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Publisher's Letter



Dear Readers,

On a recent Monday, I was in Phoenix for a meeting with decorative concrete experts Bob Harris, Steven Ochs, Tamryn Doolan, Pat Boyle, Dave Barreto and Jeff Abrahamson, as well as Nancy Stice and Lynn Walsh, directors of the Children's Museum of Phoenix. Our meetings included creative sessions and a walk-through of the Museum that covered a number of improvements to get underway during the Christmas and New Year holidays. While some of these improvements will be completed then, others are being prepped for workshops that will take place during the Concrete Decor Show & Decorative Concrete Spring Training on March 17-19, 2010.

The museum, a historic landmark built in 1913, will be the site for hands-on workshops in stamping, staining, stenciling, polishing and overlays. The indoor and outdoor spaces of this former schoolhouse have essentially become our canvas for demonstrating the remarkable ways decorative concrete products can be used to beautify and enrich a building while fostering a creative and interactive learning environment for children.

Yes, this is a place where you can not only participate in workshops with industry experts, but also make building improvements that will have a lasting impression on the lives of young people for years to come. You might also look at this opportunity as a project you can add to your portfolio.

The beauty of this museum environment is the challenge it presents for the decorative concrete trade. The museum doesn't just want something that teaches a child about our solar system. They want work that enables children to imagine their own solar system complete with scoops of mint and cherry ice cream swirling about — if that's what their little minds conjure up. How exciting of a challenge is that? Can the decorative concrete trade make this happen? I have no doubt.

One of the projects that will be completed before our event is a 100-foot origami-style rattlesnake that will be crafted on sidewalks at the museum using local artists from the Phoenix area. When you come to Phoenix, be sure to set time aside on Tuesday for a presentation by Steven Ochs and Gerald Taylor, who will discuss methods for incorporating artists into decorative concrete projects and achieving results that cities across the country and around the globe are spending big dollars to include in public works projects. This presentation and many others will open your eyes and enable your business to create opportunities where once there were none.

While the Children's Museum project is only a small part of what the Concrete Decor Show offers, it's an environment that will make a big statement about who we are as an industry and what we can achieve when the right people come together.

Registration is now open. I am looking forward to seeing you in Phoenix.

Sincerely,

Bent Mikkelsen, Publisher

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**November/December 2009 • Volume 9
Issue No. 7 • \$6.95**

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Subscriptions: USA (one year): \$22.95
 Canada (one year): \$32.95
 Other countries: \$64.00
 All prices in U.S. dollars

Subscriber Services: (877) 935-8906
circulation@protradepub.com
 Fax: (541) 341-6443

U.S. Postal Service: Professional Trade Publications Inc.
Mail Address: P.O. Box 25210
 Eugene, OR 97402

Other Shipping: Professional Trade Publications Inc.
 228 Grimes St.
 Eugene, OR 97402

Concrete Decor™ The Journal of Decorative Concrete is published eight times a year by Professional Trade Publications Inc. Bulk rate postage paid at Lebanon Junction, Ky., and additional mailing offices.

ISSN 1542-1597

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On the Cover: Denver-based Colorado Hardscapes Inc. created this old-world fountain with materials that included ArcusStone and glass-fiber reinforced concrete. The fountain graces The Streets at SouthGlenn, a retail development in south Denver. For more, see page 64.

Photo courtesy of Colorado Hardscapes Inc.

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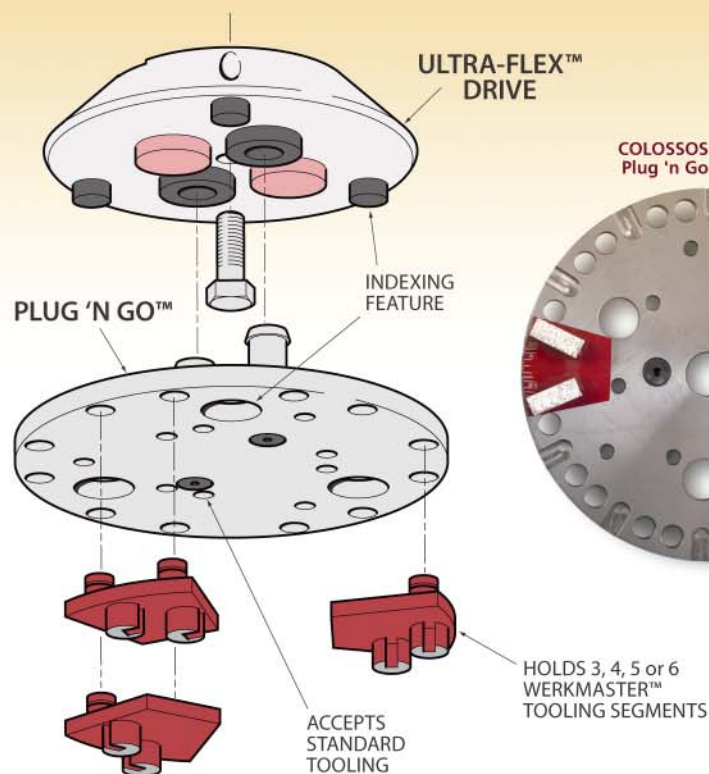
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Polished concrete gets its own section in MasterFormat

The importance of concrete polishing in construction has been given official recognition with the creation of a new section in the MasterFormat system, published by the Construction Specifications Institute and Construction Specifications Canada.

The new section number and name, 03 35 43 - Polished Concrete Finishing, gives design professionals a unique category for specifying appropriate polishing materials and performance requirements.

The new section was created in response to a proposal initiated by David Loe, a veteran concrete polisher and president of Lythic Solutions Inc., makers of colloidal silica-based densifiers. Loe perceived a significant omission in the MasterFormat concrete finishing sections, which previously had section numbers for techniques such as colored concrete, stamped concrete and grooved concrete, but none for polished concrete.

The current version of MasterFormat was published in 2004, but as of 2009, it has instituted an annual revision process to keep it current with industry needs and practices. Proposals submitted by April 30 are reviewed at a meeting of the MasterFormat Maintenance Task Team in July and posted to its Web site in September. MMTT is a group of CSI and CSC members appointed annually by the presidents of CSI and CSC.

www.masterformat.com

Hilti opens facility in Mexico

Hilti is expanding its production network with a new facility in

Matamoros, Mexico, that manufactures fastening products for the North American and Latin American markets.

The facility allows Hilti to ship products directly to locations throughout North and Latin America. This puts Hilti products closer to the customer, saves freight costs and reduces delivery times and environmental impacts.

Encompassing some 15,000 square meters of production space, the facility cost 14 million Swiss francs to build. It initially will employ 50 people, and employment is expected to grow to 150 by 2015.

Hilti's international production network now includes nine plants worldwide. Scott Tindle, a long-time Hilti employee, has been named plant manager.

www.us.hilti.com

Aztec promotes Spengler

Aztec Products Inc. has promoted Steven Spengler to vice president of sales, industrial floor-cleaning equipment.

Spengler previously served as national sales manager for the company. He will continue to operate out of

Aztec's United States headquarters in Montgomeryville, Pa.

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Scoble to run Hyde

Hyde Tools Inc. has named Rob Scoble as its new executive vice president and chief operating officer. He will oversee Hyde's professional products and industrial blade divisions.

Scoble joined Hyde as vice president of sales and marketing in October 2005 and was charged with stepping up new product offerings marketed worldwide under the Hyde brand name. In his four years with Hyde, he has overseen huge brand growth, nearly doubling the Hyde brand share and achieving clear brand dominance in its primary industry, as reported in independent research by the Paint & Decorating Retailers Association.



Over the past two years, Scoble and his staff also substantially increased company revenues derived from new and innovative products in categories where Hyde is a leader. These include hand tools for the painting, drywall and wall-covering industries sold through retail and industrial distribution channels.

Scoble will take on full operational leadership. He will also oversee Industrial Blade Solutions, the Hyde division that manufactures precision blades for a wide range of industrial and food-processing applications. 

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- Date and location of your project.
- A brief explanation of the project, including challenges you encountered, and a list of the tools and materials you used.
- Photos of the project. You must send before and after photos in order to be eligible.

*Photos must be high-resolution (300 dpi) in JPEG format.

*Qualifying entries must have been completed after October 30, 2008

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"I'm Not Paying for That!"

I got the call the other day. This one was a little different, because the friendly customer on the other end wasn't looking for me but to me.

Let me explain. It seems another decorative contractor had installed stamped work in her backyard and, let's say, the quality of work was in question. She didn't give her name, no "Hello, how is the family," nothing. She launched right into how the low-down contractor had installed shoddy work, and she wanted my help figuring out what to do about it. I would start to answer one question and she would come right over the top with another. You see, this is part of the problem with unhappy customers — they start to see more and more "imperfections" and the unhappy list grows.

I dismissed myself from the conversation by letting her know the contractor on record had a good reputation and the discussion should be with him, not me. I also, for free, advised her to pick the two things most concerning her and stick with these items only when sitting down with the decorative contractor. I wish him luck.

You will get complaint calls



by Doug Carlton

regarding your contracting, and this day needs to be planned for. Your customer may have a legitimate complaint or may need some educating. Nevertheless, not responding to the complaint will only aggravate the situation. Most contractors deal with the situation only when money is held and the only way to close the books on the job is to deal with the complaint.

Decorative concrete, all types included, has many shades of gray, and this can compound the problem. I have yet to see a decorative concrete playbook of instruction that allows a customer to simply check off the steps to completion. This would make it much easier to spot what went wrong and why, but this simply does not exist. I know of no foolproof way to completely eliminate all customer complaints. However, I do have a few suggestions learned from many years in the decorative trenches.

Suggestion 1: Confront the problem, not the customer

I realize this is especially tough when you know your crew did a top-notch job and the customer is being unreasonable. I have found it works best to meet the customer on-site with pad of paper in hand to write down the concerns — as they see them. Don't interrupt, don't shout, don't look at your watch, and don't act put out. Listen hard, because you can rest assured there is a lawyer within a block and half that

would love to collect some of your money.

Now is the best time to snuff out the problem before your customer gets frustrated. If some items are justified, than apologize for the inconvenience and let the customer know that you will look into it immediately. This will buy a day or two to do two things. The first is: Figure out what went wrong and what your crew will do in the future to eliminate it. The second is a detailed plan on what you will do to correct the problem and who will pay for it. I'm guessing the cost to fix is coming out of your pocket. Regardless, get the problem taken care of.

If you're dealing with a possible future problem rather than a real-time problem, give your customer a written letter acknowledging your intent to be involved if a fix is needed. Do not underestimate the power of this letter as it relates to decorative concrete issues.

Suggestion 2: Don't blame

Did the fire-sprinkler contractor leave oil spots? Did someone walk across your work? Did your supplier send the wrong product — again? Was it windy or rainy? Did one of your men leave the job sick? Did a tool break? Did you bid the work too cheaply? Did the pastor walk down your newly stamped sidewalk? Who keeps a 100-hundred-year old tortoise in the backyard, and how did it find your fresh concrete anyway? I have had all of the above and more damage jobs and cost me money. I have prayed, cussed, yelled and begged. But the most effective response is to accept the problem as yours. Something about a guy standing tall and accepting the problem is unique in this age. Passing the buck will cause skepticism with your customer because they do not know whom to believe. The only thing your customer cares about is getting what they expected. Chalk it up to experience and move forward. Life is short and the days are long if you constantly make excuses for why your job is problematic.

Suggestion 3: Prequalify the fix

The goal here is to calm the waters, then get yourself paid. At this point, all involved acknowledge that there is a problem or concern, and you are working to solve it. You should have contacted your material supplier as well, because they will need to know if this is an isolated situation or a potential defect.

The next step depends on the complexity of your customer and problem. You may need to go as far as to write out the problem or concern and the plan of action to correct it. I like to do this in many situations, because it keeps the customer from adding conditions of payment after the corrections. Present the plan to correct, and prequalify the customer by deciding when you will get paid and at what point. You may have to leave retention on the table, but at least 90 percent should be paid if the problem is corrected. Do not start the repair until this is agreed upon. There is a long list on the Decorative Wall of Shame of contractors that have tried to rush through repairs without a solid plan. 🚧

Doug Carlton operates Carlton Concrete Inc. in Visalia, Calif. He can be reached at carltondoug@comcast.net.



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Be an Expert on Stains and Dyes

Some years back I had the opportunity to listen to a speech on motivation given by retired U.S. Army General Barry McCaffrey. At the end of his speech he made a statement that has stuck with me to this day. He ended by saying, “Be an expert.” He was stressing the fact that too many people get caught up in trying to be all things to all people, instead of focusing in on what they are good at and becoming an expert in that one area.



by Chris Sullivan

This message crosses over into all industries and professions. It really hit home when I thought about how it relates to decorative concrete, especially in the application of stains and dyes. (For ease of reading and clarity, I will be referring to all types of stains and dyes as “stains.”) Recently I dealt with troubleshooting a stain issue, and got to thinking that over the last three to five years the decorative industry has grown in so many directions, applicators seem to have gotten away from being an expert at the basics or what they do best. New innovations and a sour economy have driven applicators to look for new and alternative products and markets

to provide additional revenue. I am not saying that innovation and trying new things is bad. In fact, applicator innovation is one of the major catalysts behind new product development in the decorative industry over the last 20 years. What I am saying is that as you expand your product offerings, don’t forget what got you to the point where you are today.

In regard to stains, let’s take a minute to go over the basics that should occur on every stain job, as well as how to avoid or repair some of the more common stain issues in the industry.

Stained concrete has been around for close to 100 years. About 25 years ago companies such as L.M. Scofield Co. and Increte Systems began marketing the idea of stained concrete as an alternative to common hard-surface flooring options. The idea stuck, and over the last decade stained concrete became the new and innovative trend in both commercial and residential flooring. Today there are more than 30 companies manufacturing or marketing different types of concrete stain. Throw in polishing, eco-friendly stains, and any numbers of supposed “new” stain technologies, and we end up with today’s stain marketplace — many choices, lots of competition, and lots of different finishes and colors to choose from. How do you weed through the

choices to come up with what works best for you?

This is where “being an expert” comes into play. An expert knows his products, knows his market, and is able to offer solutions to customers within his area of expertise.

Five steps

So, keeping in mind the idea of “being an expert,” let’s go over the key steps of any stain project.

Surface preparation: Do a water test to determine how fast and readily water penetrates into the concrete. Anything longer than three seconds, and additional surface preparation may be necessary. Surfaces need to be free and clear of all dirt, oil, grease, cures, sealers and other contamination.

Samples: The cheapest form of insurance any stain applicator can buy. Almost all stain manufacturers and distributors provide samples, so there really is no reason not to do a job-site sample. Find as inconspicuous a place as possible, and put the stain down on the actual job-site floor.

Application: Keep it easy and simple. Instead of getting caught up in multiple colors and exotic complicated designs, be an expert at what sells — one color with a quality sealer that is easy to maintain. Unlike paint, less is more when applying stains. Strive to hit the minimum square footage coverage rates, and think thin coats.

Cleaning and/or neutralizing: Depending on the type of stain system you are using, anywhere from aggressive chemical neutralization to a light damp wipe will be needed. Don’t skip or skimp on this step. Leaving residue behind leads to sealer delaminating or premature sealer failure.

