Training Information

FLOOR CARE

Procedures:

It is important for you to know the nature of the floors you are working on. There are several different types and each has unique characteristics. Using improper maintenance products or cleaning techniques may cause damage to floors. The following information should help you select appropriate maintenance systems for the floors in the buildings that are being cleaned.

REASONS FOR FLOOR CARE

Floor care is becoming more and more important in today's market. Some of the reasons for floor care include:

1. Floor protection.
2. Aesthetics. Floors are a first impression area.
3. Ease of cleaning. Porous floors are easier to clean when maintained with a floor finish system.
4. Safety - slip resistance. Floor finishes provide a safe standard level of slip resistance. An improved building environment improves the disposition and attitude of the people who visit, work and live there. In addition, it builds into the building a higher economic value. These goals are generally realized when good floor care is provided in a building maintenance system.

MAINTENANCE PRODUCTS

A floor care system consists of many products:

1. Sealers
2. Finishes
3. Spraybuff/Restorers
4. Neutral Cleaners
5. All purpose cleaners
6. Strippers

FLOOR FINISHES

Floor finishes are water based coatings that are easily removable with conventional floor stripping agents. They are designed to be the wear layer of a floor finish system. The finish should take the abuse, not the floor itself. Floor finishes are water based products suitable for use on almost all floors not harmed by water, and whose solids generally contain a minimum of 50% polymer.

What is a polymer? A polymer is composed of many monomers, which are reactive chemical building blocks. A polymer is made by joining together monomers. Examples of monomers include acrylic and styrene which are vinyl.

Floor finish polymers have specific characteristics of hardness, leveling, film-forming temperature, gloss and durability. The polymer finishes made today generally are made

with high contents of metal cross-linked polymers.

FLOOR FINISH COMPOSITION

The major component of a floor finish is the base polymer system, which may be modified acrylics or styrene acrylics. The base polymer system is responsible for most of the finish properties. A wax component, usually polyethylene, modifies to slip resistance and buffing/burnishing response. Volatile ("Coalescents"_ and permanent ("plasticizers") solvents are required for film formation. Leveling aids defoamers and stability surfactants are minority components of a finish.

SEALERS

Compared to floor finishes, non-crosslinked acrylic water based floor sealers have superior chemical resistance properties. Staining agents, for example asphalt or medicinal stains, may penetrate a finish but remain on top of the sealer layer. This allows for better floor protection in staining environments. The second characteristic of a sealer which differentiates it from a finish is that it acts as a pore sealer for porous or worn floors. Acrylic non crosslinked sealers are usually soft in comparison to floor finishes. Because of this, they should not be used as a wear layer on non-porous substrates. For such a situation, excessive marking would occur. As a result, a floor sealer is generally used as a base coat, with a floor finish on top.

As part of their superior chemical resistance properties, sealers are not readily chemically attacked by conventional floor finish stripping agents. Removal of the sealer layer generally occurs through stripping pad or brush abrasion. As a result, heavy sealer build-ups should be avoided to prevent removability problems. However this is not the case with a crosslinked sealer if it was made to be used as a top coat like some terrazzo sealers.

SOLVENT BASED SEALERS

These are products which contain organic solvents as the carriers for resins of many kinds. There are many restrictions on the use of solvent based systems. These restrictions come from the insurance and liability involved, as well as from the standpoint of the Consumer Product Safety Commission, OSHA, EPA, and DOT. Products with a low flash point must be shipped under certain freight classifications and in a certain type of container or carton.

In the past solvent based products were popular for terrazzo sealers. Generally they were recommended for use on concrete, brick or porous quarry tile, as well as terrazzo. This type of product is becoming increasingly less popular due to environmental/safety concerns with the non-water soluble solvent carrier.

EMULSION STABILITY

Floor finishes and sealers generally pass three freeze/thaw cycles as per the ASTM D3209 standard. However, in actual transit, we often don't know the freeze/thaw history of the product. In extreme cases, it is possible that the product has been frozen beyond its limit. Here, polymer solids would begin to separate when thaws, making the product unusable.

Manufacturers will provide information on he freeze/thaw stability of all types of

products. Floor finishes and sealers are also generally tested for heat stability (125o F) as per the ASTM D1791 standard. Again , any problems encountered during product storage in hot environments would show up as appearance problems - usually thickened or darkened product.

MAINTAINERS/RESTORERS

Maintainers or restorers may be used to help repair the floor finish surface during interim maintenance procedures. (See section on "Maintenance Cycles").
There are three major types of maintainers.

1. **Spray Buff Products** Spray buff products typical contain solvents, cleaning surfactants, waxes and polymers. They are used to repair the floor finish in buffing operations.
2. **Mop-On Restorers** Mop on restorers form a thin polymeric film on the floor finish surface. They are burnished immediately after drying.
3. **Cleaner/Restorers** Cleaner/restorers clean the surface as well as leaving a thin waxy film.
   Typically, they are burnishing after drying. Cleaner/restorers may be applied with a mop and bucket or through an autoscrubber.

NEUTRAL CLEANERS

Neutral cleaners are cleaners that may be safety used as routine cleaning agents for floor finishes. "Neutral Cleaners" do not necessarily need to be chemically neutral (pH 7). Typically, they have a use solution pH in the range of 7-9.5. If the use solution pH is greater than 22, attack or dulling of the finish may result.
Neutral cleaners should also not contain any solvents that may attack a floor finish.

FLOOR FINISH STRIPPER

Floor finish strippers are typically high pH products (greater than 12) fortified with solvents. They are formulated specifically to remove floor finish films during the stripping process.
Certain floors may be chemically attacked by stripping solutions (e.g. linoleum), so care must be taken when using these products.

REVIEW TEST

1. What are the main reasons for floor care?
2. What is a floor finish?
3. What is composition of a floor finish?
4. How does a water based sealer compare with a water based finish?
5. What happens if water based products are frozen beyond design limits?
6. What happens to a water based polymer if it is not heat stable?
7. What are the three major types of maintainers/restorers?
8. What is typically a safe use solution pH range for a neutral cleaner?

SUGGESTED RESPONSES

1. Floor protection, aesthetics, ease of cleaning, safety.
2. Water based coatings that are easily removable with conventional stripping agent.
3. A polymer, such as modified acrylic or styrene acrylic, polyethylene wax, coalescents, plasticizers, leveling aids, defoamers and surfactants.

