Care and Maintenance Guide for Natural Stone, Tile & Grout
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Introduction
Initially non-polished or “honored” natural stone was used for commercial flooring because its abundance in nature and durability made it an inexpensive building material that offered superior performance and easy maintenance. All that was needed was to sweep and mop to keep it clean.
As time went by the desire for more beautiful and elegant flooring created a demand for polished stone and, consequently, an increased cost in both the raw material and maintenance. No longer can you just sweep and mop. Due to abrasion from walking on the polished finish the shine goes dull and must be polished on a regular basis to retain the beauty and elegance for which it was chosen.
Over the past ten or fifteen years there has been an unprecedented demand for polished stone floors in hotels, commercial buildings and private homes. Due to the special nature of stone floors and the desire of the owner to retain the “natural” appearance, common methods for creating a shiny finish are not acceptable and specialized techniques must be used.
This guide is written to help promote a better understanding of polished marble, granite and limestone and to present the specialized methods of maintaining and preserving the polished finish.

Geology of Stone
Marble, granite and limestone vary in their physical and mineral make-up and react differently to both chemical and mechanical processes. To develop the best maintenance method and avoid damaging the stone, a complete understanding of the make-up and proper identification is imperative. There are three generic groups of stone or “rock” that make up the earth’s crust: sedimentary, metamorphic and igneous.

- **Sedimentary** is formed by the disintegration of other rocks, soil and organic matter such as sea organisms, shells, plants and animals deposited in seas and lakes in layers over thousands and millions of years.
- **Metamorphic** is formed from igneous and/or sedimentary rock subjected to heat, pressure, and chemical reactions, causing it to change into a more compact and crystalline form.
- **Igneous** rock is formed from solidified molten matter or magmas.

Visual Identification of Stone
Limestone is a sedimentary rock composed predominantly of a calcium carbonate but may contain traces of iron, magnesium and fossils or shell formations. It ranges in color from light gray to buff and is relatively consistent in color with little or no veining. It may show traces of fossils, pit holes, iron spots and streaks of calcite. The most common types of “earth tone” limestones used on floors are soft and scratch easily. It will generally polish with both abrasives and chemical systems but will not normally achieve a deep, mirror type shine.

Travertine is also a sedimentary rock.
Marble is a metamorphic rock consisting mainly of calcite or calcium in a compact crystalline form with definite cleavage or faces that reflect light. It comes in a variety of colors from light to dark, usually with veins of other colors running through it. It ranges from soft to very hard and will polish with most abrasive and chemical methods. When polished most marble will have a deep, mirror-like reflection.

Granite is an igneous rock composed mainly of feldspars, quartz, mica and hornblende. Granite has no calcium content. Most granites have little or no veining and have solid backgrounds covered with shiny speckles or flecks of crystals throughout the surface. It is not affected by most acids (will not etch) and is very dense and hard, and does not scratch easily. These characteristics make it an excellent material for floors. The most common method of producing a natural shine on all granites is by sanding with abrasives such as diamonds, silicon carbide and fine aluminum or tin oxide. A chemical method is available for maintaining the shine on black and other dark colored granites.
Soapstone

Soapstone is a very soft stone made of a variety of impure talcs. (Talc is a 1 on the Mohs Scale.) It is a dense mineral that develops a warm patina as it wears and is often stain resistant.

Sandstone

Sandstone is a porous, durable sedimentary rock composed of cemented sand-sized grains, predominantly quartz. It is categorized by the most popular bonding agents such as silica, calcium, clay, and iron oxide. Sandstone is commonly used for flooring, countertops, and vertical surfaces in both interior and exterior environments.

Quartzite

Quartzite is a common mineral (silicon dioxide (SiO2) and is usually colorless or white, although it may be colored by impurities. It has vitreous luster, conchoidal fracture, and is 7 on the Mohs Scale. There are several varieties of quartz, including rock crystal, amethyst, chalcedony, and agate. It is commonly used for countertops, flooring, showers, and vertical surfaces.

Porosity

No matter how the various grades or raw material are formed (heat, lava, magma, compression, sediment), it is virtually impossible to produce a body of stone free of space (pores). With the exception of glass, ALL raw materials have pores, even ceramic and porcelain. Some pores are open and some are closed, holding captured gases as moisture.

The Mohs Scale of Mineral Hardness

In 1812 the Mohs scale of mineral hardness was devised by the German mineralogist Frederick Mohs (1773-1839), who selected the ten minerals because they were common or readily available. The scale is not a linear scale, but somewhat arbitrary. An item with a higher Mohs value can scratch an item with a lower Mohs value. A lower rated item cannot scratch a higher rated one:

1. Talc
2. Gypsum
3. Calcite (most marbles)
4. Fluorite
5. Apatite
6. Feldspar
7. Quartz (Granite)
8. Topaz
9. Corundum
10. Diamond

Kitchen countertops with a 7+ are considered excellent, a 6 good, a 5 poor (because knives can scratch) and a 4 or below unadvisable. When sediment and grit are harder than the surface, they will scratch and harm the stone.

Selecting Your Stone

Proper care and maintenance of stone starts with proper selection. It is essential that when you are contemplating a new stone installation that you carefully select your fabricator. A good fabricator will be qualified to help you make a selection that is appropriate for the environment that it will be in, and the final result will be one you will be pleased with and will endure beautifully. With that in mind, the following are some rules of thumb to arm yourself with:

Calcite-based stones – marbles, travertines, limestone, etc. will etch when acid comes in contact with them, so special care will have to be taken if using these stones in kitchens or other places where the likelihood is high that acidic liquids could be spilled on them. They are a relatively soft stone as well, so this should also be considered. (See the Mohs Scale on right)

Granite is an excellent choice for kitchen countertops since it is not vulnerable to acids and it is very hard (7 on the MOHS scale), so it doesn’t scratch easily. Refer to the Identification by Chemical and Physical Means tests (above) for making your final selection.
Methods of Polishing Stone Floors

There are four basic methods used today to create a shine on natural stone floors: Buffing with polishing powders and compounds, grinding with diamond abrasives, crystallization and applying barrier coatings. Each method may not be effective on all stone types and the use of more than one may be necessary.

Polishing Powders and Compounds are fine grains of aluminum or tin oxide abrasive powder that are buffed or rubbed on the surface of the stone to create the shine. This process is actually the same as sanding with diamonds except that the powder is a much finer abrasive. This process is most often augmented by the addition of oxalic acid or oxalate to create a reaction similar to crystallization. The powder is put on the surface and wet with water to make a paste or slurry that is buffed into the stone with a 175 rpm weighted floor machine and a hogs hair or white pad.

Grinding with diamond abrasives is done by grinding the surface of the stone with various grits of industrial grade diamonds that are usually in three to four inch diameter pads or discs. Three to six discs are placed on the bottom of a floor machine drive plate and held on with Velcro. A low speed (175 rpm) floor machine is used to drive the plate and sand the stone surface with the diamonds to remove scratches. The process is repeated with finer and finer grits of diamonds until a mechanical shine is achieved.

Coatings are commonly known as “waxing” the surface to create an artificial shine. A liquid or semi-liquid form of wax, acrylic, urethane or other polymer is applied or “coated” on to the surface with a mop, roller, lambs wool applicator or sprayer. Some are left as applied and others must be “buffed out” to achieve the shine. This is generally done with a high speed burnishing floor machine and fiber or hogs hair pads. This process is not recommended for porous stone.

Crystallization is a process in which a chemical called fluorosilicate is sprayed onto the stone and buffed in with steel wool pads causing new, glassy like, crystals to be formed on the surface. A standard 175 rpm floor machine with a special heavy drive plate is used to create the heat and friction needed to form and polish the crystals.

