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Tuesday	7	1/2	3.30	',	'.	2
Vednesday	7	1/2	4	·* ++ `	٠,	8%
Thursday	7	Ye	4	1	:	81
Friday	7	1/0	4	.'	1	8%

David Burns

Day Mon 12/12

Tue 12/13

Wed 12/14

Thu 12/15

12/16

Jobsite Name: Morris Industries

Start 7:08 AM 12:41 PM

:12 AN

12:43 PM

:12 AM

12-46 PM

12:05 PM 3:22 PM

12:07 PM

12:02 PM

3:49 PM

12:07 PM

3:23 PM

Employee Report

4:57 hours 2:41 hours 7:38 hours

4:55 hours 2:40 hours 7:35 hours 4:50 hours

3:03 hours 7:53 hours

2:56 hours 7:58 hours

2:55 hours 7:49 hours

38:53 hours

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Dear Readers,

B elieve it or not, *Concrete Decor* magazine will celebrate its five-year anniversary at the 2006 World of Concrete show in Las Vegas (booths #S10347 and #O30614). You might ask: How did we get started? Well, on a warm Sunday morning in the fall of 1999, I came across a jobsite where a guy was preparing to stain the floor of a soon-to-be hair salon in the small Sierra foothills town of Murphy's, Calif. Intrigued by the products, I set out to publish the first articles on acid stains for concrete. And, well, here we are today...



The past five years have seen a lot of change for *Concrete Decor*. Exciting new products have entered the market. The number of people entering this fascinating area of the concrete industry continues to grow steadily. Quality and creativity in workmanship continue to inspire the world around us. But most important, I should add, is the steady increase of interest in knowledge and education. This is, of course, a cornerstone to our success and an indication that the trade is heading in a direction that's capable of sustaining significant growth.

One of *Concrete Decor's* greatest challenges in the past couple years has been our efforts to better serve our international subscribers. Fortunately, in our effort to derail slow delivery times and lower the high cost of serving distant regions such as the island of Cypress in the Mediterranean, *Concrete Decor* has found a solution everyone can enjoy. It's *Concrete Decor's* new "Virtual" magazine. Now, anyone in the world, including all of us at home, can have this incredible magazine delivered direct to our computer for reading on the road or at home. Aside from gaining immediate access to advertisers' Web sites, *Concrete Decor* will impress customers when you turn on your laptop computer to explore various colors and finishes with them.

What's more, Concrete Decor's virtual magazine is delivered to you minutes after we're finished with it. You can be on a business trip, or anywhere in the world, and delivery of your latest issue is only a mouse-click away. Best of all, a year's subscription is only \$14.95. Who says we can't show off a bit of our own innovation from time to time!

Before you indulge yourself in this latest issue I want to give special thanks to all the people who have helped make *Concrete Decor* the magazine it is today. *Concrete Decor* advertisers are a big part of our success and I encourage you to patronize them as often as possible. And to our subscribers, we want to say thanks for the inspiration you are to all of us.

As a special tribute to the 26 contractors we have profiled over the past five years, we have taken this special opportunity to recognize them on page 88. We look forward to the potential of adding you to this honored group of artisans in an upcoming issue. From all of us at *Concrete Decor*, thanks for your support.

Sincerely,

Bent Mikkelsen, Publisher

ON THE COVER: A member of the Carlton Concrete crew tamps down a skin on a poolside texturing job. Photograph courtesy of Larry Carlton.



Dec/Jan 2006 • Vol. 5 No. 6

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Contents

- 28 Brush up on Brushed Finishes Halloween is long over, but don't put your broom
- 36 Stenciling Existing Concrete A look at sandblasting, stenciled overlays and the new gelled-acid etching techniques. by Amy Johnson

56 Slip Resistance

A primer on what you can do to improve the safety of your decorative concrete floors (and avoid a lawsuit at the same time). by Susan Brimo-Cox

- 64 Cold Weather Stamping We all know there are times when you just can't get around stamping in cold weather. Here are some
- 70 Opaque Coatings Sometimes paint is simply the best choice for a concrete floor. by Stacey Enesey Klemenc
- 84 A Test in the Elements Decorative concrete panels still look good after 40 years in Chicago's extreme weather. by William C. Panarese
- How to get the look of outdoor tile on the vertical. by Stephanie Mohler

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Contents

COLUMNS

- 26 Doug Carlton How to justify your price.
- 76 Richard Smith Broaden your knowledge and bring your clients' dreams to reality.
- 114 Andy Fulton Consider the pressure washer.

DEPARTMENTS

- 22 CONTRACTOR PROFILE: Seamless Floor Coatings Seamless has been coating floors since 1939. Now the company has taken a decorative direction. by John Strieder
- 48 NEW TECHNOLOGY: Decorative Applications for Pervious Concrete Pervious concrete, increasingly in demand for its environmental benefits, takes on color. by Michael Chusid
- 80 MANUFACTURER PROFILE: Arch-Crete Arch-Crete's lightweight forming system gives the look and feel of real stone. by Christina Camara
- 90 **TOOLING:** Decorative forms
- 104 PROJECT PROFILE: David Jack Corp. produced 480 countertops in six weeks.
- 120 FINAL POUR: Climbing the walls
- 10 Decorative Concrete Tips
- 14 Industry News
- 20 Industry Spotlight Association News
- 115 Product News
- **108 Product Profiles**
- 2 Publisher's Letter

SPECIAL SECTIONS

113 Advertisers Index106 Classified Ads100 Concrete Marketplace



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- Brandon Gore, of Gore Designs.



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

Coloring Sealer with Metallic Powder

dding a metallic color treatment to interior decorative concrete floors or cementitious overlays is a simple step and adds a very distinctive look with concrete stenciling applications.

In the first photo, metallic powder is being added to a solvent-based acrylic sealer and thinned 4:1 with acetone. The metallic powder sealer mixture is then connected to a Preval Sprayer assembly and shaken prior to spraving.

In the second photo, a stencil has 2 been applied to the concrete sample and burnished to assure that all of the edges are flat and firmly adhered to the surface. Next, the metallic mixture is spray applied. It's important to remember that several light applications are better than one heavy coat. This method allows for quick drying and safeguards against any chance of material seeping under the stencil. Several light coats assure good coloring and wear resistance.



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1.888.508.3289 www.BellaVernici.com The third photo shows the stencil being removed from the surface of the concrete sample. Following this coloring application, the surface can be treated with reactive stains or acrylic stains. Since the metallic colored areas are applied with a sealer, stain colors will not affect those areas.

Note: In this case and with so many other flooring applications, reactive or acrylic stain can easily be applied to the concrete ahead of stenciling the surface. However, it is important to remember that any staining application must first be washed in order to neutralize the surface and remove any residue. This will assure that the stencil adheres firmly to the surface of the concrete and the metallic coloring of the surface bonds properly.



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What's new at ConcreteDecor.net

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If you found a new laptop computer under your Christmas tree this year then you owe yourself the special pleasure of ordering a subscription to *Concrete Decor's* new "Virtual" magazine. In fact, lets do it right now! Log onto www.concrete decor.net. Once there, just follow the instructions and in a few minutes you'll be turning the pages of *Concrete Decor's* latest issue on your screen. Aside from some really cool features like instantly connecting to advertisers' Web sites when you click on ads, your digital copy of *Concrete Decor* is less likely to get "borrowed" and it won't ever get its pages wrinkled.

Note below the current password for gaining total access to *Concrete Decor's* archives of articles and information on the latest tips and tools. There's no other Web site like it anywhere and every bit of it is designed to keep you on the leading edge of the trade. While you're there, sign up for *Concrete Decor's* FREE monthly e-Newsletter.



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MAPEI talks the Walk

dustry News

MAPEI is helping the San Antonio River Foundation install a WPA-era ceramic tile mural along the city's planned River Walk expansion. The manufacturer will supply all surface preparation and tile installation products to set the mural. The company will also provide a technical consultant to advise installers.

The 120-tile mural, which depicts colorful scenes in a Mexican village, was created some 70 years ago at the Mexican Arts and Crafts workshop started by Ethel Wilson Harris, technical supervisor of the Works Progress Administration (WPA) arts and crafts division in San Antonio during the Great Depression. The Mexican village mural was rescued from a home undergoing demolition. The piece will be the third WPA-era mural to grace the San Antonio River Walk.

For more about MAPEI, visit www.mapei.com or call (800) 426-2734.

Spreading the word about Vox

The Euclid Chemical Co. has teamed with Eliokem, a global leader in specialty chemicals, in a joint marketing campaign to strengthen awareness of Euclid's long-

standing commitment to green building. The collaboration will promote Aqua-Cure Vox and Super Aqua-Cure Vox, two of Euclid's environmentally friendly cureand-seal products. Aqua-Cure Vox and Super Aqua-Cure Vox are acrylic, waterbased, membrane-forming liquids for curing, sealing, dust-proofing and hardening concrete. Both liquids are formulated with Pliotec, a high-



performance resin from Eliokem. The low-odor formulations dry to a clear protective film that resists yellowing and protects concrete surfaces against the effects of weathering.

All Euclid products designed for curing and sealing meet the requirements of both ASTM C-309 and ASTM C-1315, and incorporate the latest technology for high gloss, hard film and VOC contents compliancy.

The Euclid Chemical Co. is a wholly owned subsidiary of RPM International Inc. For more information, visit www.euclidchemical.com or call (800) 321-7628.

Grace shuffles R & D division

Grace Construction Products has announced a strategic realignment of its research and development organization.

The global R&D laboratories in Cambridge, Mass., will be organized into two research departments, Formulated Products and Materials Engineering.

Charles R. Cornman, Ph.D, has been appointed Director of Research & Development for the Formulated Products department. This group will

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To the Editor:

Your article, "Densifiers: Moisture management and a whole lot more" (Aug/Sept 2005), by Susan Brimo-Cox, is informative and brings to your audience useful information on the fastest-growing treatment for concrete flooring.

The ASTM Committee C09.22 Materials Applied to New Concrete Surfaces has a task group developing a specification for densifiers chaired by Mike Morrison of CTL Laboratories.

I would like to take this opportunity to expand on a few technical points in the article that require clarification.

1. Concrete treated with densifiers has increased resistance to mineral acids, i.e., muriatic, sulfuric.

2. The densifed concrete is still affected by organic acids such as vinegar, citric acid (oranges, tomatoes) lactic acid, milk products, wine and most other food acids, causing white stain or deterioration.

3. Densifiers will greatly reduce wear and dusting, but not completely stop the process.

4. A surface treatment at the industry standard application rate of 200 square feet/gallon applies 3.2 grams per square foot of concrete. This amount of material is sufficient to densify the surface if the concrete is tightly trowelled. There is no evidence that it will change or have any effect on the compressive strength of concrete, which measures the ability of the concrete to take a load in compression, or its tensile strength, which measures the parting force in tension — i.e., pulling the concrete against a fixed point until it yields (breaks).

5. Concrete will naturally continue to increase compressive strength as it cures until it reaches its mix design criteria regardless of densifier usage.

6. There is no evidence that densifiers prevent the ravages of freeze/thawing and it is not a substitute for air entrainment or other methods of providing increased durability in outside environments.

7. New concrete that is properly cured and cleaned does not require any special preparation. Other new concrete may have laitance and other materials on the surface that will require removal so that densifiers will have the pores of the concrete opened and accessible calcium hydroxide available to perform their function.

8. Densifiers do not cure concrete, and if applied at the time of curing, require a curing method such as blankets, plastic films, film-forming membranes or fogging to cure the concrete so they don't cause surface problems in the concrete slab.

9. When applying topping over a densified surface, it is always recommended to utilize a bonding agent, since densified concrete is in part concrete and concrete does not adhere well to concrete.

Darryl Manuel, Chairman — ASTM C 09.22 Materials Applied to New Concrete Surfaces

> focus on products and technologies driven by the needs of producers and contractors, including water reducers, superplasticizers, self-consolidatedconcrete, cement additives, concrete accelerators and retarders, liquid membranes, and rheology modifiers.

The Materials Engineering research department, under the interim leadership of Felek Jachimowicz, Ph.D., Vice President, Research & Development, will focus on the development of technologies and products specified by engineers and architects.

All Grace research and development laboratories in Europe will be consolidated under the leadership of Michael Jung, Ph.D.

Visit www.graceconstruction.com for more about Grace Construction Products.



CIRCLE #87 ON READER SERVICE CARD



The longest yard

The largest single self-consolidating concrete pour in North America to date involved Degussa Admixtures materials at the site of the future Trump International Hotel and Tower superstructure in Chicago.

The concrete foundation of the super-structure — 198 feet long by 60 feet wide and 10 feet deep — was laid in a 5,000-cubic-yard monolithic continuous pour that lasted approximately 24 hours. The Rheodynamic Self-Consolidating Concrete (SCC) system from Degussa Admixtures Inc. was the material used in the pour.

Concrete producer Prairie Material Sales Inc. collaborated with Degussa Admixtures on a concrete mix that would adhere to the project's strict specifications. The maximum temperature allowed during the placement of the concrete was 80 degrees F and the maximum temperature of the concrete in place was 170 degrees F. The specs also called for self-consolidating concrete with strength of 10,000 psi produced on a continual basis.

Over 30 ready mix trucks from Prairie Material Sales Inc. No. 32 plant made 600 trips to the Trump Tower site. The trucks unloaded the concrete onto three large conveyors that placed the concrete right into the opening of the mat. Trump International Hotel and Tower will be 92 stories tall, consist of over 2.6 million gross square feet of building area and more than 180,000 yards of concrete when it is completed in 2009. The Tower will be constructed of concrete instead of steel so it will fit in the limited space available.

Ready, go, set

Transit Mix Concrete and Materials, a division of Trinity Industries of Dallas, Texas, achieved a 22-minute set time with a high-performance mix design for the "Two-Hour House."

The competition was staged on Saturday, October 1, 2005, in Tyler, Texas. The construction project used the latest materials and technologies to construct a 2,160-square-foot concrete slab home from the ground up in record time. The fully landscaped project was finished in 2 hours, 52 minutes and 29 seconds.

Transit Mix partnered with its chemical admixtures supplier, Degussa



Admixtures, Inc., to design and produce the concrete mix.

They used a slightly modified version of Degussa Admixtures 4x4 Concrete technology, a combination of admixtures and concrete materials used in rapid-setting highway and airport repair applications.

The project was organized by the Tyler Area Builders Association. For additional information on the admixtures used in



the high performance concrete mix design, contact Kelly Mawby at Degussa Admixtures, (216) 839-7071.

Kudos for Sika

Sika Corp. received four International Concrete Repair Institute Awards in the ICRI's annual program. They are: "Award of Excellence in the Historic Category" for Alcatraz Cellhouse in

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San Francisco, "Award of Excellence in the High Rise Category" for One and Four Longfellow Towers in Boston, "Award of Merit in the Parking Deck Category" for the Sixth Street Parking Deck in Louisville, Ky., and "Award of Merit in the Longevity Category" for Baldwin Reservoir in Cleveland.

More about Sika can be found at www.sikaconstruction.com or www.sikacorp.com.

Props to Staker and Parson

The National Stone, Sand and Gravel Association (NSSGA) recently awarded Staker and Parson Cos. five Environmental Eagle Awards for its commitment to the environment.

Staker and Parson received four Silver awards and one Bronze award for the following sites: Brigham City North Facility, South Weber Facility, McGuire Facility, Beck Street Quarry and Keigley Quarry. The awards recognize aggregate



producers that meet and exceed technical environmental and regulatory requirements.

The Environmental Eagle Award program was created in 1992 to honor companies committed to protecting and preserving the natural environment surrounding their operations. Criteria include: extent to which the operation's environmental control measures produce measurable results better than regulatory requirements; extent to which an operation has implemented effective environmental control measures; quality and effectiveness of an operation's pollution prevention and waste minimization programs; quality and effectiveness of the operation's proactive environmental program; and degree of employee involvement in environmental programs.

For more about Staker & Parson Cos., visit www.stakerparson.com.

Degussa plant puts brakes on waste

Degussa Construction Chemicals was recognized by a California environmental group for improving ecological performance, preventing waste, conserving energy and using resources more efficiently at its Newark, Calif., plant.

StopWaste, an organization dedicated to improving environmental performance and reducing costs at California businesses, presented the honor. Degussa's Newark plant had asked StopWaste to assess the facility's recycling efforts earlier that year. Resulting changes in operating procedures provided economically sound and environmentally friendly results. To name just one example, the company used to throw away "super sacks" - fourfoot-square plastic-lined fabric containers - until StopWaste told Degussa about a company that would recycle the sacks. The plant began recycling empty raw material bags and 55-gallon fiber drums that also contained raw materials. It also started reusing treated wastewater on a limited basis.

Degussa Construction Chemicals can be reached at (216) 839-7000.

Craig W. Hamilton

Craig W. Hamilton, director of research and development at MAPEI Corp., died unexpectedly from a heart attack on September 16, 2005. He was 55.

Hamilton worked in the ceramic tile and stone industry for over 20 years, and joined MAPEI Corp. in 1989. He performed various roles in the company, most recently serving as director of R&D.



Keenly involved in his profession, Hamilton served as the current President of the Materials & Methods Standards Association (MMSA). He also had a strong interest in the International Organization for Standards (ISO), acting as Convener of the ISO/TC 189 Working Group 3. In this role, Hamilton worked on the introduction of new, clearer standards for tile and stone adhesives and grouts.

Hamilton is survived by his wife, Nancy; mother, Virginia; sons, Nicholas and Michael; and stepson and stepdaughter, Brian and Elyse Gruskin. He will also be deeply missed by the MAPEI family.