4. A water based sealer has greater chemical resistance and pore sealing properties.
5. Their solids separate.
6. It may thicken.
7. Spray buff products, mop-on restorers and cleaner/restorers.
8. 7-9.5

FLOOR TYPES

Floors can generally be separated into two categories - resilient and non-resilient. Resilient floors, for example vinyl composition, are primarily composed of resins/polymers, fillers and pigments.
Resilient flooring has some flexibility which differentiates it from non-resilient flooring. Examples of non-resilient flooring are terrazzo and quarry tile.

RESILIENT FLOORING

Vinyl and Vinyl Composite Vinyl and vinyl composite flooring are the most common types of resilient flooring today. Vinyl floors are pure or homogenous; vinyl composite is composed mainly of vinyl with limestone (calcium carbonate) filler. This filler makes the vinyl composite floor more brittle, most susceptible to high-heel indentation marks, and more porous than homogenous vinyl. As a result of these basic differences, pure vinyl floors are generally easier to build gloss (since the finish stays on the surface), but tend to scuff and black heel mark more readily. Vinyl and vinyl composite floors are easily maintainable by any maintenance system.
New tile, as received from the factory, typically is coated with a factory finish. This coating prevents the tiles from sticking together in storage or transport.
The factory finish must be removed prior to the application of a sealer or finish. This may be accomplished mainly through the abrasive action of stripping or deep scrubbing. Loss of finish adhesion and leveling problems may result if the factory finish is not removed.

Rubber Rubber flooring is made of natural rubber which is colored by mineral pigments. Oil, solvents, strong soaps and alkalis may damage rubber tile. The rubber floor should be protected against indentation and against deterioration from sunlight. It may become discolored and lose its elasticity. Abrasive cleaners should be avoided because they may scratch the tile. Rubber tile has a non-porous, smooth surface and is resistant to stains, acids and mild alkalis. It is a very durable flooring.
Rubber flooring responds well to buffing techniques. Soft brushes are recommended instead of pads. Brushes bring out the natural luster of the rubber floor and also clean around raised "buttons" contained in many rubber floors.

Asphalt Tile One of the first resilient floorings made in volume was asphalt tile. This flooring was first produced shortly after the turn of the century. It is no longer manufactured, however old installation still exists.
Asphalt tile is made up of asbestos fibers, lime rock, inert fillers and colored pigments, with an asphalt or resin binder. The tile is either bonded directly to the floor with mastic or bonded over a layer of felt. A subflooring of plywood may be used to provide a smooth surface.
Solvents should be avoided as they may attack the tile. When stripping asphalt tile floors,

the color often bleeds into the stripping solution. Full stripping should be minimized; scrub and recoat operations are recommended.

Linoleum Linoleum was another early resilient flooring. Linoleum is composed of natural oils (linseed) with resin, cork or wood fillers.
Battleship linoleum is one type of flooring that was used quite widely. The name "battleship" was given to this linoleum because it was used on the decks of battleships around the turn of the century. It is very durable to weathering, and it is very water resistant.
The natural oils in linoleum are attacked by high pH products, especially strippers. Surface attack, discoloration and increased porosity are the result of over-stripping a linoleum floor. Stripping should be kept to a minimum; scrub and recoat instead of full strip procedures. If high pH products have caused discoloration of the linoleum, scrubbing with a floor neutralizer and soft pad, may sometimes help.
In either case, maintaining a proper seal layer is recommended for protection against such chemicals.

Vinyl Asbestos Tile Vinyl asbestos tile was an older version of vinyl composite tile, in which asbestos was used as a filler. These floors should be maintained according to OSHA guidelines. Bare tiles (i.e. with no finish) should never be burnished or buffed. This process could result in airborne asbestos.
With a proper wear layer, these floors may be maintained in a similar fashion as vinyl or vinyl composite flooring.

Conductive Flooring Conductive flooring is utilized wherever a problem may result from electrostatic discharges. In earlier days, conductive floors were found in operating rooms where a spark may have caused an explosion. More recently, this type of flooring is mainly used to prevent damage to expensive computer chips in their manufacture and use.
Conductive material contained in this type of floor ("grounds") the people and objects on the floor.
Conductive floor should always be maintained according to the flooring manufacturer's recommendations. The floor should be properly cleaned to prevent loss of conductivity. If a floor finish is to be applied, it must have a "conductive" rating. Since the conductivity of "conductive" floor finishes generally diminishes with repetitive cleaning procedures, maintenance recommendations from the manufacturer of the finish must be followed in order to redeposit the conductive material.

Synthetic Floors Synthetic floor are made from high molecular weight polymers, usually polyurethanes or polyvinyls. They are being used today in many gymnasiums, ice arenas, recreation centers, running tracks and tennis courts.
These floor require a different maintenance program than that used on other floors. In fact, synthetic floors seem to need maintenance over and above that which is generally recommended by the manufacturers. However, before undertaking work of any kind on a synthetic floor, it is important to obtain written permission to perform the work from the floor owner. The manufacturers of synthetic flooring are very particular about the care of

their floors. It is possible that the warranty of an installed floor may be invalidated by applying materials or using maintenance procedures and methods other than those recommended and approved by the manufacturer.

REVIEW TEST

1. Define resilient flooring.
2. What is the basic chemical difference between vinyl and vinyl composite flooring?
3. What unique problem may be encountered with factory tile?
4. Why should stripping be performed as infrequently as possible and solvents avoided on asphalt? 5. What are some of the maintenance problems associated with linoleum?
6. If linoleum discolors as a result of being cleaned with a highly alkaline cleaner, what can be done to attempt restoration?
7. How may rubber flooring be maintained?
8. Where are the majority of conductive floors installed today?
9. How should a synthetic gymnasium floor be maintained?

NON-RESILIENT FLOORING

Terrazzo Terrazzo typically consists of a combination of marble or stone chips set in a Portland cement matrix. The irregularly shaped pieces of marble in the cement matrix give the floor its beauty. The cement is usually white, but it can be colored red, blue, green, or any other color that may be desired as a background.

In the matter of maintenance, there are two types of surfaces to be considered. The marble chips are practically nonabsorbent, while the porosity of the matrix is higher. The cement, and especially the marble chips (calcium carbonate), may be attacked by strong acids. This usually results in pitting of the marble chaps.