Advantages and Disadvantages of Polishing Methods

The following pros and cons are presented from the view point that polished marble, granite and limestone are chosen for use on floors because of their “natural” appearance and beauty. When cost is shown as an advantage or disadvantage, it is only to compare one method with the others. Most often the owner’s expect the cost of maintaining natural stone floors to be higher than that of other resilient floors.

Polishing Powders and Compounds

Advantages:
1. Gives a natural appearance with a high gloss and sheen.
2. Produces a relatively durable finish.
3. Never requires stripping.
4. Can be applied with a standard low speed weighted floor machine.
5. If oxalic acid or oxalate is included in the powder, it will remove fine to medium scratches.
6. Only done periodically, not daily or weekly.
7. Compounds composed of aluminum oxide will not etch floor.

Disadvantages:
1. A messy process, requiring additional work to clean up.
2. If oxalic acid is included in the powder, it can cause etching or blistering of marble and limestone depending on the skill of the person using it.
3. Requires equipment (i.e., a floor machine, wet vac, mop, mop bucket, etc.).
Grinding with Diamonds

Advantages:
1. Is the most natural method.
2. Very durable, long lasting finish.
3. Never requires stripping.
4. Will remove all scratches.
5. Works well on marble and granite.

Disadvantages:
1. Requires an initial restoration of the floor to remove or bevel the lippage that can/will damage the fine grit diamonds used.
2. Highest cost method in both material and labor.
3. The final polish and clarity vary depending on the stone and generally have to be augmented by using powder, polish or compound.

Coatings

Advantages:
1. Most janitorial maintenance personnel are familiar with this method.
2. Can be lowest cost method if not concerned about the appearance.
3. Generally provides good slip resistance.

Disadvantages:
1. Does not provide a natural appearance.
2. Most coatings do not adhere well to polished stone.
3. Scuffs and dulls very rapidly.
4. Requires daily buffing or burnishing.
5. Requires periodic stripping that is messy and damages the stone.
6. Blocks the pores of the stone which, coupled with stripping, can cause spalling.
7. Can be a high cost method if done properly to maintain the best possible shine.

Crystallization

Advantages:
1. Gives a natural appearance with a high gloss and sheen.
2. Very durable, long lasting finish.
3. Easy to use and does not require any special skills.
4. Very clean, no mess.
5. Will remove fine scratches and polish heavy scratches.
6. Do not have to polish the entire floor. Can “touch-up” high traffic areas.
7. Can be applied with a standard low speed floor machine.

Disadvantages:
1. Can discolor or darken some light colored grout.
2. Can cause a slight yellowing in some stones if moisture is present. (The yellowing can be removed with the appropriate chemical)
3. Possibly slippery if over buffed.
4. Has limited affect on most granites.
5. Requires periodic stripping.
6. Scuffs caused by wax.
7. Steel wool sheds and rusts.
8. Steel Wool will last up to 500 sq ft.
9. Over use produces a non-responsive floor.
10. Quick fix surface shine only.
Selecting the Right Method

After you establish the type of stone, the condition and the customers' expectations, you can move forward with a specific restoration program. In the case of a calcium based stone such as limestone, marble, travertine, terrazzo, etc. when diamond grinding is not needed (deep scratches) Majestic 5X Polishing Powder (Potassium Oxalate) is an excellent choice but can be difficult to work with due to the unstable conditions caused by airborne and surface acids in the product. The product of choice is Majestic Stone Polishing Compound (Aluminum Oxide). It is a safer and easier substance to work with. Majestic Stone Polishing Compound will not etch the floor or surface while producing a good buffable shine that is equivalent to a 1500-3000 grit diamond that is easy to maintain.

The only sure method of polishing all colors of granite floors is by sanding with diamond abrasives and/or polishing powders. A chemical “spray and buff” method is available for maintaining the shine on dark colored granite. Fortunately, because granite is very scratch and acid resistant, and if the factory shine was done correctly, the need to polish it is very rare. A daily dust and damp mopping is all that is needed to maintain the finish.

Marble crystallization, is a quick fix process, that will give immediate results but can not be left to sit on the floor or etching will occur, also due to its wax content every so often the crystallized cap must be stripped off with chemical or grinding process. No matter which method is used, it is highly recommended that the process be done on a regular frequency that does not allow the finish to go dull. Once the shine is gone, it takes three to four times longer to bring it back. The frequency will be determined by how well daily maintenance is performed and adhered to and how much the floor is walked on. This subject will be covered in more detail in the section “A Systems Approach to Maintenance.”

About Impregnating and Sealing

One of the most common problems associated with the use of natural stone is that it stains very easily. As previously discussed the removal of a stain can be quite expensive and, sometimes, not even possible. To eliminate or reduce the possibility of staining, it is essential that the stone be properly protected with a good quality impregnator or sealer.

First, an explanation of the terms “impregnator” and “sealer” are in order. An impregnator is a chemical designed to penetrate into the stone and provide a barrier to prevent or repel water, pigment, dye, dirt, and other foreign substances from penetrating into the stone while still allowing vapor to transmit out of the stone or “breathe”. Sealers also provide a protective barrier however, not all sealers allow the stone to breathe. A sealer designated as a “penetrating” sealer is usually designed to function the same as an impregnator while most other topical sealers or “coatings” such as acrylic do not. The use of the term sealer in this document is synonymous with impregnator.

Besides being water or solvent based, impregnators are also classified into two types by function: hydrophobic or oleophobic. Hydrophobic repels only water while oleophobic repels both water and oil. The oleophobic types are solvent based and usually more expensive, but they offer much better protection from a wider variety of stains. In the end, spending a little more up front may save you from a costly stain removal later. All floors should be impregnated as part of the initial maintenance process and re-impregnated every 3-5 years or after finishing whichever comes first. NOTE: Solvent based impregnators are preferred for hard stone (Granite) high traffic areas and outdoors for its resistance to ultra violet rays from the sun. Enhancing sealers bring out the color in flat stone such as slate, sandstone, limestone, flamed granite, etc.

How many applications of sealer are needed?

For some stones that are more porous than others, one application of sealer may not be enough.

But how will you know? On mercantile granites that need sealing, at least two applications are recommended. Very porous mercantile granites, sandstone, quartzite, etc. may require three or more applications. When sealer can no longer be absorbed by the stone, the stone is adequately sealed.

How long will it last? There is no absolute rule of thumb when it comes to the durability of any sealer. Generally speaking, most quality impregnating sealers interior will last 2-5 years or more. Environment plays a big role. Stones exposed to intense heat or direct sunlight will probably need to be re-sealed more often.

When is it time to reseal? To find out if your stone is perfectly sealed, spill some water on it and wait for approximately half an hour, then wipe it dry. If the surface of the stone did not darken it means that the stone is still perfectly sealed. Be sure to test various areas, especially those areas that get more use and abuse.
Common Problems... And What To Do About Them

Marble, granite, limestone and other decorative stone are durable materials that will last a lifetime. However, if not installed correctly or properly cared for problems may result that will shorten its life. The following are the most common problems that may occur. Following are the most common problems and suggested methods of correcting them:

Coatings: Coatings such as wax, acrylic and urethane block the pores of natural stone and do not allow vapor to escape out (does not allow it to “breathe”). This, coupled with stripping, can cause spalling. When the pores are blocked by wax or a non-penetrating sealer, the internal vapor seeks its nearest exit which could be a weak spot in the stone, causing cracks. In addition, coatings mask other problems such as heavy etching, cracks, and deep scratches. The best solution to this problem is to remove the coating and never use them again.

