XTREME FLOORING SOLUTIONS
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In order to create an automotive motif on the floor at the entrance to this repair shop and museum *(above)*, the coatings crew spread 30- to 40-mesh colored sand to form rustic mosaics depicting an antique gas pump and oil cans *(inset)*.

Hand-poured Aggregate Automotive Floor Creates a

Grand Entrance

By Floyd Dimmick, Sr.

Terry Getzelman, owner of Getz's Auto Repair, Inc., wanted the floor in his new building to be special. He got what he wanted.

While 16,500 square-feet of the Hampshire, IL, building is used for repairing damaged automobiles, the remaining 3,500 square-foot floor area of the 20,000 square-foot building functions as an estimating and showroom-museum to house his lifetime collection of automobiles and antiques.

"Old Stuff" as he calls it.

Working with Bill Dimmick, vice-president of Crown Polymers, Getzelman decided on a seamless, high performance polymer overlay system that featured a major design element just inside the main entrance — an inlaid printed reproduction of an antique gas pump.

The demands were formidable. The floor overlay system had to be cost effective, high performance, easy to clean, and slip resistant to comply with the Americans with Disabilities Act.

Bill met the challenge by spec'ing a two-floor system that features imaginative borders, display inlays, threshold inlays and has as its "centerpiece," an inlaid reproduction of an antique gas pump.

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Choosing the Right Product

Customers and visitors enter Getz's Auto Repair from a parking lot without protection from rain and snow. Their clothes and shoes bring water, ice, and snow onto the floor. Because of this potential slip hazard, Getzelman selected an open aggregate epoxy polymer concrete (OAEPC) system that can handle spills, water, ice, snow, and dirt while maintaining neat appearance.

As you walk over the OAEPC entrance floor system, it transitions into a non-porous, dense, epoxy polymer concrete (EPC) overlay system containing a colored quartz aggregate blend. The EPC consists of a modified epoxy binder that is blended with a 30 to 40 mesh graded pigmented silica sand. It creates a dense, non-porous protective overlay that is ease to walk on.

The blended main floor colored aggregate selection includes tan, buff, camel, light beige, teak, and chocolate to compliment the décor and the OAEPC color blend. The darker borders and thresholds consist of chocolate, black, and camel.

Color, pattern and overlay density are important aesthetic and safety considerations and can determine how soil shows on the surface. While light colors show soil more readily, dark colors show soil, dust, lint, and salt. Medium shades of blended colors most effectively mask soiling. For high-traffic areas, multi colored aggregates blended together with random patterns provide optimal performance. Texture was achieved on both floor systems with a white aggregate back rolled into the polyurea topcoat that becomes transparent.

Seamless Surface Prep

Since the concrete floor had been excessively power troweled, and a heavy layer of laitance was created on the surface, it was necessary to remove all unsound cement and sand particles along with normal construction dirt and contaminants. To do so, the contractor used a Blastrac 10-inch shot blaster with a factory vacuum attachment that prevented dust from becoming airborne. Electrical power at 220 volts was pulled from the building's electrical panel.

The two-man crew used dust-free, Metabo right-angle grinders with vacuum attachments to reach the two-inch wide strip along the walls and wood platform areas. The 320-mesh steel shot blasting media was semi-angular in shape, which helped to cut the concrete surface faster. Two passes were made over all the concrete surfaces, with three passes required where the laitance was thicker or surface cracks appeared.

All surface prep work was completed in approximately eight hours. The cleaned surface profile was very smooth as specified by the polymer manufacturer and the floor was ready for immediate overlay placement.

During the floor surface preparation, the joints were cleaned with shot blasting equipment and revacuumed to remove the trapped shot from the saw-cut joint opening. The control joints were then filled with a 100 percent solids, non-shrink, low-modulus epoxy formula, designed as an industrial grade load bearing joint system. The joint was over-filled with the epoxy and troweled smooth with the adjacent concrete surfaces to create an even transition without low or high spots.

Leveling Out Overlay Height Difference

The two chosen epoxy polymer concrete decorative overlay systems met the cost-effectiveness and high performance considerations with- out compromising the aesthetics. However, the OAEPC overlay was a minimum ⅜-inch thick and the dense non-porous colored aggregate EPC overlay was approximately ⅛-inch thick, a difference of ¼-inch in height. To bridge this transition, a form similar to a half circle with a vertical straight edge was taped to the floor.

Epoxy polymer concrete (EPC) was mixed with a special graded natural color silica sand and troweled onto the floor. The batch size was one-half cubic foot mixed with an electric drill and mortar paddle mixer. The product normally has a 30 to 35 minute potlife.

The transition ramp was troweled approximately three feet wide and followed the form shape. The EPC is self-priming and designed to be troweled from a thicker mass height without sagging, down to a featheredge (Featheredge — in this case — means troweled to the thickness of the largest sand particle.)

Before this man could squeegee and backroll a mixed epoxy basecoat, the surface prep team had to employ a shot-blast machine to remove laitance and unsound concrete created by excessive power-troweling during the cement pour. Note the use of spiked shoes that allow the crewman to walk on the wet basecoat. The spike marks will level themselves out.

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The featheredge was lightly ground with a diamond disc-cutting blade to create the final smooth transition to the concrete floor. The form was removed the following day, even though it was tack-free in about six to seven hours.