If there is a marble floor in a restroom, for example, try to limit the use of strong acids in the area. Any spill of a hydrochloric acid based bowl cleaner will produce an etch mark in these floors in about 20 seconds.

Sealing the floor will help to protect the terrazzo against chemical attack. The use of a sealer will also help to seal the pores of the cement to allow trop coating with a floor finish. Once the floor has been properly sealed and finished, terrazzo may be easily maintained by any of the maintenance systems described in a later section.

Quarry/Ceramic Tile This type of tile is made of clay mixed with water and burned or "fired" in kilns. Clay is aluminum silicate with various other products. The surface is either unglazed or glazed. Unglazed tiles are alike throughout. Glazed tile has an impervious glossy layer on he surface that is different from the tile body. The tiles are set in cement with grout to form a floor or wall.

Attempt to seal or finish porous floors only. Water based sealers or finishes will flake off non-porous floors in traffic lanes, since there are not enough bond sites for the coatings to adhere to. Trying to seal or finish non-porous floors is a common maintenance mistake with ceramic or quarry tiles.

For porous floors, use products recommended for stone floors. As part of or in addition to routine maintenance, all floors in this category should be periodically scrubbed using brushes and wet vac to pick up the cleaning solution. This is the only way to ensure proper soil removal from low lying grout areas.

The periodic use of an acid based floor cleaner helps to clean the floor and remove mineral deposits.
Once the floor has been properly cleaned, the grouting may be sealed in order to keep soil out. This may be accomplished by pouring a water based sealer onto the floor and using a window type squeegee to remove it from the tile surface. The sealer will settle in the low lying grout. Alternatively, a penetrating seal may be applied directly to the trout.

Marble Marble is another natural stone flooring, composed of calcium carbonate or limestone. Marble is relatively soft and is very prone to scratching. The majority of new marble installations are glossy, highly polished marble tiles. Water based coatings typically will not properly adhere to this type of flooring. Vitrification/recrystallization or polishing with diamond grit abrasives are alternative maintenance techniques.
Travertine marble may be recognized by many small pits in its colored surface.
"Honed" or dull marble, or marble which has been worn, sometimes is successfully maintained with a floor finish system. For such a situation, coatings formulated for stone floors should be used. A patch test for adhesion is recommended.
The use of acid products should be avoided as they will attack marble. The one exception is during a vitrification or recrystallalization process, which utilizes an acid based product in conjunction with a steel wool pad.

Granite Granite is a very hard rock, primarily composed of feldspar, quartz and some dark minerals. Granite is harder, more stand resistant and more scratch resistant than marble.
Granite is typical maintained by good cleaning (dust and damp) techniques only. Similar to marble, however, granite has been successfully maintained with a stone floor finish system. Again, the flooring and coating combination should be pretested for adhesion.

Slate Slate is a natural fine-grained, bluish-gray rock that splits easily into thin layers. Slate floors usually have irregularly textured surfaces. Slate is usually porous enough to maintainable with a floor finish system. A stone floor sealer and finish combined is recommended. This floor should periodically be cleaned using a single disc machine with a soft brush and a neutral cleaner. Pick up the scrubbed solution with a wet/dry vacuum. Slate floors main be maintained by buffing or burnishing systems. However, if burnishing is to be used, a flexible burnish head is recommended so that the finish is not removed preferentially from the high sections. Brushes that are made for high speed equipment will do an excellent job.

REVIEW TEST

1. What two types of surfaces must be considered in the maintenance of terrazzo floors?
2. How can acid damage terrazzo?
3. Why is it important to seal terrazzo?
4. What is a common maintenance mistake with quarry or ceramic floors?
5. What is the best method of cleaning grouted floors?
6. What function does an acid based stone floor cleaner perform on quarry tiled floors?
7. What type of marble is used in the majority of new installations? How is it typically maintained?
8. If coating adhesion may be an issue with any type of flooring, what should be done

prior to the application of a coating?
9. How does granite compare to marble in terms of durability?
10. What is a potential maintenance problem associated with slate floors?

SUGGESTED RESPONSES

1. The marble or stone chips and the cement matrix.
2. It is cause pitting of the marble chips.
3. Protection against chemical attack and sealing the pores.
4. Attempting to seal or finish non-porous floors.
5. Scrubbing with a cleaning solution and a brush and remove the solution with a wet/dry vacuum.
6 Cleaning and removal of mineral deposits.
7. Glossy, highly polished tiles. Vitrification/recrystallization or polishing with diamond grit abrasives.
8. An adhesion test patch.
9. Granite is harder, more stain resistant and more scratch resistant.
10. Finish or sealer being removed from the high spots.

COST EFFECTIVE FLOOR MAINTENANCE.

Budgets are one of the most important topics a contractor talks about. Most contractors divide their operation budgets into two main categories - labor and materials. Labor generally accounts for 90% of the total expenditure.

Floor maintenance offers contractors an opportunity to either waste of efficiently use their labor investment. A key to using labor effectively is to develop an overall plan to keep floor appearance at a consistently high level. To develop such a plan, one should study what is happening on the floor.

Building owners have a desired appearance level that they want contractors to maintain on their

floors; for example, high gloss, and free of black marks and scuffing. As time progresses, foot traffic, coffee spills, moving furniture, etc., all take their toll on floors and their appearance begins to deteriorate. As the appearance level drops. more labor is required to return a floor to its desired quality standard.

A person who is concerned with cost control should prevent floor appearance from deteriorating tot he point that expensive restoration action is required. Depending on how far the actual appearance has deviated from the desired appearance, different cleaning action is required.

Routine maintenance is performed at least daily. The purpose of routine maintenance is to keep the surface of the floor clean. Routine maintenance is performed for a set time period, depending upon the degree of traffic and also upon the standard appearance level for the particular facility. After this period of time, traffic lanes may develop some slight marking. Very often this shows up as a loss of gloss. At this point, interim maintenance procedures are required to repair the marks and improve the gloss.

Routine and interim maintenance procedures are performed until marking or slight soiling occurs in the traffic lanes that cannot be removed by these two levels. Under a good maintenance system, it should not be necessary to completely strip the floor. A scrub and recoat procedure is recommended where the top layer of finish is replaced. The final level or the last resort, is a full strip procedure. Very heavy traffic lane wear,

soiling, or a finish build-up along the edges has occurred.
Each of these levels may be considered to be connected in cycles. Each level or cycle is described in more detail in the following sections.