Sealing and maintenance. You get what you pay for when it comes to sealers. I recommend you use a quality sealer and stay away from the less-expensive cure-and-seal products. For interior work, consider using one of the new polyaspartic or polyurea sealers for faster turnaround and a more durable finish than traditional epoxy and polyurethane sealers. Of course, you can’t go wrong when it comes to price and performance with a high-quality acrylic sealer followed by multiple finish (wax) coats.

Five issues

Getting back to basics and establishing a set standard of application is a great way to reduce callbacks, but as anyone who has stained concrete knows, it is not a guarantee for success. Every piece of concrete is different, and each stain project presents its own unique circumstances and idiosyncrasies. Let’s take a look at the five most common issues and how to avoid and repair them.

Lack of penetration: All stains, no matter the chemistry or look, need to penetrate into the concrete for proper adhesion. Failure presents itself as the stain drying on the surface, with all or some coming off during the cleaning process.

I know some expert stain applicators who sand or grind any and all slabs prior to staining. They just don’t mess around with the variables, and they build the surface preparation right into their bid. If you find yourself in a situation where the stain did not take, consider a light sanding to open the slab. You also may need to consider a




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Trowel and Error

chemical cleaning. If you do go the route of acid, make sure it is diluted at least 10-to-1, and neutralize the surface after any acid wash.

Wrong color: What happens when the job is done and the client refuses to pay because the color is not correct? This problem is more about expectation management than anything else. As an expert applicator, you know how to sell your services and manage your client's expectations so they understand stains

are as much art as science. A properly managed customer knows to expect color variations, and even if the color is off or flat-out wrong, you are dealing with someone who has been warned, versus an irate homeowner who now claims their life and home is ruined. Do your samples, manage your client's expectations, and get approval before sealing. If you do need to make a color change, it is easier before you seal. If the sealer has to come off, chemically

stripping or mechanically grinding are the two options. A solvent or mild acid will usually pull stains out of the concrete if, as a last resort, it all has to come off.

Color walking off: In high-traffic areas stain can get walked off. Penetrating stains live in the paste top of the concrete. If the paste is worn down with continuous high traffic, foot or otherwise, the color goes with it. Using a sealer that meets the demands of the floor is critical to long-term success and floor life. An expert also knows when stain is not a good idea, and may recommend another flooring option or walk away from the job.

Doing repair work on high-traffic or worn areas requires as much art as science. All residual sealer needs to be removed and the floor thoroughly cleaned. A test to determine which type of stain or colorant will work needs to be performed. Sometimes the stain that was originally used will not work in a restain situation. Using other types of tints or dyes may be required to blend the worn area into the nonworn sections of the floor. Once the repair has been made, establishing a good maintenance program with sealers and waxes that can handle the level of traffic is critical to not repeating the walk-off scenario.

Scuffs and black marks. Acrylic sealers tend to "black-mark" more than polyurethanes, and not all acrylics will black-mark the same. Black marks occur when the plastic or rubber of shoes or tires is softer than the sealer. The sealer grabs at the shoe or tire, especially when friction is high (turning tires, scuffing shoe soles) and some of the material remains on the floor. These black scuffs are usually pretty easy to remove with soap and water and gentle scrubbing. More stubborn stains may require a mild solvent such as rubbing alcohol.

Aggressive black scuffs may actually be burn marks caused by friction that exceeds the melting-point temperature of the sealer. A car tire spinning or a heavy object skidding across the sealer surface can cause these scuffs and burns. Since the sealer has actually been damaged, the scuffed section usually needs to be chemically or mechanically removed and the areas resealed.



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Lack of maintenance. All stained floors require some level of maintenance. Even polished and stained floors require some minor cleaning and occasional buffing to keep them looking their best. Too often I come across angry customers who were never informed that regular maintenance would be needed to keep their stained floor looking good. The expert stain installer not only manages expectations, but also provides written maintenance guidelines to the client so they know upfront what is involved regarding future floor maintenance.

Long-term maintenance is as important as the actual installation. Consider offering maintenance services on a regular basis as a new source of revenue. Maintenance for interior stained floors consists of multiple finish (wax) coats that can be buffed and reapplied as needed. Repair for a stained floor that has been lacking maintenance can consist of anything from a good clean and wax to stripping all the way down to the stained concrete and starting the sealing and waxing process over. If you can catch the floor before the sealer is compromised, typically a good cleaning and waxing is all that is needed. 🛠️

Chris Sullivan is vice president of sales and marketing with ChemSystems Inc. He has presented seminars and product demonstrations throughout North America, including at the World of Concrete convention. Contact him with technical questions at trowelanderror@protradehub.com.

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the concretist



Photos courtesy of Michael Miller

The Campbell residence in Seattle, Wash. pushes the compositional envelope, exploring a broad range of materials and their qualities.

Residential Concrete Reminiscences

I remember seeing the coolest home I'd ever seen, on the cover of a *Sunset* magazine. It was a tiny, 600-square-foot, colorful constructivist number set against the huge raw mountains of a river valley. And it was chosen *Sunset*'s "Home of The Year." I remember it was in Yakima, Wash., (a place I had not yet been) and I remember it was designed by architects Miller-Hull (a name I was not yet familiar with). A few years later I got a call from Marin County interior designer Sharon Campbell, asking me if I'd like to be involved in a project



by Michael Miller

near Yakima. "That's funny," I said. "One of my favorite projects is in Yakima ... a place by Miller-Hull. I saw it in *Sunset*."

"I know the house," said Sharon. "This one will also be by Miller-Hull, and it will be for my husband Craig and I."

So I was hired to stain Sharon and Craig's cast-in-place slab, interior floors and exterior patio, and to try to capture the essence of the site's basalt columns and natural grasses. I'll never forget the late fall foliage of the apple orchards, and I'll never forget Sharon and I dropping dye on the slab through pipettes, in bright yellows, scarlets, oranges and greens, attempting to stylize the surrounding lichens and wildflowers. All this while my dad (who was helping) complained about the damn wind.

Town and country: The Campbell residences

Sharon Campbell and I actually talked about two of her and her partner Craig's homes, their primary residence in Seattle and their weekend home set amongst the orchards, east of the Cascades and just west of Yakima. Sharon is an interior and furniture designer who teamed up with the Northwest modernist architects of Miller-Hull and general contractor VK Powell Construction on both projects.

Their first project was the weekend home, in Naches, Wash. It was small. It was simple. It was lyrical ... like a haiku. Sharon made the decision to limit the intersections and confine the planes of materials. If a wall was wood, it was wood inside and out. If a wall was exposed concrete, it was concrete up and down, from the first story through the ceiling, through the second story and up to the roof. Yellow was yellow inside and out and red was red up and down. The floor and patio were concrete inside and out, with a leathery sweat finish, stained brown, like the local basalt palisades or an old-timer's weathered saddle. It was lightly peppered with iron spots and small coppery floral bursts. All horizontals were continuous. The slab and the hills were one.

Their second project was the larger and more complex Seattle home. Sharon has said: "I wear my architecture." Sometimes jeans and cotton with a few accessories are just right, and sometimes something more is in order. According to Sharon, there are more than 60 colors in the palette of the Seattle home. She really pushed the compositional envelope, exploring a broad range of materials and their qualities. Qualities such as gravity (heavy concrete and blued steel walls and floors) and buoyancy (light, transparent glass, colorful mosaic art floors and whimsically painted walls, including sketches and the painter's editorial comments).

When I first asked Sharon why she liked to work with concrete, she stated, "It's about the surprise!" Part of what's so great about concrete is wanting to see where it takes you. Sharon formulated a floor concept, believed and was ready to let go. She asked general contractor VK

Powell to not protect the floors during framing. Powell was conscientious and so, of course, refused. You've never seen a floor protected until you've seen a VK Powell job. When we arrived to stain, we were presented with a lovely concrete slab in great shape — and Sharon was upset.

I located some sharp, rough plasma-cut chunks of scrap steel beams and suggested distressing the concrete with them. Sharon was elated. She provided

further art direction, including complete color and material references, and gave the nod to hack away. After beating the crap out of the slab, we hand-colored and worked it to resemble an ancient crumbling fresco or a fragment of worn papyrus or something like that. A historical connection! I also remember that I was mad at my mechanic that morning and felt a whole lot better after whacking the slab. Sharon liked the result and suggested I tip my mechanic.



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Precast concrete counters and sink grace the bathroom of the Jones-Roche home in California. Note the stylized stone look of golden-brown dye over an integrally colored, hand-painted concrete floor.

In the wine country: The Jones-Roche residence

Our crew arrived early at the Jones-Roche house in the California wine country that morning and began preparing for the impending pour. We worked furiously, masking the interior walls, placing wire mesh and reinforcement, laying out tarps, canvas and paper to protect plants and hardscape, fielding numerous phone calls, knowing we had no choice but to be ready when the truck arrived. Wait, where's the wheelbarrow? Didn't anyone bring a wheelbarrow? If the pump breaks down or the hose clogs, you'd better have one handy. Send someone down the mountain to get one. I hope it gets here before the concrete does.

Our lead finisher (Eddie Gray, concrete technician extraordinaire out of Las Vegas, Nev.) arrived, fresh from the airport. He shuffled through the house, mumbled a few things, then quietly sat down outside and removed his shoes. He pulled on his rubber boots with deliberation, and sat calmly, watching us frantically prepare.

And then the concrete arrived. Ed nearly leaped out of his boots and began furiously directing the crew. In came the hose, and the mud flew. A few hours later, there it was ... a beautifully finished living-room floor. Eddie shuffled into the house, grabbed a well-deserved Budweiser, and slumped down on the kitchen steps. He didn't budge, or say a word, until two empty cans lay at his feet ... and the pump did break down, but not until the last bit of mud was placed.

Malcolm Jones and Karen Roche are partners with a passion for art. Their home, near the line between Napa and

Sonoma counties, Calif., is a unique one, straddling a high mountain ridge and designed in the spirit of a Native American hogan. It is gear-shaped, with the hearth at the center of the structure. All other spatial and structural elements radiate from there.

The primary structure is comprised of huge exposed logs, and the home features "geological" hand-wrought concrete floors. There are no right angles anywhere, and space expands from the hearth to the outdoors, where the architecturally treated concrete patio and the landscape perpetuate the expanding radii. Precast concrete counters and sink grace the powder room, and soon, concrete art panels (commissioned to concrete artist Martin Webb) will hang along an outdoor dining area.

When Malcolm and Karen first bought the home, there were a couple of problems. The sunken living room, bridging the interior of the home and the outdoors, never got a finished floor. Also, they loved the integrally colored and hand-painted concrete floors throughout the rest of the house, but weren't crazy about the pink color. "We

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talked with concrete people for a year,” says Malcolm. “We learned a lot about concrete! We wanted to shift the color of the original slab without losing the original artwork.” Additionally, Malcolm and Karen wanted a finished concrete floor for the living room. They called on The Concretist to help them with both issues. They were excited about the possibilities.

They appreciated that concrete could be manipulated but that it also does its own thing. They were also intrigued by the idea of the living-room floor as a piece of original art. “We were excited about a fresh palette,” says Malcolm, “and wanted to transition the outside to the inside, with both color

***A few hours later, there it was...
a beautifully finished living-room
floor. Eddie shuffled into the house,
grabbed a well-deserved
Budweiser, and slumped down
on the kitchen steps.***

and design, without replicating either.” The result was a warm, leathery floor. The subtle design was a bridge between the organic hand-worked qualities of the original interior and the tighter “architectural” style of the concrete hardscape. It remained sympathetic to the “native spirit” of the home.

Malcolm and Karen were well prepared for their concrete adventure. Karen felt that using conventional materials in their home would be not only less interesting, but also practically difficult, due to its curvature and lack of right angles. The couple likes what they refer to as the “living nature” of the material. “I think it continues to evolve over time,” says Malcolm. “I think it continues to cure and therefore change. It also evolves over the course of the day, depending on the direction of light and where you stand. Just seeing it from a different angle changes it.”

They also understood that there could be no assurances that the thin slab topping (1 1/2-inch, concrete over concrete) wouldn’t crack, and were willing to embrace other imperfections as natural and unique. They let go, and are pleased with the outcome. They recognize, however, that many people would probably have trouble with the capricious nature of concrete. “It’s a concept, as opposed to an actual finish. It’s like allowing a painter to paint whatever they want. You have to trust in the concept and the execution,” says Karen.

And in each other and concrete we trust! 📱

Michael “the concretist” Miller is currently on location, art-directing the installation of sensory concrete paving at Far Far Away, Universal Studios, Singapore. He misses his wife, well-coordinated, profitable projects and the Great American West. He can be reached at concretist@aol.com.



The Jones-Roche home in the California wine country straddles a high mountain ridge. It’s designed in the spirit of a Native American hogan.

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The Demise of Fly Ash?

A term you may have heard related to sustainability and the issue of global warming is “carbon footprint.” The concept is that man-made greenhouse gases increase the greenhouse effect, leading to warming of the earth’s atmosphere. The carbon footprint of a material is the total amount of carbon dioxide or other greenhouse gases (such as methane) that are released during its manufacture.



by William D.
Palmer Jr.

When evaluating the carbon footprint of concrete, we consider the greenhouse gases released during cement manufacturing, aggregate mining, admixture production, and transportation of all the materials to the cement plant and the ready-mix plant and then to the job site. Although there are other sources contributing to the carbon footprint of concrete, cement is the bad actor, despite the fact that we couldn’t make concrete without it. According to a presentation by Paul Tikalsky of the University of Utah, when it comes to using straight portland cement, 96 percent of the concrete dioxide generated in the entire cycle comes from manufacturing the cement. (The talk, delivered in October 2009 at the Colorado Concrete Conference, will soon be up on the Web site of the Rocky Mountain Chapter of the American Concrete Institute.)

One change to concrete that has

proven helpful in reducing its carbon footprint is using fly ash as part of the cementitious material. According to fly-ash marketer Headwaters Resources, fly ash has been successfully used to replace as much as 40 percent of the portland cement in a given concrete mix — and even more in some limited applications such as mass concrete.

Not only does this greatly reduce the concrete’s carbon footprint, it also results in better concrete — stronger, less permeable, less alkaline (which reduces the potential for alkali-silica reactivity and efflorescence), easier to finish and resistant to chemical attack.

Using a waste material that would otherwise end up in a landfill to replace energy-intensive cement is more “sustainable.” The total environmental impact of mining raw products to make cement has been reduced. According to the Portland Cement Association (PCA), there is about 1 ton of carbon dioxide produced for every ton of cement — replacing half of that cement with fly ash cuts the carbon footprint drastically.

Not perfect

Of course, there are always trade-offs: Fly-ash mixes have delayed set times and gain strength more slowly, which can be a problem in winter conditions. Fly ash can make the entrained air content difficult to control. And acid stains don’t work as well with fly-ash mixes as they do with straight portland cement mixes, because acid stains react with calcium hydroxide in the concrete to produce color, and there is less calcium hydroxide in a fly-ash mix (for

reasons I'll explain below).

Fly ash is a byproduct of burning coal to generate electricity. What used to be released from generating-station stacks as smoke is now collected in a bag house. In 2007, 131 million tons of fly ash were produced in the United States, according to the American Coal Ash Association. About 43 percent was beneficially used, the vast majority in concrete. The remainder, unfortunately, was put into landfills or stored in various impoundments by electric utility companies.

