

TOOLBASE™ TECHSPECS

Concrete Floor Finishes

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TECH @ A GLANCE

BENEFITS (+)/DRAWBACKS (-)

- + **DURABILITY:** The life expectancy of finished concrete slabs far exceeds that of flooring materials often used to cover them. Carpeting and vinyl are subject to tears, staining, damage from flooding, and general wear.
- + **INDOOR AIR QUALITY:** There are no fibers or crevices that can trap dirt or allergens.
- + **HOMEOWNER CONVENIENCE:** Concrete can easily be swept or washed and requires little other maintenance.
- + **AFFORDABILITY:** Treatments can impart the look and luster of granite, marble, or other scarce natural materials at a fraction of the cost.
- **HOMEOWNER CONVENIENCE:** Very hard floor surfaces like tile, granite, or decorative concrete may not appeal to consumers with a preference for softer coverings like carpet or resilient vinyl. Objections may involve warmth underfoot, sound deflection, the likelihood of dropped objects shattering, or the safety of children who may crawl or fall on the hard surface.

MAKING THE SWITCH:

Trained contractors are often required for application because specific tools and methods are generally needed. However, some can be applied by traditional trade workers. Instructions should be followed very carefully to create a uniform and desirable appearance. Depending on the desired finish, the finishing contractor may need to be consulted before the slab is poured. Other finishes can be applied after curing. When a concrete floor is to be

finished, other trades should exercise care so as not to damage the floor.

INITIAL COST

Labor cost can consume much of the cost unless it is a do-it-yourself job. Typically, the cost of professional staining is more expensive than vinyl and carpet, but less than hardwood and tile. Polishing and staining are competitive with hardwood finish and tiling, and often less expensive than stone and slate.

OPERATIONAL COST

Decorative concrete is more durable and requires less maintenance than other floor coverings.

CODE ACCEPTANCE

All concrete flatwork must comply with applicable building code requirements for thickness, composition, and strength. There may be requirements for slip resistance on exterior walkways that preclude very smooth or glossy finishes.

RESULTS FROM THE FIELD

Several PATH Field evaluations included various concrete finishes. Overall, consumers liked the look of the finishes, and costs can be reduced by using standard labor resources.

WARRANTY

Some contractors will warrant their work against cracking in certain ways, and other damage, for a period of several years, generally about 5 to 10.

THE BASICS

Decorative finishes can be applied to existing or new concrete slabs. A wide range of effects is possible, and appropriate for both indoor and outdoor use, and often finishing techniques are combined to create the desired surface. The treatment may be as simple as coloring walkways to match architectural features or blend into the landscape. If the look of natural materials is preferred, a slab might be stamped to create the appearance of slate or granite, complete with subtle color shifts, surface texture, and real grout placed in the formed joints between pavers. A stained and scored surface can imitate terra cotta tile, or present a colorful palette of abstract interesting shapes.

The most versatile and creative concrete finishing method is chemical staining, or the application of special stains are formulated to chemically react with the concrete's lime content. They lightly etch and bond color into the concrete surface. This method can be used on new or old concrete slabs. Skilled artisans can create a wide range of effects using brushes, mops, sprayers, etc., or by creating patterns with leaves, sawdust, rags, or other inert materials. Using this method, results may vary widely from project to project, depending on lime leaching, weathering, surface texture, or exposure to other chemicals. Patches or cracks in existing slabs will not be concealed, but may add character and uniqueness.

Concrete can be scored to simulate grout finishes, or to create interesting patterns. In concrete stamping, rigid or flexible patterns are used to imprint the outline and textures of stone, brick, tile, wood planks, slate, or other natural paving materials into the freshly cast concrete surface. Additionally, grout may be applied to grooves for a more realistic

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DOLLARS AND SENSE

Costs reported vary with material grade and installer. One field evaluation showed concrete stain installation to be \$3.25 per square foot, about three times the cost of vinyl installation, and about 20% more than carpet installation in the same home. Another field evaluation showed stamping to be about \$5.00 per square foot, which was about twice the cost of vinyl installation in the home, but less than half the cost of tile installation. It should be noted that carpet and vinyl installations do wear over time more rapidly than other finishes. Frequency will depend on maintenance and use.

