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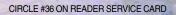


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Dear Readers,



oday America sees a different face on its citizens. One that reflects appreciation of simpler things in life and one that seems more quiet and now more reserved. The face may sometimes be sad or discouraged, but as we have recently experienced, quick to show determination and gladness at signs of goodness or acts of selflessness. These faces may not all show the scars of battle, or of loved ones lost, but their expressions are the face of Americans, free, patriotic and unwavering in perseverance.

My 39 years of life have shown me that in bad, good can always be found. Through difficulties large

and small come greater endurance, and determination to make life better for ourselves. It may be prompted by a competitiveness to win, but these days strengthen our character and our humanitarian role that best depicts the beauty of our freedom and American spirit. It is this changing face of Americans that today is strengthening us as a nation and the world around us.

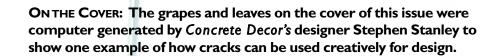
As tradesmen, we can make a significant impact on those around us simply by our attitudes and the way we approach our jobs each day. As this country was made great by the hands of many artisans, our founding fathers, we must carry on the legacy with pride through quality workmanship. Education, employers, family and friends impart to me the necessary skills for growing my business but it is my choice each day to do my personal best. This instills pride and that is something no one can ever take from us.

The trades are a good place to be. It's hard work but it provides faithfully for our needs. It's our canvas on which others can find beauty and a greater sense of self. Our quality work gives comfort to the people around us. Our hands create, where once there was something less. Our skills help us to better demonstrate our abilities to express ourselves freely in infinite number of ways that the world can marvel at and that simply give back to our country what it has so graciously given to us.

This Thanksgiving holiday will be difficult for many who are physically and emotionally hurt by these resent tragedies. However, our God did not give us a mind and body for hurting one another but rather to love and encourage each other. These are basic values and basically what we must stand for.

Happy Thanksgiving,

Bent Mikkelsen Publisher





Fall 2001 • Vol. 1 No. 3 • Issue No. 3 • \$6.95

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Concrete Decor The Journal of Decorative Concrete is published four times a year (Spring, Summer, Fall, Winter) by Professional Trade Publications, Inc. Bulk rate postage paid at Lebanon Junction, KY and additional mailing offices.

Subscriptions: One year: USA \$18.00; Canada \$34.00; Other countries \$64. All funds in U.S. dollars.

> *For Subscriber Services:* Call 866-341-3703 Toll Free *For Advertiser Services:* Call 877-935-8906 Toll Free

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Decorative Concrete Tips

Decorative Concrete Tips is a forum for readers to exchange information about methods, tools, and tricks they've devised.We'll pay for any we publish. Send details to CD Tips, Concrete Decor, P.O. Box 25210, Eugene, OR 97402. We look forward to hearing from you!





ant more flexibility, speed and control when applying stains to concrete? Here's a great garden sprayer that Marvin Dodson at Rare Earth Labs was recently using while demonstrating the use of his acid etch stain products. Available at your local K-Mart or Wal-mart stores, this small hand held pump sprayer has an adjustable nozzle for fine mist spray application under high pressure or gentle sprinkling or streaming action at low pressure. The only metal part susceptible to acid corrosion is a small spring which is replaceable and available at your local automotive supply. In fact, with regular water cleanup after every use, a single spring will last several jobs. For the ultimate look on your next stain job this sprayer is one heck of a tool. — Marvin Dodson, Rare Earth Labs he "Torpedo Groover" from Slip Industries has become an invaluable tool for the guys that know its advantages in placing control joints but as a decorative hand tool it has also taken on some slick advantages. As the name implies, the Torpedo Groover is long and straight. Once it is placed into the concrete it will guide you straight from point A to point B. It separates the aggregate up to 1½" inches deep so it also helps significantly to control cracking. Where jointers have difficulty cutting a straight path the Groover has absolutely no problem giving the jointer a straight path to follow.

Have fun cutting new lines in your flatwork with the Torpedo Groover. Now the time it takes to place joints has just become the least of your worries and design possibilities your greatest passion.

— Slip Industries, Livitz, PA



Western Forms, Inc. appoints Lavon Winkler President and Chief Operations Officer

Mr. Lavon Winkler accepted the position of President and Chief Operations Officer at Western Forms, Inc. He will be responsible for operations of all domestic and international business units and implementing strategic plans that enhance the growth of the Western Forms brand and products worldwide.

Mr. Winkler brings to Western Forms professional management and a successful track record in the manufacturing and construction industries. In 22 years of service with Butler Manufacturing, he held positions in Information Systems, Engineering Management, Venture Management, Regional Sales Management, and Customer Relations. His most recent position with Butler Manufacturing was vice-president of Butler's Engineering division. He holds a BS in Civil Engineering from the University of Missouri and an MA in Management from Birmingham Southern.

Western Forms, Inc. is the leading aluminum form manufacturing company in the United States. The Kansas City based Western Forms has been family owned and operated since founding 1955 and offers a full range of aluminum forming products and accessories for concrete foundations, concrete homes and precast industries. For more information on Western Forms, Inc. please call 800-821-3870 or fax your request to (816) 241-6877.

Please note these corrections

Pages six and seven of the Summer issue of *Concrete Decor* magazine mistakenly used four photos provided to us as reference materials. The top four pictures were actually the work of Bomanite contractors and not those of other quality work our Contractor Profile is well recognized for.

HOT news about Concrete Decor

Starting January 2002 we will begin publishing *Concrete Decor* magazine six times annually instead of quarterly. This decision will build greater awareness for *Concrete Decor* as a reliable industry resource and will better serve our unsurpassed and growing nationwide readership.

Daily we receive calls from our readers about exciting new product developments and other newsworthy events. Bi-monthly publication of *Concrete Decor* will increase the flow of valuable information within this expanding market of the concrete construction trade. We thank everyone for supporting these exciting new developments.

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Industry Events

Learning Opportunities, Essential to New Skills and Improving Old Ones

ast month Concrete Decor had the opportunity of participating in a Scofield Institute training seminar in San Jose, Calif. The evening before this two day event we enjoyed a great dinner hosted by the L.M. Scofield Co. The sold-out event included a unique blend of both new and seasoned tradesmen to this "Interiors Workshop."

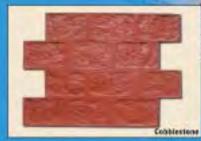
Like any seminar that covers lots of ground in a short timeframe, the Scofield Institute provided its students with excellent pre-printed guidelines for fast and effective notetaking. Several Q&A opportunities provided for active interaction among Scofield staff and students during every session of this hands-on workshop. Mr. Bob Harris, Director of Training and New Product Developments at the Scofield Institute, was the keynote speaker and our trainer for the seminar. Also on hand were representatives from the USF Surface Preparation Group, best known for the Sawtec and Blastrac product lines. (see their ad in this issue). They demonstrated new products and provided for an effective hands-on use of their tools during the course of the event.

From surface preparation to overlay application, design creations and implementation, the seminar offered everyone ample opportunity to physically involve themselves in all aspects of the overlay, design/sawcutting, staining and sealing processes. These two days of training also provided several tips and techniques to students that can only become fully understood in this type of learning environment. Although the day ended at five o'clock another dinner engagement gave everyone time to compare notes and discuss the day's events.

If you want to learn valuable skills that support your business development efforts, learning opportunities like these are essential. Thanks to the Scofield Institute and many others like them, placing importance on education has significantly improved the interest there is today on decorative aspects of concrete work as a reliable and beautiful alternative to other product offering.

If you are considering this type of learning opportunity *Concrete Decor* invites you to visit us on-line at www.concretedecor.net. Select training from the menu bar and you can find a growing list of companies that offer educational training services throughout the year. Many are companies with extensive and proven records for providing students valuable tools for improving their skills, their business and level of profitability.













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USA

by Robert Simpson

Contractor Profile

Mark Donaldson and Rebecca Meyers Skookum Floors,



hen Mark Donaldson and partner Rebecca Meyers saw a decorative concrete floor they knew instantly this was the product they were seeking. Impressed with decorative concrete's cost-efficiency, durability and unlimited design potential they were quick to recognize its commercial possibilities. In fact their fascination with interior decorative concrete flooring was so fervent they bought the company.

"My career objectives have always been entrepreneurial, so when I recognized the practical applications of decorative concrete flooring I was convinced I could build a company around it," says Mark Donaldson, president of Seattle, WA-based Skookum Floors USA Ltd.

Donaldson and Meyers represent a new breed of entrepreneur. They are symbolic of Generation Y — characterized as ambitious, methodological and steadfast. In 1998, despite no previous experience in the paint or concrete trades and only 24 years old, Donaldson gave up the security of his marketing job to begin Skookum Floor Concepts Ltd.



A year later Meyers threw in the towel and joined him.

"There was a project under construction in our neighborhood, so I stopped by and talked with the construction manager about decorative concrete flooring. By the time I left he had asked me to bid on the project. A couple of weeks later we got the job and the company started," says Donaldson.

Now, four years later, Skookum Floors has grown to become one of the premier decorative concrete flooring companies in the Pacific Northwest. Their portfolio includes such high profile projects as the Vancouver International Airport Domestic Terminal and Coast Mountain Sports, a thriving chain of retail outlets. Initially Skookum Floors established a solid reputation in the industry while working on smaller 1,000-7,000 square foot jobs and now focuses his efforts on larger 30-50,000 square foot commercial jobs.

"Our business philosophy has been straightforward-we don't over-promise and under-deliver and we do what we say we will," says Donaldson.