A memorial service was held in Hamilton's honor on September 21 in Plantation, Fla. At the family's request, donations may be made in his memory to the American Red Cross and Noah's Wish.

LEED leads

The RMC Research Foundation has released the Ready Mixed Concrete Industry LEED Reference Guide.

The Guide aims to educate ready-mix concrete producers, construction contractors, architects, and others in the construction industry about the environmental benefits of concrete and how they may fit into projects that are to be LEEDcertified. It will help concrete producers identify areas where they may improve the environmental performance of both their operations and their product. Architects, engineers and specifiers may learn from the Guide as well.

The Guide is available for download from the RMC Research Foundation's Web site at www.rmc-foundation.org. Printed copies are also available for purchase.

Multiquip, STOW make hires

Multiquip Inc. named Kevin Day director of the company's Concrete and Masonry Technologies Division. Day joined Multiquip in 1990 and returns to the company after several years as the Western Region Sales Manager for Fort Lauderdale-based NationsRent.

Also, Tom Roe was named Sales Director for STOW Construction



Equipment in Carson, Calif. STOW Construction Equipment is a division of Multiquip Inc. More information can be

found at www.stowmfg.com and www.multiquip.com.

Cemstone names sales VP

Cemstone, which makes ready-mix, engineered and architectural concrete for the upper Midwest, has named Eric

Soe vice president of sales and marketing.

Soe will direct and supervise planning and implementation of sales and marketing



strategies. His responsibilities will include business development, customer relationship management, product marketing and sales operations.

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Industry Spotlight Association News

PORTLAND CEMENT ASSOCIATION Education foundation doles out concrete cash

The Portland Cement Association (PCA) Education Foundation awarded seven graduate students with educational fellowships at the association's fall 2005 meeting in Chicago.

The 2005 recipients are: Blake Kreuer (Cleveland State University), Lesley H. Sneed (Purdue University), Kofi Ayensu (Lawrence Technological University), Ian Cosh (University of New Brunswick), Fatih Bektas (Iowa State University), Michael Robbins (University of Toronto), and Tyler Ley (University of Texas at Austin).

The PCA Education Foundation Research Fellowship identifies and

rewards outstanding masters and doctoral students in the fields of engineering and physical sciences who are studying areas that advance the science and technology of cement and concrete. PCA's Education Foundation presented each student with \$20,000 for university and study costs.

More about the PCA can be found at www.cement.org.

AMERICAN CONCRETE INSTITUTE ACI publishes consolidation guide, two others

The American Concrete Institute announces the availability of three new publications.

347.2R-05, "Guide for Shoring/Reshoring of Concrete Multistory Buildings," presents



information and design criteria for shoring/reshoring operations during the construction of reinforced and post-tensioned multistory buildings. Topics include shoring/reshoring construction needs, construction loads on formwork, and strength adequacy of concrete slabs and formwork.

209.1R-05, "Report on Factors Affecting Shrinkage and Creep of Hardened Concrete," describes the effects of numerous variables on shrinkage and creep of hardened concrete, including mixture proportions, environment, design, and construction.

309R-05, "Guide for Consolidation of Concrete," includes information on the mechanism of consolidation and gives recommendations on equipment, characteristics and procedures for various classes of construction. Recommendations on mixture proportioning and vibration equipment are presented, as well as procedures for floor slabs, pavements, precast products, structural low-density concrete, high-density concrete, and self-consolidating concrete. The guide includes information on quality control and quality assurance.

These publications can be ordered at www.concrete.org or by calling (248) 848-3800.

AMERICAN SOCIETY OF CONCRETE CONTRACTORS ASCC plans golf gettogether for CEOs

The American Society of Concrete Contractors will hold its annual CEO Forum at The Inn at Spanish Bay, Pebble Beach, Calif., Feb. 23-25, 2006. The CEO Forum brings together concrete contractors from across the country for seminars, roundtable discussions and recreation. Attendees will have the opportunity to play three of the famous golf courses that are part of the Pebble Beach Resorts.

For more information, visit the ASCC Web site at www.ascconline.org or call (866) 788-2722.

NATIONAL PRECAST CONCRETE ASSOCIATION MCPX conference planned

Billed as the largest manufactured concrete products trade show in North America, the fourth annual Manufactured Concrete Products Exposition (MCPX) will be held Feb. 23-25, 2006, at the Anaheim Convention Center in Anaheim, Calif. More than 6,000 plant owners, managers and production personnel are expected to attend.

The 2006 MCPX show will encompass 250,000 square feet of

exhibit space filled with hundreds of products and services for the manufactured concrete products industry. The event will include nearly 100 hours in industry-specific educational courses, plus a working laboratory and product demonstrations.

MCPX is a collaborative effort sponsored by the National Precast Concrete Association (NPCA), National Concrete Masonry Association (NCMA), Interlocking Concrete Pavement Institute (ICPI), American Concrete Pipe Association (ACPA) and Precast/Prestressed Concrete Institute (PCI). Visit www.mcpx.org for complete information and to register online.



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Seamless Floor Coatings Inc. Santa Ana, California

by John Strieder

head in the clouds is bad for business. Luckily, the Kolleck family does not have that problem. They have focused on floors for six decades, and their business, Seamless Floor Coatings Inc., is successful because of it.

Paul Kolleck founded Seamless in 1939, coating metal ship decks for the military. In 1942, he expanded into a new niche, coating concrete floors at airplane hangars.

Years passed, bringing new generations of Kollecks, and Seamless coated countless square feet of concrete and metal flooring in the meantime.

Today, vice president Tommy Kolleck, 28, son of current president Tom and great-grandson of Paul, is taking the family business in a more decorative direction for the twenty-first century.

Seamless began exploring architectural coatings about a decade ago, when Tommy joined the





company. "That's where I came in bringing the company to the next level, trying to keep up with everybody else," he says.

Kolleck is especially proud of 90,000 square feet of floors recently placed for Saleen Inc. at the Irvine, Calif., headquarters of the high-performance car company. Seamless laid 18,000 square feet of metallics for a showroom and put down a gray layer of 100 percent solid epoxy in a warehouse.

Seamless has also become a contractor of choice for a few chain retailers, including Charo Chicken, which asked Seamless to hand-match its signature purple, red and yellow colors on restaurant floors. Seamless has replaced tile and carpet at Nutri Shop sports nutrition and supplement stores with an acid-stained surface that is cheaper and easier to clean than the tile.

Seamless has also specialized in taking on coating jobs that nobody else

would want to do, Kolleck says. For example, when the company was called in to give the acid stain treatment to one future Nutri Shop site, workers were confronted with patches of exposed wood on a floor that was otherwise epoxy quartz. A pizza restaurant had formerly occupied the space, and the holes were footprints left by equipment removed from the old eatery. Epoxy quartz doesn't easily take to acid stain in the best of circumstances, and with the patches, the task looked daunting.

But Seamless pulled it off. Workers deep-filled the exposed holes with overlayment until they were level with the quartz, then diamond-ground the entire floor. A layer of 100 percent solid epoxy was poured over the surface and topped with 60-grit silica sand broadcast almost to refusal. After set time and a good sweep, the resulting floor took nicely to three coats of microtopping and an acid stain. Another coat of 100 percent solid epoxy sealed the surface.

The company also recently finished a waterproofing and microtopping job at an office and parking complex in Garden Grove, Calif. When the office building began to leak, its owners couldn't just tear out and replace the concrete, because the concrete was supporting the building. The seal work done by Seamless preserved the structural integrity of the building while protecting it against leakage.

"We have a lot of projects where a lot of people are like, 'ehh, we don't know what to do with that," Kolleck says. "And we do it for them."

Seamless also manufactures two kinds of decorative coatings: a metalized epoxy and a translucent epoxy that looks like an acid stain after application. "We're always playing around with different things," Kolleck says. "That's almost what I specialize in, is trying to make something that isn't out there."







What they don't make, they tend to get from Floric Polytech Corp., a supplier that Kolleck says has been instrumental in helping Seamless grow over the years.

Seamless Floor Coatings doesn't do floors exclusively. The company will overlay tile, wood or metal countertops with microtopping materials, and even pour a new top if specs and aesthetics call for it. A division of the firm takes on commercial painting, coating and waterproofing jobs. But floors are the company's bread and butter. "We do floors over concrete, over wood, over tile, pretty much anything," Kolleck says.

On the other hand, the company's first line of business, ship decks, is fading. Getting deck contracts involves plowing through too much bureaucratic red tape these days, Kolleck says, and besides, there's more work in decorative concrete flooring. "We still do hangars for the military, but it kind of has to be the right job. Plus, that really doesn't allow me to be creative. It's kind of the same thing over and over."

What's good for Kolleck is also good for Seamless, as the decorative concrete industry continues to grow. "If you're not keeping up, you're going to be left behind real quick," he says. "We're shifting gears to the more functional, architectural side, where you can pound on it but it still looks good."

The floors at Saleen are living up to that description. Someone recently dropped a brake rotor directly onto the concrete floor, and the impact from the heavy chunk of machinery dented the concrete. But it didn't tear Seamless' topping. "The concrete failed before the coating did," Kolleck notes. "That's a pretty good testament."





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Decorative Concrete Why Is It So Expensive?

by Doug Carlton

wish I had 10 cents a square foot for every time I've been asked this question. And other questions such as: How much more does stamping cost compared to regular concrete? Are stained floors more than tile? I've realized over the years that all the above questions are legitimate and deserve an honest answer. Sometimes as decorative contractors we are quick to defend our prices, but short on justification. Well, hang on, because we are going to answer all of the above and more.

You and I both know decorative concrete is expensive because it's worth it. Or, is it so expensive? Up until this point the market has perceived concrete as a functional necessity. Driveways existed simply to get from the street to the garage. Concrete slabs were nothing more than durable surfaces to facilitate floor coverings. Concrete created strong foundations, made long-lasting walkways, and helped mom keep the house clean. This durable product makes the perfect canvas for decorative concrete. It just makes sense. Answering why it's so expensive is easiest by looking at why it's so popular.

Exterior decorative work such as driveways and walkways is almost a necessity in upper-end landscape projects. Whereas a traditional concrete walk or drive breaks up the flow of landscape, a natural-looking path or drive allows the landscape to blend from left to right. A naturallooking stamped hardscape costs more because it delivers more. The cost isn't justified by the stamping, but by the complete landscape presentation. The same look can be achieved by using real stone or brick, but at what cost?

What you are offering is a product for a third of the price of real stone with the same effect. Please notice I said effect. Nothing looks more natural than real stone. But remember, the hardscape has several functions. It has to be durable yet natural-looking, as well as affordable. Decorative concrete is the only product that achieves this time and time again.

The same applies to the interior work. A stained floor with decorative saw cuts or stencil is unique and your pricing should be justified by this individuality. A custom concrete countertop should cost \$80 to \$100 per square foot. Architectural artwork has value. Charge accordingly. Justify your pricing not by comparing to regular concrete or carpet, but by the AFFORDABILITY compared to real stone.

I had a prospective client ask me how much a yard of concrete was going for these days. I must have really floored him with his stamped concrete bid. I apologized for a poor presentation. For him to ask this meant I must not have justified my cost. I felt the best answer to his question was one of my own. I commented on the beautiful paintings he and his wife had collected over the years that they proudly hung on their wall. I asked what he thought the cost of a piece of canvas and few ounces of paint were going for. I didn't get the job, but my point was made. Our clients aren't simply buying a gallon of stain or a pail of overlay. They are paying for our skill combined with these ingredients to create a personalized work of art.

Where is your market?

Do you know the difference between a cost-driven and a value-driven client? A cost-driven person only looks at the price you are charging and pays little or no consideration to quality or uniqueness. This is not your market. A value-driven client weighs skill, quality, and service into their decision to purchase. This is your market. They will pay your cost if you can justify the value. When is the last time you saw Saks Fifth Avenue rolling back prices? Think about it.

There is little doubt the best clients for high-end decorative projects are business owners and the self-employed. These people are used to making decisions, realistic about unforeseen circumstances, and don't mind spending for things that have value. Put your advertising money in this market.

Is your pricing too cheap?

If you're not hearing that your company is expensive than you need to raise your prices. Let me explain this. We all agree it costs a lot to do decorative concrete right. If your business is using the best products and providing the best service then why not charge the most money? Your market is used to paying for quality. You are not the exception. Justify your pricing by showing ways your company goes above and beyond the industry standard.

A volume market?

Decorative concrete is not a volume market. There are way too many variables. I know there are a few exceptions to this rule across the country but it is not the norm. Do fewer jobs for more money. The benefit to you is more money trickles to the bottom line with fewer headaches. Every time I make a run at increasing volume, I lessen quality. Without high quality, I'm just another company doing decorative work. I have had success becoming more efficient, which has led to an increase in volume. Another benefit to staying lean on volume is it allows your business to change with the market. Believe me in saying this, this decorative market has just started and it is constantly evolving. I'm not a big fan on jumping into every new craze entering the market. Listen to what your clients are asking for. This is always the best market indicator.

Your best tools?

Your best tools are not in the toolbox. You want to know where they are? They are at the World of Concrete, in *Concrete Decor* magazine, at decorative seminars, etc. I truly believe I could teach a crew to stain or stamp in a couple of weeks. A true understanding of your market and justifying cost will take time and continued education. Attend and read everything decorative available and implement these tools into your business.

Good luck, and please feel free to email me with questions or comments.



Doug Carlton is president of Carlton Concrete Inc., located in Visalia, Calif. Carlton Concrete specializes in decorative stamping. Doug has instructed several decorative training courses, including the 2005 World of Concrete. He can be reached at carltondoug@sbcglobal.net.

Brush Up a Decorative Finish

Brushed finishes are inexpensive and lend themselves to more creativity than you might expect.

B rushing or brooming a non-skid texture onto concrete is a standard finishing method. But with a little imagination, the right equipment and a skilled technique, a contractor can turn that finish into an inexpensive decoration that will please his client and boost his company's reputation.

Brushes and broom heads made specifically for concrete finishing are made from several materials. "We have horsehair, polypropylene, styrene, and nylon bristle brushes in our catalog," says Greta Moore, executive assistant at Magnolia Brush Manufacturers. She explains that horsehair, which is soft, gives the finest finish, while stiffer bristles give a coarser texture.

Horsehair, the traditional favorite, is still popular. "Overwhelmingly, the choice is the horsehair brooms," says Jim Stormont, vice president of Marshalltown Co. In fact, Marshalltown's horsehair brooms outsell their polyfiber brooms by roughly 200 to 1.

On the other hand, Gary Bolden, president of Marion Brush Manufacturing Co., says Marion makes only nylon bristle brushes. They achieve a softness similar to horsehair by using very fine bristles — as thin as 0.008 inch. "A lot of horsehairs and fiber materials will collect concrete and hold it at the ends in little balls, but the nylon doesn't seem to do that nearly as bad," Bolden says. His company uses only #612 Dupont nylon resin for its bristles. "It's the most expensive nylon resin on the market," Bolden says, "but we use it for its chemical and wear resistance, and its superior [shape] memory."

Innovation

One way creative contractors can achieve unusual decorative finishes is by modifying stock implements. For example, in response to customer requests, Marion Brush has made custom brushes with variegated stiffness. A brush with alternating sections of stiff and medium bristles along its length creates an appealing pattern.

Another way to achieve unusual brush patterns is to use an unconventional applicator. For instance, Rick Smith, owner of Richard Smith Custom Concrete, reports using stainless steel brushes for extremely hard, rough surfaces. "I emphasize stainless," Smith says, "because if a bristle was to come off of a standard steel brush, the bristle would typically rust and create a stain."



Another great way to achieve a brushed finish is to use a sponge, says Chris Sullivan, national technical director for QC Construction. "As the concrete achieves a certain hardness, you start applying water to the surface with a hose, and use the sponge to work away some of the cream, to get the desired effect." This requires a lot of work on the hands and knees, so it is expensive and time-consuming for large areas. However, Sullivan has seen the technique used effectively on small decorative areas such as pool copings, and accents or inlays within a concrete pad.

Another bristle-free brooming technique involves working a magnesium float in half circles. Sometimes called a floated surface, this is commonly referred to as a sweat finish. "It looks like the concrete has beads of sweat on it," Sullivan says,



"and they've been smeared around in these half circles."

Bolden suggests a hybrid method accomplished by mounting a standard concrete brush in tandem with a bull float or fresno trowel. "You are actually using the bull float or the fresno as the vehicle to get the brush across the slab," he says. "You don't have to take a regular concrete finishing brush and lift it out, say, 24 feet and try to bring it back. That's very hard to do." Instead, after pushing the bull float or fresno across the slab, turning the handle for the comeback places the brush into contact with the concrete. The texture is applied as you pull the implement back.

Technique

Having the right equipment helps, but you also have to have the right techniques to create an artistic brushed finish. It starts with knowing when to begin. "It's all timing," says Doug Carlton, president of Carlton







Keep Those Bristles Straight!

No matter how good your technique is, you won't get an attractive, consistent pattern if your brush or broom has bent bristles. Here are some ways to avoid — or fix — the "bends."

- Store your brushes and broom heads flat, not resting on their bristles, and preferably in protective boxes.
- Label them with a permanent marker: "Concrete Only Decorative Broom" so they won't be used for site cleanup.
- Rick Smith recommends wetting deformed nylon or horsehair bristles the day before you will use them. Their inherent "memory" can help restore their original shape. The effectiveness of this technique depends on the bristle material.
- Gary Bolden asserts that the high-grade nylon bristles in Marion Brush's products have 97 percent memory. Pouring boiling water over kinked bristles restores their original shape immediately. "When you pour the water over it, it almost comes alive," he says.

