boots or non-slip rubber shoes are useful and can be removed easily to allow crossing delicate floors if necessary. They can give the necessary traction to prevent slips and falls.

To reduce splashing of stripper from a gallon container, try the following suggestions:

- a. If pouring stripper from a gallon jug, hold it away from your face.
- b. Invert the gallon bottle partially so air can enter the top of the cap area as the liquid exits
- c. Pour slowly as the bottle is evenly inverted. Extra air entering the bottle will keep the glugs and splashes to a minimum.

To reduce splashing from a 5-gallon container, rotate the drum so the cap is at the top and close to you. Again, invert slowly so air can enter the container and reduce glugging and splashing.

Before stripper is poured into a mop bucket, first determine the exact amount of water in the bucket. Nylon buckets often have calibrated lines marked with the number of quarts or liters. If using a galvanized bucket without measurements, initially fill a gallon jug and pour enough in to fill the bucket  $\frac{1}{2}$  or  $\frac{2}{3}$  full when stripping a large area. Keep track of how many gallons were used and mark the level with a permanent marker identifying the number of gallons or quarts.

For example, if a bucket required  $2\frac{1}{2}$  gallons of water to fill it  $\frac{2}{3}$  full, then mark a line at that level and write "10 quarts ". If the stripper is to be mixed 1:10, then add 1 quart of stripper to the bucket. It is always best to use a measuring cup. However, if one is not available, you can use the permanent marker to place 1 quart increments on the outside of the gallon stripper container. Estimate half way down on the container and draw a line and then a second line  $\frac{1}{4}$  down and the final line  $\frac{3}{4}$  down. Observe the liquid when pouring each quart to match each pre-marked line.

## Concentration Adjustments

Be prepared to adjust the stripper mix ratio, as black tile can "bleed" onto the white if the concentration is too strong. Read and heed the label instructions for the proper dilution ratios. Many labels give a range for light, medium or heavy mixing. If you know there are multiple coats (8-15), it will probably require a heavier mix. When first starting the job, it is critical to observe results and make dilution adjustments before proceeding.

Most stripping solutions require cool water. Hot water can cause the chemicals to off-gas (vaporize into the breathing zone) and cause the solution to dry too fast. Excessive stripper can damage the floor, loosen tiles and escalate stripping costs. Not enough stripper can lengthen the stripping procedure and cause a re-do. If the stripper label allows hot water, then use hot. The first 30 minutes of the strip job should allow for proper observations and corrections to the mixing ratio.



### Working the area

It is important to follow proper procedures when applying stripper to the floor. Begin by using a mop designated only for stripper. This can be accomplished by using color-coded mops or handles, or by marking a mop handle as “STRIPPER”. Stripper is very difficult to rinse out of any mop. No matter how you identify the stripper mop, make sure it is never used to mop the floor with neutral cleaner or to apply floor finish.

Apply stripping solution to an area approximately 200 square feet; which would be 7 feet wide and almost 30 feet long - assuming you have a helper. Allow the stripping solution adequate time to dissolve the floor finish. Don't start scrubbing too soon. Most strippers require 10 to 15 minutes contact, dwell or preparatory time prior to mechanical stripping.

Dissolved floor finish and wasted stripper (slurry) often runs under baseboards and cabinets. When rinsing, thoroughly squeegee and wet mop the edges to remove all slurry. To prevent wasted stripper from later running out on a finished floor, apply less initially to the counter edges, racks and near file cabinets etc. that are to remain in place.



If the floor finish build-up is heavy, use a high production or build-up removal pad. It is twice as aggressive as a normal black or brown strip pad. The high-production pad allows wasted slurry to fill up the large pores without loading up the pad. A “loaded” (wax impacted) pad will cause the floor machine to float across the floor. If there are fewer than six coats of floor finish, a normal strip pad is sufficient. Keep in mind that worn strip pads will be less effective and may not remove all the finish from the floor. Consult with tile manufacturer to make sure a black or brown pad is approved on their floor surface.

It is best to use the least aggressive pad available that will still remove the finish. Highly aggressive (thinner pads) can create light scratches in the floor. These scratches are hard to cover with finish. Even multiple coats of finish will only be as thick as a normal trash bag. If a build-up removal pad is required, you may need to burnish the floor prior to applying floor finish in order to remove the scratches. Keep in mind that some sheet vinyl manufacturers prohibit the use of strip pads and only allow use of scrub pads. Always check manufacturer's instructions when possible.

A solution feed tank mounted on the floor machine handle is helpful. If the stripper starts to dry on the floor, simply squeeze the handle and apply more solution. Stripper must never be allowed to dry on the floor prior to the squeegee and rinse operation. If it does, it must be re-emulsified by adding water and scrubbing one more time. Learn to work each area with the floor machine by moving a heavy puddle of stripper to a drier area.

### Scrubbing tips for machine operators

Never start a scrubber while standing on a wet portion of stripper. You may lose your footing. Start the buffer while it is in contact with stripper, **but your feet are on the dry floor**. Never walk near or detail the edges until the floor machine has scrubbed the floor, allowing proper traction. Make sure the entire crew never walks on freshly applied stripper until that area has been machine scrubbed.

Try to keep splashing of walls, baseboards and doors to a minimum. One way to accomplish this is to start the scrubber and keep it running near the left side of a wall or door jamb. The right side of the floor machine will splash the most amount of stripper. So angle the left side of the machine so it cuts in the baseboard without extra splashing.



Keep the scrubber handle level and close to the hips. The least stressful position is for the handle to push against the front of the leg in the fold or crevice where the upper leg connects to the torso. Use the entire body to move the machine ahead in order to place less demand on the arms. The scrubber will move left to right by slightly lowering and raising the handle.

Begin by making a slow pass from one side to the other by slowly moving the machine. This should take about 5 seconds. The arc movement will normally cover 6 feet from right to left. If you anticipate the floor will be fairly easy to strip, move the machine ahead the same distance as the diameter of the brush or pad with a 2 inch overlap.



If the floor appears challenging to strip, then move the scrubber only ahead or back about  $\frac{1}{2}$  the distance of the diameter of the pad. This will allow the machine pad to scrub the floor from two directions – left to right and then by moving the scrubber by  $\frac{1}{2}$  the machine diameter, the same area will be scrubbed right to left.

Most floors will require a pass down and a pass back. In other words, if you have applied stripper to a 7 foot wide by 30 long area, move the machine methodically to the end of the 30 feet and then back to the start. If you are working without a helper then you will only be able to “paint out” (apply stripper to) about 7 foot by 15 feet, or else the stripper may dry too soon on the floor.

Begin stripping the old finish in an area farthest away from the designated water supply. Complete the work in approximately 7 feet by 30 feet increments. Scrub the area thoroughly and stay on a designated track, not missing any tile. If the tile shows discoloration, keep on scrubbing to reach the designated color of tile. This will require an intense observation by actually looking into and through the slurry to determine the results and condition of the floor.

## Analyzing Results

To help analyze stripping results, squeegee the stripper and apply a heavy rinse coat. Intensely observe and inspect the floor while it is wet. Does it appear free of uneven edges and discoloration? Does the floor appear almost flawless? If so, proceed with the next area. If not, repeat with another stripping operation and then rinse.

After stripping twice, without satisfactory results, you may need to revert to an unorthodox procedure. This procedure is not recommended unless the previous attempts have failed in removing the embedded discoloration. This process could void the floor warranty, so use it as a last case resort. You will need a 100 mesh sanding screen made for sanding polyurethane wood floors. (We assume no responsibility for recommending the process. Floor damage can result if you sand a dry floor).

Apply stripper (now the third time) and wait for the proper dwell time. Place the screen sanding disk under a used strip pad. NEVER start the machine on dry tile or run the solution dry. It will sand down the tile and cause floor damage. As long as there is lubrication, no damage should occur. Wet sand the build up again, making sure the disk only touches the wet floor. If you use this process, you may need to burnish the floor prior to waxing. This will smooth out the rough surfaces.

## **Detail work**

All job activities should center around the stripping machine. The goal is for the operator to never stop the floor-stripping machine. When the machine stops, the job stalls. The most skilled technician should normally run the machine. He or she can call out orders to the other team members. This is the best way to improve productivity and move the job along.

If the wax build up is heavy, a razor blade scraping will be required along the edges, and around doorjamb. Baseboards may also require stripping. If so, the person who applies the stripper must also apply stripper to the baseboards. After the required contact time, use an edging tool that contains a strip pad on a pole. Since stripper will readily run off the vertical baseboards, a second application may be necessary. A foam baseboard stripper aerosol product is also available. Baseboard stripping machines are also available. If the baseboards are stripped, they must be rinsed before the stripper and slurry dries.

As each room is stripped, always strip outside each door and into the next room at least two feet. Scrape the edges, doorjamb and Doodlebug™ two feet into the next room. Squeegee and rinse likewise. When stripping the adjacent room, stay back two feet from the doors of the previous room as they were already stripped and rinsed. This prevents stripper from running back into a finished room or splashing onto a clean floor, doors and doorjamb.

Keep a towel handy to wipe up any stripper splashes on baseboards, doors and furniture. The fine detail work separates a professional from the amateur. Many floors require a second machine pass over the same area with slight water applied. Learn to look through the slurry to observe if all the old wax is being removed.

It is critical to remove all old floor finish and wasted stripper before applying the new floor finish. A thorough squeegee operation and rinsing will be required to ensure there is no residue remaining. Stripper residue can affect durability, and leftover finish can affect the appearance of the fresh coat of finish.

## **Not all floors require seal**

Advances in polymer technology have resulted in floor finishes that last longer, resist black marks better, don't yellow, and can be burnished to restore the shine. Unless the floor is brand new or in poor shape, most chemical manufacturers agree that the use of a sealer as a base coat is no longer required when applying floor finish. A couple of extra coats of finish give the same results and are easier to remove when the time comes to strip the floor.

However, there are always exceptions. Certain areas may be subjected to spills that can penetrate through the floor finish and stain the floor. Stain resistant seal can repel damaging spills and stains. In addition to protection from spills, stain resistant seals help protect worn floors from further damage. A seal also allows you to selectively strip areas and to build gloss with fewer coats. Sealers by themselves are generally not recommended as a walking surface. They must be top coated with a floor polish.

A sealer will build a base foundation for the floor finish on worn or porous floors. Asbestos tile is quite porous and two coats of a semi-permanent seal will provide a superior protection and reduce the number of finish coats that must be applied on top of a sealer. Later, top-scrubbing and mild stripping will remove the finish but not the stain resistant seal. However, a deep strip will remove some sealers requiring a reapplication.

## **Application tips**

The best polish for protecting and enhancing many commercial resilient floors is a high-quality commercial floor polish with a percent of solids level usually between 16% and 22%. Although some of the newer high-solids finishes contain over 30% solids and are gaining popularity. As a general rule only 4-5 coats of finish should be applied within a 24-hour period.

Floor finish should be applied in thin, even coats of finish. Thick coats will not properly dry and cure in hot and humid conditions. If a floor is being refinished to produce the “wet look”, then more than four coats may be required. However, this may require laying four coats which set and cure overnight. Then, the next day another three coats can be applied. Some finishes may even require several days to cure before additional coats are applied. Check with the manufacturer for re-coat instructions.

If using a mop bucket to apply finish to a small area, attempt to add only enough finish for the job. Otherwise, excess finish must be poured out if it contains debris. One gallon normally covers 2,000 square feet per coat.

Excess finish applied to the floor will normally be detected by a thick milky appearance or puddles and bubbles. If this is noticed, too much finish has been applied. Often you can spread the excess finish to an adjacent area so the mop is able to release extra finish. Now, you must speed up the job in order to spread out the original area, plus the new area just coated. What this amounts to is that you must now cover a much larger area of the floor.

Additional coats of polish should be applied as appearance and gloss levels dictate. To maintain optimal appearance in high-traffic and high soil areas (such as lobbies, chair-slide areas in cafeterias, elevators, supermarket checkout lanes, etc.), floor finish may need to be applied more frequently to maintain the minimum protective layer. This process has been explained in the scrub and recoat section.

Once a given area has received a full coat of finish, try to introduce airflow into the area and lower the humidity if possible. It is important not get in a hurry by failing to allow cure time between coats. Cure time affects the gloss, clarity and strength of a floor finish. The average floor finish takes about 30 minutes to dry.

## **Required materials:**

Wet floor signs or barricades  
Protective gloves, goggles and safety footwear  
Dust mop with a second clean head  
Dust pan and counter brush or broom  
Used door mat or cardboard suitable for wiping feet and masking tape  
17”- 20” floor scrubbing machine with pad holder and strip pad  
Doodlebug ™ with a black or brown strip pad  
Two mop buckets with 24 oz. mop heads and handles  
Razor scrapper  
Towels  
Foam rubber floor squeegee  
Wet vac  
Commercial stripper  
Commercial floor finish  
Flat mop or 24” dust mop with special finish head



Large trash bag to place wet strip pad into, Two medium bags (one to line the mop bucket and one to hold the wet finish mop between applications and one small trash bag to attach to the belt loop for debris collection.

### **Stripping Procedures:**

1. Bring all equipment, tools and supplies to the most convenient area where you plan to start. This is normally the furthest point from the water source. Place equipment on matting to prevent damage to floor surfaces. Make sure all equipment has been fully serviced prior to starting.
2. Remove as much furniture as possible from the area to be stripped. Work around heavy furniture or equipment that cannot be moved. Tilt file cabinets and mount on blocks. Stack small items on top of larger or permanent items.
3. Dust mop or vacuum the floor thoroughly. Scrape gum, tape, labels or other debris that may have adhered to the floor, but carefully scrape without gouging or scarring the floor.
3. Place caution cones or wet floor signs and barricades at each location where it is necessary to prevent traffic from entering the area during the operation.
4. With safety glasses and protective gloves, dilute the stripping solution according to the manufacturer instructions. Check the stripper label for water temperature recommendations. Some require hot water and others require cold. Use a measuring cup, a marked container or a metered dispenser to ensure the proper mix ratio.
5. Slightly used or stained mop heads, in otherwise good condition, may be used to apply stripper solution. Because it is impossible to rinse all stripping solution from a mop head, store them in a secure location when finished and mark as "Strip Mop". Make sure someone does not grab them to later mop a floor. Some mop heads can be disposed of when finished.
6. Using a mop, a solution tank mounted on the floor scrubber or automatic dispensing machine; apply the stripper to a manageable area. Dip the mop head into the stripping solution. Place the mop head in the wringer for about two seconds to allow some of the stripper to run out. This will ensure that a moderate coat is applied.