Non-Concrete Finishes	Installed Cost per Square Foot	Concrete Finish	Installed Cost per Square Foot
Hardwood	\$6.00-\$15.00	Stain	\$2.00-\$7.00
Vinyl	\$2.50		
Linoleum	\$5.00	Polish	\$2.00-\$10.00
Tile	\$5.00-\$15.00		
Carpet	\$2.50-\$4.00	Stamp	\$5.00-\$15.00
Stone	\$7.50-\$20.00		

Cost information for concrete obtained from Concrete Ideas. Other finish costs are based on sampling from Sierra Log Homes in Chico, California. Other costs found are inclusive in these estimates.

MAKING THE SWITCH

What is required to transition from your current building practices to using this technology?

Concrete finishes are often best applied by trained contractors, because specific tools and methods are often needed. However, some can be applied by traditional trade workers. Instructions should be followed very carefully to create a uniform and desirable appearance. Depending on the desired finish, the finishing contractor may need to be consulted before the slab is poured. Other finishes can be applied after curing. When a concrete floor is to be finished, other trades should exercise care so as not to damage the floor.

When planning to finish a concrete surface, other trades should be notified to determine appropriate project scheduling, the impact of which can vary widely since different finishes are done at different times in the curing process. Additionally, trades must be careful to avoid damage to the floor surface.

Most areas have contractors who are trained and outfitted for pattern stamping and tinting exterior concrete surfaces. Some may advertise their specialties in local phone directories or the home improvement sections of newspapers or magazines. Staining specialists may be more difficult to locate. Some work through urban design centers or commercial referrals. The internet can be a valuable search tool in locating skilled local craftspeople.

RESULTS FROM THE FIELD

This technology has been evaluated by other builders in real-world building projects – learn from their experiences.

Sturgeon, MO, Hopke Buildings and Grounds: MADE to Last Home (2001 PATH Field Evaluation)

- Stamped, pigmented concrete was used on the porch floor to mimic the appearance of slate.
- Stamping and pigmentation costs were made more affordable by trenching the footings and preparing and forming the porch slab with builder's own labor.
- This took one man one day with some transit assistance and a rented trencher, and saved half the typical cost of the specialty concrete finish.

Dallas TX, Carl Franklin Homes: The Vista at Kensington Park (2003 PATH Field Evaluation)

- The floor finish was installed early in the construction phase in order for it to be visible during an open house event.
- During house tours, the building and decorating community liked the stained concrete finish.
- The floor surface endured scratching and marring during subsequent electrical, plumbing, and drywall installation.
- With a cost of \$0.25 per square foot, plus labor of about \$250, the total cost was \$3.25 per square foot. This was higher than the cost for carpet or vinyl flooring for this builder.
- The builder did not continue to offer the flooring due to the system cost and lack of customer enthusiasm.

Freehold Township, NJ, K. Hovnanian Inc: College Park Estates (2002 PATH Field Evaluation)

- A coloring and stamping system was purchased from a manufacturer. After training and testing exercises, contractors installed the system.
- It is important to use the same tamping force to each applied stamp; the final product showed that some stamps had been applied with more force than others.
- There was also staining in the finished floor, perhaps due to moisture trapped in a protective covering applied while the floor was still open.
- The approximate cost of pigmentation and stamping the floor was \$5.00 per square foot. This was about twice the cost of vinyl flooring, and about 40% less than tile for this builder.
- The homeowners did not like the finished floor, and it was covered with a different material upon sale.

TECH CHECK

Below is a checklist of steps to follow in order to implement this technology in each of your projects.

- Consult with trained contractors for your interior or exterior application or have your contractors trained by the manufacturer to install concrete finishes.
- Obtain proper tools required for particular finish and follow manufacturers instructions to correctly apply the finish. Particularly, be mindful of where in the slab laying process the finishing will take place.
- When stamping or scoring, be mindful of where expansion joints may be located in order to ensure good aesthetic appearance and symmetry.
- Before applying stains, it is good practice to have a test stain in an area that won't be seen to ensure the final appearance is desired.
- Protect the floor to prevent trades from damaging it before the floor is ready for regular home use.

FOOD FOR THOUGHT

This section provides some things to think about before switching to this building technology – make sure it's the right choice for you.

- Representative samples may be difficult to produce in some circumstances. Color uniformity often cannot be guaranteed and may vary according to the composition of the concrete, especially when treating an existing slab.
- Radiant floor heating is an energy-efficient technology that can easily be incorporated into slab floors. A decorative finish on the concrete will allow the system to provide maximum heat transfer with no thermal barriers from added floor coverings. Besides conditioning the space, the floor will also feel comfortably warm underfoot.
- Hard floor surfaces like decorative concrete may not appeal to consumers with a preference for softer coverings. Many people with hard surface floors use area-rugs or runners for walkways, play areas, or aesthetic enhancement, but the additional cost of these items should be added to budget calculations when comparing flooring options. Special techniques are available to make concrete slip-resistant and sparkling.