MAINTENANCE CYCLES

ROUTINE MAINTENANCE

GRIT CONTROL

Equipment Required:
Matting and dust mop.
Product Required:
Dust Mop Treatment.
Procedure:
Matting will remove the dirt and water from traffic and then trap and hide it.

1. Install matting at building entrances (indoor and outdoor), hallways, wet areas, and building interiors.
2. When selecting a matting system consider location, soiling conditions, weather, traffic levels, building design/decor, slip/fall hazards, as well as type and size of mat.
3. Mats should be vacuumed or cleaned regularly to remove accumulated soil and grit.
4. Sweep sidewalks and parking lot regularly.

Dust Mopping.

1. Perform daily, throughout the day, or as often as necessary in order to keep grit off the floors.
2. Thoroughly spray dust mop treating to the top of the dust mop. Do not spray near the very ends. Allow to stand to dry.
3. After mop has been used, vacuum or shake mop vigorously outdoors or onto sheet or newspaper to release the small, accumulated dust balls. If fine dust comes out of mop, it is an indication that the mop should be treated again.
4. When mop becomes too soiled, it may be rinsed under a stream of water and allow to dry.
5. Avoid oil based dust mop treatment. Adds slippery residue to floor and softens the floor finish, causing a darkening of the finish.
   Dust mop from dirtiest area toward the cleanest.

General comments:

A. A proper matting system will reduce interior maintenance costs and reduce costly slip and fall accidents, improve overall interior appearance, and extend the life of floor surfaces.
B. When using dust mop treatment, do not saturate the mop. Ends of mop should not be set.

SURFACE CLEANING

Equipment Required:
Damp mop, bucket and wringer, wet floor signs; or autoscrubber.
Products Required:
Neutral Cleaner.
Procedure:
Autoscrubber Method

1. Mix a solution of the neutral cleaner with the recommended quantity of water in the autoscrubber.
2. The autoscrubber should be equipped with red or per-burnish pads or brushes, solution and rinse tanks, a squeegee and a vacuum system that is used to scrub and rinse floors in one operation.

Damp Mop Method

1. Mix a solution of the cleaner with the recommended quantity of water in a clean bucket.
2. Use a clean cotton or synthetic mop with detergent solution. Wring out prior to mopping.

General Comments:

1. Mops can be purchased in a variety of sizes and compositions. Operator fatigue vs. area covered are key factors n selecting the size of the mop. Heavier mops will cover a larger area per pass, but will cause fatigue (and perhaps a sloppier job) faster than a lighter mop. Mops are available in sizes from 8 to 40 ounces. The second aspect to consider in mop selection is the composition. Cotton mops absorb more liquids, but liquids tend to hang on more tenaciously. Rayon tends to shed the liquid more readily. Blended mops exhibit qualities of both. If the job requires mopping up spills, a cotton mop is appropriate. For finish application, a rayon or blend is better suited to the job. Finally the wringer should be properly matched to the mop size.
2. Before using mops the first time, all mops should be conditioned. Conditioning removes loose lint, oils and other treatments that remain from the manufacturing process. Laundering or (at the very least) soaking for several hours will remove these contaminants.
3. A high pH product should not be used for routine floor cleaning, as it will attack a finish.
4. Mops should be cleaned after use and before storage. This will extend their life and give cleaner floors in the future.

INTERIM MAINTENANCE

Low Speed Spray Buffing

Equipment Required:

Dust mop, conventional cleaning equipment, rotary scrubber (175-350 rpm) equipped with a red pad or brush.

Products Required:

Spray buff product.

Procedure:

1. Ensure that the floor has a proper base. Five to eight coats are generally required for a high gloss appearance. A lower number of coats may be used if a lower gloss or matte appearance is desired.
2. Dust mop the floor and place "we floor" signs.
3. Gross soils should be removed with conventional cleaning techniques.
4. Position the pad/brush onto the scrubber. A red pad is generally recommended.
5. Shake spray buff before use and place into a suitable spray bottle (hand held or attached to scrubber.)
6. While machine is running, spray onto floor and immediately buff. Apply two to three

sprays to a workable area (approximately 20 sq. ft). Use sparingly.

7. Dry buff the same area to remove any haze.
8. Repeat steps five, six and seven until the desired area has been treated. When the pad becomes clogged with soil, turn over to the clean side. Replace with a new pad when both sides become soiled. Store used pads in a plastic bag until buffing is finished to prevent soil from hardening, then clean immediately by rinsing with water. Soaking in a stripping solution will loosen hardened residue.
9. Dust mop the floor to remove any residue from the spray buffing process.

General Comments:

1. Do not attempt to remove every mark. Most of the remaining marks will be removed with the next couple of spray buff procedures.
2. High traffic areas (entrance ways, traffic lanes) will be treated far more often than low traffic areas. Non-traffic lanes will not have to be treated until marks are noticeable.
3. The floor should never have a greasy residue or high/low gloss areas after treatment. If so, too much spray buff has been used. The floor should then be dry buffed with a pad to remove the excess product.
4. The spray buff may be used with a blue pad on heavily worn or marked floors. This could be followed by dry buffing with a red pad if a higher gloss is desired.
5. Although some people use a dilution of a floor finish in water for spray buffing, a properly formulated spray buff will provide far superior cleaning performance, particularly on oil based soils (e.g. black heel marks).

BURNISHING/ULTRA HIGH SPEED SPRAY BUFFING/RESTORING

Equipment Required:
Dust mop, conventional cleaning equipment, burnisher (1500 + rpm)

SYSTEM	PRODUCTS REQUIRED	ADDITIONAL EQUIPMENT
Burnishing (dry) 1500 rpm or higher	None	None
Ultra high speed spray buffing - 1000 rpm or higher	Spray buffing	None
Mop on restoring	Mop on restorer	Clean string mop, Bucket and wringer

Procedure:

1. Ensure that the floor has a proper base. Five to eight coats are generally required.
2. Dust mop the floor.
3. It is essential that the floor be cleaned by conventional techniques before any burnishing operation. If not, the soil will be ground into the finish. Ultra high-speed spray buffing does NOT provide adequate cleaning and cannot be used as a one-step operation.
4. Position the appropriate burnishing pad (dictated by the finish) onto the burnisher.