If the area justifies a heavy coat of stripper, then a mop bucket without a wringer can be used. In this case, you pull the mop out of the bucket and hold it directly above the bucket for a couple of seconds to allow excess solution to run out.



An area with fixtures, racks or baseboards that are not water-tight would normally justify a moderate coat of stripper. Areas that are water-tight, with heavy wax build-ups or larger areas that may dry out faster could justify heavy coats of stripper.



Finally, place the mop on the floor allowing it to fan out. Start applying solution at the edges. Most build-up is at the edges. If the edges do not show a build up, then use the Inverse Mopping Method explained earlier.

Starting at the back, apply the solution in a 6' to 7' arc or side to side movement, to cover the same width as a scrubber pass. This mopping application is often referred to as a figure 8 swivel pattern. If working alone, apply no more than a 7 foot by 20 foot area to prevent premature drying of the stripper. Avoid splashing walls, baseboards and doors, but if it happens, wipe off immediately with a damp cloth. If the heavy layers of finish dissipate (soak

up) the stripper, compensate by applying a heavier coat of stripper. With a large crew working a large facility, more stripper can be applied using an automatic application machine.

7. Allow proper contact or dwell time as recommended by the chemical manufacturer. Normally stripper must sit at least 10 minutes prior to agitation. If you fail to allow an adequate dwell time, the floor finish will not be properly dissolved. This in turn may require repeating the strip operation to remove all the old finish. During the wait time, make sure the scrubber drive block is correctly mounted and the strip pad is centered. Inspect the electrical cord for any cuts or electrical safety hazards.
8. A large floor should be stripped in stages or manageable areas for best results. A splash guard fitted around the scrubbing machine will prevent solution from splashing on walls and fixtures. Start the scrubber while the feet are on the dry floor and work into the wet stripper to keep your footing. Most floors contain slight dips that require special attention. The rotary scrubber needs to be moved back and forth over the same area to not only distribute stripper, but to work difficult build- up and low spots.

While scrubbing the area, observe if ALL discoloration and wax buildup has been removed. Peer intensely through the slurry to observe cleaning conditions on the tile. Try not to splash stripper on walls, doors, carpet or adjacent areas.

9. Pay special attention to corners, edges, and obstacles. Use a scouring pad, the hole from the strip pad, an edging tool with strip pad on a pole such as a 3M Doodlebug™, or an edging machine to clean all edges. A razor scraper will also be required to remove heavy build-up. If the stripper starts to dry, add additional stripper or water to keep the floor evenly wet. If the floor is allowed to dry in certain places, “dry back” can occur, and re-stripping may be necessary.



10. Re-wet any spots where the stripper has dried and then squeegee the wasted stripper or slurry from the floor. Using a 24” or 36” foam squeegee, start at the far end of the area and pull the squeegee straight back. Tap the squeegee on the floor about 1 inch in front of the puddle. Then reach back to the next adjacent area and pull the squeegee back 6 inches and lift and tap 1” in front of the squeegee. Next, move the squeegee back to the start and pull the slurry back three feet. When squeegeeing next to walls, press the leading side into baseboards to force more slurry away from the wall. Move the slurry to a large puddle for easy pick up with a wet vacuum. Continue moving back until all the slurry has been removed. A front mounted squeegee on a wet vac can also be used. Pay attention to details by not leaving stripper residue on the floor.



Inspect the floor for complete finish removal. The floor should appear several shades lighter and with a dull appearance (absent of any shine or gloss). If there is a glossy area, this indicates incomplete removal. If there are dark brown spots, this normally indicates old sealer that has not been removed.



If wax removal is incomplete, you will need to re-strip the area and then increase the concentration of the stripper for the rest of the floor. There will be times when a double strip is required. Re-strip any high gloss spots, with either the floor scrubber or the doodle bug and scraper depending upon the size of the area.

11. With a clean mop and clean water, apply the first rinse by not completely wringing out the mop. A heavy first rinse tends to soften any remaining build-up not completely removed during the strip-out. Do not skip any areas and thoroughly mop the edges. Mop the entire area that has been squeegeed.

Carefully observe for sealer or finish that has not been removed. Check for accumulated build up in the floor indentations and along the edges. Scrape as necessary. Paper towels and a small plastic bag attached to the belt-loop are helpful. Wipe the scraper with a paper towel as needed and discard into the plastic bag.

The rinse water, setting on the floor, will display an elevated mark where any remaining finish protrudes. This must either be scraped, doodlebugged or re-stripped. Wipe all splashed stripper from walls, doors and door jambs either with the clean wet mop or a towel.

12. Some managers prefer adding a commercial neutralizer to the final rinse water, or 1-2 cups of household vinegar to 2 gallons of water. Neutralizer counteracts the high pH of the stripper and provides a superior bond of the finish to the tile. One way to determine if a neutralizer is required is to hand wipe a section of the floor. If white powder shows up, the floor has not been rinsed properly and must be rinsed until no white powder comes up after the floor is dry.

It is highly critical to mop and remove any and all traces of the stripping-solution, imperfections and wax build-up. This must especially include mopping any slurry or stripper that has run out from under baseboards or equipment. If the rinse inspection is less than thorough, dried on slurry could remain on the floor. Never apply floor finish on top of stripper residue. It will magnify the residue and display a lack of professionalism.

Change the mop water each time it becomes heavily milky. Rinse the mop head first and wring into the bucket and then dump and refill the bucket. Continue to double check the floors for build up that was not totally removed and be prepared to scrape edges and low spots. Work the floor with the wet mop to remove any squeegee marks or dry slurry. If you have a green nylon pad installed over the mop head, this will allow extra agitation to power out any remaining residue. Never walk on the final product, or allow any other person to walk on a wet floor, as it will leave noticeable footprints.

13. Continue moving across the floor stripping, edging, picking up and rinsing section by section. Start at the back of the room each time and work toward the front. If the area is fairly small and either the first rinse remains wet, or it is drying with a perfectly clean appearance, you can wait until finished stripping the current area to apply a second rinse. Each rinse must also include a detailed inspection of the floor condition. If there are imperfections, be sure to scrape or scrub until they are removed.

Remove all liquid containment devices (wedges) and border masks (plastic sheeting), being careful not to let solution drain off the masking items onto any part of the floor. Any dribbled stripper will leave residue that must be re-mopped. A razor scraping of the line of demarcation (the floor where the masking tape borders the area stripped) may be required.

In many cases it will be best to apply a second rinse before the first rinse has dried. The second rinse should be a drier application by wringing out the mop tighter. This will reduce the drying time so you can begin applying finish sooner. It must also include a careful inspection and

scraping of any residue or imperfections. The second rinse should always be with clean water, changed frequently. In cases where the wax build up is heavy and the slurry is extremely thick, a third rinse may be required.

The rinsing operation is an extremely important step. If any stripper stays on the floor the finish will not stick, and the entire job will have to be redone. After the final rinse, airflow should be increased and humidity lowered, if possible. An air handler (commercial blow drier) can speed up the drying time so finish can be applied sooner.

14. After the floor dries, thoroughly dust mop it with a clean head. Or, vacuum it with a floor tool with a short brush attachment. If you use a canister vac, make sure the wheels do not leave marks. The objective is to loosen any attached particles as well as remove all dust.

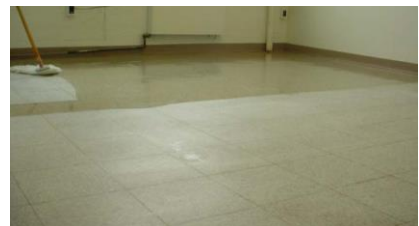
Another alternative to produce a higher gloss is to burnish the floor prior to applying finish making sure the pad does not burn any high spots on the floor. Next, a "tack rag" method can be used to remove dust particulate. Furniture and automotive refinishers normally use this method. This is done by lightly spraying the dust mop head with the floor finish. Do not dribble floor finish on the floor and do not spray the dust mop head too heavily as this could cause residue to appear on the floor. The light mist applied every 10 minutes will provide a sticky or tacky condition on the mop head fibers and cause more dust particles to be attracted and removed.

15. To prepare for the finish application process, select a clean mop, a special finish mop or finish application device. If using a new nylon wet mop, prepare it by shaking it out and then rinsing it in clear water, wringing it tightly and then shaking it out. The purpose is to prepare a mop head that is lint free. A special finish application head is best. Cotton mops contain cotton seed oil which may interfere with the finish.

A green 6" X 9" nylon scrub pad can be attached over the mop head to scrub and remove any finish not previously detected. Also, carry the razor-scraper, paper towels and a small trash bag attached to a belt loop. This will allow preparation for the unexpected. If using a mechanized finish applicator, read and follow the manufacturer's instructions.

16. Pour the approximate amount of required sealer or finish in a clean mop bucket. For protection, insert a plastic bag over the mop bucket to protect the bucket. Do not use colored liners because the finish may cause the color to bleed from the bag. When pouring the finish, place the pre-soaked mop into the bucket first and then and pour finish into it. This reduces bubbles which can cause an uneven floor appearance.

Most floor finishes cover about 2,000 square feet of floor per gallon. Dip the mop into the sealer or finish and gently press any excess back into the bucket. Avoid excessive wringer pressure as that may create bubbles in the finish which will appear on the floor once the finish is applied. A thin coat of seal or finish should be applied making sure there are no skips. Thin coats promote quicker drying and prevent puddles of finish from accumulating.



Here is an alternate method for applying finish:

If you do not have an automatic application system, you can sprinkle the finish directly on the floor and then spread it with a mop. This takes experience and great care to apply the correct amount. Too little and the applicator may tend to skip areas. Too much and there will be puddles. Apply floor finish from the gallon jug to the floor. With a rubber glove, place your

thumb over the jug opening, or drill four small holes in the cap and sprinkle the finish evenly on the floor. Do not apply the finish too far in advance as it can dry up and leave noticeable drops on the floor.

If using a mop bucket to dispense floor finish or pouring it directly, be careful not to drip finish outside of the immediate area that is being waxed. Telltale drops will dry with a protrusion and display a lack of craftsmanship. Carefully razor scrape any dried drops. Avoid overlapping onto areas that are starting to dry. The mop fibers will bite into the partially dried finish, leaving lap marks. Do not pull the mop too fast, or skips can occur. Again, a 7 X 20 foot area is a good size to re-finish at a time.



17. Many floor finish procedures recommend painting out the edges and then filling in the middle. However, this approach applies more finish along the edge where it is not required and less to the traffic lane which requires a heavier coat. It is important to use the "Inverse Mopping Procedure". Paint down the middle of the traffic lane by dragging the mop from the mop bucket to approximately 25' ahead of you and then mop back to the bucket, spreading the finish evenly. When using an auto applicator, wait until the pad is dry and then paint the edges. The same holds true when using a wet mop.

The important thing is to "kiss" the edges by applying thin coats when the applicator contains the least amount of finish. Pull the mop head perpendicular to the baseboard to reduce splashing. In most applications you will want to alternate edge coats. In other words, keep every other coat about 8" out from the baseboard. This approach should eliminate hours on your knees with scrapers, the next time the floor is stripped. This is because a normal Doodlebug™ scrub should cut thru the thin layers of finish you appropriately applied.



Use caution not to splash or mop finish up on the baseboards or door jambs. This is where a finish applicator head on a flat mop or installed over a dust mop frame has a definite advantage. These applicators do not press finish up on the baseboard nearly as high as a wet mop.

If the baseboards contained considerable build up and were thoroughly stripped, they may now appear dried out. If the baseboard displays color loss, they may require one thin coat of finish. If the baseboards are still in good shape, they will look even better if finish is applied  $\frac{3}{4}$  of an inch up on the baseboard (covering the 45-degree angle). This seals the baseboard from insect and water invasion.

If you miss a spot, don't try to go back and cover it unless the skip is right next to the area just mopped. If the finish has started to set up and you go back to re-wax a spot, lap marks will appear. Instead, catch any skips by making sure they are covered on the next coat. As finish is applied, observe for any hairs or debris that may have floated to the floor. Use a razor scraper to carefully remove any specs and then apply the finish mop over that area again. Even if you are applying the second, third or fourth coat and notice a spec that was waxed into the floor on the previous coat, carefully scrape out the imperfection and then apply the next coat. Use the razor to carefully blend the removal area into the perfect area. Repeat the application process until the entire area is covered.

18. The drying time for most floor finishes is 30 minutes. Always be sure the last coat is dry before the next application is made. The temperature, humidity, and ventilation affect the speed in



which the finish will dry. If possible, schedule stripping and refinishing jobs on low humidity days.

The number of coats required will depend upon the desired shine and the solids content of the finish. It is possible with an ultra high-solids finish to obtain a high gloss with only three coats. An economy floor finish may require 5 or more coats to obtain the same gloss. Some floor care experts prefer applying 4 coats of finish the first day and then returning to apply 2-3 more coats the next day.

Don't skip on the number of coats applied, as you want this finish to last two or more years. If possible, alternate the direction the finish is applied between each coat; this will eliminate the "streaked" look and will ensure that the entire floor will be covered uniformly.

Most commercial finish is self-polishing and will not require buffing or burnishing until later. Once the floor begins to dull from traffic, you will need to start a buffing or burnishing program. After applying finish, you may choose to speed dry the finish. Make sure the finish has had adequate time to skim over and never place the air handler blowing directly on the wet finish. Tilt the unit so it blows in the air over the finish, or set the blow drier back a few feet. Never blow ripples into the finish.