Crystal Damage/Stun Marks: Stun marks appear as white marks on the surface of the stone and are common in certain types of marble. These stuns are the result of tiny explosions inside the crystal of the stone. Pin point pressures placed on the marble cause these marks. Women’s high heels or blunt pointed instruments are common reasons for stun marks. This type of damage is sometimes very deep in the stone or may even go all the way through it. Stun marks can be difficult to remove. Grinding and/or honing can reduce the number of stuns, but some travel through the entire thickness of the stone. Grinding with coarse abrasives can remove or improve some but may not remove them completely. If grinding does not remove them, replacement of the damaged stone is the only alternative.

Deep Scratches: Deep scratches can usually be repaired by resurfacing with medium to coarse grit diamond abrasives.

Efflorescence: Efflorescence appears as a white powdery residue on the surface of the stone. It is a common condition on new stone installations or when the stone is exposed to a large quantity of water, such as flooding. This powder is a mineral salt from the setting bed. To remove efflorescence do not use water. Buff the stone with a clean polishing pad or #0000 steel wool pad. The stone will continue to effloresce until it is completely dry. This drying process can take several days to as long as one year. Do not seal the stone until any efflorescence is gone.

Etching: Etching is a dull area on the stone caused by spills of acidic products such as citrus juice, wine, vinegar, soft drinks, tile cleaners, and oxalic acid in powder polishes. Marble and limestone etch very easily. Granite is very acid-resistant and will rarely etch. If the etching is very light, it possibly can be repaired by polishing the area with polishing compound. Heavy etching must be repaired by resurfacing the area with diamond abrasives. To prevent etching, avoid using cleaners and chemicals that contain acids.

Lippage: Lippage is the term given to tiles that are set unevenly. In other words, the edge of one tile is higher than the next and is the result of a poor installation. If the lippage is higher than the thickness of a nickel, it is considered excessive and the tile will have to be ground down or beveled to alleviate the problem. This is done by grinding or resurfacing with coarse grit diamonds or abrasive stones. It is best to have this type of work done by a professional stone refinishing company.

Loss of shine: The loss of the high polish on certain marble and granite can be attributed to wear. This is especially true of marble, since it is much softer then granite. When shoes track in dirt and sand, the bottoms of the shoes can act like sandpaper on a stone floor surface and over time will wear the polish off. The shine can be restored with powders or compound or this can be done by a stone restoration professional.

Sanded Grout: Unfortunately, there is no immediate solution to the problem of sanded grout. Over time, the exposed sand at the surface of the grout may “smooth” off, but in the mean time you must make allowances for the problems it causes. Note: Marble and granite tiles generally have very thin grout lines. Terrazzo is poured in larger sections (4x8 ft.) and usually has metal expansion strips. While ceramic and porcelain will have 1/4”-1/2” sanded grout lines the majority of the time.
Spalling, Chips and Holes: Small pits or small pieces of stone popping off the surface is called spalling. This condition is common on stone exposed to large amounts of water or when deicing salts are used for ice removal. Like efflorescence, mineral salts are the cause for spalling and pitting. Instead of the salts depositing on the surface (efflorescence) they deposit below the surface of the stone, causing pressure within the stone, causing stone spalls, flakes or pits. Spalling, chips and holes in the stone surface must be filled with a polyester, epoxy, or cement-based filler material with color added to match that of the stone. Generally, the area must also be resurfaced after filling to smooth out and level the filler material with the stone surface. Replacing the stones is another, but more costly alternative. Unfortunately once a stone begins to spall it is almost impossible to repair. It is recommended that the stone be replaced.

Staining: Some stone surfaces can become stained easily if they are not properly sealed. Many foods, drinks, ink, oil and rust can cause stains. Most stains on stone can be removed. For some, more difficult stains, professional techniques by a stone restoration provider may be the only hope. Permanent stains can occur but not often. For more information, see the Stain Removal section in this guide or visit www.m3techinc.com

Water Rings/Spots: Water rings and spots are very common on marble and other natural stone surfaces. They are either areas that have become etched or are from hard water minerals such as calcium and magnesium that are left behind when water evaporates, leaving a ring or a spot. To remove either type of these spots, use a marble polishing compound. Moderate to severe etching or larger damaged areas will require professional honing by a stone restoration contractor.

Yellowing: The tendency of a light-colored stone to become “yellow” can be caused by several reasons. First, many white marbles contain iron that oxidizes over time causing the yellow appearance. This type cannot be repaired and replacement is the only answer. Most yellowing is caused by dirt that is ground into the stone or by wax type coatings that turn yellow. This type can usually be remedied by stripping or deep cleaning with a suitable alkaline cleaner or wax stripper. Some yellowing may be the result of the use of steel wool during crystallizing when moisture is present. This type can be corrected by cleaning with ammonium bi-fluoride solution.

Evaluating the Current Condition of the Floor

The first step in developing a floor maintenance program is to learn what has or is currently being done to the stone. Has a coating such as wax, acrylic or urethane been used? Has the stone been maintained with diamond abrasives, crystallization or polishing powders? Are there any damage or problems, such as cracks, lippage, stains, heavy etching or stun marks? Is the grout sanded or non-sanded?

If a coating is present, it may mask other problems such as heavy etching, cracks, pits, holes and deep scratches. A sample area should be chemically stripped to evaluate the condition. A badly damaged floor may suggest the need for refinishing at a higher cost then just stripping and polishing. If diamond abrasives have been used, more than likely, a simple deep cleaning and continued program of polishing can be resumed. Many polishing powders contain oxalic acid that can etch or “blister” marble if not used by a highly skilled person. If continuous crystallization was used, the floor must be stripped of the wax that is part of the chemical makeup of crystallizer, which can cause yellowing and/or window paning. Also the crystallizer will act as a resistance barrier to powders or compound.

Cracks can collect dirt and require more labor intensive hand work to clean out and maintain. Lippage can damage steel wool pads, fiber pads and fine grit polishing diamonds and therefore create a higher maintenance cost. Heavy etching and stun marks may require deep grinding to repair them. Sanded grout may accumulate dirt more readily than non-sanded. It will cause particles of steel wool to be “shaved” off and may darken the grout or, if not cleaned out, rust in the grout line. If refinishing is done, the sand may come out and cause more scratching of the stone. These problems and correction techniques will be discussed in more detail in the section on “Common Problems.” After a complete evaluation the owner should be made aware of the condition(s) and given the options, associated costs and alternatives. Ultimately, the owner’s expectations will determine the final course of action.
Job Site Evaluation

1. What is the overall condition of the installation? ______________________________________________________
__________________________________________________________________________________________________

2. What are the customer’s expectations? _______________________________________________________________
__________________________________________________________________________________________________

3. What are the current maintenance procedures? ________________________________________________________
__________________________________________________________________________________________________

4. What type of facility is it? (i.e. office, lobby, airport, etc.) ______________________________________________
__________________________________________________________________________________________________

5. What type of surface is it? (i.e. interior, exterior, wall or floor) __________________________________________
__________________________________________________________________________________________________

6. What is the square footage? ________________________________________________________________________
__________________________________________________________________________________________________

7. What size is the tile? ______________________________________________________________________________
__________________________________________________________________________________________________

8. Is there a pattern of different colors? __________________________________________________________________
__________________________________________________________________________________________________

9. What is the material? (i.e. stone, ceramic) ______________________________________________________________
__________________________________________________________________________________________________

10. Does the surface react to acid? _____________________________________________________________________
__________________________________________________________________________________________________

11. What color is the surface? _________________________________________________________________________
__________________________________________________________________________________________________

12. Are surface types mixed? _________________________________________________________________________
__________________________________________________________________________________________________