5a. Burnishing (Dry): Burnish the floor, walking straight behind the burnisher.

5b. Ultra High-speed Spray Buffing: Shake before use and place into a suitable sprayer. Machinery equipped with a center feed system is easier to work with and result in less

required cleanup. While the machine is running, spray onto floor and immediately burnish. Use sparingly. Apply one spray approximately every 20 feet.

5c. Mop-On Restoring: Mix according to manufacturer's recommendations in a clean bucket. Apply one thin coat with a clean string mop to the floor. Buff immediately after drying to touch.

6. Dust mop the floor to remove any residue created by the buffing process.

General Comments:

1. Typically, burnishing of finishes falls into one of two categories.
   "High Frequency" or Daily:
   -softer, require burnishing more often (usually daily)
   -higher burnishing "pop"
   "Low Frequency or Periodic or Weekly"
   -harder, requires less burnishing since marks less; can burnish daily if desired
   -lower burnishing "pop"
2. There are three major types of burnishing pads:
   -synthetic; polyester (least aggressive)
   - synthetic/hair blends; "combination" (moderate aggressiveness)
   - natural hair; hog hair (most aggressive)
3. There are three major types of burnishers:
   - cord electric, 1500 ¸ rpm (least aggressiveness)
   - battery, 2000 ¸ rpm (moderate aggressiveness)
   - propane, 2000 + rpm (most aggressive)
4. Pads should be chosen with both he finish and the burnisher in mind.

DEEP SCRUB AND RECOAT PROCEDURES

Equipment Required:
Dust mop, two damp mops, bucket and wringer, corner scrubber, wet floor signs
Either rotary scrubber equipped with a blue pad/scrubbing brush, wet vacuum
Or autoscrubber
Products required:
Any neutral cleaner may safely be used for scrub and recoat purposes. Slightly more aggressive cleaner may be chosen to deep clean. Gloss is restored by new coat(s) of finish.

Procedure:

1. Dust mop the floor
2. Position the wet floor signs anytime the floor gets wet.

Rotary Scrubber Method:

1. Place wet floor signs.
2. Mix a solution of the cleaner with the recommended quantity of water in a clean bucket. Liberally apply the scrubbing solution with a string mop to a suitable working area (approx. 100 sq. ft.) of the floor. Do not allow the cleaning solution to dry.
3. Position of the blue scrubbing pad/brush onto the scrubber and scrub the section of the floor. Scrub the corners and edges manually with a hand-held scrubbing device, using the same cleaning solution.
4. Pick up the solution with a wet vacuum. Do not allow the solution to dry on the floor before removal because this will redeposit the dirt. Must rescrub floor before

recoating with finish.
5. Ensure that the mop, bucket and wringer are clean. Do not use the same mop as was used for applying the cleaning solution.
6. Rinse the mop, bucket and wringer before rinsing for the second time.

Autoscrubber Method:

1. Place wet floor signs.
2. Mix a solution of the cleaner with the recommended quantity of water in the machine. Position the blue pad or scrubbing brush onto the autoscrubber.
3. Scrub the corners and edges manually with a hand held scrubbing device, using some cleaning solution.
4. Observe the floor to ensure that a clean, even appearance exists. All marks scuffs, black heel marks, scratches) should be removed. If not, repeat the scrubbing and pickup process on any area of concern.
5. Rinse the floor with clean water. Rinse the solution compartment and fill with clean water and change pads or rinse the brushes before rinsing the floor.
6. Repeat the rinsing process using fresh water.
7. Check the floor (feel for any residue) and water (should be clear after final rinse) for signs of incomplete rinsing. Repeat rinsing if necessary.
8. Clean any splashed cleaning solution off the baseboard. Allow the floor to completely dry before applying finish.
9. Thoroughly clean all equipment, pads and mops.

General Comments:

1. Never recoat a floor that hasn't been cleaned by scrubbing. Damp mopping only will not remove all of the soil; yellow floors will quickly develop due to soil entrapment. Film integrity/adhesion problems may also occur.
2. The use of a diluted stripper as a scrubbing solution is not recommended.

	FULL STRIP AND RECOAT
	STRIPPING - ROTARY SCRUBBER AND WET VAC
	Equipment Required:
	Dust mop, two damp mops, bucket and wringer, corner scrubber, rotary scrubber equipped with a stripping pad or brush, wet vacuum, wet floor signs.
	Products Required:
	Stripper
	Baseboard Stripper (optional)
	Neutralize Rinse (optional)
	Procedure:
	Dust mop the floor.
	Position the wet floor signs.
	Dilute the stripper with the recommended quantity of hot water in a mop bucket.
	Liberally apply the stripping solution with a string mop to a suitable working area (approx. 100 sq. ft.) of the floor. Avoid splashing solution on areas not requiring stripping.

	Allow the solution to act for three to five minutes. Never allow the floor to dry.
	Position the scrubbing pad/brush onto the scrubber and scrub the section of floor. Start with your feet on dry floor for safety and move into the area being stripped.
	Scrub the corners and edges manually with a hand held scrubbing device. Basement Stripper may be used on the baseboards.
	Pick up the solution with a wet vacuum. Never allow the solution to dry on the floor before removal. The old finish will adhere to the floor and you will have to repeat the stripping procedure.
	Observe the floor for signs of incomplete finish removal, i.e. glossy or darker areas. Pay particular attention to areas along baseboards. If necessary, repeat steps 3-6 until all of the finish has been removed.
	Rinse the floor with clean water. Ensure that the mop, bucket and wringer are clean. Do not use the same mop as was used for applying the stripper.
	Change the rinse water; thoroughly rinse mop, bucket, wringer. Repeat the rinsing process at least two additional times, changing the water and rinsing the equipment after each cycle. Check the floor (feel for any residue) and water (should be clear after final rinse) for signs of incomplete rinsing. Repeat rinsing if necessary.
	Neutralizer Rinse may be used in the first rinse cycle. It will effectively reduce the pH of the floor. However, it does not replace proper rinsing.
	Clean any splashed stripping solution off the baseboard. Allow the floor to completely dry before applying finish.
	Thoroughly clean all equipment, pads and mops.
	General Comments:
	A wet vac is highly recommended for picking up the stripping solution. A damp mop is very inefficient in this respect. Use a mop to pick up trails from the wet vac's wheels.
	Use large cotton mop heads for rinsing. Cotton will absorb more solution than rayon and allows for easier rinsing.