Balance out the workload, so one or two helpers clean up and put away the equipment. Make sure the floor has fully cured before placing heavy furniture back. Using your map, carefully replace the furniture. Do not drag items across the floor for at least a couple of days. Wrap the finish mop in a plastic bag between coats to prevent finish from drying on the mop. Never return contaminated finish to the original container. Always place a cap on the container when storing.



Wipe down all equipment and remove it from the stripping area. Thoroughly wash mop buckets, wringers and mop handles to remove all residues. Rinse mop heads thoroughly, wring tight and hang up for drying.

## **Stripping with an automatic scrubber**

An automatic scrubber will speed up the strip job considerably, but it normally requires a 2-3 person crew. Make sure all of the machine operator instructions are carefully followed. Here are the general procedures for a crew:

Preparation: Two people begin moving furniture, dust-mopping, scraping chewing gum etc., while the floor supervisor prepares equipment and chemical.

Person # 1 lays stripper 15-20 minutes ahead of the autoscrubber. Dip a mop in the stripper bucket and place it in the wringer. Do not press out the mop, but place it on the floor and paint out no more than 400 square feet. To avoid falls, do not initially walk on the stripper covered area.

Person # 2 starts on dry floor and runs the autoscrubber over the coated area so others can now walk on the solution. If the strip solution starts to dry, add water through the autoscrubber. Double passes are required to perform a deep strip.

Supervision note: Person # 2 should be the most experienced tech, so he or she can direct the crew. Person # 2 needs to supervise stripper application 15 min ahead, remind workers to change dirty mop bucket water or, detail edges a second time (if needed), and possibly trade off job



assignments whenever necessary. Person # 2 must observe the progress/pace of the other workers and make constant adjustments. The object is to NEVER allow the autoscrubber to stop. All activity must center around this operation.

Person # 3 runs the Doodlebug ™ and razor scraper (using a 5" blade) around edges and door jams (to perform detail work). Next, this person runs a foam rubber squeegee around edges to pull stripper out from edges and corners for easy pick up by the autoscrubber.

Machine note: For a heavy autoscrub strip, the first pass is with the squeegee up and the last pass is with water added as needed and the squeegee down. Edges and doorways should always be squeegeed prior to autoscrubber pick up.

Person # 1 begins the mop rinse after the strip solution has been picked up. Press out the mop lightly to leave the floor wet for additional soaking around edges.

Person # 3 follows with a drier mop rinse (mop should always be wet enough to not leave dry streaks).

Mopping note: The timing for the two rinses is not as critical as the timing for all the previous operations. Everything up to this point must be adjusted to time out exactly. The rinse must also include a detailed inspection and additional razor scrapping of build up. Prior to dumping a soiled mop bucket, wash the mop in a mop sink and press it out into the bucket. Repeat twice, empty the bucket and refill. A 4' length of garden hose installed on the mop sink will make this easier.

Inspection note: If the floor coloration is not uniform after applying the first rinse (looking at it with a magnifying glass so to speak); stop and re-strip. The way the floor appears immediately after the first rinse is the way it will appear after four coats of finish. Once old finish or dried slurry is waxed over - the job is botched. The only remedy is to re-strip.

Floor finish note: Finish application should be performed only by a trained technician. Half-dried lap marks caused by a finish mop are not easy to correct. A skilled technician knows how to apply uniform coats and avoid streaks. Starting the finish process creates another challenge, as now either person # 1 or # 3 is pulled off the stripping cycle in order to apply finish.

After the finish has started to skim-over (dried naturally for five or more minutes) place an air handler on rolling wheels, if desired. Never blow wrinkles into the finish or debris onto the floor. Organize a cycle loop to apply up to 4 coats with blow drying (often a two man job). Drying tip: reduce humidity and increase air flow.

Prior to the first coat of finish, keep a clean mop handy to wipe up stripper run-off from under equipment, furniture, etc. The finish person must also have a razor scraper for detail work and a towel to wipe it clean.

After the stripping operation is complete, clean and store the equipment while the finish application is being completed. The finish mop can be kept in a trash bag for easy transport. If possible, replace furniture the next day (no dragging allowed).

Make certain the autoscrubber is thoroughly cleaned after using it for stripping or the pickup tanks, hoses, and squeegees will become encrusted with dried slurry. This includes the undercarriage of the machine, as stripping solutions can damage the metal parts. Some managers prefer not to use an autoscrubber for stripping for this reason and others may set aside one machine specifically for this use.

On large jobs, a four-person crew can be organized in this manner. Tech #1 lay stripper, Tech #2 run the floor machine, tech #3 Doodlebug™ and scrape edges. Then, tech #1 squeegees and tech #4 follows with a rinse. The bottom line is that tech #2 who is running the autoscrubber controls the quality and productive output of the job. Toward the end of the job, two techs can begin final rinsing and applying finish.

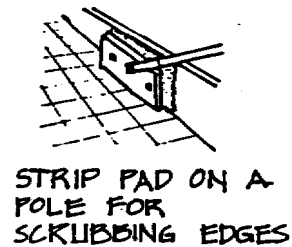
### Suitability of a propane stripping machine

Confirm the suitability of propane by evaluating the machine's impact on IAQ, noise level, and the potential of setting off smoke alarms. Probably the most important concern is maneuverability. Will the machine allow adequate access to most of the areas without damage? Too large of a machine in a small area is counterproductive. Always carefully follow all of the procedures outlined in the operator's manual.



### Important Strip and Refinish Tips:

1. **Presoak** - Most technicians get in a hurry and don't preplan for enough contact time. If the stripper label calls for a 20 minute dwell time, then 10 minutes is insufficient. Plan ahead so you are laying stripper while others are still moving the furniture. Or, apply stripper to the next area before rinsing the current area. Make sure you have blocked the entrance for unexpected visitors and are following all safety procedures.
2. **Applications** - The Inverse Mopping Procedure assures an even coat of stripper. However, there are exceptions. If there is a heavy wax buildup along the edges, "paint" them out or, cut them in first. This applies a heavy coat of stripper to the edge. Don't over apply stripper next to tables or counters. If the stripper puddles underneath inaccessible equipment, it can run back out on the floor later. Since the scrubber may not fit under tables, Doodlebug™ and hand-scrape.
3. **Moisture** - Normally the floor will require a second pass with the floor machine or automatic floor scrubber. Apply more water if the floor has dried out. The floor should always have a moderate or heavy coat (but not heavy puddles) of water and wasted stripper. Keeping the floor wet, helps keep the pad clean. You may need to stop periodically and install a new pad or wash out the current one. Once a strip pad is impacted with wax, it loses its efficiency.
4. **Patterns** - When stripping a 24/7 operation you may need to strip half of a hall. Rope off the area and strip 1-2 tiles (12-24 inches) past half way. Apply finish only half the way, leaving 1-2 bare tiles. This will act as a dry zone to prevent splashing stripper onto a freshly waxed portion.
5. **Uneven floors** - Some floors are uneven and cause stripper to puddle. A technician must learn how to move those puddles across the floor, to keep it wet and facilitate the removal process. When a dry floor is encountered, a noticeable rpm dip will occur in the machine. Excess solution must be pushed with the buffer to the dry areas. By moving 3-foot puddles across the floor, stripper and solution use is minimized and scrubbing action is maximized.
6. **Splashing** - A splashguard installed over the floor scrubber, protects walls and doors from a spray of stripper. Hand towel any evidence of splashed stripper on doors, doorjamb, furniture, etc., before it dries hard.



7. **Inspect** - After squeegeeing the floor, inspect for complete removal. If a light colored floor has a dull, white, chalky appearance, it has been stripped all the way down. If there are still glossy spots when detected by looking at the floor (inspect by studying the floor where the light reflects best), the floor still has sealer or wax.

The proper remedy is to repeat the stripping operation 1-2 more times until all the buildup is removed. If there is a time demand or deadline, you have one other option. Apply a heavy rinse coat. If the rinse water levels out 100%, with absolutely no ridges, bumps or imperfections, and if the floor is 100% uniform in color with no discoloration, it is safe to apply floor finish. If this test is misjudged, the floor may need to be re-stripped later. If the floor looks perfect with rinse water applied, this is how it will look with perhaps 4-5 coats of finish. If there is still any permanent sealer (urethane or styrene) on the floor, hopefully it will not affect results or durability.

8. **Rinsing** - On the second rinse, continue to scrape buildup, black marks, imperfections, etc., during the mopping operation. Hot water can be used on the second rinse to accelerate the drying time. Some acidic rinse additives can cause adhesion and gloss problems. With a thorough squeegee and two rinses, an acid treatment is normally unnecessary. Use common sense: do not walk on or roll buckets over freshly rinsed floors.

9. **Final inspection** - A final walk through with a damp mop allows one more check for stripper that has run out from a baseboard, splashed on a doorjamb, etc. Imperfections can be blended with a scrapper. Shaved-off wax buildup can be placed in a small plastic bag.

10. **High gloss** - To enhance the shine and produce a wet-look, consider burnishing prior to applying finish. Burnishing grinds off and smoothes microscopic rough surfaces caused by the strip pad. Buffing before waxing takes additional time, but definitely improves the results and often reduces the amount of floor finish required. Always dust mop when finished stripping, preferably with the clean dust mop head sprayed lightly with the floor finish that will be applied. .

11. **Difficult strip jobs** – If a superior stripper proved ineffective, either increase the aggression, the stripper concentration, the water temperature (if permitted) or the dwell time. Determine if the stripping solution was allowed to sit for 10 to 15 minutes before starting? This is a critical step and many people fail to allow adequate dwell time. Here are other suggestions:

- 1) Increase the aggression by using a build-up removal pad.
- 2) Increase the strength of the stripper, but do not exceed label directions.
- 3) Apply a heavier coat of stripper for maximum dwell time. Don't let it dry!

Most importantly, be prepared to repeat the strip operation up to three times.

12. **Squeegee** - A 24 inch or 36 inch foam rubber squeegee has an advantage in contouring to uneven floors. Squeegee a floor only while it is still wet. Walking while pulling the solution behind is fast and efficient. Make sure the squeegee is angled slightly so the solution runs toward the puddled side and never toward the dry side. If you decide to pull the solution toward you, try this technique:

Draw the puddle toward you, pick up and move the squeegee back 1 inch and tap on the dry floor. Next, extend the squeegee back 2 inches beyond the next puddle and tap it on the dry floor. Then move it back another 1 inch and then begin pulling the puddle toward you. This technique cleans off the squeegee and prevents stripper residue. With proficiency, a technician can leave a floor virtually residue free. For larger areas, hand squeegee edges, closets, restrooms, etc., and use a wet vac with squeegee attached or an autoscrubber for pickup. The objective is to leave a clean, residue-free floor.

13. **Applying finish that avoids overlap** –

Overlap occurs when you must finish half of a hall while the other half is open for traffic. Try to avoid overlap, which causes a higher reflection level from applying duplicate finish in the

overlap area. In other words, if you overlap 4 coats of finish approximately 2-3 inches in the middle of a hall, then you could have up to 8 coats of finish reflecting light from that line of demarcation.

To reduce overlap, use a flat mop and cut the finish exactly along the edge of a particular tile near the middle. After the finish application has been completed, decide if burnishing down the middle is required.

When a deep strip is required, strip 1-2 feet past where finish will be applied so splash backing does not occur. Cardboard or plastic can also be taped to the floor to protect adjacent areas. Always clean up any tape residue.

**14. Patch work** – tips for refinishing one or two tiles that have been damaged or replaced:

Apply 1/8 cup of diluted all purpose cleaner to each 12" tile. Carefully scrub with a scrub pad, preferably under foot, making sure the cleaner is contained to the new tile. This is necessary to remove factory seal in the advent it is incompatible with the floor finish used. Mop rinse, and rotate mop to clean side for the final rinse.

When tile is dry, apply floor finish (without dribbling) to a paper towel folded in ¼. Carefully "paint" the bare tile making sure you do not apply floor finish to adjacent tiles. Repeat for as many coats as the main floor received. A small microfiber applicator under 12" will also work. This process is necessary because finish applied to adjacent tile will cause a mismatch in the gloss level. Later, burnish-in the area to match completely with the remaining floor. If the damage is only minor; mop on restorer, blade imperfections, burnish and observe if another coat of finish will repair the appearance, or if a strip is required.

**15. Correcting imperfections in the finish -**

Swirl marks that display the pattern of the application mop can occur from the following:

- Lap marks from applying finish before the previous coat has completely dried. This happens when high humidity along with unnoticed puddling hinders drying. When the finish mop contacts these low spots, the carrier or ammonia in the finish softens the prior coat and causes the mop to grip and pull off previous finish. The finish must be dry to the back of the hand. The technician should walk the area first, picking up light reflections to detect high gloss areas that represent low spots holding un-dried finish.
- Skip marks appear if the finish is applied too thin. Skip marks are less noticeable than lap marks. Skips occur when the mop separates or "ropes" because there is not enough finish to create lubrication and produce uniform dispersion. The new style flat mops tend to reduce skips.
- Leveling problems or applicator drag can occur with some high-solid floor finishes. If the air flow or A/C is excessive during application, the finish may start to dry before it has leveled. Reduce air flow until the finish has started to skim over, then apply air flow and reduce the humidity. Contact your supplier to discuss leveling or drag problems.
- Application problems are solved by engineering the work-flow pattern. Lap marks are reduced by applying finish continually, and by avoiding working back into the finish that is starting to dry. Burnishing may remove the current swirls. If not, try pulling a razor blade angled toward you over the swirls until the surface is even. Then burnish and apply one more coat. Hopefully, the floor will not require re-stripping.

**16. Convenient refill stations** – finding a handy place to empty mop buckets and refilling with fresh water. There may be times where the mop sink is a long distance from the work area, yet rest rooms are close by. You can empty a dirty mop bucket into a toilet as long as you don't splash the porcelain or floor. In advance, cut a 3 foot plastic 1 ½ inch vacuum hose and keep it handy. Attach the vac hose to any sink and allow the water to run into the mop bucket. Clean up all splashes when finished.

