TRIPLE-S CONCRETE ACID STAINS
Comprehensive Technical Data

SYNOPSIS

Triple-S Concrete Acid Stains are acid based solutions designed to create beautiful colors on new or old concrete that will not chip, fade, crack or peel.

Staining solutions contain inorganic salts that when dissolved in water, react with the minerals in concrete to create a beautiful variety of colors. Acid Stains are not paints; they are chemical solutions that react with minerals in concrete. The chemicals penetrate through concrete pores to form a durable and permanent color. User must understand that this is a chemical process and exercise appropriate safety precautions as described in the Application and Caution sections below.

Created to color new and old concrete alike, Triple-S offers a variety of stain colors to choose from. However, because they react with the minerals within concrete, every stained floor will be different. Any concrete surface will contain the proper minerals that are essential to the staining process but every floor will have different concentrations of these specific minerals. Resultantly, every stained floor will be unique in its appearance. Even certain parts of a particular concrete floor will have a higher concentration of minerals than other parts and therefore, these areas could have brighter and more vibrant coloration. The mottled and varied appearance of acid stained floors is common and also one of the main reasons the process has so much appeal.

Acid Stains are very durable and the colors they yield are longer lasting than any concrete coating. Acid Stains penetrate the surface of the concrete and actually react with the top layer, 1/16th to 1/32nd of an inch. They will not chip, fade, peel, scratch or wear off as most paints or acrylic stains will do in time. As a result of this penetrating process, the only way to remove Acid Stain is to grind off the top layer of the concrete. This is a permanent process!

Additionally, it should be noted that Triple-S Acid Stains will not cover blemishes in the concrete. These are not paints and therefore, any blemish in the concrete that was visible prior staining will still be visible afterward. Prior to staining, attempt to repair as best as possible any major blemishes such as holes or craters.

USAGE

Triple-S Acid Stains have been used to decorate outdoor walkways, basements, game rooms, living rooms and bedrooms, kitchen counter-tops, patios, restaurants, retail stores, store fronts, decorative statues and tables, backyards, garages and portions of highway dividers. Uses are limitless.

Triple-S Acid Stains are sold ready to use. However they can be diluted with water if the resulting color is too intense for the purchaser's taste. Due to the nature of Acid Stains, too much dilution will neutralize the effects of the acid in the solution and therefore no more than a 20-30% dilution is recommended.

REGARDING OUTDOOR USAGE AND UV LIGHT: Triple-S offers over 20 colors of Acid Concrete Stains which can be viewed at http://concrete-stains.com/color.html. All of our color can be used indoors and outdoors. However, in highly sunlit areas there are five colors that can fade due to Ultra-Violet light: Burgundy, Brick, Sea Blue, Yellow and Violet. For these colors, the concern is color fading and we recommend using our UV resistant UT-9500 Polyurethane sealer. In our tests, using a UV resistant polyurethane sealer has minimalized the fading of these colors. Nonetheless, we do consider these five colors UV unstable and they are recommended for indoor use and/or in low sun-lit, outdoor conditions.

COVERAGE:

Coverage is dependant on several factors. Generally speaking, Triple-S Acid Stains will yield 200-250 square feet per gallon. However, there are several circumstances that can greatly affect this approximation: porosity of the surface, the age of the concrete, the composition of the concrete and the weather at the time of application.

The porosity affects the coverage area because a flatter, smoother surface will absorb less stain than a very porous surface; therefore less than a gallon of stain may be needed to cover a very smooth 200 square foot area.

The age of the concrete is important because through normal wear, the surface may not have the necessary minerals needed to react with an acid stain. Normal erosion over time may leave the surface devoid of the necessary minerals. This is even more probable with an outdoor surface that has been exposed to the elements. We recommend to always test a small area of such surface to evaluate the color prior to full use. See Preparation section below.