Concrete. "If the concrete sets too long, you're going to have a difficult time getting a uniform brush mark in it." He recommends pouring small amounts at a time so you can watch it closely and see when it is ready. One way to do that is to pour and broom alternating sections one day, and then fill in the remaining sections the following day.

"The concrete is ready for brooming when it gets to a 'greenware' state, where all of a sudden the moisture's pretty much

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gone off the top of it," Smith says. "You've laid it out for the second time, and you wait until it's still a little on the wet side. That's for a heavy broom finish. For lighter brooming, you wait until it's almost cured."

There's a real art to preparing the concrete. "If the concrete has a lot of cream in it and has to have a rough finish on it, you lay it down once — at the most, twice. You don't bring the cream up," Smith says. "If you have a soft broom, you lay down the concrete once, twice, maybe three times and just lightly wet the broom and the cream acts as a finishing aid."

Watching and understanding the weather is crucial, because factors such as wind, humidity, and direct sunlight affect the concrete. In the winter you might have up to 4 hours to broom the concrete, while in the summer, you might only have a window of 30 minutes to 60 minutes. Anticipating weather conditions enables you to plan on adding admixtures such as water

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reducing agents or plasticizers to make the concrete accept the desired texture.

Each contractor seems to have his own preference for using water during the brushing operation. Some wet the surface, some wet the brush, and some do neither. "Water doesn't really help with the effect of it," Carlton says. "It's more of a lubricant, just to keep the broom moving across the concrete."

Smith says that surface tension is a big factor. "On regular gray concrete, we'll use diesel as a bond breaker so the broom will slide across it a little bit better. With integrally colored concrete, we can't use diesel because it

may change the color, so we're held to using a little bit of water."

Sullivan adds a note of caution. "One of the big nono's with colored concrete is putting additional water on the surface. If you're going to do that, you have to realize that it's going to drastically change the color."

Brushing colored concrete requires special care, but it can also produce a unique effect. "Using integrally colored concrete and orienting the direction of the broomed finish in different directions will cause light to reflect off the surface differently, creating the illusion that you have more than one color," says Chris Becker, owner and president of Becker Architectural Concrete. "That's one of the values in doing a broomed finish. Simply changing the direction of how it's broomed, square by square, for example, will create two different colors."





The large entrance area to this school in Florida features a mediumbroom brush finish.



This is a circular mag brush finish. This photo shows an air brushed finish.

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Changing the direction of the brooming creates other intriguing effects as well. The traditional brush pattern is simply straight lines, which can become more artistic if they are drawn in perpendicular directions on alternating sections to create a checkerboard pattern. Swirls or arcs are other decorative alternatives, but the possibilities don't end there. "We have some brush patterns that are pretty offthe-wall," Smith says. One is a repetitive polygon pattern created by brooming successively in several directions.

Finally, says Carlton, "The thing that's most unique about broom finishes is they're user friendly. If you're doing a certain section and you're not happy with how it's brooming out, you can simply go back and re-trowel that area and then re-broom it." That is true for any desired texture, although it is trickier with a light broom finish, which isn't applied until the concrete is nearly set, leaving a shorter period of time for starting over.

The final step for a brushed decorative finish is at least a curing compound, according to Smith. He recommends using one that will dissipate after thirty days to leave the door open for after-staining in the future. Carlton says he often completes the job with a penetrating sealer. "But the best finish," he adds, "is to wait until the concrete's cured out for about 28 days and come back and put a sealer over the top, more of a lacquer base or a clear sealer. That will really give it a sheen that will enhance the finish underneath it." That enhancement, of course, would have to be figured into the project bid if the owner was interested in it.

Sweep them off their feet

"Broomed concrete is the lesser of everything now, because there are so many exotic finishes out there," Smith says. "But with a little bit of passion and a whole lot of tenacity, you can come up with virtually any kind of broomed finish. There's no limit to it."

Carlton agrees, but sees another aspect to developing skill with decorative brushing. "It's a segue into getting into the decorative market and getting into some of the higher-end projects like stamped concrete," he says. "It's a good segue to get your crew to start to understand that they have to shorten the pours and pay more attention to detail. It kind of changes their mind set from just doing something as a functional, hard surface to creating a decorative piece of art. It's good for a crew to learn, because if they're going to be competitive, they need to keep going into the market that's got a higher budget to work with. That's the thing that drives us into the decorative market."




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Stenciling Existing Concrete

From a simple brick pattern to an ancient family crest, scencils can bring concrete to life.

by Amy Johnson

dding pattern to concrete through the use of stencils was one of the earliest applications of decorative concrete. It is also the subject of some of the newest technology in the decorative field today. There are three distinct methods for adding stenciled designs to existing concrete: sandblasting, topping with an overlayment, and modifying the surface with gelled acid etching. All rely on stencils to mask certain areas and expose others to create a design, but beyond that commonality all three techniques are very different in both application and result.

Sandblasting

Sandblasting is one of the oldest techniques for etching patterns into stone, wood, metal, and, of course, concrete. This technique removes the top surface of the cured concrete that is not masked by the stencil, leaving behind a raised pattern.

Sandblasting is truly a one-of-a-kind technique for high-end decorative concrete. While the designs can be and often are very contemporary, the technique has a traditional, historic, "carved-in-stone" feel about it. Since sandblasting is an elaborate, relatively expensive procedure, sandblasted designs usually cover a fairly small area and are almost always custom projects. "It is a way to get something unique," says Lee Russell, foreman with Lowell Russell Concrete Inc., in Lakeville, Minn. Designs range from family crests on patios, pool decks, even the bottom of swimming pools, to company logos and graphics.

To get started with sandblasting, you'll need a sandblasting tank and an air compressor. You'll also need a lot of safety equipment, Russell says, including an airfed helmet mask that pumps breathable air, and various sizes of nozzles so you can adjust how much sand comes through.



Typically, the nozzle is directed straight down, shooting sand with pressure sufficient to remove the surface of the concrete. The nozzle must keep moving to avoid creating pits or deeper impressions in one spot. Another approach is "shading" — shooting the sand at an angle to create a more dimensional, asymmetrical look.

Of course, "you end up with sand all over the place," Russell says. He directs sand to a central spot for collection with a backpack blower and then rinses off what is left. For obvious reasons, this technique is more often used outdoors and not often for rehabbing interior spaces. The concrete mix and finish have an impact on the appearance of the finished project. "I try to get in on the project from the very get-go," says Clark Paepke, a contractor and international concrete consultant based in Sandy, Utah. "I enjoy that more because I know the personality of the concrete and how to finish it." For example, if an acid stain will be applied before sandblasting, the concrete needs a tight finish.

Grit and pressure also determine the finished look. "If you use a 50-90 grit you can get a glassy look. Heavier sand exposes more aggregate," Paepke says. Lowell says abrasive blasting crystals, which are sharper and harder than typical silica sand, may be needed on concrete with a harder finish or if a more aggressive aggregate exposure is desired.

So, what about the creative side of sandblasting — the stencil? "This is the cool thing about sandblasting there are no design limitations," says Glen Roman of Brickform Products. "You can get very fine detail sandblasting with a stencil."

Stencils must stand up to pressure from the air hose, so they are typically cut from vinyl rather than paper. "Vinyl can be easily adhered in most

Coloring Techniques for Stenciled Concrete

S tenciling and coloring go hand-in-hand to create works of art in concrete. Acid- or water-based stains are the most widely used — and most versatile — materials for coloring stenciled projects. Acid stains tend to produce muted, earthy colors, while water-based stains are available in brighter, more vibrant colors.

Perhaps the simplest coloring technique is to apply stain to the concrete, apply a stencil and then sandblast or etch away the exposed surface, including the stain. In the finished project, the stained color will remain in the pattern protected by the stencil, while the background will be the original color of the concrete and any aggregate exposed during the process.

The mirror image to that technique is to create a resist. Apply the stencil. Then apply a sealer to the exposed areas, whether sandblasted, etched or plain finished concrete or overlay. Remove the stencil and apply the stain. Only the



cases and allows for more detailoriented designs," says Heather Monroe, senior operations manager for Decorative Concrete Impressions LLC, in Webb City, Mo. "Vinyl also provides an increased physical durability for the sandblasting process. We manufacture stencils from 25 mil vinyl." She cautions, however, that vinyl does stretch. "It must be handled carefully to avoid distortion to the material."

Melanie Royals of Modello Designs recommends a stencil at least 10 mil thick for light sandblasting and says, "Deeper carving will require 25-mil green rubber." Brickform makes custom stencils out of 40-mil latex rubber.

Adhesive is important to keep the edges from curling (so sand doesn't infiltrate the design area). Brickform's Roman recommends using adhesivebacked stencils rather than spraying unsealed areas, the pattern of the stencil, will be colored.

Modello Dye Stains are available in 24 colors including metallics like the Copper used on this Eastern Medallion. To achieve this depth of color and shine, the Copper Stain Concentrate was only slightly thinned and two layers were applied with a stencil brush.

adhesive on at the site, which can damage the stencil or compromise sealer performance. If a custom design is large enough to require more than one stencil, they typically do not overlap. Lowell recommends butting the stencils up to each other and attaching them with tape.

Overlayments

Stenciling with cementitious toppings can produce a very different look from sandblasting and is particularly well suited to rehabilitating worn or discolored concrete. A stencil is placed over existing concrete, often over a base coat, and then a topping in a different color is sprayed or troweled over the stencil and finished. The result is a clean, fresh-looking pattern with a very tough, durable surface.

Stenciled cementitious toppings are most often used for repeated patterns

This exotic floor treatment uses a combination of acid stains and Modello Dye Stains. While acid stains are ideal for creating organic effects with more neutral colors, the Modello Dye Stains allow for the incorporation of more dramatic color in this instance, the red and green areas where the stains were applied in thin layers to create a translucent effect.



Melanie Royals of Modello Designs also uses adhesivebacked Modellos to create resist patterns. The design area can be left untouched or colored with acid or water-based dyes. The area is then sealed with a concrete sealer before removing the Modello pattern. After removal the surrounding area can be acid-stained. The sealed areas of the

> design resist the stain, resulting in a lighter-colored design on a darker field. The technique looks complicated, but the effect is actually quite easy to achieve.

> Multiple colors of stain may be added to various parts of the design. Keep in mind, though, that liquid

such as brick, cobbles or stones for borders, pathways, driveways, patios and pool decks, to name a few applications. The most popular and successful patterns are "right angles" – bricks or cobblestones, most experts agree, whereas patterns intended to mimic natural stone are more convincing in stamped concrete.

When putting down an overlayment, the concrete underneath should be rough enough to provide "teeth" for a mechanical bond between surface and topping. Scott Thome, director of product services at L.M. Scofield Co., references the International Concrete Repair Institute (ICRI) SCP 3-5 standard. "This involves mechanical means of preparation," he says. "Sandblasting, shot blasting, high-pressure water (4,000 psi or greater) or light scarifiModello Dye Stains were sprayed to color the orange/ochre background after which a Modello border design was applied and "embossed" by spraying through the design and center area with Concrete Solutions' Spray Top, a sprayable overlayment. The green dye stain colors were then applied over the Spray Top area. Then the Modello pattern was removed to reveal the original stain color below.

colors may migrate. Porous concrete can wick the liquid, drawing it under the stencil. The solution is to use a gelling agent such as Stain Mule stain carrier from Surface Gel Tek or Modello Gel-lo from Modello Designs. Aqueous gels can carry acid-based, water-based and powdered coloring agents. Once the color is neutralized according to the manufacturer's instructions, the gel can be rinsed off.

Contractors can apply many colors to a single stencil by "weeding" the stencil. Tamyrn Doolan of Surface Gel Tek explains, "I cut the whole design into the stencil, but only punch out the parts of the pattern that will be, for example, blue. I apply the blue and then move on to other colors in order." Doolan applies a temporary sealer to previously colored sections to prevent mixing colors.

Royals sometimes sprays a diluted stain over a finished project where a border has been etched with gelled acid. The stain settles into the deeper areas of the etch to add more color there.

Contrasting colored overlays are achieved by applying the base coat in one color, placing the stencil and applying the top coat in another color. Stains can also be used. For example,



applying a stain by hand to random stones or bricks in the pattern makes it look more natural and more interesting. Grout lines are also enhanced by the addition of stain.

Brickform's Glen Roman described an interesting coloring technique to be used on fresh concrete or an overlay of ¼ inch or more. After the stencil is placed, throw on a

dry-shake color hardener and float it in. Then run a texture roller over the top of the stencil and push it into the surface. When the stencil is lifted, the texture will be visible.

Finally, sealers impact the look of the colored project. Utah contractor Clark Paepke heightens contrasts by staining the concrete and sealing it with a high-gloss sealer before sandblasting. After the sealer and stain are blasted off the exposed areas, he reseals them with a matte sealer so the glossy logo stands out even more.

Modello Dye Stains were applied by spray, brush and sponge to complete the look of copper wrought iron through a Modello Design on a concrete overlayment surface.



cation creates a surface that the topping can bond to."

An existing slab can also be profiled with a gelled acid applied according to ASTM Standard D-4260. Profiling acid etches the concrete to create a rough surface. Tamryn Doolan, president and CEO of Surface Gel Tek, was a coauthor of this standard. She says etching costs roughly 12 cents to 15 cents per square foot, compared to as much as \$1.25 for mechanical surface opening.

When preparing the substrate, spalls and cracks must be addressed. Spalls should be filled prior to priming with a compatible repair material. If the cracks are dynamic (moving), they must be allowed to move and therefore be reflected through the system. "Remember, not all concrete can be repaired," Thome says. "Sometime it is better to rip out and replace than to





Placing Stencils

Stenciled overlays are usually used for relatively large areas like driveways, pool decks, patios and pathways. So how do you place the stencil properly for the most natural-looking result? Scott Thome of L.M. Scofield Co. advises starting with the same line of sight the customer will have. If the customer will look up the driveway toward the house, run the stencils perpendicular to this line. "This way the joints between stencil sheets will be less noticeable," Thome says.

While it may seem logical to start a rectangle pattern in line with the house or building, experts caution against it. "Do not rely on the building as your starting point," Thome says. "Most buildings are not square. String a line a foot or so away from the building and then start your pattern." Brad Berg of Architectural



Enhancements says, "If both the house *and* the patio are crooked, set the pattern at a 45-degree angle." Butterfield's Jancy explains another advantage of that approach. "What I like to do when you have a long run is place the sheets on a 45-degree angle so you don't see overlapping repeats." He also suggests sighting a center line and then laying out the stencils evenly on the right and left sides so the edges will match. "Avoid creating 'slivers' of the pattern," he says. "That makes homeowners nervous about giving you a check." For detailed stencils used with etching or

sandblasting over smaller design areas, the stencil can be placed in the center of the target area. Additional background patterns or saw cuts radiate out from there. Placing and adhering the stencil properly is critical for getting clear edges

and details. Both Surface Gel Tek and Modello recommend a "tape hinge" method for their designs, which are supplied with backing paper on the adhesive side and transfer tape on the other side to hold the pattern together until the stencil is applied. The design is set in the desired spot with the backing paper on the concrete. One edge is taped securely to the floor, the tape acting as a hinge. A squeegee or plastic trowel is used to "burnish" the transfer tape for better adhesion with the stencil.

Now the stencil is flipped back on the tape



hinge. The stencil can be burnished again on the backing paper side for easier release. Next the backing paper is gradually peeled off at a 180-degree angle to itself starting from the hinged edge. The adhesive stencil is slowly rolled onto the surface as the backing paper is removed. Once in place, reburnishing will



ensure a tight seal. The transfer tape can then be peeled off and the stencil is ready for color or overlay application.

Modello Designs cuts many larger-scale patterns and intricate designs. When the design area exceeds the width and cutting length of the vinyl the designs can be "tiled" into different sections that are joined together during the installation process. The company provides a clearly marked layout "key" just for this purpose, so there are literally no limits on either the size or the creative application for these stencils. place a topping to try to cover up defects. The first thing that should be done on all of these projects is determine if the substrate is sound and durable and will meet the intent of the owner for a long service life."

Once the substrate passes muster, the next step is to install a bond coat. The bond coat is typically a fluid cementitious material (sometimes a dilute version of the topping material) and acts as a primer. It can be sprayed on, but Thome recommends working the material into the substrate with a broom after spraying to minimize moisture loss and to fill small pinholes in the substrate that might telescope to the surface.

The overlayment is applied over the bond coat. Thome recommends finishing the first coat with a trowel to force the material into the concrete substrate. This improves bond strength and fills in imperfections in the concrete. This underlying layer is the color and material that will be exposed when the stencil is removed. In most patterns, it will have the appearance of grout lines.

Next, the stencil is applied. You don't need a stencil that has an adhesive backing if the overlay will be spray-applied, says Howard Jancy, business development manager for Butterfield Color. He does recommend using an adhesive stencil to avoid stencil movement if you plan to trowel, and also for vertical applications. According to Brad Berg, vice president of Architectural Enhancements in Minnesota, stencils manufactured with an adhesive backing are better suited for more intricate designs.

If more than one stencil is required, the second one should overlap the first at a grout line to keep these lines uniform.

The top layer, in a different color, is sprayed or troweled over the stencil. Spraying leaves a "sandy" finish that increases skid resistance. Alternatively, the high points can be knocked down with a trowel to leave small smooth areas on the top surface for better



Gaye Goodman used staining, Flattooing and etching techniques to create a floor perfectly suited for the Hot Air Balloon Museum in Albuquerque, N.M.



Graphic artist Tamryn Doolan of Surface Gel-Tek recreated a custom Flattoo of an antique alimeter (labeled in French) for artist Gaye Goodman, owner of Faux Real Floors of Albuquerque, N.M. Goodman was commissioned as the decorative concrete contractor for the Hot Air Balloon Museum in Albuquerque.