**17. Immediate burnishing** – burnishing between coats or immediately upon completion.

Most floor finishes require 48-72 hours to properly cure. They may be dry enough to walk on, but not hard enough to hold up to a burnishing operation. Unless the finish manufacturer specifies, wait a few days before burnishing.

**18. Tips for environmentally friendly cleaning from Green Seal**, a science-based non-profit organization that establishes environmentally friendly cleaning standards:

A). Notify building management and schedule strip and refinish operations only when required and not on predetermined schedule B). Schedule when the fewest people will be in the building

C). Provide for maximum ventilation during and after the process D). Use Green Seal approved cleaning products (Reference [www.greenseal.org](http://www.greenseal.org)).

## Preparation of new VCT

Newly installed tile can experience high traffic before the construction is finished in a typical building. Unprotected VCT is susceptible to soil and stains. The application of floor finish approximately four days after installation will help protect the new flooring and can reduce the number of tiles needing replacement before the area is put into actual use.

Do not wet wash, scrub or strip the floor for at least four or five days after installation (this prevents excess moisture from interfering with the adhesive bond). Check manufacturer's maintenance instructions. This is important because some floors should not be scrubbed with a black or brown pad and should not be dry buffed.

Armstrong, the largest manufacturer of VCT, applies a factory seal that can be mopped off during the initial cleaning. However, deep scuffs will normally require a machine scrub with a neutral cleaner or heavy duty detergent using a green or blue scrub pad or equivalent brushes. Remove any dried adhesive residue with a clean white cloth dampened with mineral spirits, carefully following warnings on the container.



Armstrong commercial vinyl composition tile is coated with the Fast Start Factory Finish. Fortunately the Fast Start Factory Finish makes initial maintenance quick and easy and does not require removal after installation. It is compatible with commercial floor polishes. Vinyl composition tile (VCT) requires polishing for protection, ease of maintenance and an attractive overall appearance.

The use of aggressive strippers such as mop on/mop off, no-scrub and no-rinse strippers is not recommended on tile floors less than two years old because they may affect the adhesive bond. If floors must be cleaned and finished prior to the wait time and the tile has Armstrong Fast Start finish, you can mop, dry buff and finish immediately.

If the floor experiences heavy traffic, the best procedure is to scrub and apply 2 coats of finish. After all the fixtures have been installed, return for a scrub and application of 3 more coats. Many General Contractors only spec 2 coats, but the customer is rarely satisfied with 2 coats as the floor normally dries with a dull appearance. Applying 4-5 coats or a minimum of 3 coats will convey a high level of professionalism and reflect a superior image.

**Notes:**



## Troubleshooting

### Floor dries with dark splash marks after rinsing

1. Slurry dried on the floor prior to removal.

**Correction:** Try to keep slurry from drying on floor. If this happens, re-dampen floor with solution tank or wet mop and then rescrub floor.

2. Squeegee operation was not thorough

**Correction:** If using an automatic scrubber, make sure squeegee blades are not leaving skips. If using a hand squeegee, tap the squeegee before and after each stroke to clean it before placing it back on the floor. Follow slurry pick up immediately with a wet-mopping to remove residue.

### Edges still show wax buildup

1. Edges were not detailed with Doodlebug ™ or razor scraper
2. Edges needed a stronger stripper solution or a second stripping

**Correction:** Re-do edges by spending more time scraping and scrubbing until they are perfectly clean. If necessary, increase the strength of stripper.

### Dark spots of bonded wax are still apparent

1. All of the old wax (floor finish) was not removed

**Correction:** Either, strip the floor again and then increase the stripper concentration for rest of the floor, allow a longer dwell time before machine scrubbing, spot strip dark areas or wet mop and scrape with razor scraper.

2. Strip pad was worn or impacted with old finish

**Correction:** Replace or thoroughly rinse out pad more often or use a coarse high-production strip pad and. Also consider applying a heavier coat of stripper to prevent drying.

### Stripped tile dries with apparent color loss

1. Most likely the tile was VAT (vinyl asbestos tile)

**Correction:** Use a Terrazzo sealer to restore color, prior to applying standard floor finish

### Final coats of finish are taking too long to dry

1. Previous coats were applied too heavy

**Correction:** Thin coats are always better with sufficient drying time

2. Too many fresh coats are now on the floor

3. Humidity is unusually high.

**Correction:** After about four coats of finish it is best to allow the finish to cure overnight before more coats are added. Try to finish floors when it is not raining.

### Lap marks or ropy appearance in the floor finish

1. Finish mop was run over an area that was already starting to dry

**Correction:** Lay out coverage sequence to prevent mopping back into finish already drying

2. Contaminated finish mop

**Correction:** Always use a clean finish mop reserved for applying floor finish only

3. Too much air flow preventing the finish from flowing out properly

**Correction:** Reduce air flow until floor finish has had time to properly level

### **Streaks in the floor finish**

1. Finish applied too fast or too thin
2. Dirty mop used to apply finish
3. Floor finish was contaminated

**Correction:** Slow down, use a medium coat of finish and always observe light reflections while moping, to identify and locate any missed areas. Make sure mop head and floor finish is clean

### **Floor finish wears off too soon**

1. Inadequate floor maintenance program for existing building traffic and conditions

**Correction:** Place more matting to trap sand and grit at doorways, dust mop, wet mop and burnish floors more often.

2. Inadequate floor finish protection

**Correction:** Apply more coats of finish to improve the depth of protection or use a premium floor finish that will demonstrate superior wearability

### **Heavy puddles of floor finish**

1. Finish applied too heavy

**Correction:** If finish is too heavy, or starting to puddle, move it to the adjacent areas and quickly spread it over those areas. Then, come back to even out and disperse the puddles. In other words, the objective is to take too heavy of an application and spread it across a broader area.

### **Floor finish applied to new tile does not adhere and begins to flake or powder off**

1. New tile was not deep scrubbed to remove factory seal which prevented a good bonding with new finish
2. Stripping solution dried on the floor or was inadequately rinsed
3. Dirty mop used to apply finish
4. Floor finish is being worn off by excessive sand tracked into the building
5. Burnish pad is too aggressive and is grinding off the floor finish
6. Water moisture leaking from the foundation
7. Poor adhesion of floor finish because prior coats are not allowed to dry thoroughly

**Correction:** Re-strip and re-finish

### **Drops of floor finish protruding above the last coat**

1. Dribbles dried on the floor before they were spread out with the finish mop

**Correction:** Take special care that splashing of finish does not occur.

### **Insufficient gloss level**

1. Not enough coats of finish were applied
2. Too aggressive of a floor strip pad was used
3. Additional coats of floor finish applied too soon
4. Floors later mopped with too strong of a detergent such as degreaser

**Correction:** Scrub and re-coat floors

### **Scuffs and scratches or swirl marks in the freshly applied finish**

1. Furniture moved back or heavy traffic occurred before finish could cure

**Correction:** Make sure floors are thoroughly dried before walking on them. Do not slide furniture for at least 2-3 days.

2. Floors burnished too soon or floor finish too soft for heavy traffic

**Correction:** make sure floor finish has thoroughly cured (normally 48 hours) before burnishing and do not use an overly aggressive pad. If finish does not hold up to normal traffic, a harder scuff-resistant floor finish may be required.

### **Foot prints in the floor finish**

If they are not yours, perhaps the floor was not barricaded properly.

### **Slippery floors**

1. Silicone based products were used and the overspray landed on the floor.

2. Ice melt products are being tracked in

3. Cleaning solutions are used too strong

**Correction:** Never spray dust mop oil, WD-40 or stainless steel cleaner over hard surface floors. Floors may need scrubbing and burnishing or scrubbing and a top coat of finish.

### **Notes:**

## Floor Care Quality Inspection Scorecard

Work performed by professional floor care technicians can always stand up to rigid inspections. Below is an inspection scorecard that allows management to evaluate the overall performance of each floor technician and for every area of a facility.

Management may choose to perform regular floor inspections and track the results and scores. This can be done on a monthly basis and the score recorded for a historical look at overall progress within the building.

**Floor Care Inspection** by \_\_\_\_\_ Manager  
\_\_\_\_\_ Date  
\_\_\_\_\_ Technician  
\_\_\_\_\_ Area inspected

Rate each item on a scale of 1-10 with 10 as perfect

- ☐ Edges have been scraped and are clean – free of buildup.
- ☐ Detail work has been performed around doorjamb, under furniture legs and inaccessible corners have all been cleaned.
- ☐ Absence of discoloration in floor.
- ☐ Absence of marks and scratches.
- ☐ Absence of splashed on stripper including baseboards
- ☐ Finish is uniform, smooth and streak free.
- ☐ Traffic lane shine matches the shine noticed on the edges.
- ☐ High gloss.
  
- ☐ **Total Score** from all eight boxes above
  
- ☐ **Percent** (above score divided by .8)

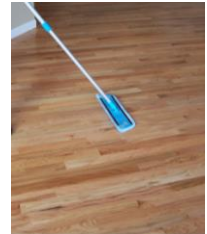
## VII. Other floor types - do not attempt without thorough training

### Wood Floor Maintenance

Wood floors are becoming more popular. Properly maintained wood floors last longer and retain their beauty. Wood floors do require effort and attention to keep them looking nice.

#### Daily and weekly maintenance:

Good maintenance practices keep wood floors looking great while reducing the wear and abrasion to the surface. Dust mop commercial wood floors daily with a treated dust mop. Walk-off mats should be located at each entrance and should be vacuumed or shaken out daily or weekly depending upon traffic.



During normal usage periods, floors with adequate polyurethane sealer should be damp-mopped or auto-scrubbed once a week using an all purpose cleaner. This procedure will remove soil, spills and excess mop treatments from the floor, bringing back the original shine and beauty of the floor.

Use very little water or cleaner when cleaning wood floors. Use microfiber flat mops because they leave very little water or moisture on the floor. Do not: a.) walk on wood floors with hard-soled shoes or high heels b.) Allow food, drinks, candy, gum, etc. on wood floors c.) Flood mop wood floors d.) Use harsh chemicals e.) Drag furniture across wood floors, as they will scratch.

**Heavy-Duty Mopping:** If floors are properly sealed, the little extra water and cleaner required will not injure the hardwood floor, but use common sense. Never flood a wood floor.

**Maintenance Coat:** If you can't restore a solid hardwood floor's luster with deep cleaning or by simply buffing, you may want to apply a maintenance coat. Waxing is an easy way to restore a hardwood floor's natural beauty. However, gym floors with heavy coats of polyurethane can be spray buffed to remove scuffs and restore the shine. Gym floors do not require waxing.

#### Parquet wood floor care:

Older parquet floors may have a lacquer or shellac finish. To test the finish, apply a small amount of acetone to a towel. Rub the wood in an inconspicuous spot. If the finish is softened and comes off in the towel, it is not polyurethane. Polyurethane floors are a harder surface and are not normally waxed. Lacquer or shellac floors can be cleaned with linseed oil and a fine steel wool pad.



#### Parquet maintenance options – other approaches to clean and shine the floor:

- Apply a non-toxic cleaner or no-rinse cleaning product to the floor. Select a product that is safe for parquet floors and follow the manufacturer's guidelines. Remove dark spots on the floor by using a spirit based solvent. Use caution because it is flammable.
- Apply white vinegar to the affected area and leave it for three to four minutes before cleaning with a soft dry cloth.
- Apply a floor polish occasionally that is designed for parquet to bring back the shine lost by the constant usage. Apply a water based acrylic wax to the floor which does not require buffing and let dry.

## Removing stains from waxed floors:

**Water Stains:** Rub the spot with No. 2 steel wool and re-wax. For more serious water stains, lightly sand with fine sandpaper, clean the spot with No. 1 or 00 steel wool and mineral spirits or floor cleaner then refinish and wax.

**Cigarette Burns:** If not severe, the burn can be removed by rubbing with steel wool moistened with soap and water or use a touch-up kit made for urethane finishes.

**Heel and Caster Marks:** Rub vigorously with fine steel wool and floor cleaner. Wipe dry and polish.

**Ink Stains and Other Dark Spots:** Use No. 2 steel wool and floor cleaner to clean the spot and surrounding area. Thoroughly wash the affected area. If the spot remains, sand with fine sandpaper, re-wax and polish. Stubborn stains may require that you replace the affected area.

**Chewing Gum and Wax Deposits:** First, apply a plastic bag of ice covered with a cloth, then scrape off any loose material with a sharpened blade and be careful not to scratch the wood's finish. Non-loose crayon marks on the floor or wood furniture are often easily removed with a wood floor cleaner like Murphy® Oil Soap. Wipe the spot dry and buff with a clean, dry cloth

**Repairing Wax Finishes:** Rub fine steel wool in a puddle of re-conditioner or paint thinner and clean as you go. Apply wax and buff. Always start cleaning at the edge of a stain and work toward the center so it won't spread.

## Solvent free treatment

A three part system allows you to use a liquid to chemically sand the existing finish, and then apply a bonding formulation followed by an environmentally friendly water-based clear coat that can be walked on in just eight hours.



Buffing, recoating, screening and re-sanding a hardwood floor should be performed by an experienced hardwood floor professional. Some hardwood floors can not be successfully recoated. Different areas may have different light exposure causing discoloration under area carpets, or those improperly cleaned with oil soaps, and other cleaning solutions, all contaminating the floor will hinder successful results.

## Chemical Stripping:

Chemical stripping of wood floors should be performed by experienced professionals, due to the toxicity of methylene chloride strippers. Other non-toxic strippers are commercially available. However, they require special procedures in order to work effectively. Use all safety measures for working with strong chemicals including personal protection and adequate ventilation and follow all manufacturers' labels.

1. Remove athletic painted court lines by first applying a liberal amount of stripper using a wide paintbrush. Apply sawdust over stripper to reduce evaporation. Allow to stand 10 to 15 minutes (or as recommended by the manufacturer) and then scrap up paint with a putty knife. Eliminating the lines first will prevent the colored enamel from staining the wood flooring during the stripping process.
2. Apply stripper using a lamb's wool applicator. Work in small areas of about 80 sq. ft. at a time.
3. Keep stripper surface wet with more stripper as it cuts into finish or evaporates. Never let the floor dry out. Covering stripper with sawdust will slow down the evaporation process. After about



10 to 15 minutes, scrub floor with a floor machine equipped with a steel wire brush. Clean out brush frequently to prevent clogging and uneven stripping.