But maintaining these steadfast business principles has not come easily, as Donaldson is quick to admit.

"The learning curve has been very steep. In a very short time we had to distinguish our product and service from the competition. We knew the key to our success was to become specialists and that required investigating every aspect of the decorative concrete industry," says Donaldson.

Product Knowledge is Power

Part of being successful in this market is knowing the various products available and how to best integrate them into the flooring system offered. The best way to provide value and increase profit margin is to educate prospective clients on the products used, how they differ from one another and, and which options best meet their needs. Understanding this, the primary challenge for Donaldson was finding products that would form a reliable architectural flooring system-one with durability, superior performance and which satisfies the end user.

"We wanted to provide clients with the best interior decorative concrete flooring available," says Donaldson. "There are several manufacturers who claim their systems are the best performing so we spent several hours testing products to determine if they stood up to the claims they made. Several do not. We put in a lot of time into doing product research before we finally discovered a combination of products we were confident would provide the best available architectural flooring system on the market," says Donaldson. "The research is ongoing and we are constantly seeking and demanding better performing products. Research is key to our success."

Donaldson recommends keeping comprehensive notes about every job. It provides him with the tools for assessing product performance under varying conditions. He also uses the notes to determine the best combination of products to use on future jobs. Notes include everything from ambient temperature and work conditions to total time required on a job.

After discovering a combination of products that Donaldson was confident would set his product apart from the



In 1998, decorative concrete was a relatively new concept in the Pacific Northwest and finding employees with the skills for the job was demanding. Both Donaldson and Meyers realized the challenges early on. There are no certification standards or nationally recognized programs that train decorative concrete professionals and no way to assess individual skills. This is a specialized profession that requires the careful eye of a professional painter and the technological expertise of a concrete finisher.

"Attracting good employees requires a good company-one that is above repute in every respect and promotes doing business the right way. That means having proper insurance, payroll systems and providing good working conditions. It also means demonstrating management's commitment to the company by rewarding employees with bonuses when there is positive growth," says Donaldson who after an extensive search found an enthusiastic foreman and crew.

To keep employees with the company both Donaldson and Meyers work very hard to create and maintain an environment where employees are

comfortable, working for a reputable company and remunerated well for company growth. "Everyone is enthusiastic about the quality of the product we deliver and motivated by the company's progress. Our employees know they are an integral part of a reputable company and we recognize that our ability to build the good reputation of the company is dependent on our employees. At the end of every job we all stand back and breath a collective sigh-we are proud of what we accomplish as a team," says Meyers. "Without good employees we don't have good business."

With product and people in place the remaining link in Skookum's success is promotion.

The company has an impressive marketing portfolio complete with color photos illustrating the versatility of architectural concrete flooring. The marketing materials also serve as educational tools providing a primer on decorative concrete-advantages, strengths and an illustration of the various design concepts available.

"Much of our sales effort is to educate potential clients about the benefits of decorative concrete. We designed our marketing tools to support this effort while also providing a good overview of the company's previous successes," says Donaldson. For those clients requiring immediate gratification Skookum has designed an extensive website (www.concretedesign.com). The website opened up a new international market for Skookum. Donaldson and Meyers receive calls daily from around the world inquiring about architectural concrete flooring.

"The key to marketing is that you have to make the call," says Donaldson. "After the call, product has to stand up for itself."

Donaldson says the most frustrating aspect of marketing decorative concrete flooring is confronting clients who have had bad experiences resulting from poor craftsmanship. "There are several companies that offer training programs on using their products. This has resulted in several small start-up decorative concrete companies who see the opportunity to make a fast buck. These companies often operate out of the back of their truck, provide poor quality craftsmanship and soon disappear from the industry, resulting in a bad rap for all decorative concrete trades," says Donaldson, who is frustrated by the lack of a professional certification standards for the decorative concrete industries.

"Having professional certification standards would help to restore confidence in the trade. I believe if this is an industry that is going to stay viable, standards will be required sooner than later," says Donaldson.

Bob Walsh, the technical director of the Master Painters Association agrees. "National standards usually only result after industry-wide failure which can severely harm an industry. Sooner is better than later," says Walsh.

Once a project is sold, off comes Donaldson's marketing hat and on goes his hard hat.

To ensure a successful job Donaldson recommends developing a clear line of communication with the general contractor. They should understand that architectural concrete flooring is scheduled as part of the finishing trades and that requirements reflect this. It may require educating them about decorative concrete finishes and in particular the conditions required for the job to be a success.

"We coordinate with the general contractor to get the job site to ourselves. Advance preparation is key. Knowing the layout and ensuring there is proper lighting, an accessible power and water supply and temperature control will help the job progress much smoother and guarantees better results," says Donaldson. Flexibility is also important; working on tight schedules requires not having fixed hours and it may mean pouring in the middle of the night.

Donaldson and Meyers admit they have faced several obstacles over the past four years, yet remain undeterred. Their goal to be a leading architectural concrete floor firm in the Pacific Northwest is within sight, and at the speed they've been progressing their long-term goals don't look too far off either. Long-term they want Skookum to be considered the best in the industry. They want to see a national certification program that includes installers across the nation and they want to diversify the company. Donaldson and Meyers are smart, ambitious and steadfast and if the last four years provide any indication watch for them to be featured on the cover of a Fortune 500 Business Magazine soon.



CIRCLE #48 ON READER SERVICE CARD



CIRCLE #46 ON READER SERVICE CARD

Concrete in disguise: Creative use of decorative forms

and liners make concrete look like what it's not By Susan Brimo-Cox



Photos Courtesy of Western Forms



atios, walkways, driveways and numerous other horizontal surfaces have been formed, stamped and colored to look like brick, flagstone and a variety of other materials for many years. Indeed, it's often a more economical and hardwearing substitute for the real thing. As a concrete technique, it was only a matter of time before it began climbing the walls.

Today, use of decorative forms and liners mean vertical projects can be structural and nice to look at. Drive down the highway and you're likely to see several examples: sound barriers and bridges, to name just two.

"We do a lot of heavy highway work," says John Toomey, project manager for Northern Construction in Hingham, Mass. "One out of every 10 bridges [we do] has a patterned design. Patterns, such as exposed aggregate ribbed patterns, make them more aesthetically pleasing."

In a project for Six Flags New England, Northern Construction used decorative forms for retaining walls and site walls, in addition to stamped concrete. The company used a creative approach for a high-end look, using borders and different colored caps.

Mark Scott, co-owner of Innovative Brick Systems in Boulder, Colo., says his company uses form liners to create natural-looking textures and patterns,

but also uses them for custom graphic work. "We did a sound wall project in Baton Rouge, La., in which we pre-cast sections with pelicans, water lilies and other sculpted effects."

In Virginia Beach, Va., a 3.2-milelong poured-in-place seawall project was finished in June 2000. Formed into the vertical surface facing the beach are fish, sea turtles and dolphins, as well as the seals of the city and the U.S. Army Corps of Engineers. But the wall is more than just decorative and protective; it's informative, too! According to Phill Roehrs, coastal engineer with the City of Virginia Beach, "At each street access the number of the street is imprinted, so you know where you are as you walk down the beach."

Light commercial and residential applications abound. Exposed foundations and ledgers, walls of buildings and homes, retaining and landscape walls, and community entrances have all been made visually appealing with decorative forms and form liners. For durability and beauty, a tavern or winery might consider a bar made of poured concrete in a simulated river rock, wood or brick pattern to complement the interior decor.

And don't forget, the little decorative details that can enhance a larger project. Cameron Morgan, general manager of Pacific Concrete Images in Laguna Hills, Ca., which manufacturers architectural profile form liners, points to swimming pool edges, wall caps, stairs and poured concrete kitchen countertops. "Forms can be bundled for larger caps," he says, not unlike one would stack crown molding. His company's polyethylene form liners have even been used to construct an outdoor barbecue, complete with concrete eating bar and stools.

The uses of decorative forms and form liners are apparently limited only by imagination and engineering capability. Which specific products to use, however, are often dictated by the job.

A product for every project

"Patterned aluminum forms are more expensive, but they are lightweight and

durable," reports Becky Kennedy, a sales representative with Precise Forms Inc. of Kansas City, Mo. And depending on how well they're maintained, "you can get 2,500 to 3,000 pours," she adds. The metal is stamped to create the pattern. Precise Forms offers two kinds of brick — smooth and textured — with deep mortars for extra detail, and a ribbed pattern. "A 3-foot wide by 8-foot tall section weighs 83 pounds. Ten-foot high forms are available and they can be stacked," Kennedy says.

Flexible forms are ideal for pour-inplace projects. With tilt-up applications, the form liners can be as large or as small as the pouring bed requires, according to David Salisbury, president of Polytek Development Corp. of Easton, Pa. "Flexible rubber molds can also be used for architectural elements - brackets, moldings, capitals and more — anything that can't be done in a rigid form." Flexible rubber formliners are utilized in both precast applications as well as with GFRC (glass fiber reinforced concrete) that can be sprayed about ³/₄" thick to create strong, hollow, light weight concrete castings of highly decorative objects.



"Form liners are light and easy to handle, and are a lot cheaper than a standard form," says Gale Fife, president of Cobblecrete International of Orem, Utah. If you use 4-foot by 8-foot or 6-foot by 12-foot forms, you won't need a lot of ties, he explains. "We recommend you stay with a smaller size and stack them. The wall will be stronger and you'll have less problems."