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Orsini The concrete for this crest was colored cream beige with a color hardener,

then stained black. A stencil was applied and the exposed black was sandblasted away, leaving only the black outline and accents. The sandblasted areas were then stained by hand to achieve the variation of colors.

walking comfort while leaving enough texture to avoid slipperiness in wet areas. This finish looks similar to a spatter finish on a vertical surface.

Troweling the top layer delivers a smooth, flat look. Berg takes troweling a step further by suggesting pulling up on the trowel so the suction "drags" the material along the surface to create the uneven look of slate.

A stencil should be lifted as soon as the sprayed material on it dries solid enough to crack but is still somewhat moist. This will prevent pulling the topping and leaving the edges of the pattern ragged.

Modello Designs makes adhesivebacked masking patterns in artistic designs such as vines, medallions and geometric patterns that are well suited for creating raised designs and patterns on concrete — a process they call "embossing" - with troweled and sprayed overlayments. The overlayment is troweled or sprayed through the Modello pattern in a thin layer — just thick enough to raise a textured design. While many overlayment systems will perform well for this process, Modello Designs has worked closely with various companies and their product lines to develop processes for achieving optimum and durable results, including Colormaker's Sgraffino, Concrete Solution's Spray Top and Skimstone's integrally colored hybridized portland cement.

Gelled acid etching

The artistic limits of stenciled concrete are being challenged by new acidetching technology. In this case a vinyl stencil is applied to unsealed, clean, dry, grease-free concrete and a gelled acid is brushed on with a nonmetallic, acidresistant brush. The acid reacts with the lime, calcium and salts in the concrete. The material is left on for five to 15 minutes until desired etch is achieved. Until the stencil is removed, the acid may be reapplied if adequate etching was not achieved the first time. A power supply on the job site is not required for this stenciling method.



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The stencil is left in place while the material is removed with a wet cloth or plastic or rubber trowel, such as a wallpaper smoother. Any material left behind is neutralized with a water rinse and then a second clean water rinse finishes the process. Gelled acid neutralized with water can be flushed into the sewer.

The stencil can be removed immediately or sections of it "weeded" so additional colors can be applied (see "Placing Stencils" sidebar). The top Logos are popular designs for stenciling projects, like this one created by Decorative Concrete Impressions.

surface of the concrete areas that are exposed to the acid is removed. The result is a textured, slip-resistant surface. Contractors can control the level of the etching by selecting a more or less aggressive gelled acid product and monitoring how long they leave it on.

Doolan of Surface Gel Tek (the original manufacturer of gelled acid) says she spent so much time explaining the difference between this process and sandblast stenciling that she dropped the word "stencil" and coined the term "Flattoo" to avoid confusion. Gel Tek's Flattoo stock patterns include a variety of borders, animals, petroglyphs, and plants. Doolan says 70 percent of the Flattoos Gel Tek supplies are custom. "This method delivers a dramatic stained look with unlimited graphic possibilities."

According to Royals of Modello Designs, there are many variations to using the simple gelled acid technique to achieve different looks on cementitious overlays as well as directly on concrete. Royals adds interest to plain borders around her company's intricate designs by dipping a piece of 1 mil plastic, such as a grocery bag, into a plate of gelled acid and then dabbing it onto the concrete in a staccato upand-down motion. The result is a stippled, textured-looking effect that can be enhanced by adding colored stain. She also varies the intensity of the etching by sponging the company's DesignEtch material through the design area and removing it almost





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immediately with a soft trowel. She then adds more color back into the etched area with acid or water-based stains thickened with a gel.

Conclusion

So how does one choose the right

system for a stenciling project? "This really depends on the design or texture the owners want," Thome says. "All of these systems have their place in the decorative concrete market but not one can do it all. The glory of these systems is that most of them can be used in

conjunction with others. This versatility enables the contractor to be extremely creative and perform at a high level of craftsmanship."





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Coloring Pervious Pavement ... because protecting the environment should be beautiful.

by Nick Paris and Michael Chusid

hen it rains, it drains." That is the primary reason why pervious pavement is rapidly gaining in popularity. A second reason, however, is that many concrete contractors have learned to produce



attractive and more decorative pervious pavement. With the addition of color and increased attention to texture and detail, pervious concrete is now being specified for public parks, fine residences, and other hardscapes where appearance is as important to the environment as drainage.

Environmental alternative

Water cannot penetrate traditional pavement, so rainwater has to be directed away from paved areas. This increases the cost of a project by requiring larger capacity storm drains and retention basins. Ordinary pavements also increase the potential for flooding due to rapid run-off of storm water from paved areas throughout an urban or suburban watershed. And as water sheets across the surface of ordinary pavement, the "first flush" washes contaminants from the pavement into the storm system and contributes to downstream pollution.

To avoid these problems, environmentally conscientious designers and builders are increasingly using pervious portland cement pavement, also referred to as porous pavement. Pervious pavement allows surface water to drain through an open-pored concrete and into the soil below. This not only avoids problems with run-off, but also allows rainwater to percolate into the soil, where it can recharge groundwater and benefit nearby landscaping. Most pollutants entering the pavement are removed by filtration in the pavement's base course or digestion by microorganisms in the soil. Moreover, the pervious concrete allows air to infiltrate the soil, making it practical to pave under



the drip line of trees without suffocating them. For these reasons, pervious pavement has been recognized as a Best Management Practice for storm water management by the U.S. Environmental Protection Agency. Pervious pavement can also help meet the storm water management criteria of the US Green Building Council's Leadership in Energy and Environmental Design, LEED Credits SS-6.1 and SS-6.2.

What is pervious pavement?

Pervious portland cement concrete is typically made with narrowly graded coarse aggregate, little or no fine aggregate, and a very low water/cementitious materials (w/cm) ratio. The result is a stiff, pebbly

mixture with 15 to 25 percent of its volume being interconnecting pores



through which water can flow. As an emerging alternative, several recently introduced systems use fine aggregates



with proprietary admixtures to assure porosity.

Installing pervious pavement differs in a number of respects from conventional concrete pavement. The concrete is typically placed on a base course of clean, gap graded gravel or crushed rock that acts as a reservoir to hold water until it can infiltrate into the soil. The concrete is placed in conventional forms except that a screed strip ½ inch to ¾ inch high is placed on top of the forms. After the concrete is placed, the screed strips are removed and a vibratory screed



is used to compact the concrete to the required density and thickness, usually about 6 inches. The material is not floated or troweled. Instead, a heavy pipe roller is used to compact the concrete further.

Before venturing into their first large project, contractors should take time to consult with their ready-mix concrete producers and to seek competent technical assistance. The National Ready Mixed Concrete Association (NRMCA) and many regional concrete trade promotion groups have qualified field representatives who can help. NRMCA has also introduced a program to certify pervious concrete craftsmen, and the American Concrete Institute (ACI) is writing standards that will provide guidelines. Resources listed at the end of this article provide guidelines for the subgrade, base course, and pavement engineering, concrete mixture design, and typical installation techniques.

Aesthetic considerations

The listed publications, however, do not have much to say on the aesthetics of pervious pavement. After more than a decade of experience with pervious concrete in the United States, builders now have enough confidence in the product that they are starting to pay attention to its aesthetics as well as its function.

Color, for example, has become an important pervious pavement design element. In visually sensitive areas, natural earth tones can be used to help pavement blend in with the surrounding landscape — whether it is a parking lot in a public park, a path through a garden, service lanes cutting across a lawn, or a driveway in your own front yard. Alternately, the use of a complementary or contrasting color can help a pavement stand out — this can help visitors locate an entrance, improve the visibility of roadway shoulders and traffic islands, or create separate vehicular, pedestrian, and bicycle lanes.

Integral color: Colorants used in pervious concrete should comply with

ASTM C979 — Pigments for Integrally Colored Concrete. Iron oxide pigments are most frequently used for the wide spectrum of earth tones; other mineral oxides are used to create shades of green, yellow and blue. Unless it is desired to have a black or dark gray concrete that fades over time, standard carbon black pigments are not suitable for use in pervious concrete because of their potential to leach out of concrete exposed to wet and dry cycles.

The dry mixtures used for pervious concrete require special attention to assure that colorants disperse uniformly throughout a batch; concrete producers should contact their pigment supplier for assistance in determining optimum procedures for adding colorants. While satisfactory results can be achieved with concentrated powder pigments, liquid colors may be more reliable because they are already in solution and can disperse readily in dry mixtures. The water contained in liquid colors and any water added by an automatic dosing system must be subtracted from the amount of batch water added to the concrete.

Another benefit of liquid colors is that they are compatible with automated coloring systems. The automated systems create increased design flexibility by allowing ready mix producers to create an almost unlimited number of custom concrete colors. The automated systems simplify quality control by precisely metering even very small dosages of pigments and creating a record of how much color goes into each batch.

Pervious concrete tends to be darker than other types of concrete because of the low w/cm in the mixture. This means that colored concrete will have a darker or more intense shade than it would in an ordinary concrete mixture with a similar pigment dosage. Other factors that affect the concrete color include the color of the cement, any supplementary cementitious materials such as fly ash, and the aggregate. For a detailed discussion of factors influencing concrete color, a copy of "Ensuring the Quality of Colored Concrete Finishes" is available from the authors.

Texture and pattern: Pervious concrete has a rough, open texture that has been compared to a rice cake. Color may be more pronounced because the rough texture reduces the glare associated with conventional concrete pavement. The size and shape (round or angular) of the coarse aggregate in a mixture are

significant visual design variables. At present, it is

not practical to pattern-stamp typical pervious concrete. The rough texture and absence of fines prevents the

material from taking on the texture of conventional stamping tools. While the old-style aluminum "cookie cutter" stamping tools might create an impression, the stiff, highly compacted concrete's short working time makes them impractical as well, and the edges of stamped patterns would be prone to ravel (crumble). This situation may change, however, since the recently introduced pervious concrete made with fine aggregates and proprietary



admixtures appear to be easier to emboss.

Pores in pervious concrete can become filled with silt and other particulate matter. This can affect appearance, particularly if the fill is deeper in some portions of the slab than in others. Periodic vacuuming or power washing will restore the appearance of the pavement as well as assure its continued ability to drain. As with any concrete, surface wear can erode the cement paste from the surface of a pavement. When this happens, exposed aggregate can have an effect on the pavement's appearance. So far, experience has shown that the erosion due to traffic is not significantly greater in pervious concrete than it is in conventional concrete so long as it is not used in areas of high-speed traffic. On the other hand, erosion due to water is reduced because liquids enter the pavement instead of draining across the surface.

Joints and score lines: The low w/cm used for pervious concrete reduces the potential for shrinkage cracking. This allows joints to be spaced at greater distances than in conventional paving or to be eliminated altogether. This changes the visual scale associated with concrete panels. Joints are best formed in the compacted concrete with a flanged roller. Joints cut in cured pervious concrete are prone to raveling. If pervious pavement adjoins conven-



tional pavement, joints in the two materials should be aligned to reduce the potential for reflective cracking from one panel to the other.

Curing: Because of its low w/cm and large exposed surface area, pervious concrete requires aggressive curing techniques. NRMCA recommends that pervious concrete be misted and then covered with plastic sheets within 20 minutes of placement. This small window of opportunity limits the amount of finishing work that can be done, although it is possible that some types of stamping can be done after the plastic is placed. Edges of the plastic should be held in place with dirt or lumber to contain moisture. The plastic should remain in place for not less than seven days.

Contact between the concrete and plastic can cause uneven coloration of the concrete. If this discoloration is not acceptable in a pervious project, consider a method of tenting the pavement so the plastic does not come in direct contact with the concrete.

Coloring with stains

Cured pervious concrete can be stained. Bear in mind, however, that it will be difficult to apply stain to all exposed surfaces within the pores of the concrete. In addition, liquid-based stains may drain away from the surface before they have had sufficient contact time to impart coloring. Stains only color the surface of the concrete, so any raveling would expose unstained concrete. With this in mind, stains are best used in conjunction with integrally colored concrete; the stains can create accent panels or borders, for example, while the integral color provides shading throughout the depth of the concrete.







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Stains produce an inherently mottled appearance, even on regular concrete. This effect may be even more pronounced when applied to the already variegated surface of pervious concrete. Since there is limited experience in the industry staining pervious pavement, trial applications and mock-ups are highly recommended before proceeding with a project.

Other design options

Pervious pavement can be combined with conventional concrete pavement to create visual interest. For example, broomed colored concrete borders can be used around panels of pervious paving in a complementary color.

Spray-applied sealers can be used to create a gloss surface. Care must be used to assure that the sealer does not clog pores.



Slightly grinding the surface of cured pervious pavements removes prominences to reduce the roughness of the concrete for improved walking comfort and less road noise. The depth of the grinding and the color of the aggregate have an effect on the pavement's appearance.

Select aggregates can be broadcast onto the surface of the pavement after screeding and then tamped into the surface during compaction to create exposed aggregate finishes.

Where the concrete is not intended for pedestrian use — as erosion protection on the embankment of a stream, for example — the compacted surface can be raked or otherwise roughened to create a deliberately rustic surface.

Look, then leap

Maintaining consistency of pervious concrete from batch-to-batch (and even from the beginning of a batch placement to its end) can be challenging whether it is colored or uncolored. While a cardinal rule of conventional colored concrete is to avoid adding water to a mixture at the job site, it may be necessary to violate this precept in order to maintain the correct consistency of pervious concrete. With a dry mixture and large surface area, pervious concrete is prone



to inconsistent evaporation due to workmanship, sunlight and wind. When either of these scenarios occurs, even small changes in w/cm will alter pavement appearance. Add to this the discoloration that can occur due to contact between concrete and plastic sheets during curing, plus the raveling that occurs on even the best pervious concrete projects, and it should come as

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Colored Pervious Concrete Used in Award-Winning Park

The recently dedicated Cottonwood Creek Park in Encinitas, Calif., is proof that pervious pavement can be as good-looking as it is functional. The half-acre park is a flood control area for a 2,200-acre watershed and had been used as a storage area for sanitation district equipment. The city restored a creek that had been underground in a pipe, and then installed a colored pervious concrete



parking lot and a meandering path with environmental education displays along the creek.

Chris Klamaske, project manager for contractor T.B. Penick & Sons Inc., located in San Diego, says pervious pavement was selected because "it makes sense in terms of storm water runoff and recharging the water table." Her firm has done 60,000 square feet of pervious pavement in the past five

years. At first, however, she says, "we had to work with our ready-mix supplier to come up with a mixture that worked, and we had to meet with the different architects and city entities to get them to accept it as a viable technology. We

call it 'STF — Save the Fish."

Landscape architect Glenn Schmidt, principal of Schmidt Design Group Inc., also in San Diego, liked pervious pavement environmentally, and proposed integral color to make the concrete look more at home in the park's natural setting. He explains, "I really like the result of colored pervious pavement from a design standpoint. It



has a gravel look that is very textural. And the surface is fairly rough, so it deters skateboarding." He specified 6-inch thick paving and two shades of Davis Colors, Miami Buff and Adobe.

Klamaske adds: "Since we specialize in decorative concrete, we put our own twist on the paving to make it a little more decorative." They ground its surface slightly to expose some of the multicolored coarse aggregate in the concrete,



giving the paving "an organic feel that other types of paving don't have. It's really beautiful."

Others, apparently, agree with his assessment: The project has received awards from the American Society of Concrete Contractors' Decorative Concrete Council, the American Concrete Institute and the American Public Works Association, and has

been featured in Sunset Magazine. More important, according to Schmidt, "The park is now a place to connect with nature, and people come from all over the county to enjoy it."

— Michael Chusid

no surprise that pervious pavement does not always look "pretty."

Still, it can be beautiful when accepted on its own terms and integrated into an overall project design. At the recently remodeled entry to the University of California's botanical garden, for example, the designer wanted a natural-looking pervious material for walkways, and proposed crushed rock. When the University's facility department expressed concern about crushed rock damaging floors if it was tracked into adjacent buildings, the landscape architect turned to the similarly rustic appeal of colored pervious concrete. At another recent project, colored pervious pavement



was used for the parking lot near a beach. The owner readily accepted the variations in pavement appearance by saying they were reminiscent of the beach itself.

Customer expectations, however, must be managed. Customers should be shown other projects with representative workmanship and realistic tolerances must be established. Final color selection should be made, whenever possible, from samples made with the actual materials proposed for a project. Mock-ups or field samples should be constructed before proceeding with large or complex projects so a clear standard of performance can be established.

Until recently, pervious pavement has been used primarily in parking lots.

Additional Information:

"Ensuring the Quality of Colored Concrete Finishes," Nick Paris and Michael Chusid, *Construction Specifier*, December 1998.

Pervious Concrete, National Ready Mix Concrete Association publication CIP-38

Pervious Concrete Pavements, Portland Cement Association publication EB302

"Producing Pervious Pavements," Matthew Offenberg, Concrete International, March 2005

With growing demand for pervious pavement in residential and smallerscale projects, decorative concrete contractors will find that their attention to detail and willingness to learn new techniques makes them well prepared to take advantage of the new opportunities. Pervious concrete is still a young art form, and new products and techniques are likely to expand its palette of decorative options. In this creative environment, providing consumers with their choice of colors will help them embrace pervious pavement as an attractive way to protect the natural environment.

Nick Paris is vice president for marketing at Davis Colors, a leading producer of concrete colorants, and the author of numerous papers on concrete coloring. He can be reached at www.daviscolors.com.