A pozzolan

Fly ash is considered a pozzolan, meaning that it possesses very little cementitious value on its own, but when mixed into concrete it will react with the calcium hydroxide generated by the hydration of portland cement to become cementitious itself. There are two classifications of fly ash, Class F and Class C — both can be used in concrete. Although Class F is generally considered preferable, Class C is also used very successfully.

Fly ash is sometimes referred to as an admixture or a mineral admixture. I have always resisted calling it an admixture, however, preferring to simply call it a supplementary cementitious material (SCM) or a pozzolan. The term “pozzolan” comes from the name of the Italian town of Pozzuoli, the source of natural pozzolans that were mixed with lime by the Romans to make concrete in the third century B.C. While some natural pozzolans are used today, most modern pozzolans, such as fly ash, slag and silica fume, are industrial byproducts.

Fly-ash particles are very small, so that they fill pores in the concrete, making it denser. The round nature of fly-ash particles also makes the concrete move more easily — as if there were little ball bearings in the mix. Fly ash does contain metals, such as mercury, lead and selenium, and can be slightly radioactive, but in levels far below those naturally found in soils and rock. One study of fly-ash bricks used indoors, authored by Henry Liu of Freight Pipeline Co., found that these bricks do not “release mercury into the ambient air. To the contrary, they absorb mercury from the air.”

Is fly ash hazardous waste?

In December 2008, a fly-ash impoundment at the Tennessee Valley Authority's Kingston, Tenn., power plant failed, releasing 5.4 million cubic yards of fly-ash slurry. No one was killed in this incident, although, as might be expected, it did have a big impact on the nearby Emory River. The cleanup is expected to cost \$1.2 billion.

In the way everything is reported these days by the news media, this spill led to fly ash being labeled as a dire threat to the health of every person in the United States. Erin Brockovich descended on Kingston with a team of lawyers and “60 Minutes” soon followed, generating hysterical attacks on the coal and concrete industries.

The Environmental Protection Agency, as recently as May 2000, stated that “regulation of fossil fuel combustion wastes under Subtitle C of the Resource Conservation and Recovery Act (RCRA) is not warranted.” The agency also

stated, in 2006, that “mercury is strongly retained by the resulting coal combustion residues and is unlikely to be leached at levels of environmental concern.” That means that fly ash was not considered a hazardous waste, but rather an industrial byproduct. But with the political firestorm that arose following TVA's ash spill, EPA is now leaning towards designating fly ash under Subtitle D, which would define it as hazardous waste.


The implications of this action could be devastating to the use of fly ash in concrete. Schools and hospitals aren't going to allow the use of hazardous waste in concrete for their buildings. Concrete water tanks would be prohibited from containing fly ash, although nearly every water tank built in the past 20 years used low-permeability fly-ash concrete with no significant increase in metals ever documented. (See the Portland Cement Association's online Concrete Thinking article called “Leachability and Concrete.”) Concrete workers who develop cancer would sue the concrete industry for exposing them to hazardous materials. The electric utility industry would simply decide it's easier to landfill the stuff than exposing themselves to the lawsuits that would surely follow.

No one is saying that fly-ash slurry spills should be ignored — this was a serious failure and the electric power industry should examine all of its impoundments to make sure it isn't repeated. But we should approach this problem with reason and facts, not with hyperbole. Fly ash has a huge beneficial impact when used in concrete. To exclude or limit its use would have a far greater negative impact than any danger that exists from properly stored and used ash. 🚚

William D. Palmer Jr., P.E., is with Complete Construction Consultants, where he develops technical and educational resources for the construction industry. He can be reached at wpalmer@cee3.com.

More About Fly Ash


An industry Web site

 www.coalashfacts.org

A Headwaters Resources brochure

 www.flyash.com/data/upimages/press/HWR_brochure_flyash.pdf


Henry Liu's 2007 PowerPoint presentation — “Test of Mercury Vapor Emission from Fly Ash Bricks: Important Finding”

 www.cement.org/manufacture/pdf/Henry%20Liu%202007%20Fall%20Technical%20Session%20Presentation.pdf


Portland Cement Association's Concrete Thinking article “Leachability and Concrete”

 www.concretethinker.org/detail/Leachability-and-Concrete.aspx

Portland Cement Association's Concrete Thinking article “Green in Practice 109 - The Three Rs - Reduce, Reuse, Recycle”

 www.concretethinker.org/technicalbrief/Reduce-Reuse-Recycle.aspx

“60 Minutes” story on the Kingston, Tenn., disaster

 www.cbsnews.com/stories/2009/10/01/60minutes/main5356202.shtml



American Concrete Concepts Inc. Springdale, Ark.



Photos courtesy of American Concrete Concepts Inc.

by Kelly O'Brien

Back in November 2004, David Stephenson got a phone call that changed his decorative concrete business forever. Stephenson was one of the three owners of American Concrete Concepts Inc., an outfit in Springdale, Ark., and the man on the other end of the line was a general-contractor friend of his. "My customer saw this floor at a vineyard in Southern California," the contractor told Stephenson. "He doesn't know what it is and doesn't care how much it costs, but he wants this floor for his building."

The call turned into Stephenson's very first polished concrete job. "We charged \$12 a foot for that project," he says. "We still lost money, but the job paid for the polishing

equipment — an HTC machine, edge grinder and vacuum."

That single job set the course for Stephenson's company, which now does 95 percent polished concrete and "has better than doubled its size every year since we've been in business."

That's about six years worth of doubling since American Concrete Concepts started taking jobs in early 2003.

Stephenson, along with Les Davis, Rushard Hudson and Garrison Wynn, formed the company with \$10,000. After a week's training in Ogden, Utah, with Concrete Coatings Inc., they set out to capitalize on the booming residential construction market in



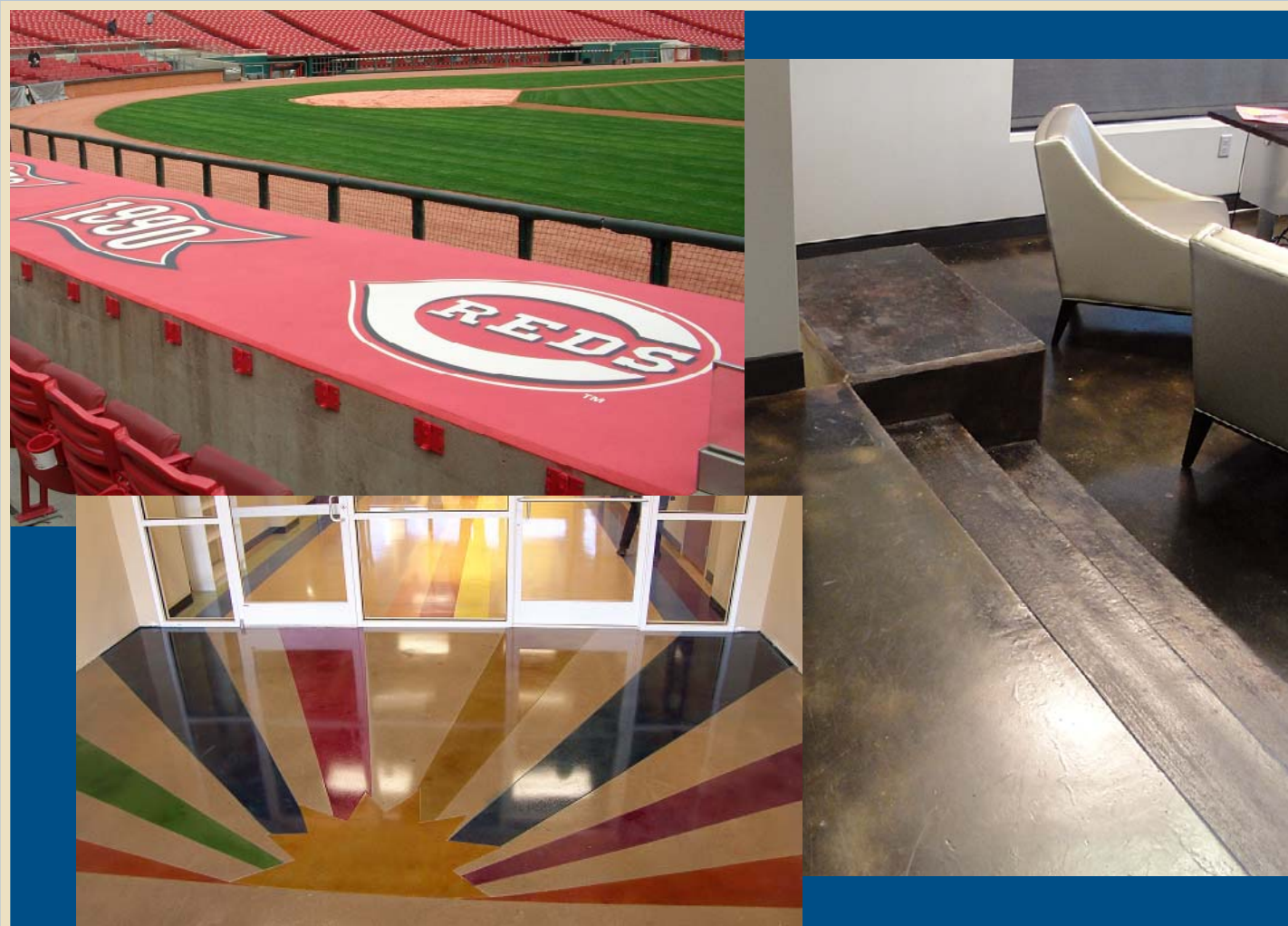
northwest Arkansas. Several Fortune 100 companies have their headquarters in the area, says Stephenson, so there was lots of high-end residential work. But after about six months focusing on residential, they decided to start making the switch to commercial construction. Despite the high volume of work, there were two major problems with the residential market. “Residential contractors will go with the cheapest concrete guy, and housewives are very picky,” Stephenson says. “The combination of the two was

very tricky.”

By the time that fateful phone call came in, American was pretty well established in the commercial market, and they were up for a challenge. That very first polished job was a polished floor with acid stain, a combination that they figured out pretty quickly wasn’t ideal. The two techniques are fundamentally at odds — polishing seeks to achieve a perfectly flat, smooth surface, while the chemical processes of acid stains erode that same surface.

Stephenson and his partners (Davis, plus newcomer Clint Howle — co-founders Wynn and Hudson had already left the company) were determined to find an alternative that could bring the same range and variety of colors to their polished surfaces without having to rely on acid stains.

So they began to experiment with India ink and different types of dye before eventually hiring a chemist to help them develop AmeriPolish, a solvent-based dye system designed especially



for polished concrete. AmeriPolish really changed things for polished concrete, says Stephenson, taking it from a largely industrial application to an architectural, design-friendly finish.

AmeriPolish proved popular, and prompted Stephenson and his partners to start American Decorative Concrete Supply. In 2005, ADCS brought AmeriPolish to World of Concrete, and the owners were excited to see how warmly it was received.

Stephenson says that at first, having an integrated installation and supply company was beneficial. Who better to give customer support on a product than guys who were using it on job sites every day? But “the way you run an installation company and the way you run a supply company ... the goals and focus are different,” he says. So in early 2007, Stephenson bought Howle and Davis out of American, and they bought him out of ADCS.

Stephenson says it’s the installations he likes best — which seems to be

working out pretty well. “We got to know presidents and tech guys from a lot of the big manufacturers,” he says, due to the industry’s curiosity about AmeriPolish.

Stephenson, with yet another new co-owner as of 2008 — Brent Schmiegelow — pulled in several million dollars in revenue this year, a pretty good return on that original \$10,000.

American now operates two offices: their headquarters in Springdale, Ark. and a satellite office in the Dallas area. Although they generally stick to jobs in Arkansas, Missouri, Oklahoma, Texas, Louisiana and Mississippi, they occasionally make exceptions for jobs farther afield. Stephenson says that expanding his management team to accommodate the company’s growth has been key to keeping things running smoothly. In addition to Stephenson and Schmiegelow, the in-house staff includes an operations manager, an office manager, a quality control and training manager, six independent sales reps and a full-time mechanic (American Concrete

operates several mid-duty and box trucks and a small fleet of four-wheelers). All of that, plus a field crew that fluctuates between 30 and 45, adds up to a pretty sizable operation.

But size isn’t the only thing American Concrete has going for it. As he’s grown the company, Stephenson has learned to be very resourceful. One of the best growth tools, says Stephenson, has been taking advantage of educational opportunities — not just getting his crews trained, but also teaching classes themselves. Stephenson personally teaches six to eight classes at architecture firms every month, and the company as a whole does 10 to 15. These lunch-and-learns are not your average sales-pitch sessions. Rather than focusing on what American Concrete in particular has to offer, Stephenson says the focus is always on the process. The courses illustrate polished concrete’s strengths (durability, design options, LEED contributions) but also its weaknesses. (Many architects are looking for a perfect floor, says



Stephenson, but “this is concrete – it’s guaranteed to do two things: be hard and crack.”)

Stephenson’s business savvy has been crucial to the company’s development, but their success still comes down to craftsmanship. “We do really good work, and we take advantage of the fact that we know how to do a lot,” Stephenson says. “You name it, we’ve pretty much done it at this point.”

That breadth of experience has yielded a very reliable formula for growth, says Stephenson, and the base of that growth has been schools and universities. Making up fully half of the jobs that American Concrete takes on, educational institutions are prime candidates for polished concrete, as it compares very favorably (particularly when it comes to maintenance costs) with the other two most common school floorings, terrazzo and vinyl composition tiles. For the other half of American Concrete’s business, around 15 percent is work for sports stadiums, such as the Cincinnati Reds

baseball stadium (featured in Concrete Decor’s September/October 2008 issue) and the Indianapolis Colts stadium. Another 15 percent is retail, including work for Wal-Marts, Sam’s Clubs, Dollar General stores, Mills Corp. malls and several supermarket chains. Ten percent is offices and churches, and the final 10 falls to repairs, prep and other miscellany.

“The good thing about this mix is that the foundation is very stable,” he says. “Schools and universities will always be building and remodeling.”

To accommodate their job mix, American has had to strike a healthy balance between quality and quantity. “We are skilled enough to do the decorative work, but big enough to do extremely large projects,” says Stephenson.

And that’s a balance they’ve had to find and refine pretty much on their own. “Polished is still very young,” says Stephenson. “There are a lot of bugs to work out, and not a lot of great models.” But in the five years since that first

polished floor, Stephenson and his crew have picked up quite a few tricks.

Managing a client’s expectations is important on any job, and American Concrete’s method for ensuring client satisfaction is simple. Each job begins with a 10-by-10 sample. “Every time, no matter what, the very, very first thing, we do a sample. A real sample,” he says. “It’s as much for us as it is for them, so we know, Are we going to be able to get exactly what they want?”

Stephenson’s other rule may come as a surprise to other polished contractors. “Everybody teaches you: Go dry, go dry,” he says. “95 percent of the time, if you run into a problem on the slab — scratches, scuffs and so on — you add water, and they go away.”