Tips of the trade

When working with decorative forms and form liners, there are a variety of general tips to help ensure success:

- Most contractors don't use admixes when doing this kind of work. However, in some instances, admixes and plasticizers may be needed to meet the specifications of the project for strength, while obtaining the cosmetic results desired.
- Design your mix for the job. The size of the aggregate should be based on the structural integrity needed.
- If doing multiple pours especially with integrally colored concrete make sure your pours are consistent. (See Manufacturer Profile in Winter 2001 Issue.)
- Vibrating the concrete is critical. Ridges and decorative elements can trap air. Use a proper size vibrator and don't pull it up too quickly.
- Use of sealers is a matter of geography and personal preference. Some contractors use sealers to lock-in the color. Others say they are vital anywhere there is direct sunlight in freeze-thaw areas. Sealer might not be used if you want a matte finish and walls that looked like they were there a long time.
- Take care of your forms. Clean them well after you use them. Remember, direct sunlight may damage urethane form liners. High temperatures over 140 degrees can also damage urethane form liners, causing them to break down and lose the integrity of the form lines.

When it comes to form liners, you can get any design you want standard to custom designs. Form liners are an investment up front, but offer savings in time and labor. You may pay \$5,000 to \$10,000 more for a custom liner, reports Scott, but nothing else would be like it. "On large projects, it's not a big expense."

"If the job is engineered and installed correctly, you can't beat a poured wall, especially one with architectural effects," touts Mike Lowe Jr., marketing director of Increte Systems of Odessa, Fla. "You save in labor and total life costs. The textures [and patterns] are pulled off real materials — slate, granite, limestone, river stone. Stone is expensive, so this is where form liners are so cost-effective. Installation costs are less expensive compared to veneer." Plus you don't have to worry about degradation or veneer delamination, he adds.

Form liners come in various grades, which have different life spans. How many times you need to use the form should be considered, as well as cost. For example, you may only get five to 25 pours out of low-reuse foam forms. If 50 to 60 pours are required, you'll need a higher quality form. High-reuse rubber forms might be reused 100 or more times, depending on the design or pattern.

Western Forms Inc. of Kansas City, Mo., and Milestones Inc. of Hudson, Wis., have teamed up to create a hybrid product called Monotex.[™] Paul Nasvik, owner and president of Milestones, describes it as a liner and rigid form that work together as a system. "The urethane form is cast into Western's rigid aluminum forms. Other forming systems, with ties and liners that have to marry to it, can be quite involved. This forming system eliminates the marrying problems." Currently, the system is being used to build several Habitat for Humanity homes in Houston, Texas. "The main push is working to convey to the housing market that concrete homes can look like traditional homes — and can be done quickly and cheaply," Nasvik explains. The Monotex forms are said



to handle 200 pours per set for exterior walls. The initial production liner system is in a brick pattern, but other texture samples are being made.

Another technique — not quite a mold, not quite a stamp—is showing excellent promise. Michael Allen Sr., owner and president of Allen & Sons Construction Inc. of French Camp, Calif., (see Profile in this issue) says his



Photos Courtesy of Western Forms

If the job is engineered and installed correctly, you can't beat a poured wall, especially one with architectural effects. company has developed a texturing roller system for Gomaco concrete extruding machines. Allen calls the proprietary patented process "Slipstone." The prototype uses a special soft rubber compound on a large roller to imprint the design on the formed concrete as it comes out of the machine. The process can imprint the three surfaces of a wall — the two faces and the top — and can imprint over visqueen plastic sheeting as it unrolls over the formed concrete. The maximum height for a plain wall extruder is eight feet-nine inches, so that's the height limitation to date. Community entrance walls, sidewalks, bulkheads, retaining walls and vertical curbs are all ideal applications, according to Allen. "The reason we developed the process is to be competitive in the market. It cuts installation time and you can see up to 47 percent cost savings over standard form liners depending on footage."

For wall caps, step edges and other similar projects, disposable forms may be just the things you need. Bud Stegmeier, marketing manager of Stegmeier Corp. of Arlington, Texas, explains that his company grinds architectural profiles into polystyrene to create forms, which are simple to attach to the face of a wooden form to create a decorative edge. "The forms are flexible, so they can be pulled away easily. Because they cushion the concrete as you pull the forms away, they protect fragile corners." The forms can also be compressed into curves

The coloring process

If the project is in a natural setting, integrally colored concrete can help the structure blend in. It also gives you a base color to expand on. Lowe observes, "Base color is important so you use less stain and accent each stone rather than coloring each stone. It saves time and materials, gives a more realistic look, and you don't have to worry so much about chipping because it won't be as noticeable."

Which integral color you select will depend on what architectural design your concrete will assume, but also what part of the country you're in. "You usually

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want to match up with the natural stones in the area. In the southwest there is a different color scheme than in Florida. In New York they have a granite stone look. In Philly, there's bluestone. In Phoenix, stones are more of a tan shade with a little red," explains Rich Solomon, vice president at Solomon Colors in Springfield, Ill. In the north, stones are typically a darker shade than what you'd find in the south.

A technique you can use with integrally colored concrete is sandblasting. "With sandblasting, you're not adding anything, but removing some of the cement paste on the surface. Sandblasting can also expose some of the aggregate—a technique that can give a good look. The type aggregate you use will play into the color." Solomon says.

Not everyone wants to use integral color, however, and integral color alone may not provide the desired effect. So, a

You usually want to match up with the natural stones in the area. In the north, stones are typically a darker shade than what you'd find in the south.

variety of other methods and materials are frequently used.

Powdered pigments mixed into a release agent [or dusted into the mold] can provide some nice effects. Color hardeners aren't commonly used on vertical surfaces, but they are sometimes used by mixing them with a bonding agents and hand-troweling them on, like a stucco. But caution is given with these customized applications that, if not done properly, it won't adhere properly. And if moisture bleeds through, the color could pop off. In applying any surface color it is a prerequisite to pressure wash the surface to remove any residual release agent. Sandblast if necessary.

Harlan Baldridge, manager of the decorative concrete division of Cut & Break Construction in Medford, Ore., prefers to mix color hardener into a pancake batter consistency and then spray it onto gray concrete. "A bonding

Coloring Tips

- Apply your color using a randomized approach. A systemized approach will look too "packaged." Apply one color at a time.
- When you start an area, finish it. Stagger areas rather than working in a straight line to prevent definition lines.
- Highlight colors are best handapplied, not sprayed.
- When working with reactive stains, be careful. If you start at the top and it runs, the runs will be permanent.
- When applying chemical stains, hand-held spray bottles can be used for detail work. Sponges can be used to agitate the stains into the nooks and crannies of the texture. Artist paintbrushes can be used for intricate patterns.
- Don't want the grout joints stained? Pre-seal them with a clear acrylic sealer. It resists the stains.
- If coloring a brick pattern, use a roller to apply the color instead of spraying to keep the grout lines uncolored.

agent is great to use before spraying on the color hardener," he advises. Baldridge uses a variety of colors to create the effects he wants. "If a native stone has a red basis, I'll start with a neutral, like cream, then add a sunbaked clay color. I can add black flecks by random bursts of color. I can hand rub to get some of the color off for a tumbled stone look. This also highlights textures of the stone pattern."

At Chaparral Pines Country Club in Payson, Ariz., Gerald King, concrete operations manager of Pace Pacific in Phoenix, and his crew applied additional color over integrally colored concrete to achieve the effect the client wanted on some 30,000 square feet of structural retaining wall. "We started with integrally colored concrete and added additional color by spraying multiple colors of color hardener," he explains. They made a presentation mock-up to see what the product would

look like, then purchased color in large volumes to help with consistency. "You have to make sure your client knows [integrally colored concrete] is a natural product and that it can change." But he points out that using color hardener over it helps camouflage and mask inconsistencies.

Acid stains are also used frequently to color architectural concrete, but be sure to protect yourself if you use them. Wear safety glasses, a respirator, non-absorbent gloves, long sleeved shirt, long pants and work boots. The stains can be applied using a sprayer, sponges or paintbrushes. But always remember to start at the bottom of the wall and work up.

No matter what method or combination of methods you use to color your project, it is important to remember that your release agent may affect the results you achieve. Will the release agent leave a residue? Will it prevent good adhesion of color hardener? Will it react with the chemical stain you use? Release agents containing petroleum products can also harm some form liners. Talk with and get recommendations from the form and liner manufacturers. It helps to talk with other contractors that use these forms and learn from their hands-on experiences.

Karl Russell, owner of R&R Poured Walls in Byron, Mich., says working

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Innovative Brick Systems (800) 413-4588 Milestones Inc. (715) 381-9660 Pacific Concrete Images (949) 581-0270 Polytek Development Corp. (610) 559-8620 (see ad) Precise Forms Inc. (800) 537-0706 Solomon Colors (217) 522-3112 (see ad) Stegmeier Corp. (770) 962-1719 Western Forms Inc. (800) 821-3870 with decorative forms and liners is not complicated, but you have to pay attention. "Practice up front. Don't sell a job never having done it. Make time and practice in different temperatures." And practice different techniques. Gaining the know-how can improve business prospects and increase the bottom line, he says. Having happy clients isn't a bad motive either.

In Virginia Beach, Roehrs reports, "I've heard nothing but compliments about our seawall. Most of the tourists are pleased with the esthetics. [Including the custom decoration in the project] was a small additional cost that will reap dividends for years."



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CIRCLE #24 ON READER SERVICE CARD



CUTTING PICTURES CONCRETE

By Elise Crain

he only limit to decorative concrete is your imagination. You may have heard that for years and it is just as true today. Products, tools, professional training and ideas are just waiting for you to make the most

of your opportunities.