The composition of the concrete is important because as mentioned before, certain concrete surfaces may have more or less of the necessary minerals for acid staining. Some concrete slabs simply do not accept acid stain very well. In all cases, **we strongly recommend testing a small area prior to full project use**!

Lastly, the weather can be important because concrete expands with heat. Therefore, more concrete pores will be exposed on warm days and resultantly more Acid Stain will be absorbed than if applied on a cooler day. On hot days, you can attempt to cool down concrete by wetting it lightly with water and once it dries, apply the stain.

If the stain color is too dark, water dilution is possible. No more than a 30% dilution is recommended. If one gallon of stain is diluted 20% with water, the square footage yielded will also increase by 20%.

EQUIPMENT

The most important equipment of all is safety gear. Please wear the appropriate safety gear at all times including safety goggles, rubber gloves, boots and protective clothing. Triple-S Acid stains contain harmful chemicals such as hydrochloric acid and iron chloride. **Avoid breathing in their vapor and mist. Avoid contact with skin, eyes and clothing.**

First Aid: Eyes- Hold lids away from eyes and flush eyes immediately with plenty of fresh water and then seek medical assistance. Ingestion-drink plenty of water and seek medical attention immediately. Skin-Flush skin with plenty of fresh water and wash with soap. Seek medical attention. SEE ***CAUTION*** SECTION BELOW PRIOR TO USE.

Cleaning before usage requires the following: a mild detergent, a mop or broom and plenty of fresh water. An acid-resistant wet-vac can facilitate the preparation and clean up process as well. If a wet-vac is not used, please use paper towels, saw dust or old rags to soak up the excess. If the surface has a coating or has been previously stained, a grinding and/or sandblasting machine may be necessary.

Application requires paintbrushes, sponges, rollers, lambs wool applicators or a hand pump sprayer, and an acid-resistant plastic bucket. Do not use brushes that have colored bristles as the acid may cause the color to run. We recommend hand pump sprayers that can be bought at hardware stores; they are the same sprayers generally used to spray insecticides on plants. They MUST be completely plastic because the acid solution will corrode metal parts!

PREPARATION:

This is the most important step because the end result is very dependent on this process. On the other hand it is a fairly simple process for new and old concrete alike. After a test area has been stained and approved, then staining of the larger area may commence.

First the surrounding areas such as walls and shrubbery should be partitioned. Tape the walls where they meet the ground and it may be necessary to place plastic sheets on the wall as well- this will protect the walls from a spray application. Acid Stains contain chemicals that may cause harm to greenery. Do not allow the solution to come in contact with plant life or animals. Partition these areas from outside interference such as pedestrians, cars or animals.

Secondly, if the concrete is newly poured, it must cure for 3-4 weeks to properly accept the Triple-S Acid Stain at the desired intensity. It is highly recommended to wait one month for full, natural curing; no liquid curing materials should be used.

Thirdly, both new and old concrete must be thoroughly cleaned prior to staining. They must be cleaned free of oil, sealers, waxes, grease, water repellants, dust, paint, etc. Natural debris such as dust and dirt can be removed with warm water and mild detergent. A wet-vac may be useful for indoor use; a mop and bucket or a hose and broom may suffice for outdoor cleaning. Make sure the cleaning process is thorough. Results are dependant on the thoroughness of this step.

Rinse the area until the run off water is completely clear. There should be nothing on the surface prior the staining procedure.

Paints and sealers can be removed with a mild, **non-acidic** paint stripper and a scraper but if the surface is porous, remnants may reside in the pores. Therefore, grinding or sandblasting may be required to remove synthetic substances such as concrete sealers, paints or oil stains. Grinding and/or sandblasting might also be necessary if a test area is prepared and it becomes clear that the concrete is too weathered to accept the stain. This may happen with outdoor concrete that has been exposed to the elements for a number of years. The necessary minerals may have been washed away with time and therefore a new layer of concrete should be sought- achieved with grinding, sandblasting or adding a micro topping.

