

Concrete

Polishing & Maintaining Concrete

Concrete has been rediscovered! Interior designer, restoration contractors and even retail chain stores are reinventing the way concrete is being used and/or viewed as a building material. Interior designers are now marketing kitchen countertops made of concrete, Tile and Marble Showrooms are displaying them and stoneworkers are devising their own molds to form them, using new tooling to cut them into specific shapes and finding diamonds and other abrasives to polish them. Retail chain stores are enhancing the appearance of their concrete floors and warehouse chains are having their floors highly polished between steel racking that houses the merchandise they sell.

The Stone Industry has quickly jumped on board by providing the specialized products necessary to provide the restoration contractor with the proper tooling to polish concrete as well as the products necessary to enhance the appearance and protect the new polished finish. Many of the restoration and maintenance products designed for natural stone are being cross-sold for concrete.

Those of us in the Stone Industry with years of experience and expertise regarding the proper polishing and maintenance of natural stone are suddenly being called upon to help the Building Service Contractor learn some new tricks about concrete. Although I am the CEO of my company with the traditional corner office and all of the amenities, I am from the “old school” when it comes to recommending new products and/or programs. I roll my sleeves up and immerse myself into the “testing phase”. With many of the products I sell for natural stone in hand, I escaped into my warehouse and much to the dismay of my employees, I began to polish the concrete floor.

A little background knowledge is necessary at this point. I knew that most of my stone products would work on concrete because marble and concrete are both calcium based. Therefore, as a stone professional, I treat them the same way. There are some important variations, however, depending upon the quality and grade of the concrete surface. Some concrete has quartz minerals mixed in and the amount may vary depending upon the geographic locations around the United States. Quartz is hard and, therefore, hard to cut. These variations affect the polishing rate of many diamonds and diamond blades and can cause great expense to the inexperienced restoration contractor or fabricator. Being aware allow the contractor to purchase the correct diamond pads or blades that are designed for concrete. These cutting tools wear appropriately, extending the life of the diamonds making the job cost-effective. Being aware also allows the contractor to price the job accordingly based on how many steps the polishing sequence will need and what type of polish the customer is going to be satisfied with. The contractor using diamond pads can go as high as a 3500 grit if the customer requires and extremely high polish.

In addition, some concrete surfaces have aggregates exposed, as was the case in some sections of the floor in my warehouse. I used an epoxy-based penetrant designed to consolidate brittle stone, and make the surface even after polishing. It worked the same way on the concrete. This is good news for the building service contractor faced with an uneven, brittle, cracked or chipped concrete surface to polish.

Another concern is the location of the concrete floor. If the floor is near a food service area, near restrooms or in high foot traffic area, there will be staining on the concrete. Many of the stains have absorbed beneath the surface requiring diligence to remove and some are permanent. If allowed to remain, the stains will show through the newly polished floor and mark the appearance. It is important to inform the customer when stains cannot be removed before beginning the job.

Concrete

Preparing the surface:

Step 1:

Cleaning:

The concrete floor should be thoroughly cleaned using a bristle brush on a rotary floor machine to remove the dirt embedded within the cracks. Use a pH neutral stone cleaner for the best results. If stains remain, use a slightly acidic stone cleaner but make sure to finish cleaning with the pH neutral stone cleaner to neutralize the effects of the acid cleaner.

Step 2:

Repairing Cracks:

Cracks need to be filled in. You will need to choose the appropriate epoxy for this purpose. Epoxies have different viscosity's. Large cracks can be filled and repaired with a thicker epoxy while smaller cracks or micro fissures require a penetrating or thinner epoxy that will absorb into the concrete, consolidating it and strengthening the joint. The same epoxies that are used for natural stone are perfect for this application and they can be color tinted using epoxy color tints.