Picture an eagle with an eight foot four inch wingspan! Darrel Adamson, Engrave-A-Crete, created this image at a recent seminar. A line drawing of the eagle was scanned into and enlarged with a CAD/CAM program. After tweaking to make it just right, it was put on a floppy disc and inserted into a computer- controlled mill to

cut a template. Seminar students used carpenter's pencils to trace the outline. Reactive stains of various colors were applied with pointed brushes to simulate feathers. DecoSup concrete dyes were used for the flowing ribbon. After curing, the surface was washed and a clear sealer applied. The template was returned to the concrete and, using a Shark engraving tool, the cutting began. Engraving provides a clean, crisp outline resulting in beautiful



Richard Smith Concrete involved children from Inner-City Youth Program to construct, color and seal this project.

concrete images like those shown above, Bald Eagle or colorful butterfly.

Company logos, family crests, pictures of pets or

Company logos, family crests, pictures of pets or children can all be engraved. The caution is that it may look "cool" in the beginning and then not so cool when the household or business has to move. Freehand creations are good for stones and natural looking surfaces. Marvin Dodson, Rare Earth Labs (*Concrete Decor*, Vol. 1, No. 1, February 2001, page 42) produces concentrated stains that provide a wide variety of colors and tones. His designs are both engraved and designs are both engraved and

freehand. He suggests when not using equipment (such as Engrave-A-Crete or Kaleido-Crete) the design be placed using graph paper and drawn on the concrete with chalk, soapstone, pencil or marking pen. Designs can also be placed with a black permanent marker since stains will not bleed across the marker lines, according to Dodson. The freehand stone pattern is an excellent choice to incorporate existing cracks as part of the pattern.

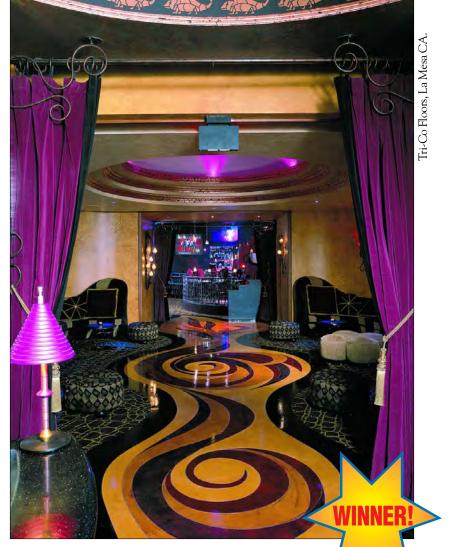
Butterfly created with the Kaleido-Crete, Engrave-A-Crete



Cracks can be cleaned out, or made bigger, and form the skeleton for the new "look."

When planning a concrete creation, the first thing to look at is the concrete surface. Is it structurally sound? Will a topping (overlay) be installed? Since the survival of an overlay is the bond, concrete must be clean and the overlay properly applied if these types of creations are expected to last. Adamson points out that the hardness of an overlay and concrete are not the same, therefore the harder the surface, the cleaner the cut.

A broom finish on an existing surface makes a more authentic looking brick pattern. To achieve a polished marble look, smoothness is better. The surface can be changed before your creation by



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More information is available from the following sources:

Darrel Adamson, Engrave-A-Crete; (800) 884-2114 www.engraveacrete.com Marvin Dodson, Rare Earth Labs, (800) 999-4062 www.rareearthlabs.com John Bernat, Star Diamond Tools, (800) 282-6470 www.stardiamondtools.com Elizabeth Anderson, Anderson Enterprises, (417) 581-4796

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grinding, sandblasting, polishing, shot blasting or with an overlay.

Tools typically used include DeWALT, Milwaukee, Black and Decker or Mikata handheld right-angled grinders and saws, Dremel type engraving pins, the Kaleido-Crete systems, or the Harris Accu-Glide concrete saw. The Engrave-A-Crete System uses specialized electric-powered saws with diamond blades, the Kaleido-Crete System uses pneumatically powered tools containing fine steel rod impactors, while the Harris Accu-Guide allows cuts with straightness of $+\frac{1}{22}$ " over thirty feet. An operator can achieve up to 5,000 linear feet of production a day with the Accu-Glide. Star Diamond Tools also has a special convex blade used in an angle grinder to cut circles.

Crafters develop their own favorite tools and techniques. Every experienced creator of concrete images emphasizes the importance of quality tools and diamond blades. Inexpensive blades become expensive in the long run because they result in chipping and rough edges. These blemishes impair the overall quality of the job. Not getting paid because of poor quality is one thing, what you leave behind can be an even worse experience. Adamson says that achieving straight lines is as simple as purchasing the proper equipment and diamonds

> that are specifically designed for decorative grooving. John Bernat, Star Diamond Tools, reminds us "high



Take the guesswork out of selecting diamond blades

By Thom Fisher, Diamond Products

S electing the right diamond blade to run on concrete saws is the best way to maximize your equipment investment. More and mare companies offer diamond blades. But how can a contractor choose the right blade for the right saw?

How diamond saws cut

Blade performance is a combination of the material being cut, cutting speed and blade life. Changing one variable affects the others. Aggregate hardness and size, amount of steel reinforcing (rebar) and whether the concrete is green or cured affects blade selection. The diamond blade segments are made up of a mixture of diamonds and metal powders. The composition of the bond that holds the diamonds must be matched to the hardness or softness of the material being cut. The simple rule of thumb to remember when selecting a blade: Use something hard to cut something soft and something soft to cut something hard.

Know your concrete

The size of the aggregate affects blade performance. Large aggregate makes the blade cut slower, while smaller aggregate makes the blade cut faster. Heavy reinforcing with rebar also tends to slow the blade and make it wear faster. The time the concrete has had to cure greatly affects how the material will interact with the blade. Freshly poured or green concrete is softer and more abrasive than cured concrete. The blade will need a harder bond with undercut protection to cut green concrete and a softer bond for cured concrete. Undercutting is a condition in which the steel core of the blade wears faster than the diamond segments. It is

caused by highly abrasive material grinding against the core. The best remedy is to choose a blade with under-cut protectors on the core or pol-yarc segments.

Know your saw

You must know the blade specifications required by your saw. Do not use blades not recommended by your saw manufacturer on your saw. You can control cutting by adjusting spindle speed. Increasing spindle speed makes the diamond blade cut harder, decreasing the spindle speed makes the blade cut faster. Harder, less abrasive materials require slower spindle speeds and softer, more abrasive materials need faster spindle speeds. Never operate blades at rotational speeds greater than the maximum RPM listed on the blade. Over speeding can damage the blade or cause serious injury.

Know the differences between blades

There axe several types of diamond blades from which to choose. High-speed segmented blades are the most competitively priced on the market and make fast, smooth cutting in many materials. They provide a constant depth of cut and fewer blade changes. Most come with a 1" arbor with a drive pinhole or a 20 mm arbor. Dry walk-behind concrete saw blades are ideal for intermittent cuts in concrete, green concrete and asphalt. They cut without water and are often used in patch/repair work or expansion joints. Dry and wet masonry blades provide a consistent depth of cut with less dust than abrasives. Segmented dry small-diameter blades are used on hand-held circular saws and most right angle grinders.

Use them on concrete block, marble, soft granite, stone, tile and other materials. Dry tuck-pointing blades are used on hand-held circular saws and small, right angle grinders. Dry tuck-pointing pins can be used on routers and clean out mortar from mortar joints and butt (vertical) joints. Dry tile blades are continuous-rim blades used for chip-free cutting on tile saws, right-angle grinders and circular saws. Dry segmented cup grinders, used on right-angle grinders, they grind all types of concrete, masonry, brick, block and stone.

Segmented or continuousrim blade?

Segmented and continuous rim blades are designed for the same task, but offer differences in speed, performance and longevity. Segmented blades have a thicker segment and higher diamond concentration for longer life and greater ability to resist very abrasive materials. They also have a thicker core and open gullets, so they are well suited for high production and heavy use. The blade segments are laser-welded, so they can be repaired.

However, segmented blades have disadvantages. The thicker segment results in a slightly lower cutting speed and the open gullets make a rougher cut. Continuous-rim blade have a thinner rim and greater surface area that delivers aggressive cutting speeds and less dust and a smooth, chip-free cut. It's a good choice for very hard materials such as stone, marble and decorative edges. Like segmented blades, continuous-rim blades also have downsides. The thinner rim and lower diamond concentration result in shorter blade life and wear fast in very abrasive materials. Their thinner core and no gullets means they cannot dissipate heat as fast as a segmented blade and can warp when overheated. Finally, they cannot be repaired.

Your diamond blade distributor is provided with a wealth of information from the manufacturer and can help with additional blade selection tips.

Thom Fisher is Advertising and Trade Show Manager for Diamond Products in Elyria, Ohio.

Elizabeth Anderson and Perry Earru, Ozark MO.

quality diamond blades run smoother and cooler and always produce fine clean cuts."

Patience is right behind imagination in required skills. Once a cut is made, it cannot be undone. Grinding or making other cuts to provide balance can change it. It can be widened or angled differently. Stain may be used to disguise or create a diversion of the eye.

Is this art? Yes! And that is the basis to determine fees you will charge for your work. The tools available today allow someone with limited skills to become an artisan. The person using the correct tools must understand concrete and must try not to be affected by those who are watching. Advice from sidewalk superintendents, including owners, must be taken lightly. If you wear earplugs for safety, they may also provide a barrier to unsolicited advice. Dodson says, "as with anything else 'practice makes perfect."