THE BASICS *continued*

finished appearance. Manufacturers often recommend stamping techniques in conjunction with coloring agents.

Colorants can be added to concrete in a number of other ways as well. Colorant, in liquid or powder form, can be added to concrete during the mixing process. This process produces uniform tinting throughout the slab and consistent results from batch to batch. Alternatively, powdered, colored hardeners can be sprinkled (or "broadcast") onto freshly placed concrete. Moisture seeps from concrete into the powder to activate and monolithically bond it, creating a denser, harder finished surface. Because the colorant is concentrated into the top layer, hues can be more intense than integrally colored concrete. Colored overlay materials can also be used. Overlaid materials add thickness to the existing slab, but like other coloring methods, can be used with other finishing options such as scoring and stamping.

The final step in any finishing process is applying sealants or waxes. Manufacturers offer a broad range of products for different applications, ranging from buffing waxes for interior floors to industrial sealers for high traffic exterior settings. Sealants and waxes are available in a variety of colors, including clear, to intensify the hue and add gloss, or bring out the depth and luster of antiquing patinas or variegations from chemical staining.

Surfaces are usually installed by skilled applicators or artisans. Certain contractors may specialize in a particular process like exterior pattern stamping, while others might do only interior staining. In fact, some manufacturers only allow their stamping patterns and color hardeners to be used by trained and certified technicians since all phases of the process need to be properly coordinated. Methods and procedures vary greatly with different products. For instance, some chemical stains may only be applied to slabs that have been fully cured for 60 days, while others work best if applied within a few days of casting. Contractors may need to consult the colorant manufacturer about proper installation techniques, best admixtures, to confirm the ready-mix plant blends the batch for expected jobsite and weather conditions, and utilize curing methods that do not affect the coloration.

If staining or other floor finishes are planned for a concrete slab during new construction, all the trades on site after it's complete should be notified that the concrete surface will be the finished floor so that extra care is taken to avoid damage during the building process.

Chemical stains and liquid colorants are more widely available. Safety precautions for working with concrete and silica dust should always be observed. Chemical stains are usually water soluble, but may contain acids that can cause irritation or injuries if handled improperly. Also remember that results can vary widely on different slabs and usually cannot be guaranteed. If possible, a test treatment should be made in an area of the slab that will not be visible.



From left to right: First stain coat applied, sealant is applied and buffed over stain coats, finished floor, Carl Franklin Homes Field Evaluation

DEFINITIONS

Chemical staining

A finishing method that uses special stains are formulated to chemically react with the concrete's lime content.

Scoring

A finishing method that is done by making shallow cuts in existing, hardened, or finished concrete surfaces to suggest tile grout lines or simply create geometric designs and patterns to separate colors.

Integrally colored concrete

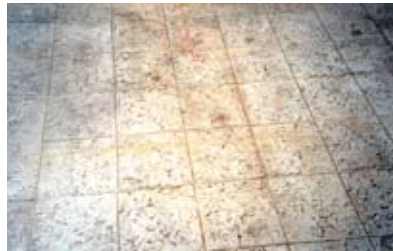
Colorant is added to concrete during the mixing process and produces uniform tinting throughout the slab and consistent results from batch to batch.

Stamping

Rigid or flexible patterns are used to imprint the outline and textures of stone, brick, tile, wood planks, slate, or other natural paving materials into the freshly cast concrete surface.



Concrete stamping, K. Hovnanian Field Evaluation



Stained and stamped concrete, K. Hovnanian Field Evaluation

RESOURCES

General information about concrete floor finishes and their installation in homes:

American Society of Concrete Contractors

1801 Royal Lane, Suite 704
Dallas, TX 75229
(972) 556-0300

www.asconline.org/

Concrete Ideas

12400 State Hwy 71W
Suite 350-254
Austin, TX 78738
(888) 904-3327

www.concreteideas.com

ConcreteNetwork.com

11375 Oak Hill Lane
Yucaipa, CA 92399
(866) 380-7754

www.concretenetwork.com/

Murray Decorative Concrete Seminars

8329 Monticello Road
Shawnee, KS 66227
(877) 924-4443

www.murraydecorative.com/



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TechSpecs are prepared for PATH by the NAHB Research Center.



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Stamped concrete walkway, MADE Homes Field Evaluation