STRIPPING - AUTOSCRUBBER **Equipment Required**:	
Dust mop, bucket and wringer (optional), corner scrubber, autoscrubber equipped with a stripping pad or brush, wet floor signs.	
Equipment Required:	
Dust mop, bucket and wringer (optional), corner scrubber, autoscrubber equipped with a stripping pad or brush, wet floor signs.	
Products Required:	

Stripper Baseboard Stripper (optional) Neutralizer Rinse (optional)	
Procedure:	

1. Dust mop the floor.
2. Position the wet floor signs.
3. Dilute the stripper with the recommended quantity of water in a mop bucket.
4. Liberally apply the stripping solution with a string mop to a suitable working area (approx. 250 sq. ft.) of the floor. Avoid splashing solution on areas not requiring stripping. Baseboard Stripper may be used on the baseboards.
5. Allow the solution to act for three to five minutes; do not allow the floor to dry.
6. Position the pads of brushes on the autoscrubber. Fill the solution tank with clean water. Scrub and pick up the solution in one operation. Clean water may be applied through the autoscrubber to supply added lubricity.
7. Scrub the corners and edges manually with a hand held scrubbing device.
8. Observe the floor for signs of incomplete finish removal, i.e. glossy or darker areas. Pay particular attention to areas along baseboards. If necessary, repeat steps 3-7 until all of the finish has been removed.
9. Change the stripping pads or rinse the brushes. Rinse the floor with clean water through the autoscrubber. Apply the water, scrub and pick up the rinse water in one operation. Repeat the rinsing procedure.
10. Check the floor (feel for any residue) and water (should be clear after the final rinse) for signs of incomplete rinsing. Repeat rinsing if necessary.
11. Left to the discretion of the customer, Neutralizer Rinse may be used in the first rinse cycle. It will effectively reduce the pH of the floor. However, it does not replace proper rinsing.
12. Clean any splashed stripping solution off the baseboard. Allow the floor to completely dry before applying finish.
13. Thoroughly clean all equipment, pads and mops.

General Comments:

1. The use of an autoscrubber is an efficient method of stripping and rinsing a floor. With an autoscrubber, only clean water or neutralizer is applied to the floor. With a mop and bucket, the rinse water becomes contaminated with stripper the first time the mop is placed back into the bucket.
2. This method is generally limited to use in non-constricted open areas or corridors.
3. It is possible to apply the stripper directly out of the autoscrubber. However, this is generally more time consuming and requires thorough rinsing of the solution tank before rinsing.
4. Be aware of uneven floor that may make stripping more difficult.

FLOOR FINISH OR SEALER APPLICATION PROCEDURES

Equipment Required:

Equipment outlined under Stripping or Deep Scrubbing procedures, floor finish mop, bucket and wringer, Wet Floor signs and personal protective equipment.

Possible Products Required:

Floor sealer (optional)

Floor finish

Procedure:

1. Prepare the flooring as per Stripping or Deep Scrubbing operation. The wet floor signs should still be in place.
2. Use only freshly cleaned finish mops for the application of finish or sealer.
3. Carefully pour the coating into a bucket. Avoid overagitation which could cause foaming. When pouring from a five gallon pail, situate the spout at the top of the pail to reduce air lock.
4. Condition mop by saturating with the floor coating. Push mop down in wringer; do not actually wring out, or foam may be produced. Resaturate and eliminate excess product by pushing mop down into wringer until it stops dripping.
5. To avoid being cornered, start applying finish at an area farthest from the door, or wherever you have to exit.
6. If applying more than one coat, keep away from the baseboards on the first coat(s) to avoid build-up. If applying several coats, keep; 12" out on the first coat, and gradually work in on additional coats.
7. Outline (three edges) area to be covered with mop on first pass before filling in the outlined area.
8. Fill in the area by swinging mop in a figure eight motion, allowing mop to go onto but not over outlines.
9. Periodically flip mop over on outline to obtain a new contact area.
10. When outlined area has been filled in or when mop shows signs of drying, evidenced by "mop drag," saturate again in the coating and push down in wringer until it stops dripping. Outline new area, fill in. Repeat until entire floor has been coated.
11. Allow adequate dry time between coats. Various factors are involved in the absolute dry time, including thickness of coat, temperature, humidity and ventilation. Generally adequate dry time falls in the 30-45 minute range. As a general rule of thumb, allow at least 10 additional minutes after the floor is tack free. Even when the floor is dry to the touch residual solvents are evaporating and the finish is curing.
12. Clean all equipment and mops.

GENERAL COMMENTS:

1. Never apply sealer to a floor that hasn't been completely stripped. Use a finish only for scrub and recoat operations.
2. Generally, rayon or rayon blend mops are preferred over cotton mops to applying floor coatings. Compared to cotton mops, rayon does not have a

natural oil which could interfere in applying the coating, and retains less product which allows for an even coat to be applied more readily.
3. Excessive wringing of the mop could result in harsher leveling conditions than applying a "moderate" coat. Streaking may occur with high solids products if the mop is excessively wrung out. However, the floor should not be "flooded" with product.
4. Allow finishes/sealers to dry on their own, taking approximately 10-20 minutes to lose their wet appearance. For extremely low ventilated areas, resulting in long drying times, use a fan to improve the air flow. However, allow the coating to visually dry first, then use a fan, but only if directed upwards away from the floor surface.

CARING FOR FLOOR PADS

Various procedures (spray buffing, scrubbing, stripping) lead to a build-up of old floor finish on the surface of the pad. If this is not taken care of properly, the floor finish will dry on the surface of the floor pad and become almost as hard to remove from the floor pad as the finish was to remove from the floor itself.

Place pads in trash can liner to keep them moist for easier clean up. One way to clean floor pads it to put them into a deep sink and with a hose and standard garden nozzle, spray the old floor finish off the pad. User water as hot as possible with as much pressure as possible. Most floor pads can be cleaned in two to five minutes using this technique. This sooner this cleaning procedure is done after use, the easier the clean up procedure is. Another method is to throw the dirty pads into a 55 gallon drum and let them soak and then spray them. Soaking in a stripping solution like this will help break down the floor finish that has been glazed onto the surface.

Probably the most important thing in keeping floor pads clean is to train the operator to change floor pads before they become so loaded that it becomes practically impossible to clean them. This is where supervision becomes a most important factor.