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CIRCLE #80 ON READER SERVICE CARD

Get a Grip on Slip Resistance

by Susan Brimo-Cox

alf of all slips and falls are caused by the floor itself. So reports the National Floor Safety Institute. Still, while most contractors are aware of the problem, they find the subject confusing. And that's really not surprising, especially as it regards decorative concrete.

Part of the problem has to do with standards for slip resistance: Who has guidelines and which ones do you use for decorative concrete? Then there is the testing aspect: Which testing methods are appropriate and reliable, and in what testing conditions?

How slip resistance is rated

Slips occur when there is too little friction between the bottom of a person's foot and the surface of the floor. The amount of direct contact is very important. The most common measure of the relative slipperiness of a floor is its slip resistance, or coefficient of friction. This scale ranges from zero to one, in increments of tenths of a point, with zero representing the least amount of slip resistance.

According to Dianne Carey, a chemist with W.R. Meadows, the Occupational Safety and Health Administration's recommendation is that walking surfaces have a minimum Static Coefficient of Friction of 0.5. But there are more stringent standards, she says. The Americans with Disabilities Act guidelines recommend 0.6 for level surfaces and 0.8 for ramps. "The higher the number, the more 'friction' is present," Carey explains.

ASTM has several standards for slip resistance. Chris Sullivan, regional sales manager for QC Construction Products,





says the age-old ASTM standard for testing slip resistance of floor sealers, coatings and polishes has been ASTM D2047. But this standard has limitations, he says, because it only tests smooth, dry surfaces in laboratory conditions. "No one slips and falls because a sealed surface was dry, which means this standard has very little correlation to real-world situations." In recent years, two 'real world' tests have slowly started to gain favor, ASTM 1679 and ASTM 1677. Both test most any surface, in the field, and both in dry or wet conditions. The difference between the two standards, Sullivan adds, is the type of machine used to perform the test.

Mike Anderson with Artscape Las Vegas also sees problems with ASTM



D2047. "While this method is extremely accurate and is commonly referred to in flooring circles," he says, "it can only be used dry in a controlled laboratory environment and cannot be used in the field on existing surfaces." The most common method for testing decorative concrete, he says, is ASTM C-1028-96 — Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.

And therein is the obvious problem, explains Russ Kendzior, president and CEO of the National Floor Safety Institute. "Unfortunately the ASTM has yet to create a slip resistance standard for concrete surfaces. The only standard is that of the NFSI's 101-A standard, which calls for surfaces to have a wet Static Coefficient of Friction value of 0.6 or greater to be considered 'High-Traction.''' High-traction surfaces, Kendzior reports, have been clinically proven to reduce slip-and-fall claims by 50 percent to 90 percent.

Testing slip resistance

Slip resistance can be measured by a variety of machines. The most common type of machine is a tribometer — and there are many versions. You may have heard of the James Machine, Horizontal Pull Slipmeters, Portable Inclinable Articulated Strut Slip Testers or Variable Incidence Tribometers.

Tribometers work by rubbing a pad of some common shoe sole material, such as rubber or leather, over the floor surface, and assessing how hard or easily the pad passes over the surface. This reading results in a Static Coefficient of Friction score, with 0.5 being the national "passing score."

But, again, the conditions and setting of the testing may offer false security. As Kendzior points out, "Slip resistance can be measured wet or dry; however, since 80 percent of all slips and falls occur on wet surfaces, we believe that wet testing has more significance than dry testing." The

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Expert perspective: Shiny does not necessarily mean slippery

At first glance, a shiny floor surface may seem to present slip-and-fall opportunity. In reality, a floor that has been ground, densified and polished can often provide a more slip-resistant floor than plain concrete. But as with any finish, common sense is required when specifying a polished floor.

Independent test results show that floors finished to an 800-grit finish will meet OSHA and ADA recommendations for Static Coefficient of Friction both wet and dry. The grinding and polishing process creates micro-pores in the floor surface that actually increase the SCOF over a plain hard-trowel finished floor.

However, when specifying the polishing level of the floor, the end use — whether it's made for a low traffic or high traffic area — is very important. It is possible to polish too high, to the point where your micro-pores do not provide a safe floor. In some environments, a micro-etching cleaning product will be used to provide peace of mind.

One of the inherent strengths of polished concrete is its ease of maintenance. Maintenance, depending on facility size and end use, is simply a scrubber with a white pad and neutral cleaner, a damp mop or dry sweeping. Polished concrete is still "a cement-based" product, so you have to be aware of acidic products, in addition to not using cleaning products which contain hydroxides or sulfates which can attack concrete. In many instances water alone will do the job.

In any case, it is imperative to have a maintenance program that utilizes walk-off mats and the correct frequency of cleaning to remove dry soils and water. Generally, what appears to be a slippery floor surface is, in fact, a dirty floor surface where the dry soil sits on top and acts as ball bearings.

Source: Peter Wagner, CSI, RetroPlate System

testing device the NFSI recognizes is the BOT-3000 (formerly called the Universal Walkway Tester). "This stateof-the-art robotic tester can measure both the SCOF and DCOF (Dynamic friction) either wet or dry and comes

with a wide range of sensor materials which reproduce various shoe materials," Kendzior explains.

The problem with wet floors Any wetness introduced between the bottom of the foot and the floor surface decreases or eliminates solid-to-solid contact. No solid contact means little or no friction. And guess what when that happens, conditions are ripe for slips and falls.



CIRCLE #35 ON READER SERVICE CARD

The technical description of what happens when a wet contaminant is pressed between the foot and the floor is "squeeze-film formation." Things like tread on the soles of shoes helps eliminate the problem in the same way that tread on automobile tires helps vehicles travel on wet roads. If, however, you have no control over the type of shoe people wear, you may have to correct for wet conditions with a degree of surface roughness on the floor itself. If the surface roughness is enough to reach up through the layer of liquid, you'll have more solid-to-solid contact and more slip resistance.

As this relates to decorative concrete, countermeasures needed depend on the type of decorative finish. And texture is key in improving slip resistance in wet conditions.

Concrete and slip resistance

Decorative concrete surfaces that are stamped or imprinted can be more slip resistant than smooth surfaces, depending on the number of channels in the design and how closely spaced they are. (On the other hand, too much "topography" and you may run into trip hazard issues.)

When it comes to smooth-type finishes, broom-finished floors offer the highest level of slip resistance. Sandblasted surfaces are better than troweled finishes. And, as Sullivan points out, wood is rougher than steel and magnesium, so a wood-troweled finish is a little rougher and more slip-resistant.

The flatness of a floor is a the best indication of how slippery the floor will be, says Phil Smith, vice president and technical director at L&M Construction Chemicals. "The flatter the floor is the more slip-resistant it is, because you have more surface-area contact with the sole of your shoe," Smith explains. For comparison, he says, an 800-grit polished floor is fairly slipresistant, whereas a hard-troweled floor can be fairly slippery because the floor surface has small ripples as a result of the troweling process. But, he cautions, a floor may be flatter in some places than others — and flatness should never be confused with levelness. As an example, super-flat floors are both flat and level.

In addition to the surface of the concrete itself, you need to look at the sealer you use.

"Most concrete hardeners and conditioners have little effect on concrete, since they penetrate into the material's surface," Kendzior observes. "However, when a topical coating is applied, like a urethane material, the slip resistance results may drop."

Anderson agrees. A film-forming sealer applied on top of a decorative treatment as a means of protecting the new finish may serve well to protect the finish from damage and/or water intrusion, [but] "it also encapsulates the surface of the concrete, reducing the non-slip characteristics inherent in concrete finishes," he explains.

Additives can increase slip resistance

There are several additives that can be used to increase slip resistance of a





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concrete floor. Some are used directly on the concrete, and others can be mixed with or broadcast on top of the sealer.

Some materials, such as aluminum oxide and trap rock, will provide traction if they are sprinkled and troweled onto the surface of concrete while it is still plastic. Smith says that these products are good for small areas and certain situations. For example, he says, aluminum oxide works well on stair treads, while trap rock is good in the threshold of doorways. Two of the most common sealer additives are silica sand and polymer grit. "They both work the same way," Sullivan says. "Imagine the top layer of a sealer as a glass-smooth surface, like water on a lake. By adding sand or polymer grit, you are creating thousands of little islands in that lake. These islands stick up above the sealer surface and give the surface more 'bite' or traction."

There are a couple of issues with sand, however. One is the health issues



surrounding the use of silica sand. Another is that sand is opaque — you can see it when it is used with a clear sealer. And sand is heavy, tending to fall to the bottom of the sealer coat.

Polymer grit, on the other hand, is clear and is light enough to suspend throughout a sealer coat.

When it comes to pool decks, Anderson turns to another additive: acrylic or polystyrene beads or spheres. "We prefer to use the polystyrene beads around pool decks," he says. "They have no jagged edges and still provide excellent slip resistance while being less aggressive to feet and swimwear."

Maintenance and frequent inspections are important

Proper maintenance is just as important to prevent slips and falls as is the flooring material itself. Frequent inspections can help identify high-risk areas and locations where a particular floor material is not being well maintained.

Slip-resistant floors themselves often present additional maintenance issues. For one thing, textured or rough surfaces are tougher to clean and keep clean. And, as Anderson explains, eventually the small beads or mineral additives will wear out or be walked out, leading to sealer breakdown and failure.

When this occurs, a new coat of sealer with grit is required.

But Anderson points out, "Despite all this, our clients believe that the additional cleaning and periodic resealing is a small price to pay when compared to the lawsuits generated by even one slip-and-fall accident."

For the same reason, Anderson encourages all concrete contractors to talk to their clients upfront about decorative concrete finishes and slipresistance issues, before the concrete is poured. "This can save a lot of heartache down the road and keep you pouring concrete instead of appearing in court."

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Cold Weather Stamping

While the obvious choice is, "don't do it," sometimes it's unavoidable. Here are tips from the pros. by John Strieder ow much does cold weather affect concrete stamping jobs? Consider this: Some say a temperature drop of only 20 degrees Fahrenheit will double the set time of a typical slab of concrete. That's motivation enough to make special preparations for stamping in the cold.

Freezing temperatures will slow the hydration process in a slab, extending the set time. On top of that, sunlight and rising daytime temperatures, along with wind, can cause the surface to dry faster than the colder concrete underneath, causing "surface crusting," or splitting and cracking. The fact that stamping increases the surface area of a slab complicates things even further.

One way to get the bottom and top of a slab to set together is to draw bleed water to the surface. A pass with a wood bull float will do just that. It also won't trap water like a finish achieved with a magnesium or metal float or trowel.

Contractors in cold-weather climates have amassed a few more tips of their own for stamping in cold weather beyond the idea that it should be avoided whenever possible.

Brad Berg, co-owner of Architectural Enhancements Inc. in Shakopee, Minn., and a former concrete contractor, says his minimum temperature for stamping was about 40 degrees Fahrenheit. "The cold does change things," he says. "Overlays that set up in a half hour in the summer can take all day. New pours do the same but not to the same extreme. You do not want to do it if there is a chance of freezing, and if you do you stamp at seven or eight in the morning, let the sun shine on it, then cover it with insulated blankets."

Berg's team also used accelerants, but not often, because they could affect the color, he says.

"One thing we would do is, with large torches, heat the ground. This brings the temperature up and traps the heat under the slab, allowing for more cure time at warmer temperatures. Blanketing the ground where you're preparing and around the surface ahead of time also helps.





"Depending on the project, you can tent it and run heaters. It all depends on the scope of the project."

John Buteyn, technical manager with Colorado Hardscapes Inc. in Denver, Colo., says his firm will stamp in 30-degree weather.

Colorado Hardscapes workers try to limit blanket time on the concrete itself because the blanket may affect the stain, he says. They use ground heaters to thaw the ground if it is frozen.

They also use accelerators, but mainly nonchloride ones. Those don't promote rebar corrosion like calcium chloride can, and they won't affect



color either. Calcium chloride can darken or discolor concrete, even an uncolored slab, he says. "We've always been told that when dealing with colored concrete, calcium chloride is going to affect that."

Colorado Hardscapes also counts on its ready-mix company to help with a

cold-weather pour. The supplier delivers concrete mixed with water that is a minimum 68 degrees Fahrenheit. Mixing a batch with hot water instead of cold helps counteract the effects of a chilly climate. "If the water is cold, even with an accelerator you can't overcome it," Buteyn says. At least two accelerating admixtures are engineered specifically for coldweather concrete work: Pozzutec 20+, from Degussa Admixtures Inc., and PolarSet, from Grace Construction Products. Both are billed as allowing contractors to pour when the temperature is as low as 20 degrees Fahrenheit. And both are nonchloride, which means neither promotes corrosion.

PolarSet is described by its manufacturer as a nonchloride admixture that accelerates hydration. The light green liquid is specially formulated to shorten setting times and increase early compression strengths in cold conditions. As an accelerator, it promotes heat generation within the mixture, which helps ward off freezing in the first hours after placement. It can be used to reduce the time that concrete needs to be protected from freezing in 20-degree weather.

Pozzutec 20+ is described as a multicomponent water-reducing and accelerating admixture. The additive is



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formulated to accelerate set time and increase early and ultimate strengths in a wide range of temperatures, from subfreezing to hot. It offers superior workability and superior finishing characteristics for flatwork and cast surfaces. It also reduces or even eliminates heating and protection time in cold weather.

But while the capability of these admixtures to help concrete perform in 20-degree weather is admirable, many contractors will not stamp when it's that cold.

Dale Griffis II, president of Cold Harbor Building Inc. in Chardon, Ohio, says he won't take stamping jobs if the ambient temperature will be colder than 35 degrees. It's not just the concrete that freezes. "The physical acuity of the laborers is too diminished to do detail work," he says.

Stamping involves workers using their hands to work stamps and press borders, and hands can't be guaranteed to do a top-notch job in freezing cold weather, he says.

Rubber stamping mats also become too stiff to work in freezing temperatures. Even in 40-degree weather, when mats will perform OK, storing them with a space heater in the back of a truck is still recommended, Griffis says. "It's certainly a good idea to keep them warm the night before."

Griffis prefers tenting instead of covering a pour with insulating blankets, because the latter will mottle the concrete.

And while he's used nonchloride accelerators, those pose challenges too, he says. "Accelerators are going to cook concrete from the inside out. The heat from hydration will be working its way out. So the inside is going to be hard, while the outside is going to be soft from the weather."

A soft surface and harder inner core make it tough for stampers to push a stamp deep enough to make a proper impression, he says.



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When to Roll Out the Paint In some cases, paints or epoxy coatings

are the right choice for concrete floors. by Stacey Enesey Klemenc

Behr's I-Part Epoxy Acrylic Concrete & Garage Floor Paint produces a finish that is highly resistant to chemicals, oil and gasoline, making it an ideal choice for interior or exterior concrete <u>floors that are hard to keep clean.</u>

Ĩ
Ithough many diehard decorative concrete contractors will argue that you should never paint concrete, there are situations where paint is more than palatable — it's an appropriate choice.

"When it comes to protecting concrete, epoxy coatings offer several advantages," says Steve Golich, associate brand manager for Rust-Oleum Epoxy Shield, a coating line developed specifically for garage floors and basements. "Epoxy coatings are both protective and decorative, and because they build a relatively thick film, epoxies hide better than concrete stains."

Rather than delivering the mottled look of an acid stain, paints are continuous in color, points out Darryl Manuel, president of Vexcon Chemicals Inc. in Philadelphia. "There are times when things almost demand that you paint a floor," he says, "like when there are different colors within the concrete that you want to hide to make the floor look uniform. And there are times when you want to keep a project's cost lower than [applying] a full stain and hardener. Concrete coatings provide resistance in one step."

But not necessarily in one coat, Manuel says, adding that he always recommends two. Others contend that their products do well with a single application.

What's on the shelf

Concrete coatings for patios and garage, basement and porch floors are available as one-part epoxies, two-part epoxies, acrylic paint and latex-based paint. Developed specifically for concrete floors, some are engineered to resist everything ranging from household chemicals and foot traffic to hot tires and salt. Others are not quite as durable but resist scuffing, fading, cracking or peeling.

These coatings also can be made to meet ADA-slip resistance requirements by mixing in anti-skid additives such as aluminum oxide, Golich says.

Regardless of the type you pick, "It's important that you use paint compatible with concrete because of its high pH level," explains Michele Neary, director of public relations for Scranton, Pa.-based United Gilsonite Laboratories. "A normal house paint may not adhere to concrete because of an incompatibility with the concrete itself. The difference in pH may cause the paint to peel up in sheets."

Two-part epoxies, which were developed specifically for more demanding environments like basements and garages, aren't difficult to apply, Golich says, "Cut in any edges and then roll in 4-foot-by-4-foot sections to maintain a wet edge so that you don't get roller marks."

Two-part epoxies are known to produce a tougher film, but they harden



Two coats of Latex Base DRYLOK Concrete Floor Paint in Sandstone really cleaned and decorated this area.





quickly. "Once this coating is mixed, you have to use it," Neary says. If it chips after it's down, she continues, it's hard to touch up. "You have to mix up a whole other batch and repaint."

With her company's latex-based product, that's not the case, she adds. "It's like regular paint. You can open and close it up after you use it." And it cleans up with water, which makes it all the more attractive.

Many of today's epoxy coatings are also water-based. The oil-based



varieties are geared more for commercial use.

Prep before you paint

Whether a floor is new or old, coated or uncoated, preparation should be a priority.

"To achieve the best adhesion, always remove any coating and contaminants from the surface," advises Steve Revnew, director of marketing for The Sherwin-Williams Co. "The No. 1 reason for coating failure on concrete floors is poor surface preparation. Be sure to follow the manufacturer's guidelines."

