

## How Concrete Acid Stain Works



Concrete Acid Stain is a water-based liquid bearing minerals and acid. The acid stain penetrates the pores of the concrete forcing a chemical reaction between the muriatic acid and the available lime in the surface. Once acid stained, the color of the concrete is permanently altered. When sealed with an appropriate concrete sealer and for indoor applications, sealed and waxed, acid stain produces the unique, variegated finish associated with this process.

## Before Acid Staining: Surface Preparation

**Surface preparation is the most important step in the acid staining process. Prior to staining, a slab must meet the following criteria:**

- ✓ The concrete must be free of debris, dirt and oils, paint, dry wall mud, adhesive, sealers, stains of any kind or similar materials. Acid stain cannot react properly with the concrete if these conditions are present.
- ✓ The slab should not have been treated with a **waterproofing agent**, cleaned with **muriatic acid** or a heavy **tri-sodium phosphate (TSP)** solution. The acid stain reaction cannot occur on surfaces treated with these products.
- ✓ Newly poured concrete can be acid stained anytime from 20-28 days after the pour or once the concrete has achieved a uniform light gray color.
- ✓ For older, excessively power-washed, or mechanically-profiled concrete, the surface must be completely intact with no exposed aggregate or sand particles. Concrete acid stain does not stain rocks, sand or aggregate. Exposed aggregate or otherwise depleted concrete may cause the acid stain to take irregularly, react weakly or produce a color inconsistent with the acid stain color chart.
- ✓ Slick, machine-troweled concrete requires mechanical or chemical etching for a complete acid stain reaction to occur. If water beads on the surface or dark gray areas caused by excessive troweling are visible caused by excessively troweling, DCI Hard Troweled Floor Prep should be sprayed on the concrete or the surface should be sanded using an 80-grit sanding pad prior to application.
- ✓ Newly poured concrete slabs and countertops should include less than 10% fly ash to insure a good chemical reaction with the acid stain. Check with your ready mix company or read the countertop mix MSDS for concrete additive information.
- ✓ Concrete poured with excessive water in the mix can create a thin, unstable layer of concrete on the slab surface. To test for instability, press the tip of nail into the concrete. If breaking or damage of any kind occurs, the slab must be profiled with a concrete grinder or a high-speed buffer using a 60-80 grit sanding disc before staining.

**Notice:** *NOTHING* takes the place of pre-application testing, particularly if you do not know the history of your slab. Always prepare a test area on the slab intended for staining prior to beginning a project. Direct Colors is not responsible for application problems resulting from a failure to start projects with a sample test.



Often, concrete surfaces 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. Use Bean-E-Do, for the removal of adhesives. Apply Soy Gel Professional Paint Stripper to remove epoxy, sealers, varnish or paint. For more information on these and other concrete

cleaning products, visit [www.directcolors.com/cleaners](http://www.directcolors.com/cleaners). Xylene can also be used to remove solvent-based sealers and clean up sprayers or tools. Soap and hot water can be used to remove water-based sealer from applicators immediately after application but Soy Gel Professional Paint Stripper or a similar product is required to strip water-based sealers from concrete. Cleaning floors that have been heavily soiled or have been previously tiled or carpeted to a stainable level is a considerable amount of work, but not impossible. If you desire a more even finish, consider overlay resurfacing especially on slabs with exposed aggregate or surfaces so soiled that cleaning would prove too difficult.

*For best acid stain results on indoor slabs, sand the floor with a 150-200 grit pad applied with a floor buffer to properly prepare the surface for staining. Sanding will remove most if not all debris from the surface and correctly profile the concrete for staining.*

The vast majority of slabs only require minimum cleaning using an organic degreaser (such as DCI Orange, Simple Green, etc.) diluted at a medium concentration with water. Scrub the surface with a soft nylon bristle brush or power wash on a low setting to prepare most floors for staining. Thoroughly rinse the surface with clear water to remove any remaining cleanser 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.

## Applying the Stain

**Safety First!** Remember to use goggles, gloves and a dust mask while working with concrete acid stain. A respirator may be required for applications with poor ventilation. 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 to eliminate any brush strokes on the surface 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 diffuse look, spray the stain onto the surface without brushing.

Keep in mind that it is your responsibility, as the stain applicator, to make sure the slab is ready to accept the stain, whether you poured the concrete or not. Take the time to look at the batch tickets to see what's in the concrete mix, and always do a sample prior to stain installation to ensure that the color is correct.



To produce a “marbled” effect, 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 slab as they are generally poured on a slope. Applying the [Concrete Acid Stain](#) with the sprayer nozzle close to the floor will also produce “pooling” effects whether indoors or out. 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, Malayan Buff or one of the darker stains cut with water. Apply one heavy coat of your base color and immediately apply accent coats while the stain is still wet to encourage a more natural appearance on the slab. Continue to apply the lighter to darker colored accents until satisfied with the results. If

walking on wet acid stain, wear acid resistant spiked shoes, golf shoes or similar cleats to avoid leaving foot impressions on the floor. 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. Contact a Direct Colors decorative concrete technician for additional information on application techniques.

No two finished floors are exactly 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 which look you prefer. Each of our acid stain colors can be cut with water to produce an array of different colors and shades. Keep in mind if the water content is too high, the chemical reaction between the stain and the concrete will be significantly reduced and may not be strong enough to produce the desired color, especially on older slabs. We do not recommend cutting our 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, a chalky residue will likely form on the surface of the concrete and is a normal part of the staining process. Each stain has different activation times to fully color the concrete, generally from four 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.

