

## **Comparison of Two Maintenance Systems for Stone**

### **By Dr. Fredrick Hueston**

Purpose of Study: To compare and evaluate the advantages, disadvantages, required labor of two popular stone maintenance programs.

Introduction: The maintenance of stone flooring in the United States today is a million dollar a year business and continues to grow. This increased growth results from the desire to maintain a highly polished mirror finish. As of this date there are basically two methods to keep stone in this condition. One method is to place some type of a coating on the surface of the stone. These coatings can be natural or synthetic waxes, acrylics, urethanes and epoxies. The majority used today on marble are composed of acrylics. The second method used to maintain stone is to polish the stone with the use of abrasive diamonds and polishing powders. This method uses no coatings. It simply smoothness the stone to produce a high shine. The purpose of this study is to compare the advantages and disadvantages of these two methods as well as their labor and material requirements. A third method becoming popular is the use of fluorosilicate compounds applied to the stone. This method is commonly called re-crystallization or vitrification and is applied as a final finish in place of powder polishing or it is applied on top of the polished finish for added shine. This study will not address this process.

#### ***Maintenance of coatings***

Once a stone floor is coated the following is the standard procedure for maintenance:

1. The entire floor is dust mopped(daily) .
2. The floor is then damp mopped or machine scrubbed with a neutral cleaner (daily).
3. Worn areas are spray buffed using a standard floor machine and a red pad. If a high speed finish is used the floor is burnished using a high speed buffer (daily).
4. Areas that do not shine after buffing or spray buffing are re-coated (daily as needed).
5. Periodically the floor is stripped and re-coated (every six months or more often).

#### ***Maintenance using honing and polishing***

Once the stone floor is honed and polished the following is the standard procedure for maintenance

1. The entire floor is dust mopped(daily).
2. The floor is damp mopped or machine scrubbed with a neutral cleaner or stone soap (two-three times per week).

3. Traffic areas are polished with polishing powder (once per week in high traffic, less often in lower traffic).

4. Severely worn areas are lightly honed and re-polished (once every six months)

Both maintenance procedures described above are typical. Frequencies will vary depending on traffic, type of stone and desired finish. Both procedures assume that floor is in maintainable condition at start of maintenance program.

### ***Method of study***

In order to evaluate both of the above methods three commercial lobby floors were studied. All three floors have used both methods for a period of one year or more. Maintenance personnel and executive housekeepers were interviewed to obtain costs, advantages and disadvantages of both methods. Since hourly labor rates vary from state to state, this study will provide labor hours only.

### ***Case Study #1***

Property - Busy Hotel lobby located near a major theme park.

Floor Description -12,000 square feet of Rosa Perlino marble in a Palandiana terrazzo pattern. Very busy lobby with traffic areas include large reception check in and four elevator banks. Floor is adjacent to a swimming pool area.

### ***Maintenance procedure (coating) from date of installation to 1992:***

When floor was complete several coats of a carnauba based sealer was applied.

1. Floor was dust mopped daily in the evenings during third shift.
2. Floor was wet mopped daily using a commercial, neutral floor cleaner.
3. Floor was spray buffed every night to remove scuffing, black heel marks and wear.
4. Floor was recoated daily in heavy traffic areas with a light coat of the carnauba based sealer.

*Total daily man hours required 16 hours*

Comments on maintenance program (coating) from staff and executive housekeeper:

Floor very difficult to maintain. It appears to mar, scuff very easily. Once floor is spray buffed it looks great but once traffic starts the finish rapidly deteriorates.

The finish on the floor is turning yellow and becoming very dark and dirty looking. The wax is accumulating in holes in the marble and turning black.

***Maintenance procedure (polishing) from 1992 to present:***

In 1992 the entire floor was stripped, the holes filled and then honed and polished using standard marble polishing powders.