Step 3:

Mechanical Grinding or Flattening:

Now that the floor is "prepped" properly, you can begin the actual grinding process. Mechanically grinding concrete is the same process as grinding stone with one exception. Mechanically grinding marble can be accelerated by using an abrasive powder or a crystallization product towards the end, eliminating some of the last sequences. However, I found that my 5X powder added towards the end did not increase the shine on my concrete. Therefore, I recommended a course grit diamond to flatten the floor area as a first step. Use a quality rotary machine with a three head disk as three heads provide more pressure to grind the lippage. Five heads are less flexible and can ride over the top without cutting. Fill the solution tank with water. Continue by using a sequence of diamonds from course to a very fine grit, or silicone carbide abrasives, which are less expensive (my personal preference). Using a crisscross pattern, abrade the concrete to a highly polished finish. Crisscrossing will prevent scratch patterns from being left on the surface. Follow the manufacturers instructions exactly as all diamond pad manufactures have their own sequencing routine. When finished, you will notice the different color quartz minerals in the concrete.

Step 4:

Protection:

The newly polished floor needs to be protected the same as you would any natural stone floor. Thoroughly clean the floor first. Use the same pH neutral cleaner you used in Step 1. The type of sealer/impregnator selected depends upon the location of the floor; the type of foot traffic, exposure to staining and building maintenance schedules. If the floor is near a food service area or restrooms where it may be subject to grease and oil stains, it is best to use an impregnator. Impregnators line the pores of the stone to prevent stains from absorbing into the stone, keeping them at the surface for easier removal during general cleaning. The stone is allowed to breath which means that vapors can escape through the pores of the stone. Concrete requires the same treatment. Barrier sealers trap humidity between the sealer and the surface and can cause a dull, cloudy appearance. They can also yellow.

High foot traffic areas, however, may require a barrier sealer to prevent wear and tear. I recommend an acrylic sealer made specifically for natural stone.

Polished Concrete

Step 5:

Polishing:

There are many polishes and waxes on the market, but I recommend that you limit your choice to one designed specifically for stone. There are residential polishes that do not require a floor-polishing machine for buffing. They work well in smaller areas with less foot traffic. Others require a small rotary buffer, which many homeowners have. Apply the polish according to the manufacturers instructions. Use a mild stone soap for daily or periodic cleaning as necessary. All waxes must be stripped periodically. Use a wax stripper designed for polished stone. Be sure to read the directions carefully as many wax stripper's state on the label that they can only be used on acid-resistant surfaces. A polished concrete must be treated the same as polished marble and neither on is acid-resistance. The wrong stripper will etch the surface requiring regrinding.

Commercial waxes/polishers are more durable but almost all require a rotary buffing machine. I recommend using a wax or polish designed specifically for natural stone. Heavier waxes are necessary in high traffic areas. Read the manufacturer's instructions carefully as some waxes and polishes require higher speed buffing machines, as high as 1500 rpms.

My company recently developed a polishing system for maintaining the shine on an acrylic barrier sealer. The first wax is applied and buffed, followed by the second polish. These two products in conjunction with each other last for several weeks before the floor needs to be stripped and re-polished.

Step 6:

Maintenance:

It is imperative to establish a maintenance routine to preserve the new shine on your concrete floor. I recommend a diluted pH neutral stone cleaner as often as necessary. Dust mopping throughout the day is essential as most polished surfaces are damaged by sand and grit brought in from the outside. Also, as with any stone floor, protect entrances with mats, especially during winter months. The routine I recommend to my stone customers is simple and cost effective. Clean – Protect – Shine. Use a pH neutral cleaner daily. Re-apply the impregnator/sealer every 6 months to a year depending upon the location and condition of the floor. Do this immediately after stripping all coats of wax and/or sealers on the surface. After protecting the floor, re-polish. Go back to your daily cleaning routine.

After my "hands-on" testing project was complete, I realized that polished concrete is unique. My floor was transformed into a mirror and the quartz chips sparkled in the light. The reflections of the overhead bulbs were crystal clear on the surface of the concrete. I treated the concrete as though it was marble and the result was spectacular. After several weeks of forklift traffic, my floor still shines. I used my best polishing system because of the location and I am pleased with the result. A simple mopping removes the dirt without dulling the luster.

Years ago, most professionals used barrier sealers to preserve the luster on natural stone. Today, with better education, we offer products that achieve the same result without causing damage to the stone. These products together with a regular maintenance program eliminate the need for costly regrinding.

Sal Banchitta is the CEO of Akemi North America and Bellinzoni USA. He graduated from Hunter College with a Bachelors of Science in Geology. Sal has twenty years of expertise in the restoration and setting of natural stone.