Multi-media artist, Elizabeth Anderson, Anderson Enterprises, discovered concrete as a new medium. Working on a project for Bass Pro Shops in Islamorada, she used INCRETE stains



Nautilus was created freehand with a 4" diamond wheel.





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with metal shavings and engraved fossils on the floor, including that of a seven-foot tarpon and the nautilus shown here.

Creativity, skill and product knowledge are the reasons you can be well compensated. You are using special skills to add value to your client's property. If you are shy about asking to be justly compensated, your customers can interpret that as lack of confidence on your part. It is also important that your trucks, your equipment and your workers look professional. You want business owners and homeowners to be proud that your trucks are parked on their properties. One last hint from Adamson: install ID medallions on all your projects.









CIRCLE #22 ON READER SERVICE CARD

Is it art? Or is it concrete work? Sht

By Jim Peterson, President, ConcreteNetwork.Com

oncrete is most often thought of as the material of choice for driveways, basement walls, curbs and gutters, and roadways — and rightly so. There is not another material on earth more durable, strong, and cost effective.

The material is being looked at through a different set of eyes, however, by a growing group of architects, designers, contractors, and most importantly, buyers who are clamoring for these concrete products and floors.

Concrete is being used as a final interior flooring surface in direct competition with wood, tile, marble, and slate. Concrete surfaces can be stained, scored, sandblasted, overlayed and stamped — or a combination of the above. While concrete is custom and beautiful, it is also clean. According to the American Lung Association, 26 million Americans have been diagnosed with asthma in their lifetime. Dirt that accumulates in carpet is a large contributor to asthma problems.

Got cold feet?

For many years concrete was not considered for some interior surfaces due to it being a cold surface, although concrete is no colder than tile. Today, buyers are opting for decorative concrete and in many cases handling the cold floor issue by using radiant floor heating systems. These systems heat the slab either by hydronic or electrical means, providing optimal comfort since it is warmest by the floor and gradually cools as the distance from the floor increases. Conversely, forced air heating systems deliver heat at the ceiling line — where it is of the least use.

Your floor is your life

Some craftsmen are literally creating artwork on floors for their customers. David Pettigrew of Diamond D Concrete in Watsonville, CA has created a floor at the 6000 square foot Griffin residence in La Honda, CA. Pettigrew and his wife Catherine drew sketches for the floor designs and the impressed Mark Griffin responded, "You can do this with the concrete?" Pettigrew's crew of five men spent three days just scoring the designs into the concrete floors. Then, it was a six-week process to color the floor. Dave utilized four treatments on this project: Micro topping, acid-etch stain, Con Color, and Plate-All — which is molten metal on concrete.



Floor artwork by Dave and Catherine Pettigrew

Gary Breaux of Surface Effects in Lake Charles, LA provides custom painted floors that create the look of marble, stone, and slate. He can create a tiled appearance without seams or lines, providing the owner with a smooth low maintenance floor. Breaux uses epoxy resins for base and color coats, and then applies a non-yellowing urethane as a durable top coating finish.



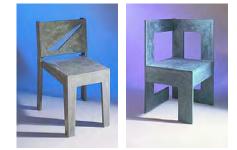
Painted floor by Surface Effects

Besides flooring, concrete is also being used for countertops, tub surrounds, sinks, fireplace surrounds, wall tiles, and even furniture. Steve Rosenblatt of Sonoma Cast Stone has 44 dealers throughout the United States who sell products such as his "Wave Sink", which won an award from the National Kitchen and Bath Association. He also makes custom pavers, tub surrounds, and a variety of other concrete products.



Wave Sink by Sonoma Cast Stone

Gary Simpson of Kaldari does a brisk business selling his concrete furniture at the Festival of Arts annual event in Laguna Beach. Simpson also manufacturers concrete countertops and does concrete staining for floors in the Los Angeles and Orange County area of Southern California.



Concrete chairs by Kaldari

The growth of concrete applications seems to have taken on a self-fulfilling aspect. As designers and consumers learn of these products on the Internet, in print magazines, or see them on floors

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America has rediscovered concrete. Concrete has always been energy-efficient, durable, cost-effective, abundant, and envirofriendly. But it is now drawing serious attention from leadingedge designers, architects, builders, artisans, contractors, and in-the-know consumers. Kitchen countertops, bathroom fixtures, and custom floors are hot, and the future of concrete is bright!



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Concrete Tub Surrounds

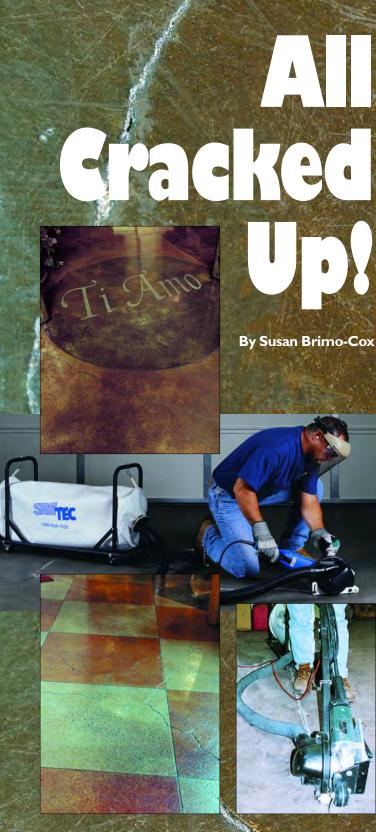


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available from the Portland Cementive Associations, including "Concrete Floors on Ground," "Maintenance and Repair of Concrete Surfaces" and "Resurfacing rete Concrete Floors." For mire information, Call (800) 868-6733.urfaces" and "Resurfacing Concrete Floors," For more information, call (800) 868-6733. hen it comes to concrete, are cracks inevitable? Technically, if every aspect of the original pour was done perfectly, perhaps not. But in the real world, it's a pretty safe bet that cracks are going to occur. Concrete cracks are caused by improper sub grade preparation, a bad mix design, poor thickness control, improper curing, poorly placed control joints, temperature changes, stress loads, ground or building movement, and a variety of other reasons — singly or in combination.

Contractors are frequently called in to repair or camouflage concrete cracks. A homeowner with a concrete driveway, walk or patio may decide that the cracks are unsightly and need to be fixed. Cracks in basement or garage floors often need attention. Darryl Manuel, president of Vexcon Chemicals Inc. in Philadelphia, observes a trend in turning older buildings often featuring concrete floors with lots of cracks — into lofts and retail spaces. And in new retail and commercial spaces, concrete floors are often specified for their durability and longevity, cracks not withstanding.

When it comes to crack repair and the decorative treatment of the concrete surface, a dozen contractors have as many recommendations. Different kinds of cracks, it seems, require different repair techniques.

"The first thing about concrete cracks is that just about every crack is different and how you repair a crack depends on what your coating is going to be," explains A. Ray Anderson, owner of Only Under Pressure in Thousand Oaks, Calif.

Being a crack detective

Some cracking is a one-shot deal, such as when the cracks occurred because of curing problems or an over-size truck ran over the slab. These are static cracks, unlikely to move. Structural and other types of moving cracks, on the other hand, typically present ongoing problems. As Tom Ralston, president of Tom Ralston Concrete Inc. in Santa Cruz, Calif., points out, "You have to honor all structural cracks. They'll continue to move."

Mike Meursing, manager at Versatile Deck Coatings in Long Beach, Calif., says, "Once you locate the cracks and failures, it is important to determine the cause, otherwise your repair will be just a short term fix." If there is still stress present, the concrete will crack again, but there are clues to what may have caused the cracks, he adds. Here are some examples:

- If you have a full-depth crack and the surfaces on either side of the crack are not level it's probably due to an unstable base.
- If the slab is on a slope and the cracks run perpendicular to the slope, it's likely slippage is the cause.
- If you observe random cracking and see or know heavy machinery has crossed the concrete, excessive load is probably the cause.
- Surface spalling or cracking where the rebar is located indicates that corrosion of the rebar is the culprit.
- Impact cracks are frequently indicated by a spall.
- Freeze-thaw cycling often causes widespread and consistent cracking across the concrete.
- And, if there isn't an apparent cause for the cracking, but

you notice curling on the surface or sporadic cracking, it's likely due to shrinkage.

Prepping and repair material options

No matter what decorative topping you're planning to apply to the surface of the concrete — stain, opaque coating, bonded or unbonded overlay — you need to make any crack repairs first. The customary practice is to chisel or chase the cracks. Not only does this help you clean up the edges of the crack, chasing also provides a slightly larger slot in which to insert the repair material.

The size of the chasing blade you'll need for the task depends on the width of the crack, reports Jason Root, western region products specialist with USF Surface Preparation Group in Rancho Dominguez, Calif. "A lot of people like to chase the cracks with a V-shape or you can use a square-edge blade." The typical blade widths used for chasing random cracks are ¼-inch, ¾-inch and ½-inch, he says, adding, "When chasing a random crack, a smaller diameter blade is better. The smaller the diameter of the blade, the tighter the radius you can turn."

There are three general categories of crack repair materials, explains Ronald Borum, executive vice president of the Miracote Division of Crossfield Products Corp. in Rancho Dominguez, Calif. Rigid repairs are referred to as welds and the resulting repair is rigid. These materials "replace the physical integrity and create a seamless substrate." Epoxy and polymer cementitious fillers are typical of this category, he says.

Products in the semi-flexible category "are used more for joint sealing than crack repair," Borum says. "Because they're semi-rigid, they can tolerate some movement. They're good under a coating that can tolerate some movement, providing good support for the coating."