Do not acid wash the concrete surface as it will almost certainly kill and remove the necessary reactants in the concrete and staining may become impossible. Always defer to grinding and/or sandblasting if the surface has a topcoat. Grinding and/or sandblasting will bring a brand new layer of minerals and aggregate to the surface and consequently, better staining.

Lastly, once all the proper cleaning procedures have been taken and the surface is believed to be free of any substance, the concrete should absorb water. If water is poured on the surface and the concrete absorbs it and darkens, it is ready to be stained. However, if water beads off in any section of the surface, these areas may not accept the stain and therefore may not change color. Further cleaning and preparation may be necessary.

TESTING:

The resulting color of acid stained surfaces will vary from floor to floor depending on the composition, age, texture and temperature of the concrete. As a result, the color may not be predictable and a test area is highly recommended!

Cleaning the test area just as you would the entire 'to-be-stained' area is very important as this can also affect the outcome. The test area should be stained just as the rest of the surface is going to be stained: the same utensils, the same stain solution and the same preparation methods.

Once the test has been conducted and the color is acceptable, keep in mind that a sealer will make it a few shades darker. You can seal the test area to see the final outcome, but note that this area will no longer be penetrable by any other solution.

Note that it is always easier to stain an area darker but it is near impossible to stain an area lighter. Therefore, if you believe the stain will be too dark, make the first test with a diluted solution. If it is too light, then simply use more concentrated stain by repeat application. However, if the area is too dark from the outset, it will be difficult to cover it with a lighter stain as the darker shade will dominate.

Additionally, there are some outdoor floors that will not accept Triple-S Acid Stains. Concrete exposed to harsh elements such as rain, water run-off and snow may lack the necessary minerals for acid staining. Over time exposure to the elements may have washed away the necessary minerals and these floors will not be stainable. In these situations the top layer may have to be grinded off to reveal a new layer of aggregate that will accept the stain, or a micro topping of new concrete may need to be applied.

For floors that do not accept stain very well, a thin layer of concrete, poured on top of the original concrete can be very beneficial. Not only does it cover any and all blemishes in the concrete, it also allows you to choose the color of the concrete. White concrete micro-toppings provide a wonderful surface to stain because of their light color- the colors are usually very vibrant if the micro-topping is lighter than normal cement. Concrete stain generally shows up very well on micro-toppings and if the floor has a lot of blemishes, has a thick topcoat or has been previously stained, this is a very good option to consider.

APPLICATION

Once the surface has been cleaned thoroughly and all debris has been removed, allow the surface to fully dry. Once dry, the adjoining walls and plants should be taped off so as to prevent contact from potential runoff, spills or over spray.

Follow SAFETY PRECAUTIONS as described in ***USAGE AND CAUTION SECTIONS***.

For a large area, stain solutions are best applied by spraying but application with a paintbrush or roller is suitable as well. Spraying applies the stain more liberally and equally than any other application method (the sprayer MUST be all PLASTIC, the solution will corrode metal parts).

If the area is small, then rolling or brushing is suitable. When brushing, use circular motions so as to prevent visible brush marks on the concrete. Avoid splashing, dripping and puddling as these areas will be darker when dry. Also, only use fresh stain on new surface areas. Do not spread reactive residue from an already stained area to a new area. Always use fresh stain.

When Triple-S Acid Stain is applied, it will "fizz" and a reactive odor and gas may arise. Some colors will fizz more than others and this can be for any number of reasons. Some concrete may be too weathered and devoid of the necessary minerals to react with the stain. This may also depend on which particular Triple-S Acid Stain is being used. Five of Triple-S's Acid Stains contain coloring agents dyes along with acid and other inorganic minerals. These colors are Burgundy, Brick, Violet, Yellow and Sea-Blue and these stains may not fizz as much as other Triple-S Acid Stains.