13. Is there a coating on the floor? ___________________________________________________________________
__________________________________________________________________________________________________

14. How has the stone been crystallized? __________________________________________________________________
__________________________________________________________________________________________________

15. For how long? ___________________________________________________________________________________
__________________________________________________________________________________________________

16. What is the surface finish? (polished, honed or textured) ______________________________________________
__________________________________________________________________________________________________

17. Are they mixed? _________________________________________________________________________________
__________________________________________________________________________________________________

18. How bad is lippage (uneven tiles)? __________________________________________________________________
__________________________________________________________________________________________________

19. Has floor been previously refinished? __________________________________________________________________
__________________________________________________________________________________________________

20. What is the condition of the grout line? _______________________________________________________________
__________________________________________________________________________________________________

21. What is the original color of the grout? ________________________________________________________________
__________________________________________________________________________________________________

22. What type of grout? ______________________________________________________________________________
__________________________________________________________________________________________________

23. Sanded, unsanded or epoxy? _______________________________________________________________________
__________________________________________________________________________________________________
Stain Removal Basics
Marble, granite and natural stone are porous materials. This porosity is why it stains so easily. It is also why stains can be removed. All that’s needed to remove a stain is to reverse the staining process. In other words, the stone has literally absorbed the stain and we simply re-absorb it into a different material. This different material is what we call a poultice. A poultice can be made with powdered whiting and hydrogen peroxide or a chemical reducing agent—depending on the nature of the stain. Whiting is sold in most paint stores. The poultice should be made and applied as described for removal of each particular stain.

Most stains can be removed from natural stone with a process known as poulticing. Poulticing is similar to using a sponge to absorb liquid. A suitable powder material is mixed with a liquid cleaning agent and placed on the stain and allowed to dry. As it dries, it absorbs or draws the stain from the stone.

Although many powders such as diatomaceous earth, whiting, clay, and talc can be used and also paper towels and cotton balls, purchasing a good poultice powder from a stone and marble product supplier is best. A professional blend of the correct powders will insure that maximum drawing of the stain is achieved. The most important step in removing a stain is to first identify what caused it. The most common types of stains are as follows:

Each type of stain requires the use of a particular chemical or cleaning agent that will most effectively serve to dilute, break down and dissolve the stain. Following is a general guide that will suggest cleaning agents for the more common types of stains:

<table>
<thead>
<tr>
<th>Stain Type</th>
<th>Color</th>
<th>Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>General dirt - dirt, yellowing from smoke or age</td>
<td>Light &quot;dirty&quot; yellows</td>
<td>Bleach</td>
</tr>
<tr>
<td>Organic - coffee, tea, fruit, tobacco, cosmetics, etc.</td>
<td>Light to dark-brown or color of the fruit</td>
<td>20% Hydrogen Peroxide, tannin</td>
</tr>
<tr>
<td>Organic - flowers</td>
<td>Color of the flower</td>
<td>Hydrogen Peroxide Plus 10 drops of Ammonia per cup of poultice powder.</td>
</tr>
<tr>
<td>Oil-based - grease, tar, cooking oil, food stains, butter, salad dressings</td>
<td>Brown to yellow or “dark shade”</td>
<td>Acetone alone or 50/50 acetone and ammonia. or Ammonia+ Powder Methylene Chloride, strong degreaser</td>
</tr>
<tr>
<td>Biological - algae, moss, mildew, lichens, etc.</td>
<td>Black</td>
<td>Bleach</td>
</tr>
<tr>
<td>Metallic - iron</td>
<td>Brown/yellow “rust color”</td>
<td>Ammonium bi-fluoride or Oxalic Acid or Iron-Out (available at hardware stores)*</td>
</tr>
<tr>
<td>Metallic - bronze, copper</td>
<td>Green or brown</td>
<td>Ammonium chloride</td>
</tr>
<tr>
<td>Ink stains - magic marker, pen, ink, etc.</td>
<td>Color of the ink</td>
<td>Mineral Spirits or Methylene Chloride</td>
</tr>
<tr>
<td>Paint (water-based)</td>
<td>Color of the paint</td>
<td>commercial paint remover</td>
</tr>
<tr>
<td>Paint (oil)</td>
<td>Color of the paint</td>
<td>Mineral Spirits or deep stains may require Methylene Chloride.</td>
</tr>
</tbody>
</table>

Please use extra caution when handling all chemicals listed above. Thoroughly read Material Safety Data Sheets for each chemical before use.

*Note that the Ammonium bi-fluoride used for rust stains may etch some stones that will require refinishing and polishing after. Always follow the manufacturer’s safety recommendations for the agent being used.
Applying the Poultice
Once the stain is identified, the following steps can be followed:
1. Wet the stained area with distilled water. Pre-wetting fills the pores of the stone with water isolating the stain and accelerating the removal by the chemical.
2. Prepare the poultice. If a poultice powder is to be used, pre mix the powder and the chemical of choice into a thick paste, the consistency of peanut butter. In other words, wet it enough so that it does not run.
3. Apply the poultice to the stain being careful not to spill any on the non stained areas. Apply approximately 1/4-inch thick overlapping the stain area by about one inch.
4. Cover the poultice with plastic (food wrap works great). Tape the plastic down to seal the edges. It also helps to poke several small holes in the plastic, so that the powder will dry out. Failure to do this may result in the poultice staying wet.
5. Allow the poultice to dry thoroughly. This is a very important step. The drying of the poultice is what pulls the stain from the stone into the poultice material. If the poultice is not allowed to dry, the stain may not be removed. Drying usually takes from 24 to 48 hours.
6. Remove the poultice from the stain. Rinse with distilled water and buff dry with a soft cloth. If the stain is not removed, apply the poultice again. It may take up to five applications for difficult stains.
Some chemicals may etch marble and limestone surfaces. If this occurs, then apply polishing powder and buff with a hand held buffer and a white or natural hair pad to restore the shine.

Etching, a.k.a. “Water Stains” Or “Rings”
Polished marble, travertine, onyx, limestone, etc. are all calcite-based stones, and as such are affected by pH active liquids, mostly acidic in nature. In layman’s language, when an acidic liquid gets on a polished stone surface, it etches it on contact. That is, it leaves a mark of corrosion that looks like a water-stain or ring. Such surface damage has nothing to do with the absorbency rate of the stone (typically quite low, anyway), but exclusively with its chemical makeup, which, as mentioned before, is mostly calcite (Calcium Carbonate, CaCo3). Trying to remove the “stain” by poulticing it would be useless exercise, since it is not a stain, no matter what it looks like.
So, how do you remove a chemical etch-mark, which, as seen, is not a stain but a surface damage? You don’t! In fact an etch mark can be effectively compared to, and defined as, a shallow chemical scratch. A scratch is something missing (a groove), and nobody can remove something missing. It would be like trying to remove a hole from a doughnut! The only thing one can do is to eat the doughnut, and … the hole is gone! Same thing with a scratch: you must actually remove whatever is around the groove, down to the depth of the deepest point of the scratch. You are actually facing a full-fledged—though small in size—stone restoration project! Is this a task for the average homeowner? The answer is: Probably not.
If it is polished marble or travertine or onyx, then there’s hope. If it is hone-finished marble or travertine, or hone-finished slate (like a chalk-board), or mixed “granite”, then you probably should hire a professional stone refinisher. If it’s a cleft-finished slate (rippled on its surface), then nobody can actually do anything about it, other than attempt to mask it by applying a good quality stone color enhancer.
While marble and other calcite based stones are vulnerable to acids, granite is much more resistant. In fact, the only acid that will etch polished granite is hydrofluoric acid, commonly found in rust removers. If the etch is light (the depth is undetectable by the naked eye, and it looks and feels smooth, then a Majestic Stone Polishing Compound for marble will work quite well without requiring the experience of a professional and no specific tools are needed, other than a piece of terry cloth.