Flexible repair products are most commonly used for minor crack repair — when the crack is ½-inch to ½-inch or less — and the crack is stable. These products bridge the crack, are gravity applied or spackled in.

In certain situations, you may need to stitch across the crack. This technique generally results in a strong repair, though it may not be pretty.

Which repair product you use is dependent on the nature of the crack, additional steps you'll take to relieve any ongoing stress in the slab (such as creating additional control joints) and the decorative coating you'll be using on top.

Terry Collins, concrete construction engineer with the Portland Cement Association in Skokie, Ill., reminds contractors, "there's a constant volume change happening all the time in concrete [as it expands and contracts]. If you lay the jointing out correctly, it provides a weakened plane for a crack to follow versus a random crack."

Repair recommendations

As mentioned earlier, contractors use various techniques in repairing cracks and prepping the surface for a decorative coating. As Anderson points out, often "you just have to get out there and see what works and what doesn't."





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Always wash out the crack with a pressure washer or blow it out with compressed air. The crack needs to be clean for good bonding with the repair materials.

If you're using a concrete stain, your "repair material needs to match the surroundings — cementitious is often the preferred material," observes Borum.

Manuel recommends using a bonding agent on the sidewalls of the crack if you're using a cementitious material for better adhesion. "Feather the patch if you're going to coat or stain the surface," he adds.

If using epoxy, be sure the material completely fills the crack, advises several contractors. If you are filling only a portion of the crack — say the top inch or so — what you have is an upside down control joint, and you know what will happen — it will crack.

With epoxy, pressure-feed injection is best, reports many. Also, using a thixotropic epoxy can be advantageous. A thixotropic epoxy congeals as it works its way down into the crack. This lessens the runoff of the material out the bottom of the crack and allows the material to fill up the crack and then cure.

With caulk-like repair materials, Darrell Adamson, vice president of Engrave-A-Crete Inc. in Sarasota, Fla., recommends using a backer rod if there's room. "You need a nice bond to each side of the crack, but the center band needs to be thin to be springy or stretchy [if there's movement]." Adamson uses a syringe when applying caulking to small cracks and he says, "If you need to scrape excess away, cut it up and away. Don't smear it down with your finger. Or you can wait for it to cure and cut it flush."

To prepare the top surface of the concrete after crack repairs have been made, Anderson recommends shot blasting to give the surface a profile, followed by an acid wash to neutralize any alkalinity and open up the surface pores to accept the coating.

"You can be creative in how you repair, [but] a good repair is taking your time. Don't do the job in a hurry," advises Wes Vollmer, owner of Alternative Finishes in San Antonio. Take the time to talk with the engineer, he advises. "You'll educate yourself for future jobs. Ask how you can manage cracks and where you should put control joints. You have to be smart about how you do your work."

Cracks as decorative elements

Mark Donaldson, owner of Skookum Floors USA Ltd. in Seattle, says that using cracks as decorative elements is probably a specialty or niche area, but he and other contractors have come up with ingenious ways to hide cracks in plain sight.

A random stone look is a natural decorative effect that uses random cracks, observes Lee Tizard, technical sales representative with Floric Polytech Inc. of Rancho Cucamonga, Calif. After chasing out the cracks and applying a knockdown texture, cut additional random cracks with masonry saw blade to create a faux flagstone effect, he says.



CIRCLE #06 ON READER SERVICE CARD

Ralston devised his own variation on the random stone theme with rave reviews from customers. Instead of creating a random stone effect across the whole surface, he uses it only in certain areas. Ralston does not chase the cracks, but marks them with nails and applies a 3/8-inch topcoat over the slab. Then he uses the nails as a guide to score the original cracks using the point of a trowel or rat-tail. He carves out random stone shapes in the topcoat (using a stick or rat-tail for a "more authentic looking joint") only along one side of the cracks and dusts these with earth tone colors. He dusts the remaining areas in between with a sandstone color. In this way, the sandstone colored areas appear to be bordered by random-laid stones.

Not everyone wants a random stone look, however. Vollmer says one of his customers wanted a more traditional tile pattern. To achieve the look, "We laid the pattern around the cracks and cut the cracks first. Then we popped chalk lines and cut the rest of the pattern."

For a more realistic look, "small spider cracking is good for leaves and other organic [design] elements," says Meursing. Additional saw cuts can help incorporate the cracks into a design.

Donaldson suggests you can garner nice effects by highlighting a crack. "Insert color in the crack with a sprayer, allowing the color to absorb on either side of the crack."

Other creative options include routing out cracks or spalls and gluing in marbles or filling the voids with another color or material for an inlay effect. As Vollmer points out, "There's nothing you can't do with decorative concrete if you have an open, creative mind."

Never say never

No matter what your decorative effect, "Cracks can be filled, but with no expectation that they are fixed," admonishes Adamson.

Crack repair is a big deal, but "I would never guarantee a customer 'no cracks," reports Donaldson.

"Never warranty cracks. They're there for a reason," exclaims Anderson.

Do you observe a common thread in these comments? That's right — don't guarantee that the cracks will not return. Tizard has even developed a flow chart to help keep him on track with concrete crack repair, including the options to get a signed release or to walk away from the project if the customer's budget isn't sufficient or the customer doesn't want the cracks repaired. Otherwise, his flow chart works its way down to varying repair techniques based on the type topping to be used — rigid and hard or soft and flexible — and the size and type of crack. Creativity seems to be his only variable.

Across the board, contractors are becoming more creative with concrete crack repair and the decorative effects they can help achieve. As Meursing observes, "Taking a defect and turning it into art, that's art!"



CIRCLE #54 ON READER SERVICE CARD

Concrete Decor • Fall 2001 • 29

Polishing Concrete: Putting a High Shine on an Old Mix

by Dave Cagle

ight after the clerk in the orange vest, the highpolish concrete floor greets you at Home Depot. Super smooth concrete, buffed to a gloss, seems too nice for a hardware store, much less a warehouse place. Don't be fooled. The near-mirror finish not only looks good and is tough, it also saves money by dramatically cutting the labor and materials needed to clean and maintain it.

Polishing concrete is a relatively new art that is fast finding an audience of willing contractors and many customers. Architects and designers who build high-tech structures, chain stores, auto showrooms, restaurants, and many homeowners have included such floors in their plans. Even the Pentagon ponied up the dough for a spit-shined floor in its boot camp gymnasium at Great Lakes Naval Training Center near Chicago.

Some customers opt for polishing to a high gloss-by removing the top ¹/₆" of the cream. Others have the contractors grind deeper, removing the cream and exposing the aggregate. Some even have special rock, bolts, and pieces of glass added to the mix to be exposed during grinding. Virtually any structurally sound concrete floor can be polished to a very hard, durable, and nearly maintenance-free finish. While the grinding and polishing add significantly to the cost, these outlays are easily recovered in the years to come from considerably lower maintenance costs.

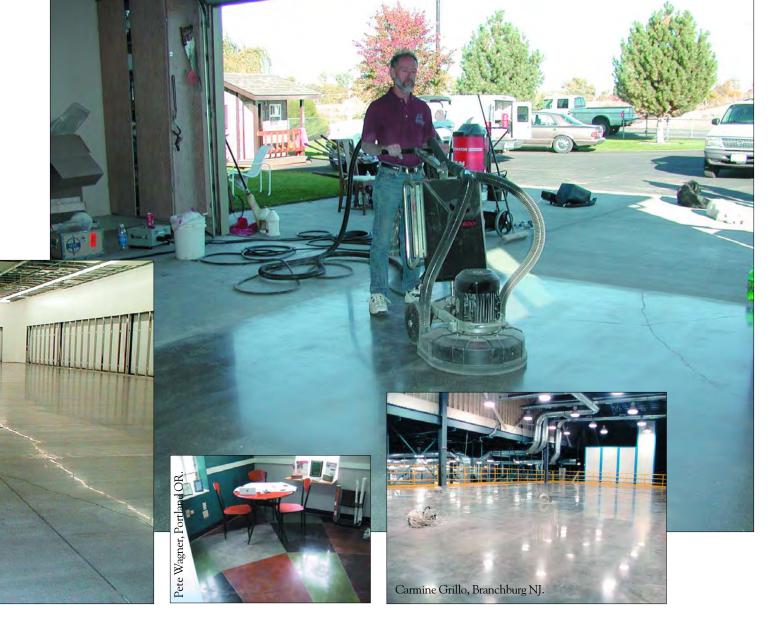
errell, Atlanta

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"Polished concrete can still breathe to let gas and water vapor through," said Bill Kulibert, North American regional sales manager for VIC International. "It resists staining by fluids, oils and certain chemicals, as well as the marks laid down by forklifts and other industrial equipment driving across it."

Kept clean, a polished floor is not slippery. However, when the surface has dirt, dust or water on it, these contaminants can have a ball-bearing effect. If a customer wants an ultrashiny and extremely safe floor, such a surface can be coated with various products that keep it from being slick.

Epoxies and urethane coatings commonly used to protect concrete and give it a high gloss will eventually crack, flake or separate, and have to be removed. Polished concrete suffers from none of these problems. If the gloss ever fades, "only the last few polishing steps are needed to bring it back to a shine," Kulibert said.



Among the downsides are the initial equipment costs. The grinding/polishing machines range upward from \$3,000. The disks can range from \$12 for a three-inch model to \$7,000 for a set of three each of seven grits. Slabs that are not level will suffer from exposed aggregate or areas that are not polished as highly as others. Vertical surfaces can be polished, but the job requires hand-held polishers and the work is very taxing. Cochrane polishes such surfaces by using a grinder that is held to a wall by suction cups.