When applying Triple-S Acid Stains to a larger area, spraying is the recommended method. The walls should be taped off and the floor, approximately six inches from the wall, should be stained using a brush or roller. If this is done, there is less risk of residual spray affecting the walls. Then, with a plastic hand pump sprayer, spray the remaining sections of the floor. Apply enough stain to fully saturate the surface of the floor but avoid puddling. Also, keep the spray tip at least 12 inches away from the surface of the concrete in order to apply the stain liberally.

Most of the time, if a second color is applied, we recommend not washing off the residue (more in ***COLOR MIXING***). Allow the first stain to dry and then apply the second stain in a similar fashion. For a mottled and varied appearance, apply the second stain in sporadic areas, not fully covering the entire floor as done with the first color. Allow approximately four hours to fully dry.

Similar application procedures can be used for vertical concrete and again, spraying is the recommended method of application. Do not over spray as over saturation could cause dripping and these areas will stain darker and be more noticeable.

Once all layers are dry, the surface must be rinsed off with water. A second layer of the same color can also be applied if the first application did not produce the desired intensity of color. A second layer can also patch up areas where the first coat of stain did not take well.

A wet-vac may be useful for indoor clean-up. Outdoors, rinsing with a water hose may suffice but neutralizing the residue with baking soda and water or Trisodium Phosphate (TSP) is also recommended. Five colors contain dyes (Burgundy, Brick, Violet, Yellow and Sea-Blue) and colored run off must be prevented from entering gutters or sewers. For all acid stains, dispose of water and equipment in accordance with local, state and federal regulations.

If using a mop and bucket, use two buckets of water. One bucket should be used to rinse the mop and the second bucket should be filled with clean, fresh water for the floor. Continue mopping until there is no more residue being lifted from the surface of the concrete. Once the run-off water and/or mop water is clear, rinsing can cease.

SEALING:

To provide long lasting durability and to enhance the color, it is important to seal the stained area with one of the following sealers: WSL-45, AL-70, UT-9500 and/or EP-3100.

WSL 45 is a water-based sealer available in flat or glossy, mostly used for interiors and for low traffic areas. It is a non-flammable lacquer for all types of concrete, brick and asphalt. Usually the first coat penetrates the concrete pores and it is advisable to apply a second coat once the first coat is dry to ensure durability. The best application is by spraying with an airless plastic sprayer such as a garden sprayer or brush on with a soft brush. WSL-45 dries to a crystal clear finish in 4 hours but we recommend letting it dry for 3 more hours (7 hours total) before walking on the surface.

AL-70 is a solvent-based sealer mostly recommended for exterior use and areas where you expect medium traffic. One gallon covers 200 square feet and should be used as is. AL-70 is flammable so extra precautions should be taken while applying and storing. Be sure to have good ventilation while working with this sealer and a respiratory mask should be used to avoid breathing in the fumes. Store at room temperature and keep away from fire. AL-70 may be applied to any type of concrete/masonry surface to protect and enhance the color. Apply with an airless plastic sprayer and let it dry for 24 hours before walking on the surface. If necessary apply a second coat 1-3 hours after the first coat. Use acetone to clean the applicators.

UT-9500 is a polyurethane sealer mostly used for high traffic areas such as shopping malls, restaurant floors and public buildings. Designed as a UV resistant coating, it is suitable for all types of concrete and metals. UT-9500 is impact and abrasion resistant and should not be applied in temperatures below 60°F or above 90°F.

EP-3100 is a 100% epoxy floor coating. It's qualities such as low viscosity, clarity, low odor, and chemical resistance make this a good choice to create seamless floors in manufacturing plants, mechanical warehouses, industrial kitchens and garages. It is mostly used to create a resistant decorative floor coating for high traffic areas.

The best application method for sealers is usually with a lint free roller. Spraying is not always recommended because firstly, the sealer may be too thick for the sprayer and secondly, spraying a sealer can make the sealer airborne which will create an unhealthy breathing situation for the applicators.