With their experience and unique perspective on polished concrete, it’s no wonder American Concrete Concepts has done well. And you can bet the company will continue to be leaders in the field. 📱

🌐 www.acci-us.com



Project Profile



Photos courtesy of Concrete Solutions Inc.

Celestial Heights Parking Garage Kowloon, Hong Kong

by Natasha Chilingirian

Last January, Hong Kong-based company APS Construction Systems International faced 600,000 square feet of unfinished parking-garage flooring and a three-month deadline at Celestial Heights, a massive high-rise condominium development in the Ho Man Tin district of Kowloon, Hong Kong.

Working systematically around the clock, crews utilized stamping, staining and sealing products from Concrete Solutions Inc. to create a pattern of neutral-toned tiles, red parking-space numbers and dark-hued borders and traffic-control markers. The result? A project billed as the world's largest quarter-inch concrete stamping job, and a mighty nice place for residents of the development's upscale condos to park.

"Michael Lau of APS Construction Systems International really raised the bar with this

project," says Concrete Solutions vice president Gerry Sadleir, who supplied the materials for the project. "It's going to be hard to beat."

Lau, the managing director of APS, can add this ambitious project to his company's already impressive portfolio, which includes decorative concrete flooring, paint finishing, wall finishing and concrete repairs for venues in Asia such as Hong Kong Disneyland Resort, The Venetian Macao Resort Hotel and Universal Studios Singapore.

Using the materials from Concrete Solutions, a San Diego-based manufacturer that has supplied many high-profile projects in Las Vegas, APS brought the concept of a high-end parking garage at Celestial Heights to life for client Cheung Kong Property Development Ltd.

The applications not only beautified the garage's floors, but added function, with



Project at a Glance

Client: Cheung Kong Property Development Ltd., Hong Kong

Contractor: Michael Lau, APS Construction Systems International Ltd., Hong Kong

Project manager: Philip Siu, Paul Y Engineering Group Ltd., Hong Kong

Architect: Carmen Wong, LWK & Partners Architects, Hong Kong

Timeline: Three months

Project specs: 600,000 square feet of quarter-inch stamped and stained concrete parking garage floor on six stories

Materials supplier: Concrete Solutions Inc., San Diego, Calif.

Texturing tools used: English Fieldstone Large stamps, Ashlar-Italian Slate 12-inch tile stamps, Staggered Wood 6-inch stamps and Italian Slate texture skins.

Other materials used: Ultra Surface Polymer Concrete; Ultra Surface Polymer Concrete Squeegee/Bond Coat; Ultra Surface Crack Repair System; Liquid Release Agent; Stamped Concrete Sealer; Antiquing Color Powder



Project Profile



The parking stall, border and driveway at the garage were textured using Concrete Solutions materials.

stamped traffic-control symbols, space numbers and stall lines that require much less maintenance than painted lines and symbols do.

The project is also the largest concrete stamping project to date utilizing the quarter-inch stamping process, a system that was first unveiled by Concrete Solutions at the World

of Concrete show in 1997. Sadleir says prior to the system's invention, about 4 inches of existing concrete would have to be removed and the concrete repoured in order to achieve the stamped look, which generally limited the method to outdoor surfaces. With the quarter-inch system, a thin, stampable overlay is applied over the existing concrete, allowing indoor and outdoor applications. "It's much easier to control than traditional concrete stamping is," Lau says.

The massive parking-garage makeover began when Sadleir traveled to Hong Kong to fine-tune Lau's crew on the quarter-inch stamping technique. They trained other crews until enough workers had mastered the process to get the job done. Then, each of the garage's six stories was shotblasted and cleaned to create a rough surface for the polymer concrete to bond to. Workers filled in surface cracks with Concrete Solutions' Ultra Surface Crack Repair System. "Its purpose is to restrict movement and to help prevent cracks from coming back through the overlay," Sadleir says of the repair system.

Workers then applied Ultra Surface Polymer Concrete Squeegee/Bond Coat to the surfaces, followed by the quarter-inch stamping mix while the bond coat was still wet.

To save on shipping costs, APS chose to purchase local concrete sand and cement, combining it with a polymer liquid concentrate provided by Concrete Solutions. "We give people a

choice — they can either buy our bag mix and pay for shipping, or get their own local sand and cement and mix it with our polymer," Sadleir says.

After shotblasting and filling cracks over the entire surface of each lot, workers taped off the parking stall lines, parking-space numbers, and arrows (which guide traffic through the garage) and began the bond-coat application process within those shapes only, following it with the stamping mix application and the remaining steps required to finish those parts of the floors. They then repeated the entire process, starting with the bond coat, in the parking stalls, and finally in the driveways. Lau said splitting the job up into these three segments allowed for smooth management of the process. "We didn't do everything at the same time, and that gave us control," he says.

Workers spread the stamping mix over bond-coat layers with gauge rakes and used fresnos to smooth out the rake lines. After letting each surface dry for about an hour — its consistency is similar to Play-Doh when it's ready, Sadleir says — workers sprayed on a liquid release agent. In some cases, such as the parking-space lines, color was added to the liquid release agent with antique powder, Sadleir says. Then, the stamping began.

Concrete Solutions' English Fieldstone Large and Ashlar-Italian Slate 12-inch tile stamps were used in driveways to create looks similar to blocks of stone paving and square tiles. A pattern of uneven tiles that mimics cobblestones was applied to driveways using the supplier's stamps, and lines, arrows and numbers were imprinted using Italian Slate texture skins. Using rubber stamps that are 3 to 4 square feet in size, crews completed approximately 1,000 square feet of stamping at a time.

The job was completed with two to three coats of stamped-concrete sealer. On areas that were not stained with color in the liquid-release-agent application step, workers added antique powder to the sealer, along with acetone to create a solid bond. Shades of brown, tan and amber were selected for the tiles in parking stalls and driveways. Variegated patterns of tan and charcoal



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were chosen for arrows, lines and borders, and parking spot numbers were stained in brick red.

"The colors were determined by what the client required, which included yellow tones and earth tones," Lau says.

To maximize time, crews followed one another beginning on the lower level of the six-story parking garage, with each crew responsible for a step or set of steps in the job. Timely completion of the job depended on an adequate number of crews working efficiently day and night.

"They had a shotblasting crew, and another crew that just did all of the arrows, numbers and lines," Sadleir says. "They designated different crews to do different things."

Adds Lau, "We did it in a systematic way to make it effective."

The time constraint was the biggest challenge presented by the job, Sadleir says. "There was also a lot of construction going on around them, such as electrical work and plumbing. There was pressure to get it done."

Lau says APS is accustomed to complex project coordination, but that executing the work over such an expansive space did pose a challenge. On average, crews worked on 5,000 to 7,000 square feet of space per day during peak production.

"I'd say our biggest challenge was the output, because the area is so big," Lau says. "Coordination was not a big problem for us, as the project management team of (Hong Kong-based) Paul Y Engineering Group is so cooperative and helpful."

Durability is a big plus of the materials used — maintenance only entails cleaning about once a month and applying additional coats of sealer down the road.

As of November 2009, Lau says a few finishing touches have yet to be made to the parking-garage floors. However, once that last coat of sealer is added, all of the building's luxury condo residents can admire a work of art that's built to last every time they walk out to their cars.

"The size, and the fact that all of the arrows and parking spot lines were stamped, is unique, and it was a lot of work," Sadleir says. "Usually, paint is used to create lines, numbers and arrows in parking lots, which have to be repainted every six months. There aren't too many parking garages out there that are as nice as this one."

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The parking stalls were stamped with Concrete Solutions' Ashlar-Italian Slate 12-inch tiles. The black lines were textured with Italian Slate texture mats, and the driveways with English Fieldstone Large stamps.

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Photo courtesy of Steve Kornher

This pavilion provides shade for spectators watching a nearby tennis court. The roof expanse is 8 meters (roughly 26 feet) and the concrete shell is approximately 2 1/2 inches thick. The reinforced concrete columns have been built incorporating catenary curves. Loading the roof with dirt and plants helps distribute the weight of the upper benches and the rooftop more evenly over the supporting columns.

Thin-Shell Concrete Structures

by Amy Johnson

Decorative concrete contractors have taken concrete all kinds of places: indoors and outdoors, underfoot and up the wall. But for a subset of concrete artisans, the decorative canvas is the whole house.

While most “concrete homes” end up looking like the usual frame house — rectangular — there are designers who use the strength and versatility of concrete to create homes that are shaped, sculpted works of art.

“These are structures that don’t rely on the bulk of concrete, but on shapes that provide structural strength and integrity,” according to Jim Kaslik of Cloud Hidden Designs LLC, based in Gilbert, Ariz.

Often, thin-shell concrete homes are built using dome shapes, but not

always, he says. “The shapes don’t have to be round — they can be zig-zag, groins, arches of all kinds.” He explains that the concrete in these shapes is in compression, and “concrete is great in compression. It won’t crush itself.” Rebar or mesh is used to impart tensile strength, holding the concrete together.

Released from the confines of the straight line, there are as many approaches to thin-shell construction as there are artisans practicing it. This article will concentrate on two types, using balloon air-form domes and free-form organic forms.

Air forms

Dome-shaped inflated air forms first came into the public eye during the post-World War II building boom

when they were used to fill an acute need for storage buildings. Lloyd Turner, an artist, inventor and retired architect, saw the potential to turn these temporary spaces into permanent structures. His idea was to spray the inside of an inflated form with urethane foam insulation and solidify the structure with reinforced shotcrete.

In the 1960s Turner used this technique to build his own concrete home outside Santa Cruz, Calif. He started with architectural forms of paper-thin fabric that he inflated at low pressure with a small centrifugal fan. The interior was sprayed with urethane foam insulation, followed by shotcrete reinforced with steel fibers. The inside was painted — no plastering was needed, as the shotcrete coat was smooth. On the outside, Turner brushed on stucco for protection against falling tree branches and foot traffic and finished it with acrylic latex paint.

Turner has lived in the house for more than 40 years and has yet to see a crack, despite numerous earthquakes.

Jim Kaslik of Cloud Hidden Designs is a residential designer who is using inflated domes in installations all around the country. He collaborates on his designs with a structural engineer and always works within the parameters of the International Building Code so that he doesn't have to apply for variances. He also uses traditional residential and concrete contractors to



Photo courtesy of Steve Kornher

The owners of this home wanted vaulted roofs, very high ceilings and an open floor plan. Steve Kornher accomplished this with a central column (not shown) that keeps the maximum roof span under 5 meters (about 16 feet). Vertical skylights create an airy feeling amid the buttress-like structural arches.



A polyester vinyl air form is inflated on-site.

Photo courtesy of Ray Merrell

construct the homes. “These designs don’t require some kind of specially trained dome contractor,” he says. “They need a good builder to get a quality result.”

Kaslik uses mathematical formulas to create the shapes he favors, usually intersecting domes. “The shape has to be one that will inflate right,” he explains. “It has to be circular in at least one direction in order for the shape to be taut in all directions.”

On-site, the vinyl polyester form is inflated and foam insulation sprayed on the inside. Then the contractor ties a cage of vertical and horizontal rebar to the foam and sprays the concrete against it using a pump with an air compressor.

A variety of standard concrete mixes can be used. Kaslik has contractors use

a typical spray mix from their local ready-mix supplier. Kaslik seldom uses additives but suggests a relatively high percentage of portland for compressive strengths of up to 4,000 psi. A drier mix is usually preferred for spraying overhead, he notes.

Free form

While air form thin-shell concrete construction is versatile and varied, it is limited to shapes that can be inflated. There seem to be no limits on the designs created by Steve Kornher from his Flying Concrete studio near San Miguel, Mexico. Inspired by the famous Spanish architect Antoni Gaudi, Kornher draws on his background as a masonry contractor and a potter to create fluid shapes that curve and swoop.



Photo courtesy of Jeff Beard

For structural reinforcement, Steve Kornher uses inverted catenary buttresses. A catenary curve is the shape a chain makes when suspended between two level points. Inverted, this shape lends strength to arches, vaults and buttresses.

He uses pumice, cement and lime to mix a concrete that is light and strong enough to be used for a roof, supported by columns every 10 feet or so.

To create his roofs, he starts with a shape made of driveway mesh. For

tighter curves he uses galvanized mesh. He trowels on the first layer of the pumice mix about 3/4 inch thick and allows this to set for two or three days. Then he builds up the roof in layers to the shape and thickness he

Starting Small: Rails and Doors

If a contractor is intimidated by the leap from slabs and tops to entire decorative concrete houses, he or she might try Steve Kornher's techniques on architectural details such as railings or doors.

To create strong rails in fanciful shapes for stairs or balconies, Kornher starts with 1/2-inch rebar. He wraps plaster lath around it in a spiral, about 1/4 inch off the rebar. He fills this form with hard ferrocement — standard cement mixed with plaster sand and containing a high load of steel or fiber — at a ratio of two parts sand to one part cement. This material is very strong, even in thin applications.

While the material is still fresh, Kornher scrapes or sculpts the mix to clean up the lines and get the desired shape. Then he brushes the leather-hard surface with "neat" cement — cement and water mixed to the consistency of latex paint. Color may be added to this layer or to the final polish coat of ferrocement containing PVA fibers for crack control. "Small railings can be finished in a single day," Kornher says. "For larger projects it is best to plan for two days."



Photo courtesy of Steve Kornher

A thin-shell concrete door starts with rebar wrapped with plaster lath.

Building a concrete door is like building a roof, only on a smaller scale. The door shape is formed from plaster lath and a thin coat of ferrocement with PVA fibers is troweled on to create the shell, which then serves as a foundation for the polish coat. The finished door is 3/4 inch thick and weighs about the same as a large oak door. Kornher has adapted the approach for cold climates by starting with 4-inch board insulation and sculpting the concrete on either side.

wants, usually about 6 inches. He incorporates layers of welded wire mesh inside the pour to prevent cracking. Lately he has been working with polyvinyl alcohol (PVA) fibers from Japan for added crack protection in the final exterior polish coat.

Jeff Beard, a sculptor and online bookseller, needed more storage and studio space. "I had thought of repurposing shipping containers, which are all the rage," he says. "But I couldn't bring myself to do a box, even just for storage." He came across Kornher's work in a book called "Home Work: Handbuilt Shelter" by Lloyd Kahn, and he was so intrigued, he traveled to Mexico for a Flying Concrete workshop. Now a Kornher creation is underway near Beard's home in Crestone, Colo.

This building is a good example of the organic, adaptable nature of Kornher's construction.

"The overhangs outside are showing some Gaudi-like distortions," says Beard, a Gaudi fan. "There will be eight buttresses at least, each one different. There are round windows and oval windows. There are not really any right angles." The building is designed for future changes and adaptations, a good thing because Kornher predicts it will last 400 years.

Kornher's largest work in progress is a house and outbuildings belonging to his seasonal neighbor in Mexico, Tim Sullivan. New extensions and additions have been added over the past 14 years, making the ranchito seem almost like a living thing. Kornher and Sullivan have created unique arches, vaults, domes, and even doors and rails, while Sullivan has experimented with brilliant colors painted on the plastered concrete surfaces. "Steve's work is always evolving," Sullivan says. "He's talented and he loves what he does. He definitely has a gift."