4. Sweep up sawdust, or push stripping solution into a small area and pick up using a shovel, placing into a steel container for disposal.

5. Lightly sand the floor with a #120 grit screen. Rinse floor with a good quality waterless cleaner, allow to dry and rebuf with a #120 grit screen again. Vacuum and tack-rag the floor once again to remove all dust and particles.

### **Scrub and recoat**

Most wood gym floors can be brought back to a beautiful shine with a simple scrub and recoat process.

1. Before scrubbing the floor, locate any stains, spills, heel marks, rubber burns, and gum on the floor. Use a good quality cleaner to remove excessive soils prior to scrubbing operation. Use a putty knife if needed, to remove gum.

2. Mix an all purpose cleaner according to label. Using a clean mop, mop the solution over a small area of the floor, using a very light amount (do not flood). If one person is mopping down solution, have the other person begin to scrub the floor using a low speed floor machine equipped with a 120-grit screen under a suitable pad.

3. Scrub with the machine in the same direction that the wood grain runs. Work in small 7' by 20' areas to prevent soiled scrubbing solution from drying on floor. Once this section has been scrubbed, immediately pick up solution with wet vacuum or auto-scrubber.

4. Damp mop the area twice with clean fresh water and a well wrung out mop. A fresh mop for this process is recommended. Continue this procedure of small area treatment until all of gym is completed.

5. Perform a final damp mop of the entire floor with clean fresh water. Allow floor to dry overnight before applying the solvent based finish. Prior to applying a solvent borne finish, tack-rag the entire floor once again with a Turkish towel wrung out in a recommended waterless solvent cleaner.

### **Screen mesh sanding – do not attempt without at least one experienced helper.**

If gym floors have experienced heavy use and contain deep scratches and worn areas, a dry screen sanding may be necessary.

1. Dust mop and inspect the floor for stains, spills, heel marks, rubber burns, and gum on the floor. Use a good quality cleaner to remove excessive soils prior to scrubbing operation. Use a putty knife to remove gum.

2. Place the appropriate mesh screen (either 80, 100, 120 or 150) under a buff pad and begin screening the floor with a slow speed buffer. Cross buff the floor. If an 80 mesh is required to sand deep scratches, it must be followed by a 120 or 150 mesh to remove sanding marks. For best results, screen east/west, then north/south. Screen the second time with the grain of the wood. Use one screen for every 500 square feet. Never use a damaged screen or particle impacted screen on floors. This may result in uneven surface dulling or create deep scratches in the finish that will not be easily removed. When necessary, remove the disc and tap it out to remove trapped particles of finish. When complete, the floor should have a uniform white powder on the surface and a dull, even appearance. Do not leave any shiny spots. When finished with a screen, fold it and hand sand any edges or corners not accessible to the buffer.

3. Vacuum up all dust using a non-marking vacuum head. Protect from creating scuffmarks with power cords, vacuum wheels, shoes or any other black rubber material. Next, tack-rag the floor with a clean Turkish towel well wrung out in a waterless solvent cleaner. Be sure to change out towels frequently and, change water when it becomes slightly discolored. Repeat this procedure at



least twice to ensure that all dust and soil has been removed. Even more tack ragging may be needed, depending on the amount of soil and dust in the air.

### **Equipment and supplies needed:**

Floor machine with drive brush  
Floor pad and enough screen mesh discs to complete the job  
Dust mop, lobby pad and broom  
Mop bucket with all purpose cleaner and clean mop head to remove spills  
Razor scraper or sharpened putty knife  
Tack rags and waterless solvent cleaner  
Wet/dry vacuum with extra vacuum bag  
Urethane finish and applicator

### **Application of gym floor seal and finish:**

A newly prepared floor (sanded or chemically stripped) should first be sealed. Sealing penetrates the wood surface and binds the wood fibers together for greater strength. Sealing also allows the final finish to build a high gloss. Choose a premium finish and follow the directions supplied by the manufacturer.

1. Apply one coat of oil-modified polyurethane sealer, allowing overnight drying with adequate ventilation.
2. Buff the floor with #100 or #120 grit screen, vacuum and tack-rag using waterless solvent cleaner.
3. Apply a second coat of sealer, repeating the above procedure.
4. After floor has dried, lay out athletic court lines and paint with a quality all-purpose enamel paint. Allow to dry over night.
5. Apply the first coat of premium polyurethane top finish in the same manner as the sealer. Allow at least 8 hours drying time. Buff floor with a #100 or #120 grit screen, vacuum, and tack-rag one to two times with a Turkish towel dampened in waterless solvent cleaner, until no dust is noticeable on floor.
6. Apply a second coat of polyurethane finish, allowing at least 24 hours dry time prior to opening floor to traffic.

## **Marble and Stone Floor Care**

### **Daily Maintenance:**

Frequent dust-mopping and wet-mopping will help prevent soil from penetrating the surface. Whenever possible, quickly blot spills especially oil and grease, to minimize their absorption into the stone. Normal detergents can dull the polished stone and acid based products should be avoided. Two ounces of ammonia added to a mop bucket is one approach for regular mopping.

### **Marble Care:**

Regular maintenance can include mopping or cleaning the floor and then buffing with a natural Tampico bristle brush and a floor machine.



A periodic maintenance process would be to spray buff the marble with a special crystallization compound and high-speed buff with a marble buffing pad. It is best if the manufacturer rep brings the materials on-site and demonstrates the proper procedures.

The maintenance program should always include a good stone cleaner and conditioner. If the floor is large, add a small amount of product to the solution tank of a walk-behind or ride-on scrubber. If the floor is small, simply add the product to mop water.

Products made specifically to clean and condition stone floors generally keep the surface looking clean while enhancing the natural sheen of the floor. This will reduce the amount of powder polishing or crystallization that will be needed.

Crystallization is an excellent way to maintain the appearance of natural stone. The crystallization product can be spray buffed with a special compound and burnish pad. However, this process may not work on every single kind of marble. But, it is a cleaner process than using oxalic acid compounds.



Periodic honing and polishing by an experienced floor tech will maintain the luster and significantly inhibit re-soiling and deterioration. Mechanical honing with fine screens creates a smooth surface, followed by buffing to a polished finish with slightly abrasive putty and synthetic felt or wool pads. This may be done monthly or quarterly, depending on the wear the floor receives and the degree of gloss desired.

### **Marble Restoration:**

If a marble floor is scratched, deeply soiled, or has a build-up of yellowed wax or discolored sealers, the luster and natural color can be restored by wet sanding and chemical stripping. This intensive process requires protection of workers with proper gear and temporary protection of adjacent surfaces, such as doors and base moldings, and floor-mounted fixtures. Sanding is followed by honing and polishing. Repeated heavy sanding can noticeably wear down a floor, producing visible depressions; thus it is best to avoid the need (and the expense) of this procedure by maintaining the polished finish.

For deep restoration, a heavy-weight honing machine should be used with diamond abrasives. There are many products on the market such as powders and creams that claim to be restoration products for stone. However, if the floor is worn to the point that the reflection is dull, these powders and creams have limitations.

### **Sealers:**

The application of penetrating sealers or impregnators intended to protect stone is controversial. Certain features are helpful, such as slip resistance and their ability to inhibit penetration of dirt, food, and beverage stains. A major disadvantage is the surface abrasion, expense, and nuisance of wet sanding and chemical stripping required to remove sealers when their appearance becomes undesirable due to discoloration, spotting, and uneven wear.

A penetrating sealer can resist heavy traffic stains. However, many professionals recommend leaving marble floors in their natural state without coatings. If floor sealers are being considered, evaluate the long-term maintenance costs and make sure to test the product during the winter on a small area near a door entrance. If the grouting is a light color, you may desire to seal the grout only to keep it looking clean.

### **Specific Cleaning Problems:**

Unsealed stone floors may stain easily. Always use the gentlest means possible to clean marble. Never attempt to remove stains or deposits by scraping, scouring, or applying strong bleaching agents, liquid marble cleaners, or other harsh chemicals. Damage such as rust stains may not

appear until months later. In addition, all acids are potentially harmful to marble surfaces. Experienced marble cleaning technicians can select appropriate poultices (smooth pastes applied to the marble which dissolves the staining matter) for specific stains. When in doubt, do not attempt to handle difficult challenges. The IICRC has a special course for stone care that is extremely valuable.

## **Concrete**

For new concrete, a 30-day curing period with a curing coating will help the concrete develop full strength. When it is dry, it can be swept, pressure washed using a 2,000-psi unit with a fan tip, or scrubbed with a rotary walk-behind scrubber and detergent, and then rinsed twice.

Acid washing using one part muriatic with five parts water might help remove oil and stains or improve the appearance of exposed aggregate. The acid wash can be neutralized with a rinse mixture of 1 pound of baking soda to 5 gallons of water. It should be rinsed twice or until the rinse water is clean, removing the rinse water with a squeegee or wet vacuum.

Determine if the application requires resistance to slips, oil, grease, acid, ultraviolet radiation, or de-icing salt? It can be sealed with an airless sprayer, roller, or lambs-wool applicator. The average sealer application rate using a lambs wool is 800-1,000 square feet per gallon, or 1,000-1,600 square feet per gallon for subsequent or maintenance coats.

Crews might need to apply two coats on previously untreated concrete, applying the second coat when the first is tack-free — after about 2 to 24 hours, depending on heat and humidity. The best conditions would allow application in a low humidity area at 50-90 degrees. Complete drying takes 12-24 hours.

Maintenance of concrete floors includes keeping them clean and free from dust and grit. Applying an emulsion-type commercial floor finish over the sealer improves wear and slip resistance. If buildup or spot damage prompts resealing, crews first should treat the spots by cleaning stripping and resealing, feathering the sealer to the old seal. If the floors have a finish coat on top of the sealer, it is important not to allow the sealer to be exposed directly to traffic.

Polished concrete is gaining popularity. The process involves grinding the floor with a diamond-impregnated abrasive mounted on a floor grinding machine. It is a progressive process where finer grits of diamond grinding is employed to remove minor pits, blemishes, stains, or light coatings from the floor, in preparation for final smoothing. Eventually the desired degree of shine and smoothness is achieved.

During the final polishing step, some technicians spread a commercial polishing compound onto the surface to deliver a higher sheen. These compounds also help clean any residue remaining on the surface from the polishing process and leave a dirt-resistant finish.

Existing floors require surface preparation prior to polishing to remove dirt, grease, blemishes or previous coats of sealer. However, floors that are uneven, need extensive patching, or are extremely porous may not be good candidates for polishing.

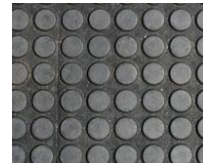
Generally, there are two types of concrete stains - reactive and nonreactive. Reactive stains are normally water-based acidic solutions containing metallic salts that react with the concrete's lime content. Once the chemical reaction takes place, the stain forms a permanent bond with the concrete and won't chip off or peel away. Nonreactive stains are normally acrylic based that do not rely on a chemical reaction to impart color. Instead, they are formulated to penetrate the concrete surface and deposit pigment particles in the open pores.

There are three primary types of sealers used: acrylics, urethanes, and epoxies. Acrylics are UV stable, inexpensive, and easy to apply or reapply, as necessary. But they have the softest surface of the three and require the most maintenance. Solvent-based acrylic sealers are softer than water-based products. They also provide a wet look that greatly enhances the appearance of colored finishes.

Epoxy sealers are much harder than acrylics. Water-based epoxies bond well to concrete and provide a clear finish, but they are nonporous and do not allow trapped moisture to escape. Urethane sealers provide the most abrasive-resistant finish. However, they don't bond well to concrete, so they must be applied over water-based epoxy applications.

## **Rubber floors**

If the rubber floor is newly installed, it is important to remove any lubricant or factory coating applied for protection during shipment. Select a solvent-free cleaner designed especially for safe, effective removal of soil and film from rubber surfaces. Dilute at the recommended dilution rate for stripping. A moderately aggressive scrubbing pad is also recommended. A pad that is too coarse can damage the rubber surface. After cleaning, rinse thoroughly.



Once the surface is prepared, a flexible dressing is recommended to offer protection from grit and soils, and to provide beauty to the rubber floor. Normally, a cleaner suitable for rubber floors will be a blend of waxes, detergents, polymers and gloss enhancers. This type of product cleans, conditions, protects and beautifies flat rubber and studded rubber floors in one simple step. Once dry, the restorer/polish can be buffed (with a red or white pad) to produce an even higher shine.

## **No-wax floors**

No-wax floors are normally installed in residential settings. They are actually a vinyl floor with a durable acrylic or urethane finish applied at the factory. They can be either sheets or individual tiles. They are designed to be cleaned with a neutral cleaner and not waxed. Usually after 6-10 years the urethane gloss begins to wear off. At this time they can be treated as regular vinyl floors which need stripping and refinishing. Since the membrane has worn off, they will now require regular care.

It is fairly common to find no-wax floors in smaller buildings such as barber and beauty shops and in rest rooms. Again, once they no longer retain their shine, the surface can undergo regular scrubbing and coating with a polymer floor finish. This would be in addition to regular dust-mopping, wet-mopping and burnishing with a non-abrasive white pad.

Typical stain removal can be achieved as follows:

Crayon, lipstick, ink, – use rubbing alcohol on a clean, white cloth followed by a clean and rinse procedure.

Permanent marker, asphalt, tar, shoe polish, paint and hair dye - rub stain with mineral spirits or turpentine on a clean, white cloth. Clean and rinse area. If stain is still present, rub area with rubbing alcohol with a clean, white cloth. Clean and rinse area.

Rust – clean with heavy duty cleaner and a white scrubbing pad. If rust still persists, rub with a soft cloth dipped in a solution of oxalic acid and water diluted 1:10. Follow label and use precaution and then clean and rinse area.