1. Floor is dust mopped every evening.
2. Floor is damp mopped three times per week using a stone soap.
3. Traffic areas are re-polished once every two weeks using standard marble polishing powders.
4. As of this date no re-honing has been performed. Inspection of the floor and wear ability indicates that honing of traffic areas will need to be about once per year.

*Total daily man hours required 6 hours*

Comments on maintenance program (polishing) from staff and executive housekeeper. Our labor costs have been cut dramatically and the floor looks and stays clean longer. Dirt doesn't seem to stick to the floor like it did before.

***Case Study #2***

Property - Busy hotel lobby, located next to major interstate exchange.

Floor description - 3500 Square feet of Rosa Alicante marble, 12x12 inch tiles. Busy hotel lobby floor with constant traffic due to adjacent meeting rooms.

***Maintenance procedure (coating) prior to 1992:***

Floor was initially stripped and several coats of an acrylic floor finish were applied.

1. Floor was dust mopped daily.
2. Floor was wet mopped daily with a neutral cleaner.
3. Once per month the entire floor was re-coated with acrylic floor finish. No spray buffing was performed between re-coatings.
4. Once every three months the entire floor was stripped and re-coated.

*Total daily hours required- 4 hours*

Comments on maintenance program (coating) from staff and executive housekeeper.

- Floor looks great for one day a month, immediately after it is re-waxed.
- During the remaining time it looks just terrible.
- Floor has a real plastic look; it doesn't even look like marble anymore.
- The bellman carts are leaving marks on the floor all over and the area in front of the reception desk is very dull.

***Maintenance procedure (polishing) from 1992 to present:***

The entire floor was stripped to remove all the old wax, re-honed and then powder polished using standard marble polishing powders.

1. Floor is dust mopped daily.
2. Floor is wet mopped daily.
3. Traffic areas are re-polished once per week using polishing powder.
4. As of this date re-honing is required about once per year of approx. 800 square feet.

*Total daily man hours required 1 3/4 hours.*

Comments on maintenance program (polishing) from staff and executive housekeeper.

- Our floor looks like marble again and the carts are no longer marking the floor.
- Dust mopping and wet mopping are now a snap.
- The mop seems to glide very easily over the floor and we are not picking up as much dirt as before.

***Case Study #3***

Property - High rise apartment building lobby located in Canada

Floor description -1000 square feet of a Negro Marquina and White Carrara in a checker board pattern. Very busy residential condo with approx 80 condo units.

***Maintenance procedure (coating) from date of installation to 1992:***

This floor has been waxed for the past several years with the following maintenance program.

1. Floor was dust mopped several times per week.
2. Floor was damp mopped several times per week, daily during the winter months.

3. Floor was spray buffed once per week.
4. Floor was stripped and re-coated with an acrylic floor finish once every three months.

*Total daily man hours required 1 hour*

Comments on maintenance program (coating) from staff and property manager.

- Floor always looks dull and scratched.
- I can never seem to keep up with the floor, it is always scuffing (Janitor)

***Maintenance procedure (polishing) from 1992 to present:***

Floor was stripped, ground flat, re-honed and polished using standard marble polishing powders.

1. Floor is dust mopped daily every morning.
2. Floor is damp mop once per week, daily in winter.
3. Traffic areas are repolished once per month.

*Total daily man hours 25 minutes*

Comments on maintenance program (polishing) from staff and property manager.

- Our floor is shiny again, it looks great.
- I can't believe how easy the floor is to maintain, no more stripping and waxing.

**Maintenance Methods Summary**

*Daily labor hours required*

	<i>Strip and Wax</i>	<i>Hone and Polish</i>
<i>Case Study #1</i>	16 hours	6 hours
<i>Case Study #2</i>	4 hours	1 3/4 hour
<i>Case Study #3</i>	1 hour	25 Minutes

***Material Costs:***

Cost for materials and consumption was difficult to obtain from housekeeping staff. Based on guess estimates, material cost were insignificant compared to labor cost. The costs of polishing powders and diamond abrasive were slightly lower than the use of strippers and coatings.