Thin-shell concrete construction may not appeal to everyone, but for those who want to literally think outside the box, it is an opportunity to create long-lasting live-in art. 📱



Photo courtesy of Steve Kornher

The vertical columns on this patio provide support and serve as downspouts for the overhanging roof. The 8-inch-diameter structural columns contain PVC pipes that drain water from the roof. Pumice-Crete was poured around the reinforced columns and carved before the finish coat was applied.

Builder and artist Bo Atkinson:

🌐 www.harmoniouspalette.com

Cloud Hidden Designs LLC:

🌐 www.cloudhidden.org

Flying Concrete:

🌐 www.flyingconcrete.com

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ROCKING OUT

**USING SURFACE RETARDERS
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A precast exposed aggregate exterior by Ferreri Concrete Structures Inc. at the Hyatt Hotel in Albuquerque, N.M.

Photo by Chris Mayo

by Chris Mayo

It wasn't all that many years ago that the popular method for retarding the surface setting of concrete to achieve an exposed aggregate finish was to spray a sugar-water mixture on the newly poured surface.

Sugar? Yes, and here's why: Sugar molecules attach to hydrating cement and inhibit the chemical reactions involved in the stiffening of a concrete mix. Then the paste can be removed and the aggregate underneath exposed.

Another method, still used sometimes in flatwork, is to spread and roll pea gravel onto the surface of a semi-wet slab, then brush and hose the cement paste away before the slab is completely cured.

Either of these methods work, but both have down sides. Too much sugar may inhibit the setting of the entire slab, not just the surface, and it is difficult to control "depth of etch" with a sugar mixture. Depth of etch refers to how deep a surface retarder penetrates — a shallow etch, and less aggregate is exposed.

Spreading and rolling pea gravel has its own flaws. It's labor intensive and doesn't allow much wiggle room — it's often a race against the set time of the concrete.

Last but not least, the pea gravel and sugar-water methods can't be used on a vertical concrete project.

Chemical surface retarders provide a better alternative. Much like sugar, chemical retarders react with the bonding properties of cement and inhibit curing. Because the chemicals can be adjusted and combined, chemical retarders allow contractors more control over surface set time and depth of etch. (Retarding chemistries include lignosulfonic acids and their salts, hydroxycarboxylic acids and their salts, phosphates and their organic phosphonate salts, and salts of amphoteric metals such as zinc, lead and tin.)

Exposed aggregate finishes are popular as a slip-resistant surface and as an attractive decorative touch to a concrete surface. The growing use of retarders to achieve them has paralleled other advancements in decorative concrete technology — first there was utilitarian use of retarders as admixtures for concrete pours in extreme or hot conditions, then use as a surface application on the top surface of decorative flatwork.

Most recently, specially designed formulas of retarders have been released that are applied to forms for vertical applications.

"On-form surface retarders allow contractors to do some nice-looking work," says J.R. Weiss, owner and vice president of Gamka Sales Co. Inc., a distributor based in Edison, N.J. "I've seen it used on bigger jobs like structure walls and panels, as well as smaller jobs such as signage at an entranceway to a business. Big or small, an exposed aggregate finish on a vertical surface looks good."

What's more, contractors can get creative with the options available. Different kinds of surface retarders can be combined in clever ways, claims Ed Heller, technical director at RussTech Admixtures Inc., in Louisville, Ky., such as on a job that involves vertical and horizontal surfaces. "Suppose you want steps with an exposed aggregate finish on both the horizontal and vertical surfaces. We would recommend that you spray the vertical with traditional flatwork retarder



Photo courtesy of Arban & Carosi Inc.

The Regent in Arlington, Va., features precast exposed aggregate cladding.

and use our moisture activated gel-type form retarder on the vertical surfaces."

An abundance of choices

RussTech's retarder has all kinds of company. Exposee V, developed by Chem Masters in Madison, Ohio, is another of a number of vertical surface retarders on the market. "Exposee V is thicker than horizontal retarders — it's more of a gel that is either rolled or sprayed directly onto forms and dries to a semi-hard coating," says Chem Masters technical manager John Kirk. "When applied evenly, it provides up to 1/4 inch of uniform retardation depth. Contractors have found that it works well for either exposed aggregate finishes or as a surface prep for additional coatings like epoxy, so long as an acceptable profile is achieved. The appropriate time still needs to be allowed for curing prior to coating, usually 28 days. The concrete should be wet-cured during this time, then power washed and allowed to dry thoroughly before coating."

Grace Construction Products is a company that, like Chem Masters, offers an array of concrete admixtures. Included in its repertoire are two brands of in-form surface retarders, Duro-Tard and Euro-Tard. Grace touts Duro-Tard as having high abrasion resistance, appropriate for more difficult applications such as intricate architectural precast or high vertical poured-in-place concrete. Duro-Tard is available in nine different depths of etch. Euro-Tard is more of an all-purpose retarder, appropriate for architectural precast or cast-in-place concrete. It is available in 10 depths of etch.



Multiple etch depths give users of Duro-Tard or Euro-Tard more tools to play with, says Rob Madore, Grace product manager of architectural products. “They can achieve a variety of different looks by varying the depth. They’re easy to use too — simply spray on two light coatings or roll one thicker coat.”

Pouring walls on the ground

Despite advancements in surface retarder technology, some contractors believe that creating a vertical poured-in-place product with an exposed aggregate finish is more trouble than it’s worth. However, that’s not to say that they don’t see value in on-form retarders.

Nick Carosi III is the president of Arban & Carosi Inc., an architectural precast company based in Woodbridge, Va., that’s been around since 1937. “We use on-form surface retarders for vertical applications fairly regularly, but we typically pour the concrete with the exposed side facing down on a form on which we’ve applied surface retarder. Doing it that way affords the advantages of climate and condition control, as well as the advantage of using gravity to pull the aggregate to the form.”

The same force of gravity that helps a face-down pour creates problems when pouring in place into vertical forms, Carosi says. “When you have a vertical plane, the aggregate will tend to migrate to the bottom no matter how you vibrate the concrete. As a result, you’ll have more aggregate exposure on the bottom of the wall than on the top.”

Mike Ferreri, president of Ferreri Concrete Structures Inc., in Albuquerque, N.M., uses similar methodology to that of Arban & Carosi. “We’ve found that the aggregate tends to stack when you pour in place vertically. When we want a vertical plane with exposed aggregate, we pour with that side facing down on a form with surface retarder, heat-cure it, flip it the next day and expose the aggregate with a 2,000-psi pump and power washer.”

Why not simply pour a horizontal slab and use surface retarder on the top surface instead of going through the extra work of flipping and stripping? Carosi cites gravity again. “By pouring face down, you get a more even and better defined dispersal of aggregate,” he says.

A place for pour-in-place

All that said, Ferreri doesn’t discount the idea of achieving a high-quality exposed aggregate finish by pouring-in-place. “I can see how it can be done. I would probably use a self-consolidating concrete to eliminate the need for vibrating and the resultant aggregate stacking.

Photo by Chris Mayo

You would have to be very aware of the set time as well. Strip the forms too early and the concrete might slump. Strip them too late and you're probably looking at sandblasting and acid washing."

T.B. Penick & Sons Inc., based in San Diego, constructs vertical walls with exposed aggregate by pouring in place. Project manager Victor Klemaske confirms that this is not a simple process. "When you pour in place with on-form

retarders, there is no room for error. The concrete has to be able to hold its own weight before the forms are stripped. Pulling the forms is a pretty exact timing issue.

"By pouring in place, we save in the cost of form materials and labor hours ... and we've discovered that it allows us a little extra decorative latitude," Klemaske says. "We can paint the on-form retarder in whatever patterns we want and that transfers to the design of the finished work, and we can achieve anything from a light sandblast appearance to an exposed aggregate finish. For a really tight finish, we strip the forms and spray on a surface retarder before the concrete is completely cured."

T.B. Penick holds the finer details of its techniques close to the vest, citing proprietary concerns. Company artisans use a variety of methods — on-form retarders, surface retarders, even shotcrete with retarders — depending upon the job requirements and the desired finish. 🚚

🌐 www.russtech.net

🌐 www.chemmasters.net

🌐 www.gamka.com

🌐 www.na.graceconstruction.com



Photo courtesy of Arban & Carosi Inc.

A Two-Sided Tip: Exposed Aggregate on a Corner Wall

Nick Carosi III of Arban & Carosi Inc. brings up an intriguing point when talking about exposed aggregate on vertical surfaces — what if you're pouring an L-shaped wall piece? Since gravity's effect on the settling aggregate is essential to the process, how does a contractor make that work?

"Some of our exposed aggregate pours are more complex than simply pouring a slab and turning it on end," Carosi says. "Most architects don't want a joint running up the corner of a building, for instance. So we pour most corners as one piece, in two separate pours.

"The first side we do face down with rebar placed through the slab and extending out of what will be the corner end. The following day we strip the forms, expose the aggregate, turn that piece on end and tie the exposed rebar into what will be a new horizontally formed slab. We then pour that slab face down. The third day we rotate the second slab into a vertical position, strip the forms and expose the aggregate. This usually leaves a small joint at the corner that cannot be seen. We fill the microscopic void in our yard."

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Moisture Tests:

Calcium Chloride vs. Relative Humidity

by David Thompson

When good floor coatings go bad, moisture is often the culprit.

Even cured concrete can emit enough moisture to blister, cloud or delaminate a coating, especially when a slab with no vapor barrier sits on ground with poor drainage. The manufacturers of overlays, microcoatings, sealers and specialty coatings set moisture tolerance limits for their products. Ignore those limits and all bets are off that the coatings will perform as intended.

To ensure that a slab is dry enough for a coating — and to cover their butts legally — concrete artisans such as James

Schwartz, of Concreteworks Design in Norman, Okla., routinely run moisture tests before laying down a topping, then document the results.

“Construction has become a big liability, so moisture testing is standard for us,” says Schwartz, who lives in a region where clay soils make moisture problems a common concern.

Schwartz relies on the calcium chloride test, which quantifies the moisture vapor emitted from a slab. The test has long been the standard in the United States, but some floor-covering manufacturers now recommend an alternative test as well,

the relative humidity (RH) test, which measures moisture conditions inside the slab. The relative humidity test is the standard in several other countries.

The gradual acceptance of relative humidity testing in the U.S. follows more than a decade of research that has found major shortcomings with the calcium chloride test. Among them is calcium chloride's sensitivity to the ambient temperature and humidity of the room and the fact that it cannot detect moisture deep within a slab.

"The big picture is that calcium chloride tests generally indicate moisture conditions in the top region of the concrete, whereas relative humidity probes tell you what's going on in the body of the concrete, which is more useful in the long term," says Howard Kanare, senior principal scientist with CTLGroup, which runs one of the world's foremost concrete-testing laboratories. (CTLGroup also partnered with Wagner Electronics to develop a relative-humidity testing system.)

Advocates of the calcium chloride test say that despite the test's limitations, it is still useful for determining the actual moisture conditions at the surface of a slab. They point out that moisture testing labs typically run both tests, since each looks at a different part of the same picture.

"The ideal is to do both," says Keith Papulski, president of Taylor Tools, a manufacturer of both types of tests. "Otherwise, do the one the manufacturer says to do. They've tested the product's performance and they tie the warranty to proper testing."

What follows is a quick overview of both calcium chloride and relative humidity tests.

The calcium chloride test

The calcium chloride test, sometimes called the moisture vapor emission rate (MVER) test, is simple, inexpensive and widely accepted.

It takes advantage of the fact that calcium chloride, a common salt, absorbs moisture like a sponge. A small container of salt is weighed before and after it's exposed to the concrete slab for 60 to 72 hours. The weight difference is plugged into a formula to calculate the amount of moisture vapor emitted from the slab. The results are expressed in pounds per 1,000 square feet of concrete per 24 hours.

The tests, which are not reusable, cost about \$10 per shot. The calcium chloride test protocol set by ASTM International, the standards organization, calls for using three tests for the first 1,000 feet of concrete and one test for each additional 1,000 square feet.

Most floor-coating manufacturers

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continue to use the calcium chloride test as the benchmark for suitable dryness. Many go with the ASTM limit for moisture vapor emissions of 3 pounds per 1,000 square feet per 24 hours, though some go up to 5 pounds.

For accurate results, the test has to be conducted with the building at the same temperature and humidity level that it will be at when in use — which can be a problem if the HVAC system isn't operational, as is often the case during construction.

The surface of the floor where the test will be done must be cleaned by grinding, and then left to acclimate to ambient building conditions for 24 hours.

Another limitation of the test is that its results reflect only the moisture in the top 1/2 inch to 3/4 inch of the slab. Most of the moisture within a slab accumulates in the lower half, which can have twice as much moisture as the upper half.

"The calcium chloride test never takes into consideration how much moisture is below the surface in the concrete," says Grete Heimerdinger, vice president of Lignomat USA, a manufacturer of relative humidity tests.

The relative humidity test

Depth is one area where the relative humidity test excels. It involves drilling a hole into the concrete and inserting a probe that measures moisture deep within the concrete matrix. The results, expressed as a percentage of relative humidity rather than in pounds of moisture vapor, are read on a meter connected to the probe. The ASTM standard for relative humidity testing says that a slab should have no more than 75 percent relative humidity if it's to receive a coating, unless otherwise specified by the manufacturer.

While the relative humidity testing apparatus isn't as sensitive to the ambient room temperature and humidity as the calcium chloride test, it's still important that both the test hole and the probe be allowed to acclimate to the room's conditions. ASTM calls for the probe to be left in place for 72 hours to allow it to equilibrate before



Handheld Meters Show Moisture at a Glance

The quick and easy way to check a floor for moisture hot spots is to use a handheld moisture meter.


There are two types. Pinless meters use radio frequency signals to detect moisture near the surface of the slab. Pin-type meters use electrodes driven into the slab to measure beneath the surface.

Neither type of meter is especially accurate, but both can give you a good idea of the best areas on a floor to perform more precise moisture tests.

taking the reading, although at least one manufacturer, Wagner Electronics, makes a probe it says can equilibrate in about 15 minutes, producing a reading that's within about 3 percent of what the documentable reading will be after 72 hours.

While the relative humidity test provides a more complete picture of what's going on throughout the entire depth of the slab, it costs substantially more than calcium chloride tests — at least upfront. The testing apparatus costs between \$500 and \$1,000, but after the initial investment the cost per test for most systems runs about \$2, which is how much the probe's disposable sleeve runs.

"In the long run relative humidity tests are more cost-effective than calcium chloride," says Paul Laurenzi, vice president for sales and marketing

with Delmhorst Instrument Co. "You've got a higher cost of entry, but once you've bought the moisture meter the only consistently replaceable items are the disposable sleeves." 