Jeff Spillane, senior marketing manager for Benjamin Moore Paints, says if the floor is currently coated and the coating is sound and in good condition, it isn't always necessary to remove it. Sometimes, all that's required is a good cleaning and deglossing.

There are many cleaners on the market that work well in this department, including the standard trisodium phosphate. For some basements, Golich says, vacuuming the entire surface, using a wet mop to pick up dust and treating dirty spots is all that's necessary before coating.

Most opaque coating manufacturers recommend a little more prep for garages. After cleaning with a general purpose cleaner and treating oil and grease spots with a degreaser, they say you should evenly apply muriatic acid or an etch powder or concentrate mixed with water over the entire surface. This is particularly important if the concrete is highly troweled and smooth, Neary says.

"Then scrub it with a stiff bristle

brush in small 4-by-4-foot sections to work the etch into the concrete," Golich says. "This opens up the pores and allows for better adhesion."

"After the surface has been etched, it should look and feel like fine sandpaper so the paint can bite into the surface," Neary says.

If you are repainting a floor, you'll also need to remove all the flaking paint with a wire brush.

"When it comes to coating a floor, there are no short cuts," Spillane emphasizes. "Like coatings, there is a wide variety of surface preparation techniques. The preparation needed is determined by the current conditions of the floor and the system that will be installed. A rule of thumb is





that the heavier the mil thickness of the system, the deeper the profile needed."

In some cases, an acid etch is adequate for bare concrete. However, if the concrete has a sealer on it or a failing coating, acid can't be used to remove it. Instead, it must be removed with a shot blast machine. "For smaller jobs, you can rent equipment to do this as well," Spillane says. "A machine called the Prep 16 by Onfloor, available through independent paint retailers, uses diamond plates to remove the old coating and create a profile."

After thoroughly rinsing with water, the surface is ready to be coated.

Many concrete paints are selfpriming, but some require a primer. You may want to consider first applying a clear protector, Neary says, such as UGL's Drylok Masonry Treatment, which is a clear moisture-vapor barrier.



Moisture can be a monster

"People need to be aware that there are floors that would be better not coated," Spillane says. "Poor or weak concrete or moisture are the enemy of floor coatings." A clear sealer will help with adhesion but it will not completely cure the problem, he maintains.

Revnew shares this philosophy. "If concrete with high moisture content is coated, premature failure will occur due to moisture being trapped behind the coating."

While there are more sophisticated tests that can be used, Spillane says, here's a simple test to determine if there's excess moisture present. "Either duct-tape down an 18-inch-by-18-inch piece of plastic or lay down a rubber mat and leave it for 24 hours. If, once removed, the floor is wet and there's water on the back of the plastic, there's a good chance a coating system will fail."

In these cases, contractors should opt for a stain, Spillane adds. "Concrete stains generally penetrate and produce a thinner film, which allows them to tolerate less-than-perfect conditions."

Vexcon's Manuel says that there's no need to test for moisture before applying any of his company's products, as they all are breathable. "There's no way to control moisture unless you allow it to come through," he says, adding that Vexcon is one of the largest producers of coatings that can be used to control moisture.

The wait

How long should you wait before coating concrete? Revnew, Spillane and Golich say they always recommend 30 days. "But in today's market, there are coatings that can be applied sooner than that," Revnew adds.

Vexcon's products are one such animal. These coatings can be applied as soon as you can walk on the concrete, Manuel says. In fact, he adds, he has coatings that can be used to help cure fresh concrete as well as coat it.





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Don't Take the Easy Way Out ... Apply Yourself!

Mastering many types of applications will inspire both you and your clients.

by Rick Smith





ur client came to us with a vision. He wanted a desert theme for his project, and in his mind that meant beige concrete with a broom finish to look like dirt. He had no idea that his vision could be so much more.

We had an intense meeting with this client. The passion he had for his project allowed us to think more creatively. He was looking for a unique and distinctive look. However, he did not realize that this look could be brought indoors as well. Having many different techniques not only afforded us the opportunity to expand our scope of work, but also gave the client many more options in his décor.

Having many techniques in your arsenal can bridge the difference between your client's vision and the reality of a project. Today's clients are more sophisticated. They expect more. Plain gray concrete is no longer good enough for them. But if you don't have different application skills to draw from, the client will look elsewhere. Many contractors have two or three things they specialize in. Perhaps it's hardscape, or acid staining, or overlays. In the project highlighted here, no less than eight different concrete applications were used.

The exterior consists of 3,000-psi integrally colored concrete, done 120 yards at a time, with three different stone textures in the same day. This allowed for greater color consistencies. A delicate touch was needed on the stamping, since we were putting different textures next to each other but could not have any real definition between them. They all had to blend together. We then accented with clear and powder release agents, then stained and sealed the concrete. The walkway was done in a wood grain stamp, and hand-stained.

The interior was done in a ¼-inch stamped overlay with custom integral color, which we then antiqued and stained. Steel tracks were embedded in the concrete to make ore-cart tracks that look like ones you would find in a mineshaft.

We also did interior rockwork, which was spraytopped, stained and sealed. Scenic painting was



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done on the walls and ceiling by an artist. We found resources on the Internet for the "props" integrated in the design. Old West wagons, a cactus, and whiskey barrels were all brought in to give this project an authentic look and feel.

We were able to do this project because we have all these techniques. From trial and error throughout the past years, we have been able to perfect our applications. The passion that we showed our client for his project was infectious. He was able to think outside the box, and we came up with uses for our techniques to make this a showcase.

We all must see each project as an opportunity to grow and learn our craft. From seminars and classes held by manufacturers, to old-fashioned "playtime" with products, we find uses that we never thought of. We cannot let fear stand in our way. Passion brings its greatest reward in seeing a client's vision become so much more that they expected. Remember, if the client can see the invisible, we can create the impossible.

Rick Smith is owner of Richard Smith Custom Concrete in West Hills, Calif. He can be reached at (818) 710-6615 or you can visit his Web site at www.richardsmithconcrete.com.



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'hat contractor hasn't approached a job with the thought that better equipment or improved techniques would make the project go more smoothly?

Hatem Hannawa and his brother Wally were tired of building concrete walls with aluminum or wooden forms, which they found cumbersome to work with, hard to maintain and unreliable. Five years ago, as a result of a form-liner requirement on a project, they started developing a new forming system. What started as an idea to create decorative concrete walls with finer detail and less hassle eventually led to a composite material that would perform the way they wanted it to.

They were looking for a textured concrete forming system that would create deep imprints of up to 2½ inches, not the ½ inch or so of relief left behind by the aluminum forms. They wanted a material that would resist the pressure of the concrete and release easily. They needed the material to be resistant to ultraviolet rays and freezing temperatures so it could be used in all parts of the country. And they wanted the

Profile

material to be lightweight, long-lasting, easy to maintain and inexpensive to use.

It was a tall order, but after innumerable formulations over more than three years, they found success. Arch-Crete Composite Forming System was born.

Now Arch-Crete, a product of Michigan-based Architectural Concrete Creations, can boast that its 3-foot by 6-foot panels weigh only 57 pounds versus a combination of form and urethane liner, which can weigh as much as 150 pounds. No cranes are needed on the job site, and the panels can be hand-set.

Arch-Crete calls its panels "unitized," meaning they consist of an integrated structural grid with a textured face that was contoured using natural stones. The grid acts as reinforcement while the concrete is being poured.

"Every feature that you find in a rock is on this mold," Hatem Hannawa says. "Even if you walk up real close to it, and touch that rock, it feels real." Some form liners can reproduce the shape of local stones, but they look shiny and feel too smooth; that's not the case with Arch-Crete. "With every









pour we can get a lot of detail," he says. The six textures available are River Rock, Castle Cut, Cobble Stone, Ledge Stone, Boulder Stone and Flat.

Other benefits? The system's applied cost is less than 2 cents per square foot; concrete, colorants and other additives don't stick to the panels; maintenance requires merely a power washer; and the panels can be used at least 1,500 times.

Developers are finding more and more uses for the company's products,

Hannawa says. They can put up a barrier wall, a frequent requirement in residential projects, and make it decorative for less money than it would cost them to hire a mason. "The system doesn't require skilled labor," Hannawa says. "The form itself does everything because the concrete fills in the cracks, and it flows very nicely." It takes only 10 minutes to figure out the installation process, he says. Stronger, more stable



fasteners were developed that are easy to use as well.

Hannawa recalls one project in which a 9-foot-high wall was needed to block the view of an industrial site from neighboring residents. Instead of building a flat wall, a four-man crew took just 23 days to cover 1,100 feet with a wall that resembled local stonework. The residents loved it.

One contractor used the forms to make bases for light poles at a nearby Moose Lodge. Others are using the flexible, plastic forms to create pillars, garden fences, mailbox bases, planters and walls that wrap around 90-degree or 45-degree angles. "Not too many systems offer the ability to wrap around the inside or outside corners," Hannawa says. "Arch-Crete allows you to be more creative."

The landscaping and fencing applications are a small part of Arch-Crete's market. Other projects include a 12-foot-high cobblestone wall for a parking structure, decorative foundations on residential homes and commercial buildings, a curving streetscape in Bend, Ore., various privacy-screen walls in Michigan and Wisconsin, and more.

The Arch-Crete principals see the potential for even more creativity and growth for the business. Their immediate goal is to create seamless panels, which they plan to unveil at the 2006 World of Concrete. (Arch-Crete won a Most Innovative Product award at the 2004 World of Concrete.) The company also is developing three new textures, and plans to target the road-building and multistory commercial markets more heavily.

Hannawa says developing the product was a roller-coaster ride, with the inevitable ups and downs of successes and failures that comes with experimentation. "The satisfaction is at the end when you see all your hard work is paying off and it's finally working," he says. "Today we have a system that works perfectly, and it puts a lot of smiles on a lot of people's faces — not just the contractors, but the end users who get to see something nice."

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Decorative Concrete Panels Survive Decades of Weathering

he question of architectural concrete's durability has finally been answered.

A review published earlier this year by the Portland Cement Association documents the performance of 60 typical architectural finishes after 40 years of exposure in the relatively severe Chicago-area climate. Most weathered extremely well, with 93 percent of the panels receiving an "excellent" or "good" rating.

The panels were constructed in the early 1960s at the PCA Research & Development Laboratories in Skokie, Ill., and assembled into a circular outdoor display that was unofficially referred to as the "PCA Stonehenge." The display was for a study that dealt with decorative surface treatments. It described and illustrated methods of

by William C. Panarese

obtaining attractive finishes on both precast and cast-in-place concrete. Many of the techniques remain viable today.

The panel project was dismantled in 2001 to allow for development of the property, but before removal, the fourdecade-old panels were inspected and photographed before and after a thorough power-wash cleaning. The panels were assigned a performance rating of "excellent," "good," "fair" or "poor" both before and after cleaning.

All 60 panels in the study were considered durable and structurally sound. Most surfaces also were sound and their appearance relatively unchanged. A slight etching or "softening" of the sharper edges was noticeable on some surfaces, but this was not severe. Though some panels looked better after cleaning, many of them exhibited only minor staining from dirt and pollution sources, and some panels looked about the same as they did when constructed 40 years ago.

However, the integrally colored concrete panels showed significant signs of wear.

The collection of 60 panels, each measuring 5 feet by 3 feet by 4 inches, was built to demonstrate seven production procedures popular at the time.

Section 1. Horizontally Precast Exposed-Aggregate Panels: In this technique the bottom of the forms are coated with a chemical retarder to expose a colorful aggregate in the concrete cast against that surface. This is the most commonly used technique in the precast industry.



The results: Of 18 panels, 12 were rated excellent, five good, and one fair. The panel rated fair contained a pink marble that faded, was not as white as was cast 40 years ago, and had dirt streaks still evident after cleaning. In another case where a panel contained a blue pigment in the facing mixture, fading took place.

Section 2. Horizontally Precast Panels using Form Liners of Rubber, Plastic and Wood: Today, most of these textures would be produced with plastic

or elastomeric form liners. The results: Of 13 panels, three were rated excellent and 10 were rated good. The textures were still sharp after 40 years of weathering, but some minor paste erosion took place on surfaces that were originally cast smooth. There was minor spalling on a few panels, but this was attributed to the power-washing process.

Section 3. Horizontally Precast Exposed-Aggregate Panels using Sand-Bedding Techniques: When

architectural qualities of boldness and massiveness are desired in exposedaggregate walls, stones ranging in size from 1 inch to 8 inches in diameter can be used with this technique. Also, flagstone can be sand-bedded to produce stone-faced wall panels.

The results: Of four panels, two were rated excellent and two were rated good. Two panels experienced debonding of a few embedded aggregates. It was evident that these stones were not embedded deep enough in the sand before casting.

Section 4. Integrally Colored Precast Panels.

The results: The four integrally colored panels did not weather well. One panel was rated fair, while the other three were rated poor. The fair panel was made with a yellow iron oxide pigment and still retained some of its yellow color after 40 years of weathering, but the other three (black, green, and blue) faded to gray or tones of gray.

This study was not a good example of how iron oxide pigments behave in

concrete because only one iron oxide pigment (yellow) was used. Today, iron oxide pigments are widely used to produce brown, red, black and buffcolored concretes. Generally speaking though, colored concrete placed outdoors tends to lighten or fade with time.

Section 5. Other Horizontally Precast Panels using Sandblasting, Bushhammering, Grinding and Polishing, and Surface-Bonded Sheeting. The results: The eight panels in this section were used to explore other production and surface-finishing techniques. Five were rated excellent and three were good. The four panels treated with a light sandblasting were all rated excellent. The bush-hammered panel was rated good. Of the two panels finished by grinding and polishing, one was rated excellent and the other good. It was found that to achieve a high polish on the matrix section of the surface, the concrete must be of high strength and well cured. The marble tiles used in one of these panels were still shiny after 40 years of weathering.



Section 6. Vertically Cast-in-Place Exposed-Aggregate Panels using Prepacked-Aggregate Concrete: In this technique, the aggregate can be carefully placed against the sides of the forms to get a uniform, dense, exposed aggregate surface in the finished wall. Water and external vibration are used to densely pack the aggregate in the form. Then, the panel is grouted from the bottom up with a cement-sandwater slurry mixture that replaces the water in the voids of the aggregate.

The results: Over the years the paste turned dark on all four panels, but they all cleaned up very well.

Section 7. Vertically Cast-in-Place Exposed-Aggregate Panels using Gap-Graded Aggregate Concrete: With this method, a gap in the gradation of the aggregate is created so that the texture



in the finished wall shows predominately one size of coarse aggregate.

The results: Four panels were rated excellent and one good. While the bushhammered panel was rated good, it was not considered attractive because of the excess space between coarse aggregate particles, a function of the mixture design procedure, which is critical with gap-graded aggregate concrete.

The panels weren't the only concrete items examined at the checkup after 40 years of weathering. The pea-gravel exposed aggregate walkway and 120 white cement concrete posts supporting the panels were also inspected, although they were not specifically part of the study. The walkway, used by thousands of visitors over the years, behaved very well with no loss of surface facing aggregate, and it cleaned up well. The white concrete posts, which were originally cast with smooth surfaces, experienced a slight erosion of surface paste, possibly due to acid rain. However, this improved rather than detracted from their appearance, resulting in an attractive white exposed-aggregate finish.

The conclusion: Concrete for exterior walls is aesthetically pleasing, durable and retains its original appearance, even after decades of exposure in an often harsh North American climate. And concrete requires very little maintenance, proof that architectural concrete is costeffective over the long term.

For more information or to obtain a copy of "Performance of Architectural Concrete Panels in the PCA Outdoor Display," a report co-written by the author of this article, visit www.cement.org.

William C. Panarese is a former manager, construction information services, for Portland Cement Association.

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Concrete Forms and Liners

It makes sense, given their name: **Stone-Crete** form liners are molded from natural stone surfaces.

The liners, part of a cast-in-place concrete wall creation system from **Increte Systems**, can fit together

on all sides to create nonrepeating patterns. They duplicate the color and technical specifications of hand-laid stone at a fraction of the time and cost it takes to by down actual reals

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lay down actual rock.

Stone-Crete liners are made of highly durable urethane and can be used multiple times. Together with Increte acid stains, integral colors and clear-seal coating, they constitute a cast-in-place decorative concrete wall system that can be mounted on any standard forming system. They come in 10 deep relief patterns, including "Dry Stack," "Navajo," "River Rock," "Wood Plank" and "San Luis Obispo," and are available in an assortment of filler sizes. Certain liners can be used when molding corners or corner posts.

For more information, visit www.increte.com or call (866) 342-8760.

If you're going to erect a long molded concrete wall, you're going to be doing a lot of vertical pouring, and one of the most cost-effective ways to do that is with



the Panel Stacker System. Made by Verti-Crete LLC, the precasting assembly turns out seamless, double-sided walls and posts with the look and feel of real stone, and can do it several pieces at a time.

The system is a steel-frame structure that holds a row of steel and polyurethane molding sheets. Several panels are poured at once, while the outside frame holds the molding in place, eliminating the need for tie rods that leave ugly holes. This precast system produces

higher quality molded walls at faster speeds than castin-place systems, and it does more with less space than traditional precasting steel beds. The System is more expensive than cast-in-place equipment, but if a contractor is going to be pouring a lot of decorative precast walls, the assembly may well be worth it.

For more information, visit www.verti-crete.com or call (801) 571-2028.

Arch-Crete is the form-work system from Architectural Concrete Creations that took home the "Most Innovative Product" award at World Of

Concrete 2004. The integrated poured wall system makes it easier to attain vertical textured concrete surfaces while curbing the time and cost associated with traditional liner assemblies.