Combination “Stains”
Finally, we may have a combination of a stain with etching. For example, if some red wine is spilled on an absorbent polished limestone, then the acidity of the wine (acetic acid) will etch (corrode) the surface on contact, while the dark color of the wine will stain the stone by being absorbed by it. In such a case, first you remove the stain by poulticing (hydrogen peroxide), and then repair the etching by refinishing the surface.
A Systems Approach to Maintenance

Once the stone type has been identified and any problems corrected or accepted, a daily system should be developed which will keep the stone in a polished condition. The main reason polished stone floors become dull is that we walk on them and “grind” in dust, sand, and other fine, gritty matter that abrades the finish. Remember that it will take three to four times longer to bring the shine back once the floor has gone dull. If allowed to remain dull for a long period it may even have to be refinished to bring back a good reflection and gloss.

Polishing

Whatever the method used to maintain the shine, polishing a certain amount of the floor each day is best. The only difference will be in how many square feet can be polished with the method being used. With marble and limestone, one person can polish 200 to 250 square feet per hour with polishing powders that contain oxalic acid or compound.

Traffic Areas

Some areas such as main entrances, registration desks, elevator lobbies, and restaurants may need to be polished every three days or perhaps even daily while low traffic areas may only need to be polished once per month. The frequency will be determined mainly by how much the floor is walked on. For example, some hotels in Las Vegas have 10,000 to 20,000 people per day walking across the floors and, from experience, we have found that polishing is needed about every three days to maintain the finish. Other hotel properties in major, non-resort, cities may only require polishing every ten to fifteen days because the rate of foot traffic is about 2,000 or 3,000 people per day. This can be used as a guideline, but the best way is to observe and test the floor being maintained. Quite simply, polish the floor and watch how long it takes before it begins to go dull in a given area then adjust the polishing frequency accordingly. Based on the labor hours available, polish the high traffic areas each day and as much of the lower traffic areas as possible.

Daily Maintenance

Of course, dust mopping and damp mopping should be done several times a day or at the very minimum once per day. Dust mopping should be done with a clean, non-treated dust mop as many times a day as possible. The more you dust mop the better. The floor should be damp mopped at least once a day with a good quality neutral cleaner. A looped or flat mop works best. Do not over wet the floor, a light damp mopping is all that is needed. Particular attention should be given to mopping into the grout line lengthwise. As you dust mop, much of the dirt falls into the grout line and can only be removed by mopping it out. Note, that if the grout is of the sanded type, do not use this method because it may abrade the mop and leave the lint or fibers in the grout. Sanded grout should be scrubbed periodically with a brush and the residue sucked out with a wet vac.

Cleaners

Make certain that the cleaner you use has a “neutral” pH of seven. A stone soap or cleaner/conditioner is best. High alkaline or mild acidic cleaners can etch and damage the finish. Be careful with concentrated “no-streak” cleaners. Although they may be a neutral pH, some contain chelates which can dull the finish. Chelates dissolve or destroy calcium in the water and eliminate hard water deposits. Since marble and limestone contain a large amount of calcium, the chelates also attack the finish. The best way to be sure your cleaner is neutral and will not damage the finish is to test it yourself. You do not have to be a chemist to do this, just pour a drop about the size of a quarter full strength onto the stone surface and let it stand five or ten minutes if, after you dry it off, a dull spot or “etch” is left the product should not be used. If the surface is not etched, the product is ok to use. Any spills that occur throughout the day should be cleaned up immediately with neutral cleaner or clean water. Then timely buffing with a high speed floor machine using a white polishing pad to “pop” the shine on a clean floor.

Cleaning Supplies

Last, but very importantly, keep mops, rags, sponges, dust mops, and other supplies to clean the marble separate from other cleaning supplies. A mop used in a kitchen may have grease or oil in it. A mop used in a restroom may have acid from toilet bowl cleaners or urine in it. Both can have a negative affect on polished stone floors.

Over time, if the high traffic areas become too worn to polish back to an acceptable finish, they should be refinished with diamond abrasives to restore the clarity and depth.
Comparison Chart of Stone Sealers
Penetrating sealers/impregnators are the only recommended products for protecting natural stone.

<table>
<thead>
<tr>
<th>Sealer Type</th>
<th>Use On</th>
<th>Primary Applications*</th>
<th>Type of Finish</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Based Impregnating Sealer</td>
<td>Best on stones with open pores, i.e. marble, limestone, slate, etc.</td>
<td>Indoor/outdoor use. Have little or no odor and are more economical.</td>
<td>Moderate to reasonable reflective values.</td>
<td>Easy to apply. Very absorbent due to nature of stone.</td>
</tr>
<tr>
<td>Solvent Based Impregnating Sealer</td>
<td>For stones with hard, highly polished, tight pores, i.e. granite, ceramic, porcelain, etc.</td>
<td>Recommended for outdoor use for its resistance to ultraviolet rays from the sun.</td>
<td>High gloss, depth and enriched color.</td>
<td>Deep penetrating and long lasting. Initial solvent odor.</td>
</tr>
<tr>
<td>Color Enhancing Sealer</td>
<td>Use on unpolished stone, i.e. honed, flamed travertine, slate, etc.</td>
<td>Indoor/outdoor use. Floors and vertical surfaces.</td>
<td>Protects the stone and brings out the rich colors in normally dull unpolished stone.</td>
<td>Absorbent, darkens stone and has a matte finish.</td>
</tr>
<tr>
<td>Anti-Slip Treatment</td>
<td>High gloss, hard stone, ceramic and porcelain.</td>
<td>Use on entryways, shower floors, ice machines, saunas, steam rooms, etc.</td>
<td>Can be alternated with a daily mopping procedure. Adds a breathable sacrificial barrier that greatly increases the coefficient of friction.</td>
<td>Excellent anti-slip properties. Does not affect the natural color of the surface.</td>
</tr>
<tr>
<td>Polymeric 1</td>
<td>Use on all resilient floors including stone, terrazzo, quarry tile, vinyl asbestos, asphalt tile, vinyl sheet, tile, rubber, linoleum.</td>
<td>For high traffic areas that are maintained with a high frequency program such as daily or weekly high speed burnishing such as supermarkets, malls, office buildings.</td>
<td>High gloss, high solid finish. Advanced polymer technology releases from mop easier to reduce worker fatigue and provide a smoother finish.</td>
<td>Easy to apply. Outstanding initial gloss with excellent durability.</td>
</tr>
<tr>
<td>Polymeric 3</td>
<td>Concrete, marble, terrazzo, and other stone floors.</td>
<td>Use on concrete floors, automotive floors, unsealed stone floors.</td>
<td>Provides a non-slip, high gloss, durable finish capable of withstanding heavy traffic.</td>
<td>A very high durability polymer that is specially designed to provide a semi-permanent coating.</td>
</tr>
</tbody>
</table>

*Always check with the sealer manufacturer to verify the compatibility of its product with the decorative surface you plan to apply it to.
## Comparison Chart of Concrete Sealers