Nail Polish - Very carefully wipe stain with fingernail polish remover containing acetone on a clean, white cloth. Then clean and rinse area.

## **Grout cleaning of clay stone and ceramic tile**

Ceramic tile is becoming a popular floor choice for rest rooms and break rooms. The tile surface is easy to clean and maintain, but often the grouting is subject to staining, and soil build-up. Since the grout lines are normally lower than the tile, they collect debris and grease. If the grout has never been sealed, it will begin to discolor. Eventually, traffic and use will wear off the grout sealant. Cement based grout and non-glazed ceramic tile should be sealed, or it will begin to rapidly stain with heavy traffic and use.

### **Do not neglect cleaning and maintenance**

Cleaning problems with clay and ceramic tile floors are noticeable because the grout is often rough, porous, and below the level of the tile floor itself. This makes grout a challenge to scrub and thoroughly clean. Always use clean equipment and solutions when maintaining a floor.

Inspect for any damage prior to cleaning. Cracked tiles or damaged grout should be repaired prior to wet cleaning. If repairs are not possible, then considerably reduce the amount of moisture or water used, or cover or tape over damaged areas with plastic. Try not to soak any damaged areas to prevent liquid penetration into the sub-floor.

### **Daily maintenance**

Pre-treat a dust mop and dry mop the floor or, thoroughly sweep or vacuum the area before starting with the wet-cleaning. A vacuum tool helps extract fine dust in the low areas. Spot damp mop or wet mop the floor as required with an approved cleaner. Do not use high acidic cleaners which could attack the tile or grout. Large areas can be cleaned with a floor machine or automatic scrubber.

Special cleaning chemicals are available for heavily soiled tile and grout. Damaging chemicals should never be used to clean the tile or grout. Steel wool pads can leave rust producing shavings on the floor. Here are steps to follow:

1. Vacuum the area with a backpack vacuum equipped with a non-marking hard floor attachment.
2. Wet mop the floor with an all-purpose floor cleaner approved for ceramic tile with grouting. In food service areas, use a degreaser. In healthcare facilities a disinfectant may be required.
3. Mop lightly without leaving excessive chemical residue. Do not neglect regular mopping procedures.

Unsealed grout will attract heavy soils that may stain the grout. The exception would be a dark colored epoxy grout, which is stain resistant. If the grout hasn't been sealed, it may require a deep restorative procedure. Some sealants require the grout to dry and cure for 2-3 days prior to the application of the sealant.

### **Periodic or Regular Maintenance**

A deep cleaning of grout may be required on a regular basis. First, move furniture and items from the floor. Dust mop, sweep, or vacuum the area. Apply a liberal coating of degreaser or tile/grout cleaner by following the manufacturer's directions for the dilution ratio and recommended dwell time.



Install a medium stiff bristle nylon or nylon grit brush to a floor machine or autoscrubber. Floor pads are not effective in reaching deep into the grout lines, as they run over the top of the tiles.

Once the area has been thoroughly scrubbed, use a wet vacuum or foam rubber floor squeegee to gather the wasted solution. Hand scrub tight areas and edges with a special grout cleaning brush. Always follow the directions for all cleaning agents as some require a neutralizing solution to be applied next, to counteract the original strong chemicals.

When using a particular chemical for the first time, pre-test a small area first to see if the product is suitable and safe.

When rinsing, if the water hardness is high, and the rinse water leaves the tile spotted after drying, consider adding a cup of vinegar to the rinse water. Using 2 ounces of white vinegar per gallon of water is normally safe. This will correct the tendency of water spotting, and additionally remove any detergent buildup. Another option to remove any streaking or dullness - is to periodically dry-buff the tile with a white floor pad using a standard 175 rpm floor machine.

### **Spot Removal Techniques**

Immediately clean up spills so they don't stain the grout or tile. Do not use bleach or ammonia full-strength, and never mix these two chemicals. If you choose to use a bleach product, pretest in an inconspicuous area first. Don't use an abrasive process to clean the tile as it can scratch the surface.

Your local stone and tile supply distributor may stock a special spot removal kit for ceramic and clay tile and grout cleaning. Always follow safety precautions. Consult the MSDS safety sheets. Use PPE as recommended. Do not mix chemicals. Follow product directions or precautions. Protect from spillage or tracking onto adjoining areas, and rinse thoroughly.

Some harsh acid products will etch, discolor or burn ceramic tile, and cause damage and discoloration to grout. Always pre-test chemicals and remove excess residues. Safe solvents, detergents, and degreasers may work for mild spot removal techniques.

### **Approved steps for removing stains**

Ceramic and porcelain tile is more resistant to absorbing stains, but unsealed cement based grout will soak up many stains. Even food and drinks can etch, or deeply stain unsealed grout. For many typical stains an oxygen or safe bleach product may be helpful.

Blood – household hydrogen peroxide (normally 3%) will normally dissolve the blood.

Burn Marks – apply a citrus solvent gel product used for paint and gum removal for carpet. Allow to dwell 5 minutes and agitate with a white nylon scouring pad. Rinse and dry.

Coffee, tea, food, and juices – use a neutral commercial cleaning product. Rinse and then apply hydrogen peroxide, or bleach if stain persists.

Fingernail polish – apply a small amount of fingernail polish remover, scrub and then dry the area. If the stain remains consider applying bleach. Then blot, rinse and dry the area.

Grease – apply heavy-duty cleaner or degreaser, agitate and rinse.

Ink and dye - Apply bleach, let stand until the stain disappears and then rinse and dry.

Mildew – apply bleach or mildew stain remover. Allow to dwell a few minutes and then rinse and dry. Consult the manufacturer before using bleach on slate tile, as discoloration could occur.

Paint – for hard drops of paint, spray with an all-purpose cleaner and carefully scrape with a razor blade. Do not scratch the tile. If the paint has been smeared, apply mineral spirits, agitate and wipe dry. Follow with a neutral cleaner, and then rinse and dry the area.

Permanent Marker – apply denatured alcohol or acetone: allowing dwelling, agitating, rinsing and drying. Or apply graffiti remover and agitate. Wipe off residue, clean with neutral cleaner, rinse and dry.

Rust – apply white vinegar to the rust area and allow it to sit for several minutes. Rinse and dry. If the stain persists, apply laundry rust remover, allow to dwell and then rinse and dry. Finally, if a trace of the stain persists, apply bleach; allow dwelling for a few minutes, and then rinse and dry the area.

Powdered oxygen bleach diluted in water according to instructions is usually safer than liquid bleach. Never mix acid with any type of bleach, as dangerous and lethal fumes could result.

### **Applying a poultice**

A poultice is a powdered treatment that can be mixed with a stain removal ingredient and placed on top of a difficult stain. Diatomaceous earth is the most common type of poultice. The poultice lifts the stain from within the grout or tile, to the surface, and is drawn into the poultice material.

Try to determine what caused the stain, so the proper removal agent can be added to the poultice. Add one of the following chemicals for a given stain - to one cup of poultice material. If normal spot cleaning fails to remove a particular spot, a poultice may be required. A proper chemical that removes each individual stain should be added to the poultice powder and thoroughly mixed into the preparation to achieve the consistency of peanut butter.

Here are some suggested chemicals that can be added to a cup of the poultice powder:

Coffee, tea and drink spills – mix 20% (commercial) hydrogen peroxide with the powder until a soft consistency is achieved.

Cooking oils, salad dressing, etc. – mix one table spoon of dish detergent and then add water until the preparation thickens.

Food stains such as tomato paste, mustard, etc. – mix 3 tablespoons of ammonia. Be careful not to breathe the fumes.

Rust - mix two or three tablespoons oxalic acid or laundry stain remover - with one cup of flour or poultice material.

Apply the paste directly to the stain, approximately ¼ inch to ½ inch thick, overlapping the stain ¼ inch beyond the soiled area. Cover the paste with plastic wrap and poke a few small holes in the plastic with a knife. Let it stand for 12 hours. If after 12 hours, the paste has not hardened, cover it over and check in another 12 hours. In some cases it will be necessary for the paste to set 48 hours until it is dry.

Once the paste has hardened, remove the plastic and the dried paste with a plastic scraper. If the stain remains, but is somewhat lighter, apply the same treatment a second time. If the stain has not been removed, consider replacement of the damaged area.

## **Efflorescence**

This is a condition that occurs from excess moisture seeping through the floor and dissolving minerals in the concrete or grout. The solution wicks to the top surface and evaporates. The remaining deposit displays a salt like appearance. Brushing the residue with a stiff brush may remove light accumulations.

Efflorescence haze can often be prevented by reducing the amount of water used when cleaning the tile. Or use an air handler to speed up the drying time after cleaning. Sealing the grout with an impregnating sealer may also help reduce re-occurrence.

An acidic treatment will be required to remove heavy deposits of efflorescence. However, any new installations should dry and cure for two weeks prior to acid cleaning. Acid can burn cement and leave a white film that is difficult to remove. Always use safe and proper equipment for acid cleaning.

Select an acid treatment that is safe for ceramic, porcelain or quarry tile. Pretest to ensure the acid is not too strong and would etch or dull the tile. Protect items or areas that are not to be cleaned, making sure the acid does not kill plants, corrode metal or damage carpet.

Do not use strong acids on limestone, travertine, marble or stone that contains calcium. Always carefully follow the directions and wet vac and rinse the area to remove all residues.

Some distributors carry specialized acid products that are safe for most ceramic tile. It might be necessary to clean the tile and grout first with a heavy-duty degreaser. This will remove caked on oils before acid cleaning is tried. When using strong acid on any cement based grout, apply water first to the grout before applying the acid.

## **Preventing sealer haze**

New tile can be stained with grout haze and cement smears, which can be removed by a commercially prepared acid solution. Read and follow manufacturer's instructions. The basic process involves using a mop, brush or sprayer to apply the treatment, followed by a five to ten minute dwell time. Then the area is scrubbed with a nylon brush. Heavy buildup can be scraped with a nylon putty knife. Finally, wet vacuum the area to remove the slurry and rinse it at least twice. The floor should be sufficiently neutralized to a pH of 7.

There are several causes of an uneven gloss appearance including: sealer was overlapped onto adjoining tile, or too much sealer was applied. Applying water to the finished job will show if the correct amount of sealer has been applied, and now repels penetration of the tile or grout.

Some manufacturers recommend applying seal with a white buff pad or nylon bonnet under a floor machine. This in turn, soaks up excessive sealer. If sealing the grout only, there is a wide selection of foam wheels that apply the correct amount of sealer without getting too much on the ceramic tile surface. Excessive epoxy grout residue may require removal by heating up the excess with heat gun.

## **Deep or Restorative Cleaning**

If everything else fails to clean the tile or grout, you may need to consider a stronger and more aggressive process. Pre-test the process first, to ensure safety. Begin with the least aggressive procedures and chemicals, and then progressively move toward more aggressive processes and chemicals.

### Heavy scrub or strip

Some tile will require a stripping operation to first remove floor finish or sealer. Instead of standard floor finish stripper, a specialty chemical may be required along with hotter water, additional dwell time, and repeating the process several times. Always protect adjacent areas by placing equipment and chemicals on plastic sheeting, walk-off mats or heavy cardboard.

- Apply masking tape and plastic sheeting to create safe barriers between the work area and areas that will not be stripped. It is recommended to place cardboard over the plastic to prevent it from tearing. Use masking tape for chrome and metal fixtures that are on, or near the floor.
- Again, follow all safety precautions. Apply stripping solution to an area approximately 100 square feet. Apply a heavier solution along edges where there is normally a build-up. Allow the required contact time.
- Use a strip pad or aggressive high-productivity pad on a 175 rpm floor machine. Move from the dry area into the wet area so safe footing is maintained. Never use a pad that scratches the tile. Do not allow the stripper to dry, or at least dampen the floor again, prior to squeegeeing.
- Use a strip pad on a pole to scrub the edges, and or use a razor scraper if required. A special grout brush is another great method to detail and deep scrub the grout lines.
- Hand-squeegee or pick up solution with wet vacuum that has a front mounted attachment. Start on dry ground, and then move into the wet area.
- Inspect the floor to ensure all the finish has been removed. If there is any evidence of residual, then re-strip the area a second time perhaps using a stronger concentration of chemical.
- Thoroughly rinse the area twice with clean water and thoroughly mop the area.

Grout cleaning machines are available that use rotational cylindrical brushes. They are especially superior in accessing the recessed grout lines.

### Aggressive chemical cleaning

After the tile has been stripped, a second step may be necessary. An acid based cleaner may be required to remove deeply imbedded soil and to brighten the grout. This process will actually etch and remove a thin layer of grout. It is critical to limit the dwell time (normally three to five minutes), and then to neutralize the area. It should be flooded and then wet mopped. Again it helps to use a grout brush to access deep in the grout lines.

Keep in mind these chemicals can be damaging to the grout, and other surfaces. So use extreme caution. Once the tile and grout is clean and completely dry (allow 24 hour dry time prior to application) then one or two coats of a penetrating sealer should be applied to cement based grout or unglazed tile.

### Here are the steps to clean and seal grouting

1. Prepare an approved cleaning solution according to the label directions. Identifying the type of soil that is found in the grout and select a cleaner best matched to remove this type of soil. Apply the cleaning product to the grout. Allow the cleaner to stand for several minutes, or according to the dwell time listed on the chemical label.
2. Scrub the grout with a stiff brush or a floor scrubber equipped with a special grout cleaning brush. Tynex is an abrasive filament that is impregnated with silicone carbide. It provides a high degree of agitation - along with the material being resistant to most solvents.



Special cylindrical brush machines are also available. Another approach that has proven superior for cleaning quarry tile (Saltillo) is a machine with counter-rotating cylindrical brushes. They allow prolonged brush contact in the horizontal and vertical lines of the grouting and at a deeper level.

3. Wet vac the solution and then rinse the grout with clean water and allow to dry overnight.
4. Apply an approved penetrating sealer. There are handy wheel devices that dispense the sealer from an inverted bottle.