Applying a floor finish is also very important if you want to protect your newly stained floor. After the floor is sealed, a floor finish or wax should be applied in order provide added resistance to scuffs and scratches. Several layers of wax are recommended- no less than three but as many as ten layers. The more layers of wax, which can be bought at most janitorial supply stores, the more resistance to scuffs and scratches. Additionally, it is easier to apply more wax after a couple years of wear, than to reapply a whole new coat of sealer. Therefore, owners should try and maintain the floor finish and never allow the surface to wear down to the sealer.

COLOR MIXING

With Triple-S Acid Stains, old and dull concrete can be transformed into beautifully colored, marble-like floors. Sometimes, several colors can be used on one floor and there are two ways to do this.

Firstly, two of Triple-S Acid Stains can be mixed together in liquid form and the resulting color will be a mix of the two. However, due to the nature of the acid stains, colors may not react well together. Some colors may dominate others. **Always test.**

Secondly, the more common form of mixing two or more colors is to layer them on the concrete with different applications. This is done by applying one layer of stain, letting it dry and then a second stain is applied on top of the first. The first color is sprayed to cover the entire slab and the second color is usually only applied in sporadic areas for contrast. This procedure is usually done with sprayers to apply the stain very liberally. If done correctly and with a glossy sealer and floor finish, the finished floor resembles beautiful marble floors.

If a second color is applied, more times than not, we recommend not washing off the residue. Allow the first stain to dry and then apply the second coat in a similar fashion. For a mottled and varied appearance, apply the second stain in sporadic areas, not fully covering the entire floor as done with the first color. Allow approximately four hours to fully dry.

However, if one layer of stain is applied and a tremendous amount of residue remains, lightly clean the area before applying the second color. If this is not done, the second color will not work effectively because a good portion of the second stain will simply lie on the residue of the first layer and never make contact with the concrete. For a double layer of two different Triple-S Acid Stain colors, please be sure to test the compatibility of the colors. Some colors may dominate others and therefore, layering of different colors is not always recommended.

We are seeing more and more ARTISTIC DESIGN ELEMENTS in application by our users for unique effects. For instance, concrete floors can be scored, stamped and/or saw cut to achieve desired effects either before or after staining. Stencils can be used on already stained floors as well. When the floor is sandblasted and the stencil is removed, the original concrete color will be visible. This can be stained a different color or left as is to enhance the effect of the stained concrete.

CAUTION:

Triple-S Acid Stains are CORROSIVE LIQUIDS and must be handled with care. Users must understand that appropriate care must be taken as in the use of other building and construction methods. Appropriate safety precautions must be taken.

Wear a respirator, chemical splash safety goggles, rubber gloves and boots and protective clothing. Provide adequate ventilation.

Triple-S Acid stain contains harmful chemicals: hydrochloric acid and iron chloride. Avoid breathing in their vapors or mists. Avoid contact with skin, eyes or clothing. They can cause severe eye and skin irritation and burning. Contact with broken skin may cause ulcers. Constant and/or repeated breathing may cause ulcers in the nasal membrane. These are industrial chemicals that may cause cancer. Risk depends on the duration and level of exposure. As with contact with other building materials appropriate protective measures must be taken to avoid such exposure.

First Aid: Eyes- Hold lids away from eyes and flush eyes immediately with plenty of fresh water and then seek medical assistance. Ingestion- drink plenty of water and seek medical attention immediately. Skin- Flush skin with plenty of fresh water and wash with soap. Seek medical attention especially if burning sensation persists.

Wash thoroughly after use and close lids to bottles tightly. Do not reuse bottles and dispose of them according to local, state and federal laws.

KEEP OUT OF REACH OF CHILDREN!

Material Safety Data Sheets (MSDS) are available for all of our products. Call us to request the appropriate MSDS for the product you are interested in.

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