REVIEW TEST

1. What is the key to using labor effectively in floor maintenance?
2. Describe the four levels of maintenance.
3. Why is grit control so important? How is it achieved?
4. Why should an alkaline (high pH) cleaner be avoided during Routine Maintenance?
5. What type of pad is recommended for low speed (175-350 rpm) spray buffing?
6. What are the two results of overusing a spray buff product?
7. What is the only type of product that can be used in a one step cleaning/restoring procedure? How is it to be used?
8. What are the three major types of burnishing pads? How are they chosen?
9. Before any application of finish, what must be ensured? Why?
10. What are some key points in achieving good stripping results?
11. What are the two major types of mop heads? When should each be used?

SUGGESTED RESPONSES

1. To develop an overall plan to keep floor appearance at a consistently high level.
2. Routine - To surface clean - grit control, surface cleaning

Interim - Repair minor traffic lane wear - spray buffing or burnishing
Scrub/Recoat - Replace top wear layer of finish
Strip/Refinish - Replace all layers of finish

3. Grit will grind through any floor finish

Matting - proper type, quantity, keeping clean

Dustmopping

4. It can attack a floor finish

5. Red

6. Greasy residue, high/low gloss areas.

7. A cleaner/restorer should be used in an autoscrubber or mop/bucket procedure. Follow with burnishing

8. Synthetic/polyester (least aggressive)
Combination synthetic/natural hair - (moderate aggressiveness)
Natural hair (most aggressive)
Pads are chosen according to the finish/burnisher combination

9. The floor must be cleaned or stripped/scrubbing. If not, soil entrapment would occur.

10. User stripper according to manufacturer's recommendations. Allow to act on floor.
Ensure complete finish removal after stripping. Rinse well.

11. High cotton content - cleaning operation
High rayon content - application of finish, sealer

TROUBLESHOOTING

The ability to observe a floor care problem and recognize causes and solutions is an art that is enhanced only through experience. Although every situation may be slightly different, the following guide may be used as a starting point for troubleshooting.

PROBABLE CAUSES OF COMMON FLOOR FINISH PROBLEMS

PROBLEM **PROBABLE CAUSES** (In order of probability)

Poor initial gloss 2,6,4,3,1,7
Poor burnishing/buffing gloss response 10,22,21,1
Powdering or dusting 8,10,9,6,5,4
Scuffing, black heel marking 14,1,15,12,3,11,13,24
Scratching 8,10,9,5
Slipperiness 12,8,24

Streaking, uneven application 4,6,16,3,5

Discoloration of light floors 17,18,8,3,19

Uncharacteristic odor 4

Poor detergent resistance 19,20,6,3,11

Removability problems 18,10,1

Stripper attack on flooring 23

Legend:

1. Check for proper product selection.
2. Insufficient coats applied/very porous floor.
3. Inadequate dry time between coats/coats too thick
4. Product contamination/application equipment not clean/pouring product

back into container.
5. Factory finish not removed from new tile.
6. Improper rinsing after stripping.
7. Frozen product.
8. Insufficient grit control.
9. Non-porous floor/adhesion problem.
10. Wrong pad/pad not clean.
11. Very high humidity/low ventilation during application.
12. Foreign substance on surface - soil, grit grease, excessive restorer.
13. Sealer used as wear layer.
14. Excessive traffic flow.
15. Soft, flexible flooring (e.g. pure vinyl).
16. Excessive agitation of product/too much foam.
17. Soil impregnation into film.
18. Build-up of old sealer/finish
19. Detergent too aggressive.
20. Cleaning equipment not clean (e.g. residual stripper in damp mop, scrubber
21. Uneven floor, pads not touching floor.
22. Machine not operating at proper speed/pressure
23. pH/solvent sensitive floor
24. Insufficient number of coats

EXPLANATION OF PROBABLE CAUSES OF FLOOR CARE PROBLEMS

1. Check for Proper Product Selection

Sometimes an obvious place to start for certain problems. For example, if application gloss is the main issue, then a high floss finish would be the best choice. Heavy duty strippers will facilitate extremely heaving stripping operations.

2. Insufficient Coats Applied/Very Porous Floor

This would result in a low application gloss. If insufficient film thickness were achieved upon application, the gloss will never be satisfactory. Floor finish may sink into certain porous floors (e.g. terrazzo); this would indicate that a sealer may be required.

3. Inadequate Dry Time Between Coats/Coats Too Thick

Too much finish in too short of time may pose two types of problems:

a. Initial application problems. Recoat attack - the top layer of floor finish attacks the underlying coat. This could result in mop drag, streaking, hazing or loss of gloss.

b. Early film wear problems. Although a finish may feel dry to touch after 1-2 hours, film-forming solvents evaporate out of the film (in an increasingly lower level) for approximately a week. If too much product is applied in too short a time period, then additional solvents become trapped. More solvents have to evaporate out of the film, which could lead to marking or detergent resistance deficiencies during the first week of wear.

4. Product Contamination/Equipment Not Clean/Pouring Finish Back

Clean mops, buckets and wringers are essential for proper film integrity.

Finish mops should be dedicated only to the application of water-based floor coatings. Lining the bucket with a plastic garbage bag is a good way to help reduce contamination. Application problems (streaking, dark lines in film) from oils of new cotton mops are also included in this category. Most contamination problems would be noticeable before or very quickly after applying the finish - uncharacteristic appearance or odor of the wet emulsion, but more commonly low application gloss, incoherent film formation (resulting in powdering), streaking, etc.

5. Factory Finish Not Removed From New Tile

Most resilient flooring comes with a factory finish (a coating that prevents the tiles from sticking to other tiles in stacks). This coating must be removed prior to application of a floor coating. Normally this coating will abrade off quite easily with an aggressive pad. If the factory finish is not removed, adhesion or leveling problems may result.

6. Improper Rinsing after Stripping

This is basically the same problem as the product contamination/dirty equipment issue.

Stripper residue may result in similar film problems, only to a worse degree due to the alkali attack on the polymer.

7. Frozen product

Frozen product is usually only a scapegoat for other problems. Most floor finishes are tested to three freeze/thaw cycles. If freezing were a problem with a finish, it would be evidence mmediately; the product would normally show separation or gelling. Such a product would certainly affect film integrity properties. Problems caused by abusive winter conditions, such as salt, are often blamed on a frozen product or a lack of durability.

