

How to Acid Stain Concrete

Concrete Acid Stain can be applied using many different techniques. The information below is by no means the only way to complete the project; however, this method is appropriate for most acid stain applications.

How Concrete Acid Stain Works

Concrete Acid Stain is a water-based liquid bearing minerals and acid. The acid penetrates the pores of the concrete to force a chemical reaction changing the color of the concrete in a manner similar to a forced rusting. When covered with the proper sealer and for indoor applications sealed and waxed, the acid stain produces a bright, variegated surface color unique to this process.

Surface Preparation

Surface preparation is one of the most important steps of the acid staining process. The concrete must be free of debris, dirt and oils, sealers or any waterproofing agents. If your surface has been treated with a waterproofing agent or cleaned with muriatic acid or a heavy tri-sodium phosphate (TSP) solution, acid stain will not penetrate the pores of your concrete. If you do not know the history of your slab, preparing a test patch or sample area would be highly advisable. For older concrete, the surface must be completely intact with no exposed aggregate. Concrete acid stain does not stain rocks or sand.

Notice:

Concrete that has been acid etched or washed with muriatic acid CANNOT be acid stained. Often, surfaces inside an existing house will have dry wall mud, paint, wood stains, tile adhesives, carpet adhesives, grease, pet stains, etc. on the concrete. Concrete Acid Stain is not an over coat, but is an opaque, penetrating color that permanently changes the appearance of the concrete. Areas where debris remains on the surface will likely not accept the stain leaving color imperfections on the floor, particularly mastic, dry wall mud and paint. Xylene can be used to remove solvent-based sealers and clean up sprayers or tools. Soap and water can be used to clean water-based sealer. A fine sanding pad on applied with a floor buffer can even the surface and re-open the pores of distressed concrete. Distressed floors will nearly always yield a varied finish with a high degree of color difference from area to area across the surface. The distressed sections will lend character and depth to your floor. Cleaning one of these floors to a stainable level is a considerable amount of work, but it is not impossible. If you desire a more even finish, you should consider overlay resurfacing; especially on a floor that has exposed aggregate or is so soiled cleaning that would be too difficult. For most jobs, using an organic degreaser (like Simple Green) diluted at a medium concentration with water to scrub the surface will properly prepare most floors for staining. Thoroughly clean the surface with a nylon brush, rinse with clear water and leave the floor to dry. For interior projects, use a shop vacuum, mop and/or squeegee to contain the water and aid in drying. **Notice:** All soap and cleanser residue must be removed and the surface is completely dry before staining.

Applying the Stain

Safety while applying Concrete Acid Stain is very important. Remember to use goggles, gloves and a mask while working with the stain. The appearance of the finished product is very much influenced by the manner in which the acid stain is applied. We recommend spraying the stain on the surface using an all-plastic pump sprayer. If a darker, more even tone is desired, brush the acid stain into the surface using consistent circular strokes. If using a brush, spray on a second coat after the first coat dries to eliminate any brush strokes in the stain unless that is the desired finish. Though new concrete may not always require a second coat of acid stain, older concrete does require two coats of stain for complete coverage. For a more diffused look, spray the stain onto the surface without brushing. To produce a “marbling” effect on the surface, spray enough stain on the surface to allow the color to naturally run and pool in the lower areas of the slab. This technique is particularly effective on outdoor concrete including patios, porches and driveways which are most always poured on a slope. Applying the Concrete Acid Stain with the sprayer nozzle close to the floor will also produce “pooling” effects on the surface whether indoors or out. No two finished floors are the same as acid staining is an artistic process. Always complete small test patches on your surface or prepare sample boards to practice with the sprayer and determine what look you prefer. Each of our acid stain colors can be cut with water to produce an array of different colors and shades. Please note that if the water content is too high, the chemical reaction between the acid and the concrete will be significantly reduced and may not be strong enough to produce the desired color. We do not recommend cutting our Concrete Acid Stains by more than 4 parts water to 1 part acid stain. Some colors vary more than others when increasing the water content and many factors determine how dark the final stain color will be such as age of concrete, cement content and weathering. As the acid stain dries and processes, an alkali and minerals residue will form on the surface of the concrete. This is normal and is part of the chemical reaction. Each stain has different activation times to fully color the concrete, generally from two to eight hours.