<table>
<thead>
<tr>
<th>Sealer Type</th>
<th>How They Work</th>
<th>Primary Applications*</th>
<th>Type of Finish</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Penetrating Sealers</strong>&lt;br&gt;(includes silanes, siloxanes &amp; silicates)</td>
<td>Penetrate &amp; react chemically within capillaries of the concrete to shield against moisture penetration &amp; deicing chemicals.</td>
<td>-Exterior concrete surfaces subject to corrosion &amp; freeze-thaw damage&lt;br&gt;-Where a natural, matte finish is desired.</td>
<td>Provide invisible protection without changing the surface appearance or leaving a sheen.</td>
<td>Provide excellent protection against outdoor exposure conditions. Most products are also breathable, allowing moisture vapor to escape.</td>
</tr>
<tr>
<td><strong>Acrylics</strong></td>
<td>Form a thin protective film on the concrete surface. Available in both solvent and water based formulations.</td>
<td>-Both exterior &amp; interior concrete&lt;br&gt;-On projects where easy application &amp; economy is important.&lt;br&gt;-To enhance the beauty of colored, stamped or exposed-aggregate concrete.&lt;br&gt;-On fast-track projects, since acrylics often dry to the touch within an hour.</td>
<td>Available in a range of sheen levels. Solvent-based acrylics generally enhance color better than water-based products.</td>
<td>Provide good protection against water &amp; chloride intrusion, but usually wear faster than polyurethanes &amp; epoxies. Solvent-based acrylics generally perform better than water-based products for outdoor use. On indoor surfaces, softer acrylic sealers usually require regular maintenance with several coats of a sacrificial floor finish, or wax, to prevent wear &amp; black heel marks.</td>
</tr>
<tr>
<td><strong>Polyurethanes</strong></td>
<td>Form a high-build protective film on the concrete surface. Available in both solvent and water based formulations.</td>
<td>-Both exterior &amp; interior concrete.&lt;br&gt;-On floors in high-traffic areas, to provide good resistance to scuffs and staining.&lt;br&gt;-To enhance the beauty of colored, stamped or exposed-aggregate concrete.&lt;br&gt;-Concrete countertops.</td>
<td>Available in a range of sheen levels. Finish is transparent &amp; non-yellowing.</td>
<td>Nearly twice as thick as acrylic sealers, &amp; produce a very durable chemical and abrasion resistant finish. Most urethanes are moisture intolerant until they cure, so no water should be present on the surface when the sealer is applied.</td>
</tr>
<tr>
<td><strong>Epoxies</strong></td>
<td>Form a high-build protective film on the concrete surface. Most are two component products mixed prior to application.</td>
<td>-On floors in high-traffic areas.&lt;br&gt;-Cement-based overlays&lt;br&gt;-May yellow with UV exposure, so generally limited to interior use.</td>
<td>Available clear or pigmented, if you wish to add color. Most products impart a glossy finish.</td>
<td>Produce a hard long-wearing abrasion-resistant finish. Also offer excellent water repellence, but some products are impermeable &amp; could trap moisture in the concrete.</td>
</tr>
</tbody>
</table>

*Always check with the sealer manufacturer to verify the compatibility of its product with the decorative surface you plan to apply it to.
Production Rates/Job Estimating Guide

The time required to properly restore stone surfaces is considerably longer than the time required to polish conventional surfaces such as VCT or asphalt tile flooring. Since labor remains the largest single expense, it is necessary to know how much time will be necessary to do the job so a price can subsequently be developed. Chemicals and other supplies will also be higher than what may be considered conventional. Once the floor is initially restored, the maintenance process (mopping and buffing) is less and more cost effective than the waxing process used on VCT flooring. No stripping, no scrub and re-coat, no high speed burnishing etc.

The following information helps provide the necessary information to incorporate the adjusted work rates/material usage. Hourly rates for marble maintenance will be higher than traditional rates. Due to the skill and training needed to do the job right, and the less competitive nature of this service, loaded hourly rates can be 20-30 percent higher than rates used for traditional janitorial services. Prices per square foot vary due to the process used and the subsequent time spent to perform that process. For example, crystallization on a regularly scheduled program may be 10-15¢ per square foot while two cuts with diamonds followed by a powder polishing can be $1.25 per square foot.

**Production Rates**

- Refinishing marble with diamonds ................................................. 45-65 sq. ft./hour
- Refinishing granite with diamonds ............................................... 10-20 sq. ft./hour
- Polishing powders & Compounds (Marble) .................................. 300-550 sq. ft./hour
- Crystallizer (Marble) ..................................................................... 450-550 sq. ft./hour

**Factors to Consider When Bidding**

A. Furniture or other items that may need moving in the work area.
   1. Calculate time and add to bid price.
B. Excess masking and protection of adjacent surfaces and areas.
   1. All work rates include standard masking time for average areas in which only wall baseboards need protection. Calculate and add on time for masking carpets, windows, desks, columns, doors, etc.
C. Small or confined floor areas.
   1. Narrow walkways, borders, and areas behind desks will reduce average times. Add on costs as required.
D. Allowable working hours.
   1. Many places do not allow work such as restoration during regular business hours. Also, some businesses may not allow a full eight (8) hour shift to complete some tasks. Find out what the policies are before bidding and figure into bids.
E. Conditions to be aware of:
   1. Lippage (excess high/low tiles).
   2. Type of grout (sanded grout reduces life).
   3. Width if grout lines.
   4. Presence of dirt or other contaminants on floor.
   5. Continuous vs. small area polishing.
   6. Wax on floor/stripping.
Procedure for Floor Prep/Cleaning
Floors with no wax or acrylic finish
   a) Rate: 400 sq. ft. per man hour.
   b) Product coverage: About 1,200 to 1,500 sq. ft. per gallon.
Floors with light wax or acrylic
1. Strip with Majestic Deep Cleaning Stripper Degreaser.
   a) Rate: 200 sq. ft. per man hour.
   b) Product coverage: About 700 sq. ft. per gallon.
Floor with medium to heavy wax or acrylic finish
1. Strip with Majestic Deep Cleaning Stripper Degreaser.
   a) Rate: 75 to 100 sq. ft. per hour.
   b) Product coverage: About 400 to 500 sq. ft. per gallon.
Floors in good condition with no wax or acrylic finish
1. Dust mop and damp mop with Majestic No-Rinse Neutral Cleaner.
   a) Rate: 1,500 to 2,000 sq. ft. per man hour.
   b) Product coverage: About 8,000 sq. ft. per gallon.

Procedure for Diamond Sanding/Refinishing Floors
A. Deep grinding to remove lippage
1. Start at 30 or 50 grit - lippage diamonds.
2. Rate: 12 to 15 sq. ft. per man hour.
B. Medium grinding for deep scratches
1. Start at 60 or 100 grit.
2. Rate: 20 to 25 sq. ft. per man hour.
C. Medium sanding (most common)
1. Start at 120 grit to 400 grit. Finish off with Majestic Stone Polishing Compound.
2. Rate: 30 to 40 sq. ft. per man hour.
Diamond Sanding/Refinishing Counters and Stairs
A. Most will require medium sanding (120 to 3,500 grit).
1. Rate: 6 to 8 sq. ft. per man hour.
Procedure for Marble and Terrazzo Polishing

**Step 1: Preparation**

Use Majestic Deep Cleaning Stripper Degreaser to remove wax or topical coatings (Crystallizer). Dilute 1:1–1:10 depending on condition of floor. Mop or brush onto surface and let stand 5 to 20 minutes. Agitate with machine or brush and rinse well. Continue to rinse until residue has been removed. Do not let it dry onto stone. Always test the product in an inconspicuous area prior to use for suitability and results. Use Majestic Stone & Grout Intensive Cleaner if no coatings are involved.