### Rotary spray extraction – hydro spinners

Your local distributor may carry rotary floor machine heads that contain a spinning head surround by a vacuum shroud. This hydro spinner is normally connected to a high-pressure portable machine, or a truck mount extractor. It is great for large areas, and prevents splattering or flooding of floors. The extra pressure and heat, allow deep penetration, and removal of embedded soils and stains.



Some units contain a brush head for agitation and provide a floating action that can prevent scratching. Many operation manuals suggest cleaning the tile at about 800 psi. The shroud also keeps the water hotter, and from running out across the floor. Make sure the head does not scratch the tile before using one of these units.

### Dry steam cleaning

Steam vapor machines can be used to clean the grout in small or confined areas. The excessive temperatures help penetrate, and dissolve soil. Some operators use this equipment without chemical - in situations where chemical usage is discouraged. The process is slow and very detailed, but provides impressive results.

### **Additional tips for sealing of grout and tile**

A penetrating sealer should be applied to unglazed tile and all absorbent grout. Porcelain and ceramic tile does not require sealing and often will repel sealant and later peel off when previously treated. Consult with the tile and grout manufacturer for specific instructions. If you cannot locate maintenance procedures, then pre-test a small area to make sure the sealant will adhere or is appropriate.

Penetrating sealers normally dry clear with a dull look, or they may dry invisible. These sealers do not produce a shine. Eventually the ongoing traffic, or wear, may remove the seal, requiring a recoating process. You should conduct a water-based stain protection test to determine if the tile or grouting has been sealed, or may still contain enough sealer to resist staining.

To accomplish this: apply a tablespoon of water to the tile surface and grout, and wait about ten or fifteen minutes. Observe the reaction. Did the grout absorb the water, or is it still beaded up on the surface? Determine if the grout changed color? Finally, use a dry towel to blot up the water and touch the tile and grout. Does it still feel damp?

If this test shows a lack of water resistance, then it is likely the sealer is no longer protecting the tile. This test is helpful to determine if additional sealing is required, which protects and prevents staining and wear to unglazed tile or absorbent grout. It is common in many commercial settings that a re-application of a penetrating sealer may be required every two years, even to ceramic tile. However, low traffic settings usually do not require sealing of the surface of ceramic tile.

### **Grout colorants**

A selection of grout colorants or sealer/stains is available to recolor grout lines. The floor is first deep-cleaned with an alkaline cleaner and then followed with an acidic treatment. Different applicators are available such as a bottle of colorant that mounts on a pole, and is fed to a foam wheel that paints the colorant on the grout only.

When using a colorant, only cover a small area at a time. Be sure to hand-wipe any excess colorant that has protruded onto the tile itself. Follow the manufacturer's directions carefully.

### **Slip-resistant treatments**

Slip-resistant treatments are available that can be applied to most ceramic or clay tile floors. Most of these chemicals etch the floor, making microscopic grooves that improve traction. This application can be especially helpful in kitchen settings where floors become wet and greasy. Another process involves applying a slip-resistant treatment that contains micro-abrasive particles that in turn improves traction. Normally the floor must be deep-stripped prior to application of these type of products.

### **Notes:**



## VIII. Glossary

**Abrasion Resistance-** The ability of a floor finish to resist removal or damage from heavy traffic.

**Adhesion-** The ability of a floor finish to adhere to the substrate (floor) by physical or chemical means.

**Asphalt pavers** – normally a black, composite flooring. This floor requires adequate seal and finish coats to prevent dirt entrapment and color bleeding during cleaning.

**Asphalt Tile-** A flooring material made of asbestos fibers, pigments and inert fillers bound together with an asphalt or resin binder. Ingredients are mixed, heated, then rolled out in sheets and cut to size. Asphalt tile is also furnished in a grade designated as grease proof. Oils and solvents should be avoided on all types. One possible way to distinguish asphalt tile from vinyl asbestos, which is also hard and brittle at normal temperatures, is to rub the tile in an inconspicuous spot with a rag dampened with petroleum naphtha. Any color transfer from the tile to the cloth indicates that the tile is asphalt instead of vinyl asbestos. Rubber tile will also show some color transfer, but rubber tile can be indented with a fingernail.

**Biodegradable-** Capable of being decomposed or broken by bio-logical organisms or action. Generally refers to detergents and cleaners that are safe for most municipal sewage systems and the environment.

**Bite-In-** dulling or mop streaks caused during application of floor finishes. It can occur if re-application is done too quickly or if too much product is used and low spots have not completely dried. Bite-in can be detected by increased drag during application of multiple coats.

**Black Marking-** Black marks left on the floor finish caused by scuffs from rubber heels of shoes.

**Black Heel Mark Resistance-** Resistance to permanent transfer of material from a shoe heel to a floor finish. Premium finishes contain selected ingredients to improve black heel mark resistance.

**Bleeding-** A condition where a stripper may be mixed too strong and causes a black tile to impart black dye onto an adjacent white tile. Also, too much solution can be applied too soon to new tile and cause the adhesive to bleed up through the cracks.

**Buffable Floor Finish-** A term used to describe any solvent or water based finish requiring mechanical action to improve gloss and/or general appearance.

**Buffing burns** – A condition where a floor machine or burnisher has been left too long on a particular spot and turns the tile a dark color.

**Build-up-** Multiple layers of dirt, grime, wax or floor finish including previous stripper that was not rinsed and then waxed over.

**Burnishing-** A maintenance process using a high-speed floor machine to produce a gloss.

**Ceramic Tile-** A flooring material made from a mixture of special clays and colorants that are fused together at high temperature into a hard brick like or porcelain substance. Sometimes the tiles are coated with a thin film of glazing.

**Chemical Resistance-** Ability to withstand an assortment of chemicals including solvents, without experiencing damage.

**Clarity-** Clearness; Lack of haze or dullness.

**Clouding** – the floor finish gloss is dulled often because an aggressive pad is used with a slower speed machine. May also indicate a buildup of residual detergent or detergent disinfectant improperly diluted or applied daily through damp mopping.

**Concrete-** A flooring material made from a mixture of sand, gravel, Portland cement and modifying additives which react with water to form a hard rocklike substance. It can be coated and protected after an initial cure of 60 to 90 days.

**Conductive Flooring-** A flooring material that will conduct electricity to reduce hazards from unwanted static electricity such as sparks in an explosive environment or computer data centers. Conductive flooring materials include linoleum, terrazzo, ceramic tile, vinyl, and rubber. Conductivity is achieved by special conducting materials or wire mesh to assure uniform conductance of the entire floor.

**Cork Tile-** A flooring material composed of ground cork with or without resins that is compressed and heat cured into the finished product. Chosen mostly for its beauty and sound deadening properties. Cork is best maintained with organic solvent-based products such as a wax or paste.

**Damp Mopping-** A maintenance method using a wrung out mop dampened with water or cleaning solution to remove light soil from floors.

**Defoamer-** A substance used to reduce foaming due to agitation. Defoamers include silicone fluids and organic phosphates.

**Detergent-** A chemical which is used for cleaning surfaces, which may possess various properties such as surface wetting, soil emulsification, soil dispersion or soil suspension.

**Detergent Resistance-** Ability to withstand treatment with detergent solution and water without damaging the finish.

**Disinfectant cleaner-** A cleaning product that also contains germicidal properties.

**Drag-** A physical resistance felt when applying a seal or finish normally encountered after applying the first coat. It can mean the previous coat has not dried thoroughly or the finish is setting up too soon.

**Dry Buffing-** A maintenance method using a floor machine and appropriate polishing pad to restore floor finish to a glossy appearance.

**Dry Stripping-** A process used to remove floor finish with a floor machine, suitable pad, and spray stripping solution. The stripping solution is applied and the floor buffed until it is uniform and clean. However, most floors require a deep strip which is a wet process.

**Dry Time-** A floor finish can be dry to the touch, dry so dust will not adhere, dry and ready for a recoat or fully cured dry and ready for heavy traffic.

**Durability-** describes how long a polish film will resist changes in appearance caused by foot traffic or other types of wear before spray buffing, recoating, or stripping is considered necessary. Terms

used to describe durability include abrasion resistance, adhesion, black heel mark resistance, lack of soil containment, hardness, scuff resistance, scratch resistance, detergent resistance, and gloss retention.

**Dust-mopping-**A maintenance method used to remove dust from floors with a dry or specially treated mop.

**Emulsifier-** A chemical agent used to suspend one incompatible material in another. Generally, one end of an emulsifier molecule is soluble in water; the other end is soluble in organic solvent. This dual solubility helps hold the dissimilar liquids together.

**Epoxy-** a type of floor material or painted on covering that is made from durable resins. They are often used in areas that require a high degree of chemical resistance such as automotive shops or airplane hangers.

**Factory Finish-** A temporary coating applied to flooring material during manufacture for ease of manufacturing and protection during shipment and installation. It is recommended that this coating, often referred to as mill finish, be removed before applying a floor finish.

**Feathering-** A process where a floor technician attempts to blend a freshly waxed area with an adjacent area that has not been waxed so the results are barely noticeable.

**Film-** An extremely thin sheet of floor finish that is continuous without holes or cracks.

**Fisheye-** Small round surface imperfections in a polish film caused by incompatible ingredients in the floor coating product or on the floor. Oil, silicone, or other solvent materials are the usually causes of fisheyes.

**Floor Polish-** A temporary coating that enhances the appearance and protects the flooring from damage. Also called Floor Finish, Floor Wax.

**Floor Sealer-** A coating, temporary or permanent that is applied to a floor before applying finishing coats to help fill porous holes in the floor surface. Fewer coats of floor finish are necessary because less product is absorbed by the floor, resulting in a more uniform appearance.

**Gloss-** A high degree of shine or reflection that imitates the appearance of the floor being wet. Gloss is often described by:

- (1) Depth - how deep or thick the surface appears
- (2) Clarity - lack of cloudiness, or a milky appearance.
- (3) Uniformity - lack of unevenness.
- (4) Reflectance – the ability to reflect light and improve the shine.
- (5) Distinctness of image - a lack of distortion that the surface causes to reflected images.
- (6) Sheen – the amount of active reflectance
- (7) Hue - the amount of bluish coloration promoting the perception of depth seen in clear films.

**Hardness-** A measurement of the concentration of inorganic salts in water which prevents effective cleaning and germicidal action. Hardness is measured in ppm (parts per million) and usually consists of calcium and magnesium in the ground water of a particular city. Water that is extremely hard will normally required a greater amount of detergent in order to provide the same cleaning results.

**High-solids-** A floor finish which has a 20% or higher non-volatile content. A higher solids finish normally requires fewer coats to be applied to the floor. However, a higher solids finish can be more difficult to apply and flow out (self-leveling) across the floor.

**Heeling-** A maintenance technique where the operator twists the floor machine handle clockwise to shift the weight and pressure to one side of the machine. The pressure point is normally at the 4 o'clock position and allows extra torque to be applied to a difficult spot on the floor.

**Leveling-** The ability for a floor finish to easily spread and dry to a smooth, uniform film.

**Leveling or mop marks-** Wet floor finish doesn't appear to level out after application and mop marks remain after drying. This is caused by improper cleaning or rinsing or use of a so-called stripper-neutralizer.

**Linoleum-** A flooring material composed of mixture of oxidized linseed oil, resin, and various fillers such as sawdust, ground cork, mineral filler and coloring material which is cured for several weeks in specially heated buildings. Linoleum is soft, porous, and tends to discolor and become more porous when subjected to strong strippers and cleaners.

**Marble-** A flooring material composed of a form of limestone hard enough to be polished. Marble is damaged by harsh alkaline cleaners, soaps and acids; it also stains easily. Normally, an all purpose floor finish will not adhere to marble and it will also prevent the marble from breathing.

**Material Safety Data Sheets-** MSDS forms that are required by OSHA to explain the ingredients and hazardous potential for any cleaning agent.

**Metal Interlock-** A floor finish formulation that includes a zinc metal that is added to the polymer ingredient. This formulation causes the dried film to be more durable and detergent resistant while still allowing its ready removal with amine type strippers.

**Neutral Cleaner-** A mild (pH of 6 to 8) detergent that does not contain strong alkaline materials, and is designed to remove soil, without affecting the floor finish.

**No Wax Flooring-** A broad class of flooring materials usually having a clear organic wear layer, usually urethane over a vinyl backing. It is usually textured and designed for minimum maintenance.

**O.S.H.A.-** Initials of the Occupational Safety and Health Act. O.S.H.A. is designed to provide employees with safe and healthy working conditions. It provides, inspects and enforces all standards that affect the health and safety of employees.

**pH-** The measurement symbol used to express the degree of acidity or alkalinity. A pH of 1 indicates an extreme acid condition, while a pH of 14 is highly alkaline. The pH scale runs from less than 1.0 to 14 with a pH of 7.0 considered neutral (close to pure water).

**Plasticizer Migration-** Migration of ingredients from their intended location. Migration of plasticizers from flooring materials can cause tackiness in floor finishes or adhesion problems. Migration from floor finish to flooring is also possible.

**Plasticizer-** An organic compound added to a polymer to increase its flexibility and toughness. Plasticizers contribute to the durability, gloss, and leveling of a floor polish.

**Polishing-** The application of a floor coating that protects from wear, abrasion, soiling and discoloration, while smoothing the surface and improving gloss. Polishes are designed for touch ups and removal when necessary.

**Polyethylene-** A plasticizer commonly used in floor finishes.

**Polymer-** A chemical compound composed of many similar, smaller parts chemically linked to one another. Polymers are the major film forming agents which contribute gloss and durability to a finish or sealer.

**Polyurethane-** A thermoplastic polymer which has excellent hardness and gloss. It is the major ingredient of gym floor finishes.

**Powdering-** A condition where a fine dust occurs on the finished floor surface, often obvious when tracked onto adjacent carpeting. Often, powdering is due to dust settling out where construction or other sources of dust are present. Powdering shows a lack of floor finish (or sealer) adhesion, loss of plasticizing agents to the substrate or application while temperature or relative humidity is too low to allow proper film formation. The causes of lack of adhesion can be heavy detergent residues, burnishing a floor finish not designed for buffing, using a buff pad that is too aggressive, insufficient stripping of old finish and applying finish too thinly.