Borders Without Strips

Both overlay systems were designed with borders of darker aggregates to separate the main floor overlay from the vertical walls and wooden floor displays. The raised wooden display curbs and island lift the beautifully reconditioned collector's items approximately four inches above the floor level for easier viewing. The transition of aggregate without plastic or metal strips allows for color changes that are monolithic and without cold joints. Moisture, dirt, mold, insects, and contaminants cannot penetrate the overlay system at these connection areas, eliminating hard-to-maintain surface areas and cleaning problems associated with jointed systems.

"Old Stuff" Inlaid Into New Floor

One of the benefits of these systems is the ability to insert patterns, logos, borders, thresholds, and artistic reproductions. Getzelman specified a stone reproduction of a gasoline pump used more than 80 years ago. The pump is actually on display in the showroom. The automotive and antique dealer also specified reproductions of oil and water cans. The materials used to make the inlays included pigmented aggregates, colored quartz sands, brass strips, natural colored and white silica sands, and two original signs removed from other collectibles. The result is a one-of-a-kind, extraordinary floor.

Some inlays were troweled in place by using forms directly on the floor surface, and others were produced and cured at another location. The epoxy used to bond the colored aggregates together for the on-site formwork was self-priming to the substrate.

Inlays built off-site were bonded to the concrete surface with a thixotropy epoxy adhesive that became tack-free in about 30 to 45 minutes. Both methods of placement were used on this project to improve the production time.

The slow-setting polymer epoxy binder provided sufficient working time during the inlay placement process. Typical working time is approximately 30 minutes, but the material requires considerably more time to gain strength. If the epoxy has not fully set when the forms are removed, damage can occur to the inlay edges. In this case, the OAEPC was allowed to set overnight before removing the forms and starting the next inlay placement.

Placement of complicated inlays such as those used on this project is time consuming. The person selected for this work is artistic and enjoys creating specialized projects. As important as artistry is dexterity — the artist who trowels the OAEPC up to each inlay must exercise care not to damage the inlays.

Double Broadcast System

Approximately 3,200 square-feet of floor surface was overlaid with CrownQuartz™ as a double broadcast epoxy polymer concrete system.

For the first lift, the mixed epoxy basecoat was self-priming, applied by squeegee, and back rolled to ensure an even thickness. The select blend of colored aggregates was then broadcast into the wet epoxy. When the aggregates contact the wet epoxy, the epoxy capillaries upward, binding the aggregate into a dense, void free, epoxy polymer concrete. The epoxy growth factor on this aggregate blend increased its thickness by 100 percent.

After the first lift was allowed to become tack-free, the dry aggregate remaining on the surface of the first lift was swept and the surface vacuumed. For the second lift, the mixed epoxy basecoat was applied to the aggregate surface by squeegee and back rolled to ensure even thickness.

More of the same colored aggregates were broadcast into the wet epoxy and the epoxy growth factor increased its thickness by an additional 100 percent until the floor thickness averaged ⅛-inch.

The second lift was allowed to become tack-free and the excess sand was removed by sweeping and carefully vacuuming to remove all dust and broom bristles.

Open Troweled System

The entrance area was overlaid by hand troweling CrownStone™ in a thickness of ⅜-inch over the majority of the floor and slightly tapering upward to ½-inch at the connection area to the CrownQuartz™ overlay. The two-epoxy polymer concrete systems bridged to create a smooth transition that cannot be seen or felt.

After creating the mosaics, this worker hand trowels coarse-ground aggregate over the surrounding areas. The flooring system is topped with a two-component clearcoat that is rolled, broadcast with aggregate, and backrolled to maximize slip-resistant qualities.

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In addition to creating a dramatic entrance, the coatings crew created a durable floor that may be vacuumed and wet mopped. Should years of foot traffic dull or mar the floor, a new clearcoat will restore its sheen.

The mixed epoxy is poured into a concrete drum or paddle mixer. The colored aggregate is poured into the same mixer and blended until the aggregate is evenly wetted. The OAEPC mix is then dumped onto the floor, spread evenly over the surface, and hand or power troweled. During the spreading of the wet OAEPC, sufficient resin wets out the concrete surface and seals it from the elements. The EPC is compacted and surface leveled during the troweling process. As the EPC is curing, the epoxy is designed to hold onto the colored pigmented aggregates and point bond them together. Upon curing, a monolithic EPC is developed, that has voids between the individual aggregates.

Top Coat Selection and Placement

Getz's Auto Repair building is beautifully lit with natural light, therefore the project demanded UV resistant systems. Protection starts with the U.V.-resistant pigments for each overlay system and includes a U.V.-resistant aliphatic polyurea clear topcoat.

The mixed, two-component clear coat was evenly rolled over the epoxy polymer concrete surfaces with a special blend of aggregate broadcast and back rolled to achieve ADA slip resistance compliance of 0.6 static coefficient of friction.

Special Benefits

During the floor placement there was nearly no odor of the polymers, allowing the systems to be placed without disrupting the company. The floor is durable, may be vacuumed and wet mopped, and does not require waxing. If high-traffic areas become dull, the surface can be restored with clearcoat to its original luster. CP

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