Arch-Crete's standard 3-foot-by-6-foot panels consist of high-impact, wear-resistant composite materials. A dynamically designed grid matrix provides maximum strength during the pouring stages, limiting deflections.

The forms come in several natural stone textures: "Boulder Stone," "Castle Cut Stone," "Cobble Stone," "Ledge Stone," "River Rock"





and a flat panel. This group of textures represents much of the below-grade geology in the United States, and more designs are in development.

Arch-Crete forms do not absorb water, are impervious to most chemicals, and work with integral colors, release agents and other concrete additives.

For additional information, call (877) 753-6767 or visit www.arch-crete.com.

Western Forms will encourage contractors to think brick with its Vertex Brick patterned form panels.

The pattern on these panels is touted as being the deepest in the industry, while well-hidden form seams and joints improve its look even more. Vertex forms are easy to strip, are available in a variety of form panels, including ones with PinLock Attached Hardware, and

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Metal Forms Corp., the makers of Poly Meta Forms, are fond of comparing their high-density polyethylene forms to wood, and if you were them, you would too. Poly Meta Forms are only half as heavy as comparable-sized wood pieces. They are reusable, they offer uniform straightness and height, and their size is guaranteed — unlike wood forms,



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whose uniformity is dependent on what happens to be at the lumber yard.

Poly Meta Forms set and strip quicker than wood does, with a wedge that unlocks and loosens the pieces after the pour has set. The wedge makes horizontal and vertical



adjustments easier, too. The plastic forms also perform better than wood when it comes to absorbing moisture — they don't absorb any moisture at all.

Poly Meta Forms come in straight and radius forming designs and several different dimensions for variety. Top spacers, division plates and overhead hangers help when



pouring curbs and gutters. The forms can be bent to suit when pouring curved slabs.

For more information, visit www.metalforms.com or call (414) 964-4550.

Form liner textures from Symons enhance the appearance of concrete walls and columns. Hundreds of standard patterns, in four different materials, are available for specification to create appropriate and attractive architectural finishes.

The liners come in four grades with varying life spans. SPS Plastic is a polystyrene form liner that provides an inexpensive alternative for single-use applications. ABS Plastic is an ABS form liner that offers durability and performance for projects requiring five to 10 uses. Dura-Tex, a urethane material that can be stripped from complex designs without damage, is a medium-use liner good for roughly 40 uses. Elasto-Tex is a pure urethane form liner that provides consistent pattern reproduction. This liner offers an exceptional cost advantage when used 100 times or more.



All four liner types come in wood patterns, rib patterns, fractured patterns, custom designs and more.

For more information, visit www.symons.com or call (847) 298-3200.

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The line of concrete countertop forms is used for cast-inplace installations of residential as well as commercial countertops. Forms may be mitered to fit corners or bent to a radius as tight as 2 inches.

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Stamping Concrete Tiles on Vertical Surfaces

by Stephanie Mohler

he crew at Airspeed Skateparks was laboriously gluing ceramic tiles to vertical areas in our public skatepark projects until we were introduced to concrete stamping by Concrete Decor in 2001. Once exposed to the possibilities, we switched from traditional tile setting to all-concrete stamped tiling. There are many advantages. Tile stamping happens the same day as the initial pour, saving setup time and labor. It's easier and faster to stamp tile on vertical walls than to prep and apply ceramic tiles. Stamping tiles makes particular sense in regions exposed to drastic freeze-thaw cycles: Glued-on tiles can pop off during cold weather when moisture freezes between the tiles and their substrate. We've found that most people don't even realize that stamped tiles are concrete instead of ceramic. They create the ambience of ceramic tile without the misery of tile prep and setting.

First, the mold is prepared.





Second, the urethane is poured.



The stamp is removed.



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Stamping

Prep your tile stamp first with Bubble Gum Liquid Release. Michael Dahl, who makes all of our stamps, makes a few full-size stamps and then cuts them up into different sizes one row, two rows, etc. — which allows for the different curves of the park. It's also helpful to cut a few blocks of 2inch rigid insulation foam the size of the stamps to use as tampers. You can also use the edge of the foam block to touch up grout lines.

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When you feel that all the elements are aligned in your favor, spray or brush on the Bubble Gum release, then place the stamp where you want it, hold the foam block on top of the stamp and tap to get the impression desired. Adjust the intensity of your tapping to suit the hardness of the concrete as you progress. Take one corner of the stamp and peel back slowly. Should there be a section that did not get completely stamped, carefully roll back the stamp, apply release and repeat the tapping procedure. If the stamping took to your liking, remove the stamp all the way.

As is typical of working with concrete, one often encounters problem areas while stamping tile. If you are tiling a complex shape or the mud consistency is not ideal, the initial impression may be flawed. Don't panic — it's easy enough to manicure the stamp with small, improvised tools like a nail. If the tile surface is too fuzzy when you pull the mold, the concrete needs to set a little longer, or you need to apply more release. Custom tools can be made to match difficult areas or clean up sloppy grout lines. Nearly every job site is replete with miscellaneous objects that will serve your

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purpose. Always remember that you are the master of the mud, not the other way around.

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brilliant turquoise reminiscent of the classic swimming pool tiles of '70s suburbia.

You can apply several different stains for a varied appearance. Remember that the exact color from acid stain is never 100 percent predictable, but it will always look good. The key to staining is to let the concrete cure out before applying — each pour cures differently, depending on the weather conditions.

We apply the stain with a sponge or a paintbrush. Be sure to use gloves and safety glasses! Often the tiles will be stamped above a stretch of unstamped concrete. To prevent your stain from dripping down and staining your unstamped work, be sure to seal all the concrete below the tile before staining. We use an acrylic cure and seal with a semi-wet look. During staining, have an assistant rinse the stain drips before they can eat through the layer of sealant.

Stamping works great for all your vertical tiling needs. It's quick, easy and fun once you master the technique. Stamped tiles look great and last forever.

Stephanie Mohler is project manager for Airspeed Skateparks. For more information on Airspeed, visit www.airspeedskateparks.com.



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102 • www.ConcreteDecor.net • Dec/Jan 2006

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by John Strieder

Profil

urbank, Calif., contractor David Jack Corp. specializes in countertops. So when Los Angeles-based Reform Furniture hired the firm to cast a group of workstation tops for a client back East, it was business as usual — with one exception. "The only thing," says owner David Cunningham, "is that we had six weeks to build 480 tops."

While historians have not kept records as to the largest number of concrete countertops poured in one job, most would agree that 480 is a whole lot. "We cranked 'em out," Cunningham reports.

Each desktop slab measured 50 inches wide and 26 inches deep. Each also had to be strong enough to hold 500 pounds without any support directly underneath.

Cunningham and his crew got to work. First, they poured a 35-foot-by-80-foot slab to create a form that would allow them to cast 120 tops at once. The desktops would be cast upside down, so the surface of the form slab was ground smooth. Aluminum channel forms were bolted to the surface. "I used to build tiltwall buildings. I just went with that concept," Cunningham says.

The crew then poured batch after batch of desktops, popping them off with help from a release agent. Wood strips were fixed to the back of each slab for attaching the workstation tops to their wood frames. The slabs were stacked to finish curing.

Up to 20 people at once worked assembly-line style on the project, with each person doing a specific task on several slabs all day long. One, or sometimes two full-time runners would procure diamond pads and other expendables that regularly became scarce.

The team could not use vibrators to work air out of the setting concrete. The tools were too likely to scrape the bottom of a curing slab, leaving blemishes on what would end up being the surface of a desk. As a result, the tops hardened with little air holes on their surfaces. The cured slabs were given a fill coat of an Army green color, then moved to the microtopping table for a coat of warm gray.

Thanks to the air holes and the rest of the process, the tops ended up looking more mottled than usual, which, as it turned out, was a good thing. "The client just went ape over that," Cunningham says. "In reality, everything just worked in our favor."

The tops were shipped in crates that weighed 3,000 pounds when full. "We filled two semi trucks with 80,000 pounds of countertops," Cunningham says.









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The tops were shipped to the first phase of a commercial project in Philadelphia. The recipients and their office designer have backed up their praise with orders for more. At this point, the total order may come in at about 3,000 tops, Cunningham says.

David Jack Corp. is no stranger to big productions. The company has poured concrete for a number of Hollywood movies and television shows. It has cast concrete tops in bulk before too, in the range of 50 to 100 for a restaurant. Accomplishing this mammoth job was just a matter of careful scheduling, Cunningham says. When they started the job in August 2005, they were finishing 10 tops a day. Two weeks later they were up to 45 or 50 per day.



More information about David Jack Corp. can be found at www.davidjackcorp.com or by calling (800) 225-8420.



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PRODUCT PROFILES

Pebble-Flex Synthetic Rubber Surfacing System

When it comes to putting a soft, springy surface on top of a craggy concrete floor, Pebble-Flex is where the rubber hits the road. The porous thermoplastic polymer and binder system is made up of countless tiny rubber balls sealed in place. It's color-stable, user-friendly and environmentally safe.

The thermoplastic rubber shapes measure 2 mm to 4 mm in diameter. "They're different sizes, so they compact easier," says Pebble-Flex LLC vice president of sales Rose Saluti. "We don't want them all the same size."

Perhaps the most significant quality of these flexible pebbles is how they stand up to the sun. Unlike earlier generations of synthetic rubber surfacing, Pebble-Flex does not degrade from exposure to ultraviolet rays, so it does not suffer premature fading, chalking and decomposition.

The system is also prized for its ease of installation. Laying Pebble-Flex is a three-step process. A penetrating, adhesive two-part urethane "primer"

goes onto the substrate first. The rubber bits are combined in a cement mixer with an aliphatic urethane binder, and the resulting mixture pours like cement. The coating can be troweled by hand or machine, with soapy water used to slick the blades. Pebble-Flex does not employ harsh chemicals such as acetone, xylene or kerosene. It bonds to most surfaces and can be applied over wood, metal or fiberglass as reliably as over concrete. With Pebble-Flex, damaged surfaces can look new again

within rebbies lex, damaged suffaces can look new again without any demolition needed. Once the surface is installed, it can be repaired in minutes. And it won't recrack. Being thermoplastic urethane, it expands and contracts instead of giving way. "It's like a whole surface made from an expansion joint," Saluti says.

> Pebble-Flex comes in 13 standard colors, and the company offers custom color-matching services to help the surface fit an existing space. The vibrant colors complement playgrounds and pools nicely. Logos and designs can be incorporated into the surface. Because of the pebbles' resistance to UV rays, colors and designs won't fade. "Bright colors that stay that way is huge," Saluti says.

> Besides playgrounds and swimming pool decks, the surface works well on patios, walkways, driveways and balconies. It is soft, safe and skidresistant, it's comfortable to walk on barefoot, and it

conforms to ASTM standards for critical fall heights. Introduced in 2002, Pebble-Flex is billed as "the first truly light stable soft rubber surfacing material." Pebble-Flex LLC is currently on the grow, having recently set up international distribution for the first time, in Australia and New Zealand. "We are still a growing company with an innovative product that has been getting a lot of positive feedback, from many large-scale surfacing companies in the concrete resurfacing industry as well as the playground surface industry," says Pebble-Flex sales manager Bill McGrath III.

Contact: Pebble-Flex LLC (800) 509-4144 www.pebble-flex.com

Bella Vernici Overlay Compound

Bella Vernici's sprayable overlay compound is the crown jewel of the company's stainable concrete veneer system.

The overlay powder is a unique combination of marble flour, lime, fly ash, Portland cements and ultrafine aggregates. At the job site, it's mixed with Bella Vernici's liquid Enforcer, an acrylic polymer, instead of water.

The overlay can be diluted to be as thin as needed and still take stain. It can be applied with a sprayer or rolled or troweled on. More Enforcer can be added without risk to re-emulsify the compound as it starts to set. Emulsions in the Enforcer improve the overlay's flexibility, adhesion and hardness.

"Our overlay has powder-fine aggregates that allow for a smooth finish less than ½ inch thick in a single pass," says Bella Vernici Studios art director Rodney Ray. "Additionally, it is sandable for 24 hours to reclaim profiles and eliminate trowel lines. It also can be kept workable for hours on end with additional Enforcer. It can be mixed as thin as soup and sprayed without losing stainability, adhesion or strength."

Contractors can't get this kind of performance from overlayments that, for binders, use powdered acrylics that emulsify with the addition of water, Ray says. As more water is added to increase workability, the binder becomes diluted and the coating is set up to fail. "Our binder is the Enforcer liquid," Ray says. "So, the more you mix in, the better. You just want to insure it's blended well."

The compound works with all stains. However, its alkalinity is very high, so stains that are high in acid content tend to become very intense when reacting to the Bella Vernici overlay.

This problem can be avoided altogether by using Bella Vernici's own Oxidizers to stain its overlay. The Oxidizers are made from metallic salts and have little or no acid in them.

The stains can be applied just one day after the overlay compound. Finally, a hardener topping seals the surface and sets the color.

The sprayable overlay is sold on its own. But the other three key components of the system — the bonding primer, Enforcer liquid and the hardener-sealer — are engineered to work with it. Is the company's bonding primer required before the overlay? "Yes and no," Ray says. "Yes to the consumer as it offers additional insurance. However, there are instances where enough 'tooth' is present so as not to require it."

Contact: Bella Vernici Architectural Concrete (888) 508-3289 www.bellavernici.com

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Four-Dimensional Stain Cube stamp pattern

t sounds just a little bit like a pulp science fiction story: While packing up their warehouse to move, workers at a concrete stamp company discover a long-forgotten design for a concrete stamp that is — gasp — threedimensional.

The 3-D design is actually 2-D flat, of course, but with the right stains, it really can fool the eye with the appearance of depth. The stamp is a series of simple box shapes. Each box consists of one 8-inch-by-8-inch square and two trapezoids, and several boxes fit together seamlessly on the stamp. The whole design is topped off with a slight amount of slate texturing. The boxes don't fool the eye much on the stamp, but after the three sides of each concrete box impression are stained, they can jump out at the eye like a floor full of real cubes. The illusion can even be achieved while using a clear release.

Because the 3-D effect incorporates both stained and stamped concrete, merging both worlds in one design scheme, it is unique in the world of stamped concrete, says Kris Kaitanjian, senior vice president of Matcrete.

Kaitanjian's father designed the stamp, most likely about a decade ago, he says. "It was just ahead of its time. Staining just wasn't as big as it is now."

What's more, today Matcrete is looking for unique. Kaitanjian says the company wants to get more in tune with the community of concrete artists and expand beyond ubiquitous, cookie-cutter stamp designs such as ashlar slate and granite stone — even though, he acknowledges, designs like those are still the "bread and butter of the concrete industry."

Matcrete began selling the cube stamp in 2002, and plans to introduce two more textured 3-D patterns in 2006. Kaitanjian says the 3-D cube would be especially striking in a casino or resort. "This adds a little bit more of the creative juices, rather than just finishing the concrete and stamping it," he says. "It gives a little bit more character and uniqueness to stamped concrete. It definitely is an extra step (when used with stain) but it's a cut above the rest."

Contact: Matcrete (800) 777-7063 www.matcrete.com

Solvenator Premier Concrete Sprayer

he problem: How to spray sealers and other solventbased liquids onto concrete as if they were paint.

The solution: The Solvenator Premier Concrete Sprayer.

The new sprayer is a standard hand-pump model that Floric Polytech Inc. has retooled with fixtures and seals that stand up to solvents. This sprayer applies solventbased materials and can be cleaned with solvents without damaging a single part.

The basic steel sprayers are manufactured by Chapin Manufacturing Inc. with Floric Polytech's name on them. Workers at Floric Polytech retrofit the sprayers for solvents, replacing rubber seals, O-rings and gaskets with parts made from solvent-resistant polymers and plastics. They also replace the plastic check valve in the pump barrel with a brass valve engineered to withstand higher pressure — specifically, the 200 pounds of pressure needed to spray solvents, which can be thicker than a sprayer's typical cargo. "When you pump up to 200 pounds of pressure, the plastic valves just blow out," says Floric Polytech business development manager Craig O'Hara.

The Solvenator, which sports a 3.5-gallon tank, was designed to spray Floric's CS-101 Clearseal, but will apply other sealers and solvenated urethanes as well.

Because the brass fittings at the bottom of the pump resist corrosion and the pump is airtight, excess solvent can be left in the tank for a later

job. "You can actually store some short term as long as the level of the sealer in the sprayer is safely above the bottom of the check valve," O'Hara says. "It'll maintain pressure."

Since the pump can be cleaned with solvent, it can be used over and over. Standard sprayers on the market can only be used once, O'Hara says, because the solvents that would clean them

will dissolve their parts. The Solvenator can stick around for a year, possibly even longer, he says.

There are other pumps that are billed as being solventresistant, but they won't outlast the Solvenator, O'Hara says. "You might be able to get two or three uses out of one, but ultimately it's going to fail."

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Less than one hour

Gore Design Co. sink molds

hen asked how Gore Design Co.'s two (and soon to be three) integral sink molds set themselves apart in the marketplace, Gore Design principal Brandon J. Gore says it's a matter of timeliness.

"The time involved for a fabricator to create designs such as these would price the project out of most clients' budgets," he says. "For instance, take our wave sink and wave drain board. Both of these designs took 3 to 4 weeks in mold-making, prototyping, refining and so on before they were ready to be cast."

It's also a matter of being modular. The sink molds can be cast with either a standard round drain opening or a slot drain assembly. Gore sells accessories to accommodate for both options, and the company is developing a line of drain openings in varying shapes and sizes. The sink mold system also includes drain board molds, soap dish molds, standard faucet knockouts, contractor-series faucet knockouts, edge molds, trivet kits and decorative detail molds. These components can be assembled in almost countless configurations.