## ***Conclusions & Discussion***

Based on the above case studies it is apparent that the honing and polishing method is more economical than the use of coatings on stone flooring. Labor costs are reduced by one-half or more.

### ***Reduction in labor costs***

- *Case Study #1 is saving 3650 hours per year, at an average labor cost of \$12.00 per hour this is a savings of \$43,800.00 per year.*
- *Case #2 labor savings is equal to 821 hours per year or \$9852.00 per year saved based on average labor cost of \$12.00 per hour.*
- *Case #3 saves 212 hours or \$2544.00 per year.*

Although costs are a major consideration when comparing the above two maintenance programs, it is also apparent that there are distinct advantages to the honing and polishing program as well as some disadvantages to the coating program. Coatings will mar, scuff and wear very easily. It is a well known fact that there are no coatings currently available for stone that are harder than the stone itself. For this reason coatings will scuff and mar much more than the stone itself. It is often argued that these coatings place a sacrificial layer on the stone protecting it from dirt and staining. Although this would make sense the opposite is true. These coatings are soft and will attract dirt faster than a natural polish. This is easy to prove if one takes a section of stone floor and applies a coating and on another section performs a hone and polish. After one or two days it will be discovered that more dust and debris is attracted to the coated surface than the honed and polished surface. It will also be discovered that removing the dust and debris from the coated surface is much more difficult. Coatings also will build on the surface producing a plastic like appearance. Some coatings will also turn dark and yellow rapidly. This is especially true if the stone is exposed to ultraviolet light. The removal of coatings by the use of harsh strippers can also damage the stone. Many strippers contain Sodium Hydroxide, which can form what is known as an alkaline salt. These salts can penetrate into the stone and cause premature spalling. Some coatings may also block the breathing of the stone causing it to suffocate and rot.

How does one protect the stone from staining if coatings are not used? Stone can be protected with products known as penetrating sealers or impregnators. These materials are designed to penetrate below the surface of the stone and keep water and debris on the surface. Since they are not coatings they will not require repair. They do not however add gloss to the stone surface.

The following table outlines the advantages and disadvantages of the two maintenance programs studied. Although only three case studies were used, many contractors and maintenance companies were interviewed to obtain these conclusions. Those who use the hone and polishing programs are very pleased and will not return to the old strip and coat

method. Those companies interviewed who use the strip and coat method were not aware that another program existed.

Although this study shows that the polishing method is more economical, caution is advised. Each case must be studied carefully. Labor skill, budget requirements and existing condition of the stone must be evaluated before choosing the proper maintenance system. Those using marble polishing powders and diamond abrasives must be trained in their proper application. There are many quality coatings available that may be a good alternative to the above system if these special skills are not available. It is advisable to contact a reputable stone maintenance professional for advice.

***Advantages and Disadvantages Summary***

<p><i>Coatings- Advantages</i></p> <ul style="list-style-type: none"> <li>* Can be repaired by buffing</li> <li>* Easy to apply</li> <li>* Provides a sacrificial Coating</li> </ul>	<p><i>Hone and Polish-Advantages</i></p> <ul style="list-style-type: none"> <li>* Will not scuff and mar</li> <li>* Provides a natural shine</li> <li>* Longer lasting than coatings</li> <li>* Allows stone to breathe</li> <li>* Reduced labor costs</li> </ul>
<p><i>Coatings- Disadvantages</i></p> <ul style="list-style-type: none"> <li>* Will mar and scuff</li> <li>* Can Yellow</li> <li>* Stripping is required</li> <li>* Can appear plastic-like</li> <li>* Can block breathing of stone causing spalling</li> <li>* Will attract dirt</li> <li>* Labor intensive</li> <li>* Lifetime maintenance cost</li> </ul>	<p><i>Hone and Polish- Disadvantages</i></p> <ul style="list-style-type: none"> <li>* Increased skill level- Training required</li> <li>* Does not provide stain protection</li> <li>* Initial cost</li> </ul>