### 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 or attempting to stain separate rooms the same color, use a timer to insure equivalent activation times for each countertop section or room.
- Remember to spray a second coat of stain over the dried residue of the first coat to assure complete coverage.

# How to Acid Stain Concrete Guide

- **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, football cleats or plastic bags over sock feet can also be used.
- Avocado, Azure Blue, Sea Grass and Shifting Sand [concrete acid stain](#) are **not** recommended for outdoor use.

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

Keep in mind that all concrete surfaces are not alike. Although acid staining overlaid surfaces generally produces similar results to that of new concrete slabs, variation between products can occur. 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 excess stain removed in the following manner:

1. Prepare a solution using baking soda at a ratio of 1-2 tablespoons of soda per gallon of water. Thoroughly spread the solution across the slab, scrubbing with a nylon scrub brush where needed to remove residue. A shop vacuum can also be used for indoor projects. For applications including [Lithium Hardener/Sealer](#), 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 residue and excess color must be removed from the floor BEFORE leaving to dry. For stubborn residue or porous surfaces, use a floor soap or organic degreaser to aid in the 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. Direct Colors offers both [solvent and water-based sealers](#) suitable for any concrete project. Sealers can be applied with either an applicator or a sprayer; however, due to more stringent VOC regulations, some solvent-based sealers are not legal for use in certain US states.

**CAUTION:** Wear a mask or ventilator while applying; ventilate well to the outside if applying a solvent indoors.



*Recommended application methods for machine troweled, ground, or smooth hand-troweled floors:*

- [AC 1315 Solvent-based High Gloss sealers](#) should be applied with a [Padco® Floor Coater](#) or [Padco® Floor Trim Pad](#) on smooth surfaces and with a short-napped (3/8 in. or less) roller on textured/stamped surfaces.
- [DCI's Sprayable Satin Finish](#) sealer (SSB) and [DCI Lithium-based Sealer/Hardener](#) can be applied with a pump-up deck and fence sprayer. Sprayers can be purchased at your local hardware store. Separate instructions for DCI Lithium-based Sealer/Hardener can be found at [www.directcolors.com/howto](http://www.directcolors.com/howto) and are included with each order
- [DCI Water-based](#) or [Krystal Kote](#) Sealers should be applied with a [Padco® Floor Coater](#) or [Padco Floor Trim Pad](#) from a paint tray or with a short-napped roller (3/8 in. or less) roller on textured/stamped surfaces.

*Textured or broom finished surfaces* sealed with a non-sprayable solvent and water-based sealers should be rolled on using a short-nap roller (approximately 1/8") or less. For best results, use the pan grid to purge the roller of excess sealer and apply with slow, even strokes. Sealer bubbles, should they occur, can be removed with a hair dryer set to cool or a clean leaf blower set to low speed. SSB can be either sprayed or rolled on a textured/broom-finished surface.



Apply 1-2 thin coats of sealer to the surface. Thick coats will result in an inconsistent finish with tacky areas that may not set-up correctly. Sealers applied with an applicator should be “pushed on” only. Pulling back with the applicator will result in unattractive sealer streaks that often require stripping to correct. For best results with water-based sealers, soak the applicator in warm water and shake out excess before beginning the application. Depending on the sealer selected, leave the solvent-based sealers to dry for *at least 4-6 hours* between coats. With the exception of DCI Lithium-based Sealer which has a drying time of 1-2 hours, *Water-based sealers should be given up to 24 hours to set-up between coats.* If you live in a humid climate or the weather conditions are damp and overcast, give the surface additional time to dry. Do not walk on wet sealer, as it will leave permanent impressions on your surface. Cover your feet with plastic bags to protect your floor’s finish. Do not allow foot or vehicle traffic for up to 24 hours after sealing.

If applying an acrylic-based sealer outside, expect to reseal once every 2-3 years depending on sun exposure and weather conditions.

**Notice:** DO NOT apply masking or duct-tape to a stained and sealed surface. The tape will adhere to the sealer and damage the acid stain finish.

*Basement applications* require special consideration when selecting a sealer. Basement floors with water seepage, high humidity or hydrostatic pressure under the slab REQUIRES a breathable sealer, such as the Lithium Sealer/Hardener or DCI Water-based Sealer. Breathable sealers allow water vapor to pass through the pores of the concrete reducing the possibility of future sealer failure. Generally, a water-based sealer would be preferred to a solvent for all residential basement projects because of reduced ventilation and odor migration concerns.

## Waxing Indoor Surfaces

Applying [DCI Concrete Floor Wax and Polish](#) to your surface is a critical final step in maintaining interior decorative concrete. Wax protects the finished surface but does not replace the need for sealer on your floor. While sealer penetrates into the pores of your concrete and maintains your floor’s color, wax is a topical coat designed to serve as a barrier between daily wear and tear and your floor’s sealed surface. If properly waxed and maintained, you’ll never need to seal again! Remember, floor polish is intended for interior applications only and should not be applied outdoors.



*\*Allow for 48-72 hours dry time for floors sealed with solvent based sealers before applying Residential or Commercial Wax.*

Before waxing thoroughly clean all dirt and debris from the surface using warm soapy water or water mixed with a light organic degreaser. Do not use harsh chemicals such as xylene, lacquer thinner, adhesive remover or similar products. These chemicals will remove your sealer and ruin the finish on your decorative concrete. First mop the floor with the cleaning solution then mop again using water only. Finally, leave the floor to dry making certain all residue has been removed