Manufacturers

-  www.delmhorst.com
-  www.lignomat.com
-  www.taylorlortools.com
-  www.wagnermeters.com

Standards information

-  www.astm.org

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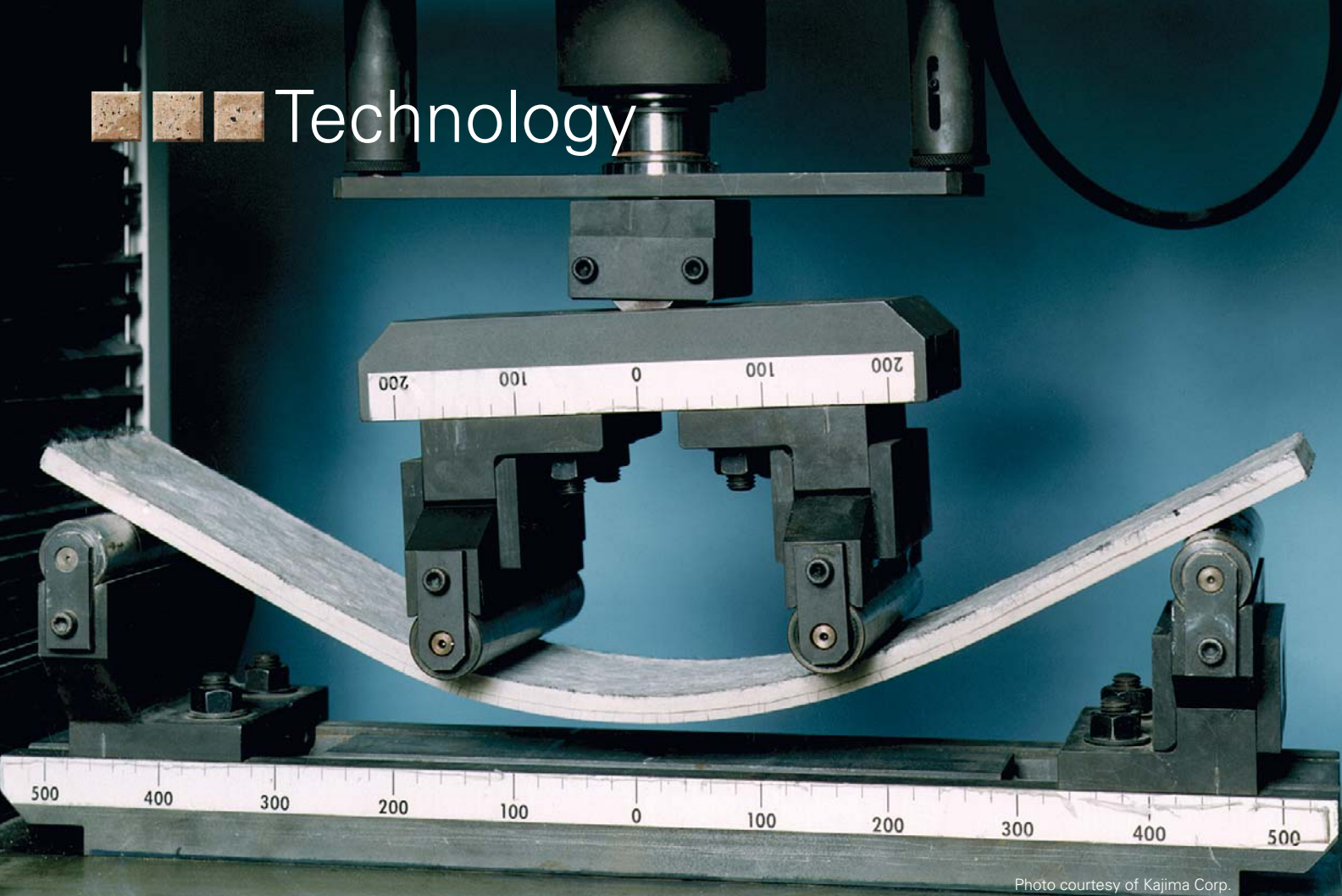


Photo courtesy of Kajima Corp.

PVA fibers allow movement in concrete. According to Jim Glessner of GST International LLC, concrete with PVA fibers can microfracture, allowing it to bend.

PVA Fibers

by Stacey Enesey Klemenc

High-performance fibers made of PVA, which is short for polyvinyl alcohol, were developed some 20 years ago by Kuraray, a Japanese company. When added to concrete or mortar, the fibers develop a molecular and chemical bond with the cement during hydration and curing. The result: concrete with high tensile strength and amazing ductility whose makeup can significantly reduce a project's steel load.

"Polyvinyl-alcohol engineered cementitious composite, PVA-ECC, was developed to be used in high-rises for earthquake remediation because it eliminates vertical shear," says Jim Glessner, owner of GST International LLC, a Nevada-based company that manufactures as well as distributes an array of specialty concrete products.

"While concrete is very strong side to side, any vertical movement will make it

break or crack," he continues. "PVA-ECC allows movement like a blanket. This stuff won't crack, but it does microfracture to allow it to bend. It's literally bendable concrete."

This sets PVA-ECC apart from glass-fiber reinforced concrete (GFRC) which is subject to vertical shear. According to materials on the Kuraray Web site, PVA-ECC has strain-hardening capacity, while GFRC has none, meaning a PVA piece is less prone to failure when it cracks. "Your mechanical numbers on tensile and flexural strengths are far superior with the PVA fiber versus glass or steel," Glessner notes.

When it comes to architectural and decorative applications, Glessner says the engineered cementitious product can be used for anything large or small, from vertical walls and horizontal countertops to precast slabs and patch-and-repair shotcrete.



A custom egg-and-dart edge with embedded red crystal, for a counter at Panini's Italian Grill in Copperopolis, Calif.

To use or not to use

There is one big drawback to using PVA fibers, Glessner states — “otherwise everyone would be using it.”

Mixes with PVA fibers are really difficult to formulate and use, he says. “Coming up with the right mixture takes time. Sometimes it even takes years.”

The PVA fibers tend to clump and bind to each other in the mixing process, Glessner says, “something we call the hairball effect.” To help alleviate this problem, his company, along with some others, makes a special dispersant to make the contractor's job easier.

Not everyone agrees with Glessner that PVA is hard to use. Jim Ralston, president and owner of Urban Concrete Design in Phoenix, says he's been using the product for years to make a lot of different things. What those things are in particular, he's not revealing. “But I'll tell you I'm using it to create 5-by-10 foot slabs I sell to fabricators who use them for countertops. They install them like granite,” he says. He mixes PVA with three other fibers, including GFRC. His only complaint is that PVA is not cheap.

“Hands down, it's the best fiber there is on the market. I'm fully on

board with that stuff,” Ralston says.

On the other hand, Brandon Gore, owner of Gore Design Co. in Tempe, Ariz., has no interest in incorporating PVA fibers into any of his eye-catching sinks. “I'm satisfied with the results I get from using GFRC and I don't see any reason to switch,” he says. One of his main suppliers has convinced him GFRC is more affordable, easier to work with and structurally more adept.

And then there's Jon Schuler, owner of CreativeCrete in Murphys, Calif., whose projects involve sinks, countertops and cast-in-place creations. “Everything we make has PVA fibers,” he says, adding that he only uses hand-placed GFRC when a certain look calls for it.

He's been using PVA for the last four or five years. “And we've never had an issue with dispersing fibers. It's my number one recommendation, followed by a PVA-glass combination,” Schuler says.



A display table with a blended-color marbled top and hand-chiseled edges.

“PVA is an incredibly stealth fiber,” he continues. “When I grind and polish, I don't worry about fiber showing up or sticking out.” He currently loads 1/2 pound per cubic foot, which he says gives him the same strength as 5 pounds of glass fiber.

“That (amount of PVA) is two to three times what the other guys are loading,” he notes. “We produce many products that require PVA fiber loading as high as a pound per cubic foot. Once you get past a pound, that amount of fiber acts more like an aggregate.”

The PVA fibers allow him to cast pieces much thinner than traditional concrete. “The thinnest I go is about an inch. That's my comfort zone to maintain the looks we are known for.”



Jerry Van Cleave of VanCrete Decorative Concrete repaired this Tulsa, Okla., driveway using a ductile concrete mix with PVA fibers from GST International LLC. The fibers were used to repair the cracks, and then an overlay was applied.

PVA and Overlays

Besides being used to make thin yet durable countertops that don't easily chip or break, a mix of PVA fibers and ductile concrete does an excellent job of fixing cracks in concrete. Jerry Van Cleave, co-owner and president of VanCrete Decorative Concrete in Tulsa, Okla., who has been using GST's ductile cement mix for the past two to three years as a repair product, sings its praises.

"I tried epoxy and urethane injection, but they didn't work as patches to keep the cracks from reappearing under an overlay," he says. He began to work with Jim Glessner of GST International LLC, and after much testing, concluded that ductile concrete mixed with PVA fibers was the way to go.

To work well, he continues, a heavy coat is required to gain adhesion. "I mainly use it for difficult repairs where cracks are excessive or there is a heavy fracture. In the past, I had to cut out those sections and repour. But I don't have to do that now. I've had good success with the ductile cement product. I haven't had any callbacks."





Photos courtesy of University of Nevada, Reno

Civil engineering students competed in this year's National Concrete Canoe Competition, held by the American Society of Civil Engineers in June. One of the teams — from University of Nevada, Reno — fashioned its canoe with a concrete mixture that contained PVA fibers. The team finished fifth.



As for the cost, Schuler says, "It's not some superexpensive product. I think you're shooting yourself in the foot if you don't use it. It really increases impact resistance and surface hardness."

Bob Cruso, international regional sales manager for Rhode Island-based New Nycon Inc., a company that distributes an assortment of fibers for concrete reinforcement, says not only do PVA fibers make for a stronger concrete, but the finished product has increased ductility, another big plus. "PVA fibers allow concrete to move or be more ductile and to absorb more energy, which eliminates cracking that may occur over time," he points out.

Costwise, Cruso continues, a finished piece is very comparative to those made with GFRC. "You'll use about half as much with PVA." He estimates the cost to be about 5 percent to 6 percent of the total cost of the project. "And the material has a lot more benefits than wire mesh or steel reinforcement in precast countertops or architectural panels."

In precast applications, the panels can be cast thinner, thereby reducing the amount of material used and the weight of the precast piece, he says.

Finally, Cruso maintains PVA fibers are easier to work with than GFRC because they are shorter. They measure 3/8 inch, compared to GFRC's premix fibers that are anywhere from 1/2 inch to 1 inch long.

Tips for best results

The key to success with PVA lies in having the proper equipment, Cruso says — first and foremost, the contractor needs a mixer that has shearing action.

To achieve the best results with PVA fibers, Cruso cautions contractors to make sure the fibers are thoroughly mixed and homogenously dispersed throughout the mortar or concrete. He recommends adding the cement, sand, aggregate and water into the mixer for 3 to 4 minutes before adding the fibers, then mixing a few minutes more.

Schuler agrees with Cruso. He says adding the PVA fibers early with all dry ingredients is where you'll get in trouble



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with the “balling” effect. He says he adds his fibers at the last 3 to 4 minutes of the mix cycle, when the mix is fully wet.

GST's Glessner offers one more important opinion: Concrete laden with PVA fiber is not trowelable. “It’s such an aggressive fiber you can’t overwork it,” he says. After one or two passes, the whole thing will start to pull up. “This is an expert-use product,” he states. “It’s not for laymen.

“The product needs to be worked slowly,” he continues. “When it comes to precast, that’s not going to be a problem. But when you are doing an overlay, you can’t put a Magic Trowel down and move it back and forth. It’s really hard to work with. I just can’t explain how bloody hard it is to work with.”

Schuler says he really doesn’t have a problem troweling his PVA mixture but agrees it takes a certain bit of finesse to learn how to trowel it properly. “If you are using low water-cement ratios and higher PVA fiber loads, I recommend you don’t follow conventional troweling techniques. That’s a mistake some guys make. You need to wait for it to slightly set, then use water or lubricant, mag (trowel or float) quickly and then steel-trowel it to avoid the fibers pulling up.

“If we’re talking about the recommended lower dosage of 1 to 2 pounds a cubic yard,” he continues, “I don’t see how anybody would have too much trouble troweling it. It depends on your loading. You can have problems with any fiber if you load higher than you are used to.”

Still, once contractors get over the learning curve, Schuler encourages them to load up on the PVA. “A heavy dose has helped us get away from problems associated with placing primary reinforcement. PVA fibers are far easier to use than rebar and other wire tensile reinforcement. It’s helped us maintain our quality control.” 📱

🌐 www.gst-intl.com

🌐 www.kuraray.co.jp/en/

🌐 www.nycon.com

Top: An island with a cantilevered edge.

Middle: A master-bath vanity with a double integral vanity sink featuring a marbled design.

Bottom: The cast-in-place counters with hand-troweled finishes were polished to 400 grit.

Solachrome Integral Coloring Treatment for High-SRI Concrete from L.M. Scofield Co.

by Emily Dixon

As part of its effort to improve the environment through green product offerings, L.M. Scofield Co. has developed Solachrome Integral Coloring Treatment for High-SRI Concrete. The patent-pending color additive is specially formulated to reduce the urban heat island effect, which occurs where pavement and buildings have taken the place of vegetation that would have kept the ground cool.

As its full name suggests, Solachrome addresses the solar reflectance index (SRI), which the U.S. Green Building Council uses to predict a given surface's temperature in full sunlight. The higher the SRI number, the cooler the surface should be, with 100 being a typical white surface and 0 being black.

One key to keeping unshaded concrete cool is to increase the reflectivity of the surface. Solachrome utilizes pigments with high reflectivity in certain ranges of the solar spectrum, which reduces the amount of solar energy that is absorbed and turned into heat. The end result is a cooler surface.

The development process came about when Scofield began conducting extensive SRI testing of its Chromix Admixtures for Color-Conditioned Concrete and its Lithochrome Color Hardener after the USGBC incorporated mitigation of urban heat islands into the LEED program.

"Chromix Admixtures and Lithochrome Color Hardener both offer many colors with SRI values that meet or exceed LEED requirements," says Cam Villar, director of marketing for Scofield. However, they knew they could do better, he says, and the result is Solachrome.

"One of our most popular Chromix colors is Dark Gray, which has an SRI of 10," he says. "The darkest gray in Solachrome has an SRI of 30."

The two colors are almost identical, but after 20 minutes under a heat lamp, the concrete with Solachrome was almost 30 degrees cooler than the sample treated with Chromix.

In all, there are 44 colors available in the Solachrome line. Twenty-four are available for use



Image courtesy of L.M. Scofield Co.

Color samples of Solachrome, clockwise from top left: Aura, Grayfin, Ember, and Magellanic Cloud.

with a medium-gray cement, and an additional 20 are available for use with a white cement. Colors used with white cement have higher SRI numbers. Overall, values range from 30 all the way up to 103.

Ideal uses for Solachrome include hardscapes, parking areas, plazas and sidewalks. It can also be used in vertical applications, where it could significantly cool down exterior walls on buildings.

Not only does Solachrome provide color and cooling properties to concrete, but Scofield has incorporated an SRI-restoring characteristic into most colors that, in the presence of sunlight and moisture, will actually break down many organic surface contaminants that can reduce solar reflectivity.

"The vast majority of contaminants are particulate matter from the air," Villar says. "Those organic pollutants have been shown to reduce concrete's SRI over time. Solachrome's SRI-restoring feature helps the concrete maintain its SRI longer than conventional coloring methods."

 www.scofield.com

Specialty Cutting Blades



CS Unitec – AirForce F4

CS Unitec's new AirForce F4 diamond saw chains have large diamond segments laser-welded to a steel chassis for faster cutting of a wide variety of masonry materials, reducing kickback and damage that other percussive methods can cause. Additionally, this feature allows the user to plunge-cut up to 20 inches and make perfectly square corners with no overcuts.