**Step 2: Polishing**

NOTE: If marble is noticeably scratched, go to Diamond Grinding Procedure first. If you desire a little more of a polish prior to impregnating – Use Majestic Stone Polishing Compound. Ensure the area to be polished is free from all coatings and soiling – see Step 1. Protect all surrounding surfaces (wood, carpet) with a poly protector. Select an area of approximately 40 sq. ft. for the polishing process. Lightly wet the floor with clean water and place a ¼ cup of compound in the center of area to be worked. Use a natural pad (hogs hair) and work the area with a 175/300 ppm floor machine (the heavier the machine the better the results) – weighted floor machine or weighted pad driver. The consistency of the slurry should be fluid enough to achieve even coverage. If the slurry becomes too dry, add water as needed. After making several side to side passes (Usually 6-8 times at a very slow movement) squeegee back slurry to determine that a consistent level of polish is achieved. Then wet dry vacuum slurry, rinse with plenty of clean water and wet dry again When dry, high speed buff with 20” white floor pad. If you have an area that has granite and marble mixed together, the Majestic Stone Polishing Compound will not hurt, dull or damage the granite. NOTE: If marble is extremely dull, use Majestic 400 Grit Honing Powder first.

**Step 3: Impregnating**

Area to be impregnated needs to be totally clean of soil and dry (Usually for 6 – 8 Hours). Adjacent areas that may be sensitive to solvents should be protected with poly protector. Apply Majestic Impregnating Sealer using a pump up sprayer, roller or brush. Allow 10 minutes for penetration and apply a second application (Wet on wet). 10–20 minutes after second application or before surface drying, remove all excess material from surface. Always apply light even coats and ventilate area. Area can be walked on usually an hour after application. Always test in an inconspicuous area. NOTE: A good quality penetrating impregnator should last 2-3 years before re-impregnating again.

**Step 4: Maintenance**

Cleaning the stone (marble or granite) should be very easy. Use a clean mop bucket and wringer and mop with a plastic mop handle. Dilute 1-1.5 ounce to 1 gallon of Majestic Stone Soap with water. Mop as needed. Avoid re-applying dirt, empty mop bucket consistently Completely cover all of the surface area, but do not re-mop. Floor should be buffed with white pad when dry. If you are going to use the auto scrubber, just dilute 1 ounce to gallon. NOTE: On extremely slippery floors, alternate with Majestic Anti-Slip.

**Step 5: Quarterly Scrub with Stone and Grout Intensive Cleaner**

Majestic Stone Polishing Compound can be used to polish worn stone, even after impregnating. It will not hurt the impregnator. Polishing Compound is used when the desired polish is not to your satisfaction. Use in worn areas due to foot traffic, but always overlap to blend in.
Procedure for Refinishing Marble Countertops, Walls and Stairs with Hand Grinder

Equipment and Materials
1. Variable speed hand held grinder.
2. Velcro backed diamond pad holder for grinder.
3. Pump/sprayer to supply water to the grinder.
4. Diamond abrasive pads from course to fine grits.
5. Plastic sheeting and/or EZ Mask tape and duct tape for masking.
6. Sponges, rags, and wet vac for water control.

Instructions
1. Mask off walls, floors, carpet and other areas that may be damaged by water.
2. Attach the water tube from the pump/sprayer to the water intake valve on the top of the grinder - Optional.
3. Fill the pump/sprayer with fresh, clean, cool water, replace the pump assembly and “pump” in as much air as possible. (Be sure that the water intake valve on the grinder is turned off) - Optional.
4. Attach the diamond pad holder on to the shaft of the grinder.
5. Attach the Velcro backed diamond abrasive pad to the pad holder. Begin with the coarsest grit needed to remove scratches and other defects in the area to be resurfaced.
6. Turn the water valve open to allow a slow, steady stream of water flow through the shaft to the diamond pad and the work area.
7. Place the diamond pad flat on to the work area and turn on the power switch.
8. Grind and work the area until the scratches and defects are removed. Use a steady, even pressure on the diamonds, do not press hard, let the diamonds do the work.
9. After grinding, turn off the water, clean up the area and check to be certain that no spots were missed.
10. Repeat steps 5-9 with the next finer grit until the desired finish is achieved.
12. Seal with Majestic Water Based Impregnating Sealer required.

Maintenance
1. Maintain surfaces with Majestic Stone Plus, Majestic Polish Protector or Majestic Marble Polishing Cream.

Procedure for Granite Polishing
Preparation
1. Use Majestic Deep Cleaning Stripper Degreaser solution to remove wax, grease or topical coatings.
2. Dilute 1:1 – 1:10 depending on condition of floor.
3. Mop or brush onto surface – Let stand for 5-20 minutes.
4. Agitate with machine or brush and rinse well. Continue to rinse until all residue is removed.

Preparation Option
Use Majestic Stone & Grout Intensive Cleaner if no coatings are involved

Polishing
1. If granite is visibly scratched, go to Procedure for Diamond Grinding first.
2. Then apply 1 scoop of Majestic Granite Polishing Powder on the floor.
3. Use a weighted floor machine – approx 140 lbs less stack weights and #0 or #00 steel wool pad.
4. Work about a 10 square foot area.
5. Work slow – 6 to 8 passes – keep semi moist with the Majestic Marble Spray Polish Crystallizer.
6. Double rinse and recover with a wet dry vacuum.
7. High speed buff with a 20” white pad.

Impregnating
1. After 6-8 hours dry time, impregnate with Majestic Solvent Based Impregnating Sealer.
2. Smooth out with a micro fiber flat mop.
3. High speed buff with 20” white pad.
Procedure for Granite Polishing - continued

Daily Maintenance
1. Mop with Majestic Stone Soap, 1 oz. per gallon of water.
2. High speed buff when dry.

Deep Cleaning
As needed, scrub with Majestic Deep Cleaning Stripper Degreaser – See Step 1.

Procedure for Diamond Grinding Marble/Granite
NOTE: There are specific diamonds for marble and designated diamonds for granite

Step 1: Check for lippage and overall condition of floor

Step 2: Stage Equipment
• Mop, mop bucket and wringer
• Wet dry vacuum
• 17” or 20” weighted floor machine and/or weighted pad driver (Optimum total wt 140#)

Step 3: Provide Materials
• 4-5 stages of diamond discs (5 each grit)
• 17” or 20” natural hair floor pad
• 2-4 lbs Majestic Stone Polishing Compound
• 1 case Majestic Stone Soap

Step 4 (A): Serious lippage (quarter test) requires lippage discs along with stage grinding.

Step 4 (B): Minimum to no lippage proceed as follows:
• Wet floor.
• Start with #1 60 grit or #2 120 grit diamonds 4-5 per pad driver.
• Work in 4 x 4 sections – 8-10 SLOW passes.
• Figure on approximately 50 sq. ft. per hour per grit.
• Repeat with progressive diamond discs.
  #3 - 220 grit - Pick up slurry with wet dry vacuum.
  #4 - 400 grit - Pick up slurry with wet dry vacuum.
  #5 - 800 grit - Pick up slurry with wet dry vacuum.

Step 5: Rinse and check for smoothness and polish.

Step 6: For marble only - If condition has improved, go to Majestic Stone Polishing Compound with natural pad procedure. Work slurry slowly and recover with wet dry vacuum.

Rinse with Majestic Stone Soap and polish with white pad.

Step 7: If floor is still dull prior to doing Step 6, go up to #6 diamonds (1800 grit) then do Step 6.

Clean equipment and mop daily with Majestic Stone Soap.

If you maintain a regular systematic cleaning and occasional polish program, you can all but eliminate diamond grinding in the future. At worst, maybe some #6 or #7 fine grit touch up once a year and/or diamond pads.
Procedure for Cleaning and Sealing Grout on Polished Marble
1. Dilute Majestic Stone & Grout Intensive Cleaner at 8 oz. per gallon and apply to grout using pump up sprayer.
2. Agitate using variable hand tool with nylon brush, rotary floor machine with nylon brush or use nylon hand brush.
3. After all grout has been cleaned, wet vacuum floor.
4. Flood rinse floor with water.
5. Wet vacuum floor.
6. When floor is dry, apply impregnator evenly using pump up sprayer and spread with damp flat mop.
7. After impregnator has dried, buff with white pad.