However, the stains can be left on for longer if a darker color is desired. **Summer Tip: Hot, dry conditions can cause acid stain to prematurely dry before properly reacting with the concrete. For best results, slightly dampen the surface before applying acid stain to outdoor concrete. Sealers should not be applied to concrete over 90 F. For outdoor projects, apply sealers either late in the evening or early in the morning when concrete temperatures are at their lowest.**

There are several techniques for acid staining floors to choose from. The basic technique has been described above. To produce a multi-colored effect with distinct areas of color, begin with your lightest color as a base coat. Base coat colors can either be a light acid stain color such as Azure Blue or Malayan Buff or one of the darker stains cut with water. Apply one heavy coat of your base color and allow for one hour drying time before spraying on additional accent colors. Continue to apply the lighter to darker colored accents until satisfied with the results. Reserve a quantity of your base color to spray a thin coat of stain over the entire floor after applying the final accent color. This will “float the color in” to avoid blotchiness on the floor and produce a more even overall appearance. For a veined appearance, spray your secondary or “veining” color on the surface first. While still wet, feather the primary color into and around the secondary color allowing it to flow together at the edges. Be careful not to cover your secondary color completely especially if it is a lighter shade. This will produce a more diffused and natural appearance.

Color	1st Appearance of Color	Final appearance	Minimum Time Required on Surface
Azure Blue	Light Blue	Medium Blue	4-6 hours
Coffee Brown	Greenish Brown	Dark Brown	4-6 hours
Cola	Greenish Brown	Brownish Red	4-6 hours
Avocado	Greenish Brown	Greenish Yellow	4-6 hours
Black	Dark Brown	Black	4-6 hours
Malayan Buff	Greenish Black	Golden Tan	8 hours
English Red	Greenish Brown	Reddish Brown	4-6 hours
Desert Amber	Greenish Brown	Straw Color/Tan	8 hours
Shifting Sand	Greenish Brown	Greenish Tan	4-6 hours
Sea Grass	Greenish Brown	Greenish Brown	4-6 hours

Notice:

- ☑ Check your stain's activation time before beginning the job. Stains can be left on the surface for longer but not less than the activation time. If you are working on a concrete countertop project, use a timer to insure the same activation time for each countertop section.
- ☑ Remember to spray a second coat of stain over the dried residue of the first coat to assure complete coverage.
- ☑ Do not walk on wet residue. If you must walk on the processing surface use acid stain resistant spiked shoes to prevent marks or shoe impressions on the surface. Golf shoes or football cleats can also be used.
- ☑ Avocado, Azure Blue, Sea Grass and Shifting Sands concrete acid stain are **not** recommended for outdoor use. Keep in mind that all concrete surfaces are not alike. Although acid staining overlaid surfaces generally produces similar results to that of concrete slabs, variation can occur between products due to differing overlay additive levels. Mixes can often dry several shades darker than regular concrete causing acid stains to also appear darker or for lighter stains, fail to produce any color at all. To assure the desired results, always prepare a small test area prior to beginning any acid stain project.

Neutralizing the Surface and Removing the Residue

- Once the residue has dried and the stain has been given at least the recommended minimum time to react, the surface should be neutralized and all debris or extra stain removed from the floor in the following manner:
1. Prepare a base solution using baking soda at a ratio of 1-2 tablespoons of soda per gallon of water. Thoroughly spread the solution on to your surface, scrubbing with a mop handled nylon scrub brush. A shop vacuum can be used to remove the residue. For applications including **Lithium Densifier**, consider repeating this step to be absolutely certain all concrete acid stain has been neutralized before cleaning.
 2. Wash the surface carefully using clean water until nothing but clear water is visible. All debris and access color must be removed from the floor. For stubborn residue or porous surfaces, use a floor soap or organic degreaser to aid in removal. The clean, wet surface will be the approximate color of the final sealed surface.
 3. Leave to dry. After the surface has completely dried, the floor should be ready to seal.

Sealing the Surface

After the surface has been neutralized, cleaned and has thoroughly dried, the acid stained floor must be sealed with an appropriate concrete sealer. Legacy Industrial offers many sealer options:

OUTDOORS/INDOORS:

- HD36, HD37 or HD39 Lithium Densifiers (spray or roll) **no visible change to surface.**
- HD-6415 Acrylic Sealer (roll only), two thin coats are best, **wet look finish**

INDOORS (only):

- Legacy Industrial's Standard Epoxy Sealer (roll only), two thin coats are best, **satin gloss finish**
 - This product is commonly used in restaurants, retail stores, homes, etc...
- Legacy Industrial's HD356VOC Urethane Sealer (roll only), two thin coats are best, **gloss finish**
 - This product is commonly used as a protective top-coat for our Standard Epoxy Sealer
- Legacy Industrial's Extreme Aspartic Sealer (roll only), two coats are best, **gloss finish**
 - This product is useful where solvents and heavy traffic are present

Contact: Legacy Industrial, A Clean Seal LLC Company, 908-269-8300 for more information.

www.legacyindustrial.net

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