While estimates of the area that can be polished in a day vary widely, most agree that a well-experienced crew can polish several thousand square feet.

Polishing: Just Like Sanding a Piece of Wood

In an ideal world, a polished floor will be specified by an architect in the original plans. Then the concrete contractor would ensure an appropriate mix is prepared and delivered. Pains would be taken to assure the floor is very flat and extremely smooth.

But construction is not an ideal world and many polishing jobs are on slabs that were poured years, if not

decades, ago, and whose flatness and smoothness are questionable. These problems often mean the cost will rise and the job will be longer and harder.

Once the pour has cured anywhere from seven to 30 days, a 40-grit diamond grinder is employed, according to Greg Ferchaud, U.S. sales manager for SASE Company, Inc. "Typically, during the first, most aggressive steps, we recommend using diamond disks with a metal binding. This step takes the longest because it is about 75 percent of the work."

"The initial grinding is the most important," contractor Doug Demmert of Demmert and Associates in Glendale, California, added. "It takes a lot more time than subsequent passes, but taking that time and care is worth it. If you grind too deeply or the floor is uneven, or if you leave some scratches, they will still be there when you finish up at 1,800 grit."

Some grinders use diamond plugs; others use diamondimpregnated disks.

Mile Cochrane of Diamond Tool Products-Canada noted, "The plugs remove up to 4 mils at a time. A disk can remove only 0.6 to 2.4 mils." Virtually all of the diamonds are synthetic. Then, just like sanding a piece of wood, using progressively higher grades of sandpaper, finer grinding disks are employed. The second and third steps employ metal disks that are 100 and 200 grit, respectively.

Next, Ferchaud said, it is wise to switch to resin or plastic disks. "The concrete has become very smooth and nonaggressive after the 100 and 200 disks which means the metal disks can't be worn away, and thereby keep the diamonds sharp. The diamonds can become ineffective, glazed over." When switching to resin disks, many contractors will return to a grit one grade rougher than the texture on the last metal disk. At this point, they will often spread sodium silicate on the concrete to make it more dense and harden it.

The first resin disk is about 120 grit, followed by 400, 800 and 1,500.

"At this point, it is starting to look like natural stone," he said. "Some people will go on to 3,000 grit."

"If you miss one step in the process, you might have to start again," Cochrane said. "Skipping a step means that the next disk is overworked.

Polishing will take longer and the next disk will wear more than it should."

Knowing when to switch to the next-finer grit is a bit of an art. Cochrane gauges when to change by looking at the milky gray slurry of water and concrete dust. "If the water is clear, the diamonds are not abrading the floor and you probably don't have the right machine in terms of weight, speed, motor power. Once you have created a slurry and the water becomes clear again, it is time to switch disks."

About the only consistent problem is too-soft concrete. "We polish a lot of floors with different aggregates and have managed to polish most of it," Demmert said.

"Concrete that's 40 or 50 years old can be densified," Kulibert added, "which will chemically reform it to be much harder and denser. Densifying saves the customer the labor and cost of laying a new pad down. Any pad can be polished, but preparing the newly poured one will make it quicker and easier."

Wet or Dry?

The wet-or-dry question is about the biggest bone of contention amongst contractors, dealers, and manufacturers. Demmert does both. "Metal disks can be used wet or dry. Resin disks have to be done wet. Otherwise, friction will burn them out," he said.

Cochrane insists on wet because concrete dust is carcinogenic (cancer-causing). "By using water as a lubricator, it and the dust become a slurry. The dust is not discharged into the air." Like so many other tools, diamond disks and plugs last longer when employed properly: on the right kind of concrete and with a little care.

Contractors, distributors and manufacturers generally agree that most disks are good from 5,000 to about 40,000 square feet. Those numbers, of course, can change dramatically based on the hardness and roughness of the concrete, the disk's grit size and binding material, etc.

"Metal bond diamond disks last 10,000 square feet or more," Kulibert said.

"And the finer the grit, the longer they last."

Retroplate[™]: Moving from Experience to Technology

Because each slab of concrete is unique, polishing it can require a lot of experience and often involves the attendant mistakes. Advanced Floor Products in Provo, Utah, decided to develop a concrete-polishing technology to eliminate some of the guesswork.

Retroplate,[™] AFP's patented system for using a special hardener during the polishing process, is the fruit of their labors.

AFP started working on the system about four years ago when a customer in Richmond, Virginia, restored a terrazzo floor. When the shine was gone and the floor started to dust after three months, he called Mark Wetherell, AFP's technical director, to help solve the problem.

Wetherell's background in the janitorial business came in very handy. He suggested exploring some of the available products in an effort to find one that would protect the shine and eliminate the dust. "We bought some products and spread them side by side on a slab. Then we started grinding them."

One seemed to do the trick. The area of the slab it covered kept its shine longer and controlled dusting after the other products were gone.

Since then, AFP was conducted a lot of research and development on hardening agents and completely reformulated that original product.

"Basically, we put it on steroids," Wetherell quipped.

The current densifying hardener is not sodium silicate, the hardener of choice for many other manufacturers and contractors. Because the formula is a trade secret, AFP is tight-lipped about its nature, saying only that it is a modified silicate.

The heart of the Retroplate $^{\rm TM}$ system, the densifying agent penetrates the concrete from %" to %" and reacts chemically with the concrete salts.

"It creates crystalline growth," Vernon Talbot, AFP's sales director, said, "which densifies and solidifies the surface."

It offers significant abrasion resistance. "On a very hard floor, the abrasion resistance might increase 200 percent. Softer concrete might increase 400 percent," Talbot noted.

AFP distributes the Retroplate[™] system only to its 60 certified applicators in North and South America, Eastern Europe, Scandinavia, Australia and New Zealand.

"With the resin disks, we have gotten as high as 25,000, and as low as 1,700," Demmert said.

Because polishing is such a new service, it is still going through its growing pains. Since each floor is different-age, composition, hardness, intended use-one problem is selecting the right diamond and binding combinations. Some 40 different combinations of diamonds and soft, medium, hard or extremely hard bindings are available.

Hardening: Necessary or Wasted Money?

The polishing process does not harden concrete. Since the hardness and density of each pour varies, different chemicals are used by some contractors to ensure the concrete is sufficiently solid in order to be polished. The most common is sodium silicate.

Failing to use a hardener is a mistake in the eves of Vernon Talbot, sales director of Advanced Floor Products in Provo, Utah. "Without a hardener, either you put a coating over the concrete or the shine will deteriorate or 'walk off."

Demmert does not use sodium silicate, feeling that is not necessary.



Just like all construction, polishing concrete has its hazards. They include the mundane, the possibility of slipping on a wet floor. If electrical polishers are used, the wiring requirements must be met.

Because concrete dust is carcinogenic, proper precautions must be taken to control the dust and to protect workers from breathing it. Control measures include water systems to control dust and vacuums to remove dust or slurry or both.

Costs

The

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The costs of polishing concrete can range from a few cents per square foot to several dollars for materials, plus the costs of the equipment.

According to Demmert, these costs can be easily recovered because he is able to charge his clients 25 to 50 percent more for a slab that is polished.

However, he said, "the cost of the equipment and the consumables will keep a lot of people out of the business."

Concrete polishing is a new trick that is still being pioneered. If you want to try it out, Cochrane suggests grinding your own garage floor. "You can become competent in one or two jobs, and it really helps if you find someone who will guide you, tell you everything you need to know."



CIRCLE #62 ON READER SERVICE CARD Concrete Decor • Fall 2001 • 33



System on black terrasso at Lexus dealership in Portland, OR.

Rolling along! New Slip Stone system

ALLEN & SONS

New Slip Stone system enhances extruded walls By Susan Brimo-Cox



ichael Allen Sr. had been mulling an idea around for some time: The concrete goes in the front, the wall comes out the back. How to add a decorative finish to a vertical wall as it was extruded was the question. The answer came earlier this year, and already commercial projects are exhibiting the ingenious results.

Allen, owner and president of Allen & Sons Construction Inc. in French Camp, Calif., learned the concrete trade from his uncle and formed his own business in 1979. His new patentpending invention, the Slip Stone Extruded Wall system, is the result of years of experience and recent concerns about staying competitive in the marketplace.

"Architectural finishes have always been a factor in commercial and public work projects. As the industry has changed over the past 20 years, owners and architects have sought out different techniques and finishes. However, developers aren't always willing to pay for decorative concrete created with traditional methods," Allen observes.

In May 2001, Allen began experimenting with his Slip Stone prototype — a textured mold wrapped around a roller that was attached to one of his Gomaco machines. One of the first challenges was finding the right texture and mold material to affix to the roller. Allen explains, "The key was finding a soft and forgiving material that would leave an imprint. Metal wanted to indent the concrete and pop the aggregate out. We found that our special soft rubber compound married well with the soft concrete." Developing the right concrete design meant working closely with the ready mix company.

Slip Stone

PRODUCT PROFILE

Another challenge was combating the buildup of material on the roller. Allen says, "During the experimental phase for placing the walls, we had a buildup of cement material on the roller which required a lot more labor and release agent. We needed to find a better way. One day, we happened to look around our shop and came across some thin mill plastic - plastic picnic table covering." Allen's crew attached the roll of plastic to the Gomaco machine. As it unrolled over the freshly extruded concrete, the textured finish rolled right over it. He says the plastic sheeting cut labor needs by twothirds, because they didn't have to keep cleaning buildup off the decorative mold. "I was able to move those extra crew members to other jobs. Then, after an hour - more or less — we peeled the plastic off and the perfect finish was achieved. And we can cut deep joints and control joints right through the plastic."