8. Insufficient Grit Control

Grit will grind through any floor finish. Over half of the floor finish from an entrance could be removed by grit under extreme traffic conditions within the first day after application. Grit, mainly in the form of sand or salt, should be kept off the floor by the use of properly maintained matting. Dust mopping should be performed as frequently as necessary to ensure grit-free floors. The major effects of improper grit control are a loss of gloss due to scratches and loss of finish, powdering and dirt entrapment in the fine scratches.

9. Non-Porous Floor/Adhesion Problem

Flooring must contain pores for a flood finish or sealer to attach to in order to obtain good adhesion characteristics. For extremely non-porous floors (for example, glazed ceramic tile) a floor finish may simply not have enough bonding sites. When this occurs, the finish may be mopped down to a high gloss, however abrasion will start to peel it off the surface. Traffic lanes with no finish quickly develop. Scratches or white spots (adhesion failure) may exist. Alternatively, any attempt at scrubbing the floor in cleaning or spray buff operations could result in the finish being ripped off the floor.

10. Wrong Pad/Pad Not Clean

Pad selection is often overlooked, but is an extremely important aspect of any floor care system. The pad should always be matched to the floor finish and machine. If a burnishing pad is too aggressive for a floor finish, then we could scratch the finish or rip too much off the floor. If the pad is not aggressive enough, then the finish will not respond to the burnishing process - low gloss and poor mark removal. Problems

suggested as a finish "walking off the floor" could be as simple as improper pad selection - either too much finish being removed or no burnishing response. Pad selection is also very important in stripping operations - heavy duty jobs may require a high productivity pad.\

11. Very High Humidity/Low Ventilation During Application

High humidity or extremely low ventilation lead to longer required dry times, with possible results being similar as noted for INADEQUATE DRY TIME.

12. Foreign Substance On Surface - Soil, Grit, Grease, Restorer

As described under INSUFFICIENT GRIT CONTROL, grit will tear through any finish, as well as cause slippery conditions. Other residues (soil, furniture polish overspray, etc.,) may also cause slip problems. Excessive restorer or soil may result in reduced scuff and black heel mark resistances.

13. Sealers Used as Wear Layer

Sealers offer excellent protection to the floor against mechanical and chemical damage. However, water-based sealers are inherently soft in nature compared to floor finishes. Sealers should never be used as a wear layer on relatively non-porous floors, including resilient and low porosity stone (glazed ceramic, polished marble). Sealers are meant mainly as a pore filler and protector. If multiple layers are built up with no wear layer of floor finish, then severe scuffing and black heel marking may be expected. Finishes should always be used as the wear layer. The one exception could be a porous quarry or brick, where a couple of coats of sealer would mainly be soaked into the pores.

14. Excessive Traffic Flow

Certainly traffic flow has an effect on the overall look of a finish. If severe traffic flow results in excessive scuffing, then more scuff resistant products or higher frequency maintenance in the areas of concern are possibilities.

15. Soft, Flexible Flooring

The flooring itself can affect the apparent mark resistance of a floor finish. Under equal conditions, the same floor finish will appear to scuff more on pure vinyl than vinyl composite flooring. The main reason is that pure vinyl is less porous, so the finish tends to sit on the surface. With vinyl composite, more of the finish is deposited in the pres, so there is less of a scuffing issue. In addition, extremely soft floors (e.g. cushioned rubber) may give under the weight of a person walking, resulting in film fracture.

16. Excessive Agitation of Product/Too Much Foam

This would be evident in the bucket. If too much foam is produced, it may not break properly on the floor, resulting in foam entrapment in the film. There is no reason that a modern finish should have to be wrung excessively and applied in extremely thin coats. If transportation has caused foaming, the product should be allowed to sit and naturally defoam before being applied to the floor.

17. Soil Impregnation into Film

In the vast majority of cases involving a finish which has "yellowed," simple soiling has occurred. Basically insufficient cleaning procedures are in place to ensure proper cleaning of the floor. Burnishing has given rise to "shiny dirt." Continually burnishing floors without proper prior cleaning will cause dirt to be ground into the finish. Cleaning with an autoscrubber prior to burnishing is the best way to prevent the soiling problem.

18. Build-up of Old Sealer/Finish

Continual application of coats of finish or sealer without stripping/properly scrubbing the

underlying coats may result in a gradual yellowing of the floor due to soil entrapment. Build-up of sealer poses another problem - removability.

19. Detergent Too Aggressive

As a general rule of thumb, floor finishes are attacked by cleaners with use solution pH values of greater than 20, or which contain high levels of solvents (e.g. glycol ethers). Continual use of such products could result in gloss deterioration over time, tackiness or soiling.

20. Cleaning Equipment Not Clean

Residual stripper in mops used for both stripping and routine damp mopping could result in attack on floor finish. Separate mops should be designated for all operations. Alternatively, autoscrubbers (and pads) that have been used for stripping or heavy duty degreasing operations should be thoroughly rinsed before being used for routine cleaning purposes. Dullness or tackiness could result.

21. Uneven Floor, Pads Not Touching Floor

Acceptable burnishing response cannot be achieved if the pads are not in contact with the floor. An example would be an extremely uneven/wavy floor which is being burnished by a burnisher with a non-flexible head. For such a case, the low areas could possess a much lower gloss than the higher areas.

22. Machine Not Operating at Proper Speed/Pressure

The burnisher is an important component of a burnishing system. If it is not functioning properly, poor results can be expected. Harder finishes which do not need to be burnished as often in order to maintain a scuff-free floor are more susceptible to machines operating at lower speeds.

23. pH/Solvent Sensitive Floor

Certain floors (for example, linoleum or asphalt tile) are extremely sensitive to stripping agents. For stripper sensitive floors, strip as infrequently as possible. Deep scrubbing with a neutral detergent and a blue pad is highly recommended.

REVIEW TEST

1. What is the major cause of yellowing?
2. What are the possible causes of slippery conditions?
3. What types of floors are adhesion difficulties prevalent? What is the result if a floor finish is used?

SUGGESTED RESPONSES

1. Soiling - improper/inadequate cleaning
2. Foreign substance on surface - soil, grit, grease; insufficient number of coats
3. Non-porous floors (glazed ceramic).

Finish will peel off floor under traffic/scrubbing.