These chains feature an internal water distribution system for better lubrication between bar and chain

and have 50 percent greater tensile strength for reduced breakage and longer life. Three chain styles are available: AirForce Premium saw chains cut concrete with heavy steel reinforcement; AirForce Standard is a general-purpose diamond chain for reinforced concrete; and AirForce AbrasivePro is ideal for cutting soft, abrasive material. The 10-inch chain has 25 segments for maximum cutting depth of 10 inches. The 15-inch chain has 29 segments for maximum cutting depth of 15 inches.

www.csunitec.com

Cutter Diamond – One Blade

The One Blade is Cutter Diamond's premier all-purpose blade designed for cured concrete and green concrete.

The Blade can be used on high-speed saws and floor saws of up to 20 horsepower. Available sizes are 12 inches, 14 inches, 16 inches, 18 inches and 20 inches.

[\(866\) 816-8074](tel:8668168074)

www.cutterdiamond.com



Diamond Tec Inc. – V-Series Diamond Crack Chasers

V-Series Diamond Crack Chasers from Diamond Tec Inc. provide fast and efficient cutting of random cracks in concrete for repair purposes. The resulting V groove is the ideal joint size for the application of epoxy.

A heat-sintered bonding process innovated by Diamond Tec enables V-Series Crack Chasers to deliver longer tool life even while the tools are used for dry-cutting through hard concrete and epoxy-coated applications.

V-Series Diamond Crack Chasers are available with 3 1/2-inch, 4-inch, 4 1/2-inch, 5-inch, 7-inch and 8-inch diameters and 3/8-inch and 1/2-inch thicknesses.

www.diamondtecblades.com



Flex North America Inc – MS 1706 FR

The rotating-motor system in the MS 1706 FR from Flex North America Inc. allows the machine to be used in pull cutting for vertical slots and push cutting for horizontal slots. It can cut two parallel slits up to 35 mm deep and 30 mm wide.

Other key features include adjustable cutting depth and toolless blade changing and slit width adjustment.

When combined with the Flex S 36 M vacuum cleaner, the MS 1706 FR gives

optimal dust protection for the user even when plunge cutting.

www.flexnorthamerica.com



Husqvarna Construction Products – ProEdge V-Line and Radius Line blades

The Husqvarna ProEdge V-Line and Radius Line blades bevel the cut, allowing for straighter joint lines, higher production and reduced labor versus using hand tools.

These blades are ideal for residential and commercial applications, including driveways, sidewalks, hardscapes,



patios, pool decks, parking garages and commercial site work. With the Soff-Cut system, the ProEdge blades and saw models 390, 50, 150 and 150D saws can be used to chase standard joints for a beveled look the day after ultra-early-entry dry-cut control joints are cut.

www.husqvarna.com

Metabo Corp. – Choice Cuts line

Metabo Corp. now offers its expanded Choice Cuts line of thin cutting wheels matched to specific applications. The Choice Cuts line features four wheel types with a wider selection of job-matched premium abrasive grains and engineered resin-bond formulas to provide optimum cutting speeds and wheel life.

Ideal for cutting steel and ferrous-metal materials such as smaller-diameter rods, rebar and angle iron, the economical Original Slicer cutting wheels are 0.040-inch thick. These aluminum oxide wheels, billed as the industry's fastest cutting wheels, have the flexibility necessary for flush cutting.

Slicer-Plus high-performance cutting wheels are 0.045-inch thick with the ability to perform aggressive, cool cutting on all metals. Specially-coated aluminum oxide blended grains and a proprietary resin bond create wheels ideal for the toughest applications, including thicker sectional cuts in steel, stainless steel, heavy rebar, harder metals, heavy wall pipe and angle iron.

Also available is the 1/16-inch LongLife Original Slicer and the Super-Slicers, at 0.045 inch.

All wheels in the Choice Cuts line are available in sizes of 4 1/2 inches by 7/8 inch and 6 inches by 7/8 inch. Both the Original Slicer and Slicer-Plus are available in Type 1 and Type 27 versions, while the Super-Slicer is offered as a Type 1 cutting wheel. Each features two full layers of high-strength fiberglass for added user safety.

www.metabousa.com



MK Diamond Products Inc. – MKS-935D

The MKS-935D continuous-rim diamond blade from MK Diamond Products Inc. has been engineered to cut hard concrete and masonry materials. The V-slant segments provide additional side clearance to prevent binding in the cut and protect the steel core during circular cutting.

MKS-935D is also designed for cutting stone and other hard materials. It





Tools

is available in diameters ranging from 4 inches to 14 inches.

☎ (800) 421-5830

🌐 www.mkdiamond.com

National Diamond – T-SEG 15 Signature Diamond Blade

The T-SEG 15 Signature diamond blade from National Diamond is made to cut hard surfaces such as cured concrete, reinforced concrete, rigid concrete pipe, refractory brick and similar hard materials.

The blade features high-quality thermo-grade synthetic diamonds, the correct balance of metals with diamonds in the matrix and double-laser-welded 15-mm-high segments. The double-tensioned blade is built with a mixture of chromium, molybdenum, steel and cobalt alloy. The T-SEG15 is available in 12-inch, 14-inch, 16-inch, 18-inch and 20-inch diameters.

🌐 www.national-diamond.com



U.S. Saws – Tiger Tooth

U.S. Saws' Tiger Tooth super-grit diamond blade is an ideal blade for joint clean-out and removal of polyurea from joints.

Polyurea typically causes conventional blades to load up and quickly become ineffective. The fast-cutting Tiger Tooth diamond blade with its air-cooled laser-welded segments has been proven to eliminate this problem.

☎ (866) 987-7297

🌐 www.ussaws.com



Virginia Abrasives – Tungsten Carbide Abrasive Disc

Virginia Abrasives' new Tungsten Carbide Abrasive Disc is tough enough to tackle just about any concrete cleanup application. It grinds through paint, carpet and tile adhesive, epoxy coatings and carpet padding, and removes gummy coatings from all concrete surfaces.

Because the disc mounts to a rubber-faced sandpaper drive plate on a 17-rpm, 1 1/2-horsepower buffer with existing hardware, a simple switch-out creates a serious grinder. In addition, the disc is two-sided and cleanable. 🛠️

☎ (800) 446-1805

🌐 www.virginiaabrasives.com



V-Tex Hopper Spray System introduced

The V-Tex Spray System from Benron Equipment & Supply Inc. is a peristaltic squeeze pump designed for interior and exterior use with GFRG (glass-fiber reinforced concrete) and other materials.

Known for a short time as the Vortex, the V-Tex comes in two models — the V-Tex 400-G system, a gas-powered model with a 5.5-horsepower Honda engine, and the V-Tex 450-E, with an electric-powered, 220-volt, 5-horsepower motor. Both feature a 17-gallon hopper that allows up to 4 square yards of coverage per minute, given the right viscosity. Other features include a 1,650-psi hydraulic system, a pole gun and a hose kit. The design of the peristaltic soft-hose pump delivers several advantages, including low risk of media contamination, simple and cost-effective operation, low maintenance, self-priming, and gentle pumping action.

☎ (888) 327-9839

🌐 www.benron.com

J&M Lifestyles add custom hood

The Custom Concrete Hood from J&M Lifestyles LLC is now part of the company's standard hood design catalog.

The hood is 66 inches wide by 65 inches tall and constructed of lightweight glass-fiber reinforced concrete. The hood is available in a limestone texture and color.

The design is sectional — columns are separate from the corbel and the breast is separate from the moldings. All of these pieces can be exchanged for others or made in different sizes. Each piece is held together with adhesive and masonry screws. The upper section can be made removable for easy access.

🌐 www.jmlifestyles.com



New micro-etch surface retarder

SurfEtch from Butterfield Color is a new water-based, biodegradable, low-odor micro-etch surface retarder.

Applied to the surface of fresh concrete, SurfEtch chemically delays the set of surface mortar while allowing the underlying concrete to harden normally. This allows time to wash the surface, removing the surface mortar and exposing sands from 1/16 inch to 1/8 inch deep.



Used with natural grey, integrally colored concrete or in conjunction with stencils to create a pattern, this product creates a sand matrix finish with subtle and varying reveals of texture, pattern and color. These sand-matrix finished surfaces are attractive and slip resistant.

☎ (800) 282-3388

🌐 www.butterfieldcolor.com

New General Equipment floor-covering remover

General Equipment Co. has introduced the FCS10 Rip-R-Stripper to its line of floor-covering strippers. This electric-powered model provides a compact, lightweight alternative to larger walk-behind units. It accommodates cutting blades up to 10 inches wide and is ideal for applications that include removing carpet, VCT, linoleum and mastics.

Featuring an operational weight of only 40 pounds, the machine's small size provides superior maneuverability in confined areas. Its removable lightweight handle offers better weight and vibration reduction.

Built with a 2,300-watt electric motor, the FCS10 operates from a standard 15-amp circuit. Oversized, high-capacity rubber mounts, extra-capacity ball bearings and high-alloy aluminum castings help prevent damage from abuse or high shock loads. Several blade options are available to handle different materials and applications.

☎ (800) 533-0524

🌐 www.generalequip.com

Admixture aids self-consolidation

Fishstone Concrete Countertop Supply has released Optimum 380 Premium Superplasticizer. Optimum 380 is a modified polycarboxylate high-range water-reducing admixture formulated to deliver extremely high spread rates and "self-placing" properties.

Using Optimum 380 delivers higher early strength, improved workability and surface densification with lower dosage rates compared to standard superplasticizers for self-consolidating concrete.

Water-to-cement ratios can be reduced by as much as 25 to 30 percent using Optimum 380.

Optimum 380 is available in 1-quart, 1-gallon, 5-gallon and 55-gallon sizes. Its dosage rating is 3 to 5 ounces per 100 pounds of cement material.

☎ (847) 515-2232

🌐 www.concretecountertopsupply.com

New brick and mortar saw

Arbortech has unveiled their new brick and mortar saw,

the AS170.

Besides its ability to cut square, deep and safe, the AS170 comes with innovative design features that include a dust-resistant motor. The small handheld saw's patented cutting action means virtually no fly dust. The saw also boasts improved reliability, faster cutting speed, and durability in the toughest work environments. It is ideal for mortar and housing repairs, where dry, accurate cutting is a necessity.

🌐 www.arbortechusa.com

New cordless rotary hammer from Makita

Makita USA Inc. has announced the release of the company's first ever 36-volt cordless tool, the 36V LXT Lithium-Ion Cordless 1-inch Rotary Hammer Kit, model BHR261. The new BHR261 was engineered to deliver the speed and power of a corded 1-inch SDS-Plus rotary hammer, with the added flexibility of cordless operation.

The BHR261 has a Makita-built motor that delivers up to 1,200 rpm and up to 4,800 bpm for speed and power. It has three modes of operation: rotation only, hammering with rotation, and hammering only. The built-in torque limiter ensures stable torque control. In addition, the one-touch sliding chuck enables easy bit changes and the built-in LED illuminates the drilling surface for improved visibility.

The hard-hitting BHR261 has enhanced durability features, so the tool beats up the work surface, not the tool or the tool user. It has an ergonomically designed vibration-absorbing handle and a large two-finger trigger for reduced operator fatigue.

🌐 www.makita.com

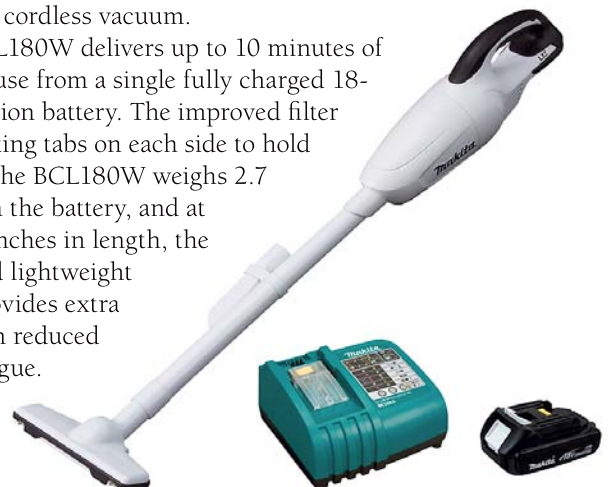


Makita offers two new vacuums

Makita USA Inc. has released two new vacuums. The BCL180W is an 18-volt Compact Lithium-Ion cordless vacuum, and the CL100Z is a 10.8-volt Ultra-Compact Lithium-Ion cordless vacuum.

The BCL180W delivers up to 10 minutes of continuous use from a single fully charged 18-volt lithium-ion battery. The improved filter has two locking tabs on each side to hold it in place. The BCL180W weighs 2.7 pounds with the battery, and at just 18 3/4 inches in length, the compact and lightweight machine provides extra comfort with reduced operator fatigue.

The floor extension and





redesigned swivel floor nozzle attaches easily and includes a crevice nozzle for improved cleaning in tight spaces.

The new CL100DZ is a compact, powerful cordless vacuum with strong suction power for fast and efficient clearing, with or without the floor nozzle extension. The CL100DZ weighs 1.9 pounds with battery and is 17 7/8 inches long. The CL100DZ delivers up to 12 minutes of continuous use from a single charge. This cordless vacuum is engineered for almost any dry application.

In both vacuums, the angled design provides strong suction for fast and efficient cleaning, while the bagless two-stage cloth filtration system allows for easier cleaning and quicker debris disposal.

www.makita.com

Water Cannon releases foam jet kit

Water Cannon has introduced a new professional foam-jet kit, the Water Cannon Foam Jet Injector. This high-pressure system shoots more than 20 feet of dense foam that sticks to surfaces, conserving chemical use.

This foam jet tool has a fully variable spray pattern, with the ability to shoot a straight stream or be

Project Vision software from Cemstone Products

Cemstone Products Co. has introduced Project Vision imaging software, a tool that enables contractors to use a computer to show "after" images for any driveway, pool, patio, walkway, parking lot or other decorative concrete project before the project is undertaken.

Project Vision allows contractors to apply more than 28,000 Cemstone color and pattern combinations to a digital image of the proposed project site. The project owner can view side-by-side "before" and "after" images of the project site prior to starting. Project Vision can display colored and stamped concrete, acid stains, epoxy and knockdown finishes, granite, tile and more. The unique software is programmed to display Cemstone's new line of proprietary Rheocolor L liquid colors.

The software can also show images of asphalt converted to standard grey concrete.

www.cemstone.com

Vibco redesigns Web site

Vibco Vibrators has launched a completely redesigned Web site, which features streamlined access to Vibco's online information, an enhanced user experience with increased functionality, and a modernized site structure.

In addition to a new look and enhanced navigation, Vibco.com now features a dynamic online product catalog, an interactive 360-degree virtual photography gallery and an online video library. Product catalogs, product information including technical and dimensional data, service manuals and installation instructions are readily available from the product page. In addition, a new "On the Job" gallery shows users how vibration is used in a variety of industries.

www.vibco.com

New DVD on sink molds

Gore Design Co. has created a DVD, "Advanced Sink Fabrication Using Stock Sink Moulds," to raise awareness of the infinite variations that can be achieved when using stock sink molds as the foundation of a design.