In July 2001, two months after he began experimenting with the prototype, Allen & Sons produced a sample product for Grupe Co. and landed a \$258,000 project at one of the development firm's new lakefront communities. Interestingly, the walls that Allen's Gomaco machine extruded for the Grupe project were too straight. The developer wanted an Old World wobbly look, "so we had to bump the machine a little bit every now and again to achieve the look. Grupe is very pleased [with the results] and has plans on the drawing board for another project in the next quarter," Allen reports.

Contrary to what one might assume, the Slip Stone system does not slow down the pace of the extruding machine, Allen says. "Speed depends on height, width and the concrete volume you can get through the machine. Moving slowly and vibrating well is important to control slump. Even if we use rebar, we add fiber mesh to the mix to help bind everything together." And the Slip Stone system can imprint all visible surfaces of the extruded wall — front, back and top — whatever is needed.

On some projects integrally colored concrete is beneficial. "It depends on the final results you want. If you want darkcolored or green stones, it's better to use integrally colored concrete — three pounds of base color per yard of concrete. Liquid color works best. This gives the wall an initial darkening that you can apply stain colors to quickly."

Allen only uses acid stains on his Slip Stone projects. "You can get so many varieties of colors. We make a 5-foot to 10-foot sample wall to show colors for a client. If the client wants to see a mortar line, we brush a light coating of oil on the mortar lines to reduce the acid coloring on those areas." Acid staining goes quickly, too. On the Grupe project, a two-man crew achieved the desired design color on 3,600 linear feet of wall (4 feet tall by 1 foot wide) in three days.

Four design patterns are currently available: random stone, stacked stone, slate and old barn board. An Old World brick design is on the drawing table. But, Allen says,



whatever the client wants he can make. "We cast our own molds right off the natural material and build the roller to fit." A traditional brick design with straight mortar lines is not recommended, however, because the concrete naturally wants to slump. That would result in sagging mortar lines.

The Slip Stone system is adaptable to most slip-forming machines. The rollers are interchangeable and attach to an adjustable bracket that allows you to adjust the depth of the pattern. It takes 10 minutes to take one roller off and put another on, Allen reports. Stacking mold designs on a single roller offers additional possibilities — one could envision a highway sound barrier wall featuring a scene of waves breaking on a beach beneath a cloud-filled sky.

For subdivision entry walls, retaining walls, waterside bulkheads, highway sound barriers and crash walls, the Slip Stone system offers distinct savings in time and labor. Allen reports, "Slip Stone saves 40 percent over traditional decorative form systems, because you don't have to buy forms or liners, and you need less labor. The system has been profitable for our firm and the future looks bright, as the industry becomes receptive to Slip Stone walls."

In a typical 9-hour day using traditional forms, Allen says his crew can produce about 36 feet of concrete wall. Using the Slip Stone system his crew accomplishes 600 feet in the same time. "Our goal is 1,000 feet in a 9-hour day using a Gomaco machine with our Slip Stone roller. If you look at it from a financial perspective, [at that rate,] producing a Slip Stone Extruded Wall at \$60 a linear foot is not a bad day's revenue." Hmmm. It's not bad at all.

Editor's note: For more information about the Slip Stone Extruded Wall system and licensing information, contact Allen & Sons Construction Inc. at (209) 983-4910. A Web site, at www.slipstone.net, is scheduled to be online in late November.



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Product Profiles

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CIRCLE #30 ON READER SERVICE CARD

CIRCLE #28 ON READER SERVICE CARD

Exaktime Releases Jobclock Time and Attendance System

xaktime, Inc., a technology company focused on the construction industry has introduced the Jobclock, a hardware and software package that allows remote job time and attendance tracking utilizing Dallas Instruments' ibuttons, Palm Inc.'s Palm Pilot and the latest PC technology.

The heart of the Jobclock system is a small, construction grade timeclock that can be affixed and left at the job site. Because it is weatherproof, tamper-proof and battery powered, it is entirely self-contained. Employees clock IN and OUT via miniature ibuttons designed to be carried on their keychains. The supervisor can come to the jobsite any time of the day or week and download the attendance records via the Infrared strobe built into the Jobclock and a Palm Pilot. Right on the jobsite they can see who has touched in, who was late, who was early and who should be there any time of the day. Once back at the office, the time records can be automatically transferred into the Jobclock software in a PC that can generate printed reports for any employee, crew, or job site.

Converging Technologies Provided the Solution "The problem of time and attendance tracking in the construction industry is not a new one," said Scott

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SURFACE PREBARATION GROUP © 2001 USF Surface Preparation Group Prewett, VP of Business Development at Exaktime, Inc. "The Jobclock system takes advantage of the low cost of Dallas Instruments ibuttons and the easy availability of Palm Pilots. Contractors no longer have to second-guess hand-written employee time cards or spend time adding up hours. There is simply nothing like it on the market."

"What I like about the Jobclock is its simplicity," said Lou Pagano of Little Foot Construction. "It took only minutes to install and understand. My employees like it and my bookkeeper refuses to go back to having to read scribbled-in time cards. We even use one Jobclock to track the use of the company's tools."

The Jobclock System is Designed for Anyone in the Construction Process

Painters, framers, roofers, remodelers, masons, plumbers and electricians can all benefit from tracking arrival and departure times. A primary benefit will be to companies who are running multiple job sites and do not have a full-time supervisor at each site.

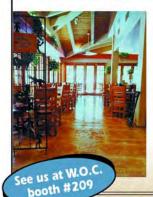
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Diamond Products Introduces Core Cut CC6000D with Differential Drive

D iamond Products has announced the introduction of its new Core Cut CC6000D Concrete Saws with Differential Drive to its product line. The new CC6000D features a patent-pending design with a differential drive system that allows for easy maneuvering by pivoting the saw on its rear wheels. No heavy lifting is required to turn the saw.

- The CC600D offers these features:
- 65 HP Wisconsin gas engine.
- Fits through a 30" doorway.
- Hydrostatic transmission with differential is totally enclosed. No exposed chains or gears.
- Differential lock provides positive drive to both rear wheels for maximum traction.
- Choice of 14", 20", 26", 30", and 36" blade guards.
- Maximum cutting depth $14\frac{3}{4}$ " with a 36" guard.
- All CC6000D saws come standard with quick-release blade shaft/flange, slip-on blade guards, quick-release 10" rear wheels, double concave roller bearings, telescoping front pointer and three position handle bars.
- Bladeshaft tachometer standard on multi-speed saws.
- Free wheel neutral on hydrostatic transmission for manual maneuvering.
- Four stage air cleaner with maintenance indicator for maximum engine protection.

Headquartered in suburban Cleveland, Diamond Products is a leading manufacturer and distributor of diamond tools and

equipment. The company product line includes wet and dry diamond blades, diamond core bits and core drill rigs along with concrete, wire and masonry saws. For more information please contact Thom Fisher, Promotions Manager at (440) 323-4616.

Sawtec MegaChipper Quickly, Easily removes High-Build Coatings, Flooring Materials

D olly mounted to reduce operator fatigue, the Sawtec[™] MegaChipper peels up coatings when grinding and blasting are ineffective and is particularly suited to the removal of all types of high-build coatings. The Sawtec MegaChipper quickly removes elastomeric and deck coatings, tile mortar, heavy paints, resilient and ceramic tile, linoleum and wood flooring.

The MegaChipper is a sturdy hammer bit with spring steel blade. Powered by a demolition hammer, the blade slides under and releases floor coatings and coverings without damaging the concrete surface. The unit has an adjustable range of motion within 33 to 43 degrees to provide just the right angle needed for efficient removal. The MegaChipper is best used for small to medium-sized jobs and to quickly clear areas next to walls, around columns, or obstructions, or in tight areas.

Sawtec, a division of USF Surface Preparation Group, offers a full-line of portable dust-free surface preparation equipment including air-powered saws; grinding equipment; tilecutting, tuckpointing and crack chasing equipment; joint cleanout equipment and dust collection systems. The Sawtec[™] line also includes a full complement of standard and premium diamond blade, cup wheels and abrasive discs. Sawtec sales professionals work with knowledgeable equipment and supply vendors and are available for consultation at your jobsite to help determine which tool and diamond blade will best serve your needs.

For more information on USF Surface Preparation Group or Sawtec, visit the expanded web site at www.surfacepreparation.com or send an e-mail to info@usfspg.com.





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or countertops in public places — they want more of the products. As demand grows — so does the amount of creativity and diversity of offerings from concrete trade's people and other craftsman from outside the concrete industry.

In some cases it is artists or those with architectural backgrounds or other building experience turning to concrete as their medium, versus concrete contractors turning into artists. Mark Rogero of Concreteworks Studio in Oakland, CA, for instance, is a trained architect. Fu Tung Cheng of Cheng Design in Berkeley, CA has a background in building. Jeff Girard, of Formworks in Raleigh, North Carolina, is an engineer by training.

This diversity among the applicator and product producer communities is sure to spawn an even greater number of innovative decorative concrete applications, to which we can all look forward to.

About The Concrete Network (www.concretenetwork.com): Founded in 1999, The Concrete Network serves architects, builders, designers, consumers, and remodelers with over 1,300 pages of concrete information and local service providers for stamped concrete, acid-etch staining, concrete resurfacing, and 43 other types of concrete work. Jim Peterson is Founder and President.



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