**Programmed Floor Care Maintenance-** a process of total floor care that keeps floors at a maximum appearance level. It includes regular dust-mopping and wet-mopping, regular burnishing, periodic scrub and top-coat and eventual strip and re-wax.

**Recoating-** A maintenance method where additional coats of floor finish are applied without prior stripping. Successful recoat operations are dependent on proper floor preparation, and amount of time between applications.

**Removability-** A floor finish that resists deterioration when cleaned with detergents and disinfectants, yet will come off with specifically formulated strippers.

**Resilient Flooring-** Flexible flooring materials including asphalt tile, cork, linoleum, no wax, rubber, seamless floors, vinyl, and vinyl asbestos. These materials can withstand moderate impact without major damage to the floor surface. Non-resilient floors are normally a hard stone or ceramic type of surface.

**Restorer-** A maintainer for ultra high shine finishes, which adds a small amount of finish protection.

**Rippling-** A condition where air handlers are placed directly blowing on wet finish and causes miniature waves to appear. A re-strip of the area or heavy razor scrapping is usually required to correct the problem.

**Roping-** An inadequate leveling problem caused by poor rinsing of a stripped floor, especially where there are excessive gaps between tiles that hold stripper residue. The wet finish appears to be pulling away from the tile seam.

**Rubber-** Flooring materials made up of natural or synthetic rubber rolled and heat cured into a final product.

**Scratch-** Imperfection in the smoothness of a polish film caused by a scraping action. A scrub and recoat will be required to remove deep scratches.

**Scuff-** Damage to a finish caused by excessive friction normally from foot traffic or by sliding furniture across the floor. The floor will lose a shine where scuffs occur. A mop and burnish operation should remove most scuffs.

**Sealing-** Application of a coating to a bare floor to fill pores and reduce excessive absorption of the finish coats.

**Self-Polishing-** A floor finish or furniture polish that dries to a shine and needs no further effort to bring about a shine. Most modern polishes are of the self-shine type.

**Sheen-** a low gloss or natural floor reflection.

**Slip Resistance-** The drag noticed when walking on a floor that prevents slipping. It is measured by a floor film's coefficient of friction and by using a slip meter. Slip resistance is evaluated according to American Society of Testing and Materials (ASTM) methods. A coefficient of friction reading of 0.5 indicates a safe floor.

**Solids Content (Non-Volatile)-** That portion of the product (floor finish, sealer, cleaner, etc.) which remains as the film or residue after drying has occurred. The solids content is usually expressed as percent by weight of the total product. Often, the solid content of a floor finish is wrongly used to measure the quality, durability, and performance of a product.

**Spray Buffing-** A maintenance procedure used to restore a worn, dull floor finish to a glossy appearance with a floor machine, special buffing pad, and special product. A typical spray buff operation consists of spraying a buffing product, then using a floor machine equipped with a buffing pad to buff the floor finish to a gloss.

**Sterilization-** The act or process, physical or chemical, which destroys or eliminates all forms of life, especially microorganisms.

**Streaking-** A non-uniform appearance left in a floor finish film by the application process. It is often caused by inadequate rinsing of stripper residue or use of a dirty mop. Residues prevent the finish's leveling agents from spreading the wet finish prior to film formation and drying.

**Stripper-** A product used to remove coatings from floor substrates. Specific types are needed for water based coatings; other types are needed for solvent based coatings.

**Stripping-** A maintenance method that removes floor finish. After the stripping operation, the floors are rinsed thoroughly before applying a floor polish.

**Swirl marks-** Usually caused by an aggressive buff pad or pad that is heavily impacted with old floor finish and hardened residue. Also, the problem may stem from softer finishes not standing up to burnishing.

**Terrazzo-** A polished surface floor consisting of marble or granite chips mixed with Portland cement. The mixture is troweled onto the floor, leveled, and allowed to cure for a period of 5 to 6 days. The surface is then ground with an abrasive stone grinder and polished. Use of harsh acids and alkalis should be avoided.

**Thermoplastic-** A polymer that softens when exposed to heat and returns to its original condition when cooled to room temperature. The polymers, resins and waxes used in floor polishes are thermoplastic.



**Time to Recoat-** The time from application when an additional coat of floor polish can be applied without damaging the previous coat.

**Top-coating-** A maintenance procedure for applying an additional coat of floor finish. The floor is thoroughly scrubbed with a suitable cleaner, mopped clean and re-finished when dry.

**Top-scrubbing-** a process that uses a floor machine and suitable pad to clean and remove a top-coat of the finish and soil to prepare it for subsequent re-finishing.

**Vinyl Flooring-** A flooring material made up of a mixture of polyvinyl chloride and plasticizers. Pigments are added for color. Vinyl flooring is usually flexible; fine textured, and appears to be relatively non-porous. Vinyl flooring is often seen in 12 inch squares installed in supermarkets. Sheet vinyl is also popular in beauty shops and daycares.

**Notes:**

## Test to receive floor care diploma

### Circle True or False

1. True or False. Trained floor techs must learn how to evaluate cleaning challenges as light, moderate or difficult to determine the required cleaning procedures.
2. True or False. By checking a list of required supplies prior to starting a job, you can save wasted time in going back to the supply closet.
3. True or False. Proper equipment selection includes choosing the largest machine or tool for the job which reduces the number of required passes without being too large or clumsy.
4. True or False. Extra door mats placed at entrances are an unneeded expense.
5. True or False. Fine grit tracked in on people's shoes is a leading source of wear on floor finish.
6. True or False. It is perfectly acceptable to use a dust mop much like a broom by frequently lifting it off the floor and shaking it.
7. True or False. In many applications it is acceptable to use a canister vacuum or back-pack equipped with a floor tool to remove the dust from a floor.
8. True or False. Treated dust mop heads pick up the fine grit that damages floor finish.
9. True or False. The best way to treat a dust mop is to soak it in the treatment and then use it immediately.
10. True or False. When wet-mopping a finished floor, always flood it with water to prevent any streaks.
11. True or False. Overuse of a floor cleaner can leave a sticky residue.
12. True or False. A white nylon pad can be installed over most mop heads to help scrub a floor without damaging the finish.
13. True or False. A double mop method is most helpful on heavily soiled or greasy floors.
14. True or False. A looped-end wet mop with a tail band helps reduce skips when mopping a floor.
15. True or False. The mopping job always goes easier if you fill the mop bucket all the way to the top.
16. True or False. Rayon mop heads always shed more lint than cotton.
17. True or False. It is generally safe to mop a floor daily with stripper as long as it is diluted.
18. True or False. The Inverse Mopping Method distributes mop water over the floor more evenly and can help floors dry faster.
19. True or False. If wet mops are not properly cleaned and dried they will tend to sour and can then leave streaks on the floor.
20. True or False. VCT is a type of tile that can never be buffed. VCT stands for Very Common Tile.
21. True or False. Bowl cleaner is the best product to clean spots on marble floor.
22. True or False. Terrazzo tile should never be sealed.
23. True or False. Always wax a laminate floor with a "mop and shine" type of product.
24. True or False. Glazed ceramic tile should always be treated with a standard polymer floor finish.
25. True or False. Different floor types often require different types of floor finish.
26. True or False. Burnishing a floor can only be accomplished with a 175 rpm buffer.
27. True or False. Most tile floors can be effectively burnished to a high gloss by using a black strip pad.
28. True or False. As long as finished floors are burnished on a high maintenance schedule they will no longer require stripping or scrubbing with a top-coat of finish.
29. True or False. The best way to clean a buffing pad is to launder it in a large machine.
30. True or False. It is unnecessary to dust mop and wet mop a floor prior to buffing or burnishing because the buff pad will pick up the dirt.

31. True or False. Pad drivers are used to hold the buff pad on the bottom of a floor machine.
32. True or False. The more spray buff material you apply to the floor, the higher the gloss.
33. True or False. Propane buffers are easier to use because they have no cords, but they are slower and do not produce as high of a gloss as electric corded machines.
34. True or False. Vinyl asbestos tile must be buffed and stripped with caution because hazardous asbestos can be released into the air.
35. True or False. Normally the buff pad that you select will work on all floors and all types of floor finishes.
36. True or False. Different colored pads normally indicate a different range of aggression levels.
37. True or False. One way to avoid burning a high spot when burnished is to press down on the handle of the burnisher and quickly move the machine over the spot.
38. True or False. If the rpm of a floor burnishing machine drastically decreases, you should reduce the pad pressure or change the pad.
39. True or False. It is possible that an improperly maintained propane buffer can cause a fire.
40. True or False. Never leave the brushes running on an automatic scrubber while you stop to unlock a door.
41. True or False. The stripping frequency of a floor can be prolonged by regular burnishing and periodic scrub and top-coat of the floor.
42. True or False. A new strip pad should always be used when cleaning or scrubbing a floor.
43. True or False. When preparing to scrub and top-coat an area, it is best to protect any adjacent floor that is not being re-finished with cardboard, plastic or door mats.
44. True or False. The most efficient and thorough way to remove cleaner from a floor that has just been scrubbed is to rinse it with a mop once or twice.
45. True or False. The right side of a floor machine (scrubber) splashes more cleaner on the baseboard and doors than the left side.
46. True or False. A razor scraper with a handle angled toward you and pulled across a mark can remove the mark without severely damaging the tile.
47. True or False. Blending is a process where you work to remove all imperfections and ridges that separate a freshly scrubbed tile from adjacent tile that does not require attention.
48. True or False. It is possible to scrub and top-coat a worn traffic lane without applying finish under furniture and in areas that are never walked on.
49. True or False. It is advised to use PPE (personal protective equipment) when mixing stripper.
50. Circle the correct answer. PPE would include using (a) safety glasses or goggles (b) rubber or vinyl gloves (c) protective clothing (d) all of the above.
51. Circle the correct answer. Programmed and regular floor maintenance includes: (a) dust-mopping (b) wet-mopping (c) scrubbing when needed (d) burnishing (e) scrubbing and top-coating (f) All of the above.
52. Circle the correct answer. Liquid containment devices, such as water wedges can be placed in doorways and other boundaries because they help: (a) reduce the stripper usage by ½ (b) help keep the stripper from drying out (c) keep the stripper from running out on other areas that are not stripped (d) make the floor less slippery.
53. Circle the correct answer. Floor care chemicals such as stripper (a) will work better if mixed with ammonia or bleach (b) should always be used straight (c) should always be properly diluted and never mixed with any other cleaner or chemical (d) just mix it so the floors can be walked on within one hour.
54. Circle the correct answer. An important reason to block off the area you are stripping is because (a) it will prevent building occupants from slipping and falling (b) it will keep people from walking on freshly applied finish (c) it will keep people from being injured by scrubbing equipment (d) all of the above.
55. Circle the correct answer. The easiest way to determine if all the old finish has been stripped is to (a) apply bowl cleaner to see if the tile changes color (b) strip the floor three

- times just to be certain (c) use stripper straight to make sure it dissolves all the floor finish (d) observe for glossy or discolored spots and uneven ridges after the first rinse
56. Circle the correct answer. A high production or build-up removal pad is used for (a) obtaining a superior gloss (b) removing wet slurry from the floor (c) removing the heavy buildup of floor finish.
57. Circle the correct answer. Wet slurry splashed on doors or walls will (a) normally dry clear (b) can be wiped off later (c) should always be wiped off immediately.
58. Circle the correct answer. During the stripping operation, dwell time is considered the time for (a) the stripper to stay in the bucket so it can mix thoroughly with the water (b) the amount of time that should be spent on coffee breaks (c) time that floor finish must dry before it can be walked on (d) the time that stripper should stay on the floor prior to scrubbing.
59. Circle the correct answer. Once the floor has been thoroughly scrubbed after the application of stripper you should (a) immediately pick up the slurry before it dries (b) collect a small sample for analysis later to see if all the floor finish was dissolved (c) squeegee all the slurry and immediately apply floor finish (d) continue to buff it until the floor is dry.
60. Circle the correct answer. If the stripper puddles into low spots in the floor and is only thinly coating the high spots the best solution is to (a) flood the high spots with stripper one more time (b) squeegee the low spots and wet vac to remove heavy puddles (c) work the scrubber so the puddle is moved across the floor to where it is needed.
61. Circle the correct answer. If the floor finish is not readily being removed by the stripper and scrubbing action you can (a) use two strip pads one on top of the other (b) place a strip pad on a burnisher to remove the floor finish (c) mix the stripper stronger and repeat the operation (d) use the stripper straight.
62. Circle the correct answer. If wax build-up is heavy along the edges it is best to apply stripper heavily and then (a) scrape with a razor scraper (b) apply glass cleaner to the build-up (c) apply diluted bowl cleaner (d) apply bleach.
63. Circle the correct answer. If the floor finish has already started to dry and you notice a skip, you should (a) re-strip the floor (b) immediately go back and apply more finish to the skipped area (c) wait until the next coat and cover the skip at that time (d) place a blow dryer air handler immediately near the area to speed up the drying.
64. Circle the correct answer. When applying floor finish it is best to (a) apply the next coat of floor finish as long as it is not totally wet (b) use a cotton mop to apply finish (c) always cut in the edges first (d) wait approximately 25-30 minutes between coats to ensure the finish has completely dried.
65. Circle the correct answer. The best way to improve a lasting shine is to (a) burnish the floor with ammonia glass cleaner (b) apply more coats of finish after the floor has been stripped and sealed (c) use a very aggressive burnish pad on the floor (d) use a heavier coat of dust mop treatment each day.
66. Circle the correct answer. The best way to keep the floors looking great is to (a) only burnish when absolutely necessary (b) Double the amount of floor cleaner when mopping (c) follow a programmed floor maintenance system (d) always apply 12 coats of finish when re-doing the floors.

**To receive a diploma of completion, please contact Pro Clean College**  
**[gary@nationalproclean.com](mailto:gary@nationalproclean.com)**