The methods revealed enable contractors to fashion unique sinks time after time using nondestructive techniques.

www.concreteapothecary.com

CS Unitec's Web site now available in Spanish

CS Unitec has announced that its Web site is now available in Spanish. Like CS Unitec's original Web site in English, the Spanish version covers the company's complete line of pneumatic, hydraulic and electric power tools for construction and industry.

The Spanish-language Web site may be accessed directly or through the homepage of CS Unitec's English-language Web site.

www.csunitec.com

www.csunitec.com/spanish

History of Metal Forms Corp. chronicled in book

A new book written by Tom Miller, president of Metal Forms Corp., details the 100-year history of the family-owned manufacturing company. "Forming the Roadway to Success" features information from many sources, plus hundreds of photos and illustrations.

The book also covers Miller's personal experiences with MFC, along with events relayed by his grandfather and father that took place through his childhood into early adulthood.

Metal Forms Corp., which began as a manufacturer of concrete forms, was the first company to successfully design and produce a steel form for constructing concrete homes and buildings. Metal Forms has been awarded more than 40 United States and foreign patents and currently holds nine registered U.S. and Canadian trademarks.

www.metalforms.com



adjusted up to 50 degrees. The Foam Jet Injector works on any pressure washer delivering up to 5,000 psi with a maximum flow rate of 5.6 U.S. gpm. This injector operates with cold or hot pressure washers.

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🌐 www.watercannon.com



Dust Muzzle improved

Dust Collection Products now offers a new version of the original Dust Muzzle, the Dust Muzzle Ultra.

The Ultra is based on the efficient side-mounted exhaust port design of the original Dust Muzzle. It uses a flexible adapter ring that allows it to attach firmly to any grinder and avoids the common problem of hose-clamp pinch-off on grinders with small collars. It comes in two diameters, 4 inches to 5 inches and 7 inches to 8 inches, and it is made from a new plastic that is flexible and rugged.

☎ (877) 223-2154

🌐 www.dustmuzzle.com



New vessel sink mold

Expressions has developed a new vessel sink mold. The mold, made of durable, reusable fiberglass, creates a shallow concrete sink.

Simply fill the single-part mold with concrete. Sinks can be quickly mass-produced.

🌐 www.expressions-ltd.com

Mix, transport and pour with Hippo mixing station

CS Unitec's new Portamix Hippo PMH 70F mixing station allows quick mixing and accurate placement of construction compounds. It allows for cement screeds, grout, mortar, texture coatings, sealants, adhesives and other self-leveling compounds and construction materials to be easily mixed in a short time. With the Hippo PMH 70F, one person can mix, transport and pour directly onto the floor.

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The Hippo is supplied with two mixing paddles designed with a special helix ribbon and side bars. They lift and shear the product quickly and efficiently to produce an excellent mix consistency and thorough mixing of colors and additives. The 8-inch diameter of the paddle provides increased peripheral speed, which eliminates the need for high-rpm mixing and helps to prevent any flash curing. It offers 1,800 watts of power. The two-speed motor operates at a load speed of 140 rpm and 470 rpm.

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Association News

American Concrete Institute

Fall 2009 Convention details announced

The American Concrete Institute's Fall 2009 Convention is set to take place in New Orleans, La., at the New Orleans Marriott, Nov. 8-12.

Engineers, architects, contractors, educators, manufacturers and material representatives from all over the world will meet to provide input on concrete industry codes, specifications and guides during 300-plus committee meetings and more than 30 technical and educational sessions.

Attendees of this fall's convention will have the opportunity to participate in a variety of special events and initiatives, including a Concrete Mixer held at the famous Mardi Gras World, a student and young-member networking event, a dinner in honor of Thomas T.C. Hsu, and more. ACI attendees are also encouraged to help support ACI's book drive by bringing a new or gently used children's book (suitable for grades K-12) to the convention to help support literacy in the local community.

Highlighted at the convention will be a forum on sustainability. In addition, several committee meetings and technical sessions will focus on sustainability and green design, and during the International Lunch, featured speaker Khaled Awad, technical manager for Advanced Construction Technology Services, will discuss "Building Green in the Desert."

📞 (248) 848-3795

🌐 www.aciconvention.org

New publications released

The American Concrete Institute has introduced four new publications to educate and inform industry professionals on the newest concrete-related information and technology.

Titles are: Report on Soil Cement (230.1R-09), Specification for Cast-In-Place Concrete Pipe (346-09), Guide for Specifying Underground Shotcrete (506.5R-09), and Requirements for Design of a Special Unbonded Post-Tensioned Precast Shear Wall (ITG 5.2-09).

📞 (248) 848-3800

🌐 www.concrete.org

American Society for Testing and Materials

Cements get new standard

Rapid-hardening hydraulic cements are used in a variety of applications in which reduced cementitious content is desired or early service is needed. A newly approved ASTM International standard covering these cements, ASTM C1600/C1600M, Specification for Rapid-Hardening Hydraulic Cement, has been developed by Subcommittee C01.13 on Special Cements, part of ASTM International Committee C01 on Cement.

Four types of cement are covered by the new standard: Type URH, ultra-rapid hardening; Type VRH, very rapid hardening; Type MRH, medium-rapid hardening; and Type GRH, general rapid hardening, for use when higher-strength properties are not required.

📞 (610) 832-9585

🌐 www.astm.org

Concrete Sawing and Drilling Association Magazine Web site launched

The Concrete Sawing and Drilling Association has launched a Web site for its official magazine, Concrete Openings.

The site allows readers to page through the entire magazine or print out sections to read later. The home page of the Web site is organized with the same headlines as the magazine to make navigation easy. Features of the site include Concrete Cases (job stories submitted by CSDA contractor members), discussion forums and archives.

The launch of the new Web site signals the start of a period of expansion for the magazine, providing a new platform that will introduce the public to both Concrete Openings and CSDA through computers or Internet-enabled portable devices.

www.concreteopenings.com

Portland Cement Association

Sample ordinance developed to help local governments

To help local governments implement green building codes, the Portland Cement Association has developed "High-Performance Building Requirements for Sustainability," a sample ordinance written in mandatory language that amends and appends the International Code Council International Building Code to address high-performance and sustainable buildings.

The PCA requirements include the concepts found in most other sustainability or green standards that are within the purview of the building code department, while enhancing disaster resistance and setting more stringent durability requirements.

Enacting and enforcing these provisions provides the basis for designers and owners to obtain certification from the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) system for new construction.

www.cement.org/codes

Foundation selects research fellows

The Portland Cement Association Education Foundation awarded three graduate students with educational fellowships at the association's recent fall meeting in Chicago.

The 2009 recipients are Charles Hope, with research titled "Full-Depth Reclamation Using Cement Slurry and Microcracking," from Brigham Young University; Steven Barbachyn, with research titled "Nominal Shear Strength Limits for Short Diagonally-Reinforced

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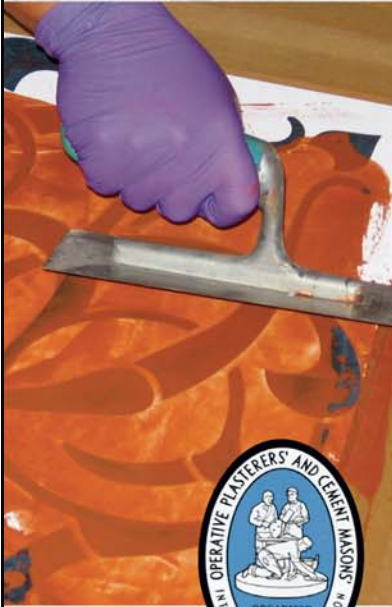


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Coupling Beams,” from the University of Notre Dame; and Sean Haymans, with research titled “Durability of Concrete Exposed to Potassium Acetate,” from the University of New Brunswick, Fredericton.

The PCA Education Foundation Research Fellowship identifies and rewards outstanding graduate 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 presents the students with \$20,000 each for university and study costs.

www.cement.org

American Shotcrete Association Promoting sustainability

The American Shotcrete Association has announced several new initiatives and activities with the purpose of promoting the use of concrete as a sustainable building material.

Last August, ASA joined other concrete organizations in the Joint Sustainability Initiative. Through JSI, these member organizations will present a unified industry approach to sustainability through the creation

of programs and products to promote the use of concrete for its sustainable benefits.

Also in August, the ASA Board of Direction voted to form a new committee, Sustainability, which will focus on the identification and promotion of the sustainable benefits of building with shotcrete. Through the work of this new committee, ASA plans to launch new projects and products that will aid ASA members and the shotcrete industry as a whole in advancing the use of shotcrete in sustainable building projects. These projects will include the creation of a brochure outlining the green attributes of concrete and shotcrete, a sustainability-themed issue of Shotcrete magazine, sustainability-related education and training programs, and presentations designed to explore the use of shotcrete as a green material.

The ASA Sustainability Committee held its inaugural meeting during the ASA Fall 2009 Committee Meetings in New Orleans, in conjunction with the American Concrete Institute’s Fall 2009 Convention.

www.shotcrete.org

Restoration Contest

Show us your best work!

Enter your project into *Concrete Decor*’s 2010 Concrete Restoration Contest, which will highlight the top decorative concrete restoration jobs of 2009. Finalists will be showcased in *Concrete Decor*’s February/March issue.

To enter, please send ALL of the following:

- Company name and contact information.
- Date and location of your project.
- A brief explanation of the project, including challenges you encountered, and a list of the tools and materials you used.
- Photos of the project. You must send before and after photos in order to be eligible.

* Photos must be high-resolution (300 dpi) in JPEG format.

* Qualifying entries must have been completed after October 30, 2008

Categories: Concrete Restoration (Indoors), Concrete Restoration (Outdoors)

Deadline: All entries must be submitted by **January 15, 2010**

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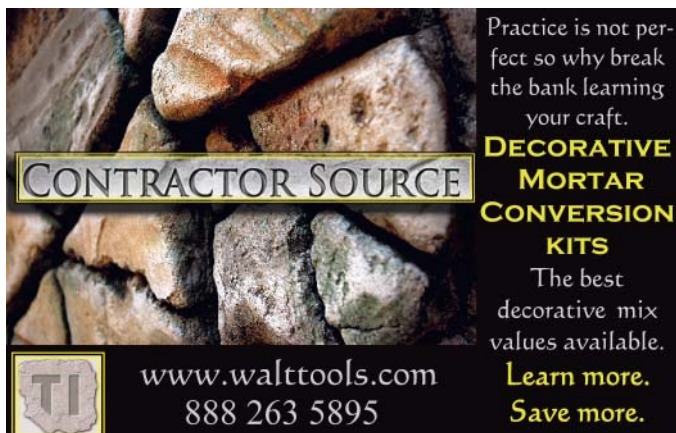


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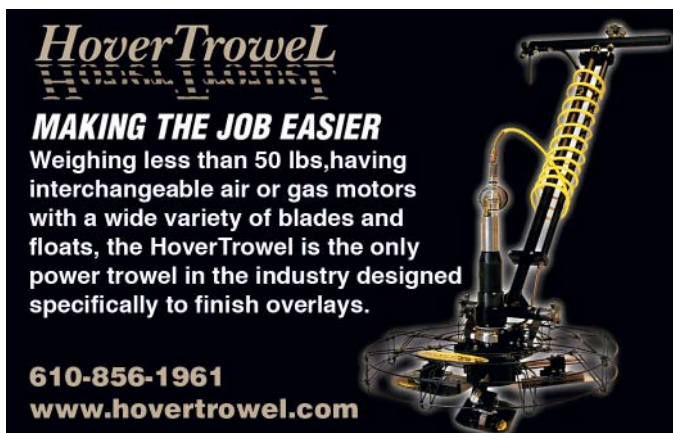
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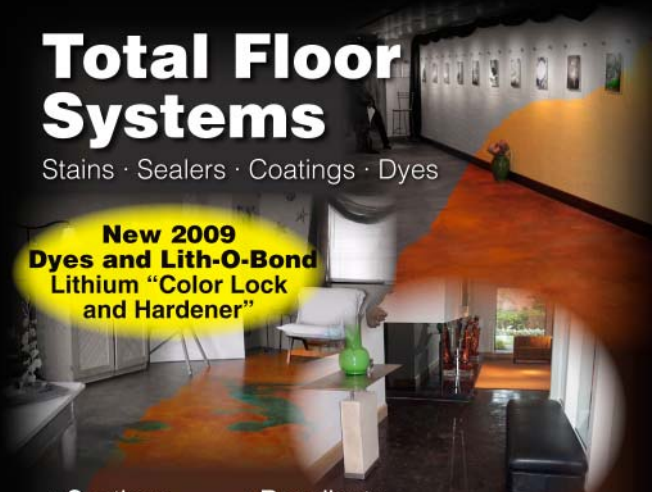
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Final Pour

Photos courtesy of Colorado Hardscapes Inc.



A Coinproof Fountain

The Streets at SouthGlenn, a sprawling new shopping destination in south Denver, boasts a block-long urban park with a brick fireplace, tall “legacy trees,” gardens and cafes, and a centerpiece: a grand, European-style fountain, more than 16 feet tall with four falls.

In the old world, such a fountain would have been carved from stone. In modern-day Colorado, builders used glass-fiber reinforced concrete.

Denver decorative concrete contractor Colorado Hardscapes Inc. constructed the fountain, which includes two elevated concrete bowls and two basins. Edges and patterns were designed to produce a specific water-flow effect, which is fed by 24 jets in a lower basin and another at the top.

Colorado Hardscapes precast the shells of the two bowls monolithically for seamlessness and strength. “When there are cold joints in a water feature, there is greater chance for chemicals, debris, and coins to get lodged into the cracks and with freeze-thaw, cause unrepairable damage and leaks to the bowl,” says Colorado Hardscapes spokesperson Karen Van Heukelem,

LEED AP.

Artisans cast the smaller bowl off-site and placed it by crane. But the lower, bigger bowl, 16 feet wide, was essentially precast in place. GFRC materials and methods were used to form and finish the bowl more than 10 feet in the air. “The lower bowl, although precast in nature, was poured in place due to its size being too large to transport,” Van Heukelem says. “This cast-in-place, precast nature makes it a unique feature and first of its kind in the States. We brought the precast shop to site.”

Casting the bowls was a three-step process, starting with ArcusStone, a crushed limestone material that mimics the natural rock when mixed with cement. “It acts just like natural limestone in that it darkens and hardens with age,” Van Heukelem says. The ArcusStone gives the outer face of each bowl a weathered, old-world look with veins and bug holes. The material was colored with ArcusStone’s Champagne 50.

GFRC was applied wet-on-wet inside the ArcusStone, thicker in the center than at the edge. After the

shells cured, steel reinforcing and more concrete came next, and a final inner layer of Champagne 50-colored ArcusStone finished the job. “We did the inner bowls colored for the people in the surrounding buildings looking down on the feature,” says Van Heukelem.

The end result recalls aged, polished stone, but with decorative flourishes that go beyond mere rock. Flowers on the outer basin around the feature were precast by Denver-based Nostalgic Stone Inc. and attached wet-on-wet. “Multicolored mosaic tiles in patinated greens and browns project the level of artistic detail found in an aged European fountain,” notes a Colorado Hardscapes news release.

The fountain was completed in August 2009. 📷

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