"We learned a long time ago that the profit in concrete countertops is made in options," Gore says. "Similar to the automotive industry, clients rarely want the base model. Most clients request an integral drain board, soap dish and/or sink. By having molds that can be used hundreds of times we are able to quickly and easily produce cutting-edge designs in a matter of minutes."

Gore sells two sink molds right now. The Columbia Sink Mold lets water cascade down the sloped front of a design that was inspired by the deep gorges of British Columbia. The spacious Sedona Kitchen Sink features rounded interior seams that are easy to clean and a look that fits both modern and traditional design schemes. The company also has plans to introduce a Moab bathroom sink design with a

> basin that resembles a topographic map. "Most of the sink designs will be named after locations that reflect the personality of the design," Gore says.

Gore Design molds are aimed at contractors who go into the concrete countertop field to be creative, Gore says. "The fabricator can combine components to create a completely unique sink each time, and then disassemble the sink components after casting to create a completely different sink for the next project."

Contact: Gore Design Co. (480) 209-4241 www.goredesignco.com

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Advertiser	.WOC Booth #	.Page #	RS#	Advertiser	.WOC Booth #	.Page #	.RS#
Applied Concrete Technology	. S11711	.CM	01	Hover Trowel	. S13127	. 55	47
Arch-Crete	. N2777 & O030804	. Inside FC $$	02	НТС	. S10801	. 46	48
Architectural Enhancements	.N2777	$.CM\ \ldots\ldots$	03	Innovatech Inc	. S10437 & O21053 .	. 33	49
Arcus Stone	. S10617	. 24	04	Innovative Tool Design	. N2868	. 60, CM	50
Arizona Polymer Flooring	. S11302	. 34	05	Inter-Tool	. S11352	. 41	51
Armcon Molds	.N467	$.CM\ \ldots\ldots$	06	Kemiko	. S11911	. 119	52
ASCC	. C6923	. 105	07	Kipper Crete	. 030807	. 50, CLS	53
Bella Vernici	. S13007, N175	.11, CLS	08	Larsen Products	. S10921	. 98	54
	. & O31043			LandscapeNetwork.com		. CM	55
Benjamin Moore	. S11111 & O30622 .	. 15	09	Love-less Ash	. S12309	. 118	. 102
Bobcat	. C5481	.97	10	Matcrete		. 91	56
Bomanite		. 87	11	McKinnon Materials	. S11707	. 109	57
Brickform/Rafco Products	. N2763 & O30640 .	. 4-5	12	Metal Expression		. CM	58
Buddy Rhodes Concrete	. S12121	.43, CLS	13	Metal Forms	.C4215	. CM	59
Butterfield Color	. 030712	.7	14	Miracote	. S11221	. 79, CM	60
Cemen Tech	. C6543	. 60	15	Modello Designs	. S12003 & O30922 .	. 73	61
CemTec		$.CM\ \ldots\ldots$	16	Pacific Palette Concrete Products		. 32, CM	76
Cheng Concrete Exchange	. S10637	.25, CLS	17	Pebble Flex	. S13127	.CM	62
Cohill's Building Specialties		$.CM\ \ldots\ldots$	18	PICS		. CM	63
Coloration Systems		$.CM\ \ldots\ldots$	19	Polytek	.N759	. 92	64
Colormaker Floors Ltd		. CM, CLS \hdots	20	Proline Concrete Tools	. S12605	. 93	65
Concrafter		. 82	21	QC Construction	.N511	. 66	66
The Concrete Colorist		.68, CLS	22	Rico Rock	. C8255	. 75	67
Concrete Countertop Institute $\ \ldots$. 51, CM, CLS	23	Rubber Mold Company		.CM	68
ConcreteIron		$.CM\ \ldots\ldots$	24	SCP Pool Corp		. 53	69
Concrete Solutions	. O30926	. 18, CLS	25	Seal Krete/Convenience Products	. S12521	.3	70
Concrete Texturing Tool & Supply $% \mathcal{S}_{\mathrm{S}}$.		. 12	26	Skimstone	. S12005	. 35	71
Custom Concrete Creations	. 030817	. 44	27	Slip Industries	.C4070	. 69	72
Dayton Superior	. C8032	. 17, 19, 21	28	Slip Stone		.96	73
Decorative Concrete Show		. 99	29	Soff-cut International	. C6250	. 67	74
Decorative Concrete Store		. CLS	· · · —	Southern Color Company	.N1423	. 62	75
Decosup Dallas	. 12029	. 45, CLS	30	Specialty Concrete Products	.N1253	. 61	77
Desert Polymer Flooring		. CM	31	Stegmeier Corp	.N2525	. 118	78
EDCO Inc	. S10427	. 21	32	Stardek	.N3063	. 47	79
Exaktime	.N2266	.1	33	Stone Pro		. 55	80
Excellent Coatings	. S11524	. 68, CM	34	Super-Krete International	. S10247	. 86	81
EZ Chem		. 59	35	Super Stone	. S10313	. Back Cover .	82
Flex-C-Ment	. S11745	. 118	36	SureCrete Design Products	. S11303	.CM	83
Floric Polytech		. 13, CM	37	Surface Gel-Tek		.CM	84
Fossil Crete	. O30918	. CM	38	Tech Fab	. S12337	.77	85
Franmar Chemical	. S12411	. 111	39	Tygar Manufacturing	. S11349	. 50	86
Fritz Pak	.N617	. 58	40	Versatile Building Products		. 16	87
Glaze 'N Seal	.N1852	. 30-31	41	Vexcon Chemicals	. S11325	. 52	88
Gold Cast Products		. CM	42	VIC International	. S10409 & O21044 .	. 83	89
Gold Leaf & Metallic Powders/NEI G	roup	. 12	43	Wagman Metal Products	.N2019	. 20	90
Gore Design Products		. CLS	· · · —	White Cap	. C4575, C4565	.9	91
Gran Quartz	. S11325 & O21052 .	. Inside BC .	44		. & O20954		
Heritage Glass	. S12704	. 34, 44	45	World of Concrete		. 117	92
Home Design Services		$.CM\ \ldots\ldots$	46				

CM: Concrete Marketplace is on pages 100-103. • CLS: Classified ads are on pages 106-107. Reader Service Card is between pages 112 and 113. When contacting an advertiser, please mention Concrete Decor.

The Humble Pressure Washer

... both a workhorse and a magic wand for the decorative concrete contractor by Andy Fulton

he pressure washer is one of the most useful and versatile tools available to the decorative concrete contractor. As with most tools of the trade, a pressure washer in the hands of a pro becomes a magic wand, while in the hands of a novice it can ruin your newly created surface. For most professional contractors the upside far exceeds the downside.

When you buy a pressure washer, you buy psi. This means the low-end pressure washer is little more than a glorified garden hose with 700 psi to 1,000 psi. Stated simply, the psi of a washer determines how effectively it breaks the bond between the debris and the surface. For concrete and industrial uses, the washers of choice offer at least 2,000 psi, and preferably 3,000 psi. In a contractor environment, a pressure washer sees plenty of action, often daily. This continuous use eliminates the residential-type washer as a viable tool for the professional.

A second measure of pressure-washer effectiveness is water flow, measured in

gallons per minute (gpm). The water flow affects the time it takes to clean a surface. A serious industrial-grade pressure washer has a gpm of 3.5 up to 4.4.

A pressure washer is driven either by direct drive or a belt drive. In an industrial environment, the longevity of the belt drive makes it the clear winner for the professional contractor. The belt drive allows for much higher flow rates, up to 5 or 6 gpm, and because the pump is located away from the heat of the engine, it requires less maintenance such as oil changes.

The top-of-the-line industrial pressure washers offer quick-connect nozzles with spray alternatives of 0, 15, 25 and 40 degrees. The know-how to select and adjust the proper nozzle for the job is where the experienced contractor shines. The 0-degree nozzle used at full throttle at close range can etch a groove in concrete — generally not a desirable outcome. By attaching a rotating nozzle, the 0-degree flow is dispersed over the 25-degree area, which can remove a parking stripe in one pass.

The decorative concrete contractor often uses a pressure washer to prepare the surface or rinse the finished surface of a job. The versatility of a pressure washer shines in these two very different applications. The concrete surface left after adjacent construction trades are finished is often marred, scarred and caked with dirt, grime and who knows what. The preparation of this surface requires high psi throwing a high gallon-per-minute to the

114 • www.ConcreteDecor.net • Dec/Jan 2006

task. On the other hand, rinsing newly applied color requires a delicate touch to clean off the surface while not blowing the color off the finished job. Once the color has been applied and rinsed, color cannot be reapplied. Color can be removed, but more color cannot be added. You want your most experienced technician to pressurewash the finished surface.

The rotary surface cleaner is an overlooked accessory that combines water pressure with a hardy bristle brush to clean or rinse decks, patios, driveways or any horizontal surface. Rotary surface cleaners are available with 18-inch or 28-inch diameters and psi ratings of 3,000 and 4,000. The water pressure can be adjusted through the pressure washer unit.

As with all tools of the trade, your pressure washer cost is calculated by quality work completed on time and the subsequent word-of-mouth business. A pressure washer is a necessary, important tool for the professional decorative concrete contractor; it pays to purchase the most power and versatility you can fit into your budget. Train your most experienced workers in its use, and most importantly, test your nozzle's performance in an inconspicuous location before turning it loose on the concrete leading up to your customer's front door.





New Architectural Enhancements items strengthen product line

A batch of new decorative concrete products from Architectural Enhancements Inc. includes patch material, a countertop mix, a plasticizer additive and a microfilament additive.

The microfilament additive, called Invisifiber, is imported from Japan. Because its fibers are less than a quarter inch long, the additive offers many more



separated microfilaments per unit of weight than does the traditional version. The shorter length of the microfilaments makes them almost impossible to see in a mix, while the greater number of filaments per measure means more fibers to interlock.

A new patch material called Tru-Patch boasts a mix that includes the Japanese microfilament and a generous portion of polymers. Its makeup allows it to be installed full-depth in one application with no shrinkage cracks between the original concrete and patch. This material serves as both patch and overlay.

Another new product, Tru-Top, is a self-leveling countertop overlayment mix. When poured onto a mesh or concrete board backing, the stampable, stainable result looks like a full-pour concrete countertop. The mix also comes in an "ultrasmooth" mix that leaves a burnishable surface similar to one that has been power-troweled.

Finally, the company has debuted Truflow, a plasticizer-polymer additive for countertops that adds strength and slows cure time to increase workability.

For more information, visit www.decorativeover layments.com or circle #94 on the Reader Service Card.

Release coating maintains detail

Huron Technologies Inc. has developed a concrete release coating designed to easily release decorative concrete products from their molds.

Release Coating 6187's superior mold release properties maintain the intricate details found in decorative work. The



coating, tested for five years, is especially effective on large parts and parts with extreme vertical surfaces. It contains solvent and silicone release materials that are ideal for in-plant concrete product production lines, and it is sold in five-gallon containers and 55-gallon drums. For more information, visit www.hurontech.com or circle #95 on the Reader Service Card.

A hammer designed to take a pounding

Hitachi Power Tools has introduced a new 20-pound SDS Max demolition hammer, the H60MRV.

The hammer features a powerful 12.5-amp motor that delivers 19.2 ft/lbs of impact energy to get the job done faster.

It is engineered to power through concrete and stone materials quickly. The design of the tool absorbs vibration. It offers constant speed control with a variable speed control dial and turns out a no-load noise level of only 91.5 dB.

The hammer features both Hitachi's new aggressive ergonomic design and its patented IDI technology, which increases durability



and longevity. With IDI, the aluminum housing of the hammer is intertwined with an injection molded inner nylon core. This technology combines the durability of an all-metal-body tool with the insulation advantages of tools with plastic housings. The armature bearing is seated in aluminum, not plastic, to withstand high heat and stress from extreme use.

The H60MRV hammer is equipped with a handle that flexes on the sides to isolate and absorb shock. The handle is made from elastomer, a Hitachi-patented compound that reduces vibration transfer to the user. In addition, the hammer features an adjustable side D-handle that rotates 360 degrees and swivels front to back.

For more information, visit www.hitachipower tools.com or circle #96 on the Reader Service Card.

Give yourself a warm, dry hand

Gorgonz Performance Work Gear has introduced a handful of gloves that may help keep contractors warm and dry in the winter months.

Performance Work Gloves feature Thinsulate Insulation, which is made from microfibers that form a breathable, thin, moisture-resistant layer. The gloves'

Exhale Heating System lets breath in to warm the hands. The gloves come in two models.

The Winter Pro 475 glove has an engineered microporous liner that is 100 percent waterproof and still allows hands to breathe. The outer layer of the palm is made from Toughtek and flexible



synthetic leather. The glove's middle layer, a 100 percent waterproof liner, repels water but allows moisture from sweaty hands to escape. The glove is insulated and "windproof," with reinforced fingers and Neoprene knuckles, cuff and strap, and offers superior tactility.

For more, visit www.gorgonz.com or circle #97 on the Reader Service Card.

Keep a lid on it

The Performance Work Hat, new from Gorgonz Performance Work Gear, cools heads in hot weather and warms them in the cold. If worn wet in hot weather,

> it can keep a head up to 30 degrees cooler while venting sweat and heat. In cold weather (and when dry), the hat insulates and traps heat on the head. For more, visit www.gorgonz.com or **circle**

#98 on the Reader Service Card.

Going the distance

The C. H. Hanson Co. has introduced SpeedMeter, a new electronic measuring wheel that is available with 4-inch and 13-inch wheel sizes to accommodate almost any industry.

The 4-inch model is ideal for indoor applications, including flooring installers and interior designers. This

one-pound unit extends to 39 inches for comfortable measuring and features dual-wheel design for added stability. The 13-inch model is better suited for outdoor conditions and is intended for contractors and concrete installers, among others. It features a pistol grip and collapsible kickstand, and it weighs 2½ pounds.

> Both models feature a large LCD display that is easy to read, an electronic brake that holds measurements until it is reset, and a telescoping handle. The

electronic measuring units can measure up to 10,000 feet/inches, 10,000 yards/ tenths, or 10,000 meters/centimeters. The unit adds up the distance traveled when moving forward, subtracts when operated in reverse, measures trip distance and calculates total distance. The models are 99.9 percent accurate and sealed to IP65/NEMA 4 specifications.

For more information, please visit www.chhanson.com or circle #99 on the Reader Service Card.

Cool for the pool



Key Pool Deck, new from Key Resin Co., is a polymeric modified concrete resurfacing mortar designed to provide a durable, slip-resistant and waterproof surface.

The two-component system is ideal for resurfacing both old and new concrete or masonry and provides a decorative finish for outdoor recreational areas such as swimming pool decks, floors, sidewalks and outdoor patios. The coating boasts reduced surface temperatures, resistance to moisture and salt intrusion, and improved durability. The new product is ideal for both residential and commercial applications. Key #805, the acrylic finish applied with Key Pool Deck, comes in a variety of decorative color choices.

For more, visit www.keyresin.com or circle #100 on the Reader Service Card.

A truck designed with contractors in mind

Microsoft Corp. and Stargate Mobile have teamed with Ford Motor Co. on a mobile office system for Ford's "General Contractor" F-250 Super Duty Truck.

The Ford mobile office system is a small, lightweight computer that can be docked inside the vehicle and used away from the traditional office or

taken anywhere on the job site. The system comes with global positioning



satellite (GPS) technology, wireless broadband access, a printer, a credit card scanner and a digital-cameraequipped mobile computer that can



help when bidding jobs, ordering and purchasing parts and materials,

and processing payments. The mobile office system features the Microsoft

Windows XP Professional operating system bundled with Microsoft Office Suite.



The Stargate Mobile computer is mounted on the transmission tunnel hump within easy reach of the driver. Once the computer is securely mounted in its vehicle cradle, it is powered by the



truck's battery. The driver can remove the touch-screen computer

and carry it like an ordinary laptop. With the slate form factor, a user won't be hampered by the unnecessary weight of a keyboard unless that is desired.

The lightweight, versatile design is constructed to withstand typical uses on a job site. Its screen is visible in sunlight so that several workers can huddle around for an impromptu meeting. The

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Ford plans to offer the unique mobile technology as a dealer-installed accessory through the Genuine Ford Accessories program.

For more information, visit www.microsoft.com/automotive or circle #101 on the Reader Service Card.



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kinner Butte Park's 45foot-tall basalt columns have attracted rock climbers for decades. So when the city of Eugene, Ore., decided to build Riverplay, an innovative playground in another area of the park, a replica of the columns sized just for kids — was part of the plan.

The job went to Ray Robinson of Deadwood, Ore., who recently completed 15 "basaltic" climbing rocks made of concrete.

First, Robinson fashioned the column-like sculptures out of rebar and expanded metal lath. Next, concrete was pumped into the hollow columns. The rough concrete columns were then covered several square feet at a time with a 70 grit silica sand, lime and cement mixture (which he calls frosting) and haphazardly troweled, leaving imperfections. After dusting the mixture with a release agent, he then patted the soft concrete for texture with a self-made latex rubber pad.

Then, with six colors of the best latex paint money can buy — black, white, raw umber, burnt umber, raw sierra and burnt sierra — he began the intricate coloring process of mixing mist and random blobs to transform the columns of concrete into the "rocks" they've become today. Armed with a hose in his left hand and a hand-spray atomizer in his right, he methodically applied 14 different shades of paint, starting with the lightest and working his way to black.

"The coloring is more difficult than shaping the rocks," he says, adding that his technique is largely intuition. "It's like backpacking into an area you've never been before. You know what to take and how to survive, but you don't really know how you're going to do it until you get there."



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