Procedure for Intensive Cleaning of Unpolished Ceramic/Porcelain
1. Remove or strip all topical coatings with Majestic Deep Cleaning Stripper Degreaser.
2. Mix 1 part Majestic Stone & Grout Intensive Cleaner with 20 parts water.
3. Pre-wet surface and apply solution.
4. Scrub and recover with auto scrubber at 80 lbs. plus down pressure and stiff poly brush. (Optional weighted floor machine and wet dry vacuum.)
5. Repeat steps 3 and 4 with clear water to ensure floor is neutralized.
Optional: Impregnate with Majestic Water Based Impregnating Sealer (lasts 2-3 years).

Procedure for Restoration and Polishing of Unpolished Porcelain/Ceramic Tile
1: Strip off any wax or sealer.
2: (A) OPTIONAL: Scrub with tile rotary brush and weighted floor machine.
   Use Majestic Stone & Grout Intensive Cleaner.
2: (B) OR: Scrub with tile brush, weighted floor machine and Majestic Tile Polish #1.
   – 1 scoop per 100 square feet – Moisten to slurry.
3: Rinse and recover with wet dry vacuum.
4: Polish with weighted floor machine, hair pad and Majestic Tile Polish #2.
   - 1 scoop per 100 square feet – Moisten to slurry.
5: Double rinse and recover with wet dry vacuum.
6: High speed buff to shine with white pad.
7: Let floor dry for 6-8 hours.
Impregnate with Majestic Water Based Impregnating Sealer, sprayer and flat mop.
8: Daily mop with Majestic Stone Soap – ½ oz. per gallon.
NOTE: If soil builds up repeat step #2A.
Procedure for Stone Impregnating
1: After stone restoration process and/or new stone. Surface must be moisture free (6 to 8 hours).
2: Apply a light coat of Majestic Solvent Based Impregnating Sealer, Majestic Water Based Impregnating Sealer or Majestic Color Enhancing Impregnating Sealer with a pump up sprayer (Root Lowell type). Do not puddle.
Step 3: Level off with micro fiber flat mop or paint roller.
Step 4: If stone is very porous, repeat step 2 again.
Step 5: Let dry for 60-90 minutes.
Step 6: Buff out any streaks with burnisher and white pad.
NOTE: Surface is ready for traffic.
Average protection life 2 – 3 years.

Procedure for Use of Majestic Honing Powder
Equipment and Materials:
1. 175 rpm floor machine with Majestic drive pad
2. Two natural/hogs hair buffing pads
3. Majestic Honing Powder - 250 and 400 grit
4. Spray bottle of water
5. Easy mask or plastic sheeting for masking
6. Wet vac, mop, bucket, sponge, rags, etc.
Instructions:
1. Protect adjoining surfaces such as carpeting with masking material.
2. Plan to hone a maximum of about 15 square feet at a time.
3. Two scoops of Majestic Honing Powder will hone about 15 square feet. Adjust the amount of powder you use to cover the size of the area you are honing.
4. Sprinkle Majestic Honing Powder on the floor to cover an area about the size of the buffing pad.
5. Wet the powder with water to form a paste consistency while buffing.
6. Place the 2 buffing pads stacked one on the other and the machine over the powder and begin buffing. Buff on direction and at 90 degrees to help get into low spots/lippage at the grout line. Buff about 5 minutes adding water as needed if the slurry begins to dry.
7. Flood the area with water and buff over one more time.
8. Remove residue with wet vac, mop and let dry.
9. Check for desired results and repeat above if needed.

Procedure for Re-Crystallization
NOTE: This process only works on stones that are calcium carbonate based (Marble, travertine, terrazzo, etc.)
Crystallizer is a wax/acid formulation.
Do not let chemical settle on floor. BUFF IMMEDIATELY
Step 1: Preparation
Remove any topical coatings (wax) with Majestic Deep Cleaning Stripper Degreaser
Rinse and recover.
Step 2: Procedure
Use a 175 rpm weighted floor machine (140 lbs) and #00 or #0 steel wool pad.
Fill a trigger bottle with Majestic Marble Spray Polish Crystallizer, working a 3 x 3 area – spray and buff until dry.
Rotate in four sections.
Blend until desired shine is achieved.
Turn steel wool pad over when it becomes too wet or loaded with product. (200-300 sq. ft.)
Maintain with Majestic Stone Soap.
NOTE: Over time a cap or coat could form on surface and you will have to repeat step #1 again to remove the wax build up.
Procedure for Majestic Cleaners and Strippers

Majestic Neutral Cleaner - Floors
1. Dust, mop, sweep, or vacuum the floor to remove any loose dirt that may be present.
2. For normal cleaning mix 1 part Majestic Neutral Cleaner to 16 parts water. (Approximately 1 cup per gallon of water) For heavy soiled floors mix 1 part cleaner to 6 parts water. Note: To avoid foaming be sure to put the water in the container first and add the cleaner to the water.
3. Damp mop floor with a clean mop set aside for use only on your stone floor.
4. Allow the floor to dry completely before allowing any foot traffic. If water streaks occur, simply buff them off with a soft cloth or white buffing pad.
5. Every 2 or 3 months, wet the grout lines with the “heavy” mix and scrub them with a bristle brush. Follow with the normal damp mopping procedure.
6. Since Majestic Neutral Clean is a neutral cleaner you may mop as often as needed. We suggest mopping at least once per week.

Majestic Neutral Cleaner - Upper Surfaces
Mix Majestic Neutral Cleaner with water using the same instructions as floors above.
1. Pour into a spray bottle and spray on to the surface or apply with a sponge or soft cloth and scrub vigorously. Wipe dry with a clean, soft cloth.
To clean marble - If no sealer is present, mix 1 part Majestic Deep Cleaning Stripper Degreaser to 12 parts water.
To remove wax - mix 1 part Majestic Deep Cleaning Stripper Degreaser to 4 parts water.
To remove sealer - mix 1 part Majestic Deep Cleaning Stripper Degreaser to 2 parts water.
For counters, tables, etc. - apply liberally to marble surface with sponge. Allow to stand 3 to 5 minutes, then agitate with brush or sponge. Rinse thoroughly and allow to dry before applying polish. Maintain with Stone Plus RTU spray.

Majestic Stone Soap
1. Dust mop floor.
2. Mix 1 ounce Majestic Stone Soap per 1 gallon water.
3. Damp mop with blended loop or flat mop.
4. Let air dry.
5. Periodically buff with high speed buffer and white pad. The microscopic residue from the Majestic Stone Soap will produce a highly reflective shine.

Procedure for Anti-Slip
Majestic Anti-Slip is a one step cleaner and polisher used to dramatically increase the slip resistance for all hard surface flooring. Anti-Slip is non-flammable, biodegradable and free of phosphates, solvents and abrasives.
For Use On: All stone, rigid, composite and previously sealed and polish floors.
Product Features: Cleans, polishes and protects. Increases slip resistance on both wet and dry floors. No build up. Immediate ROI by lowering your cost of risk.
Directions:
1. Remove all waxes and finishes using Majestic Deep Cleaning Stripper Degreaser.
2. Use 3 or 4 ounces of Majestic Anti-Slip per gallon of water for normally soiled areas. Heavy soiled or very slippery floor may require a higher concentration.
3. Thoroughly wet the area, agitate and pick up. Do not rinse.
4. To increase shine or repair scuffs, buff the treated area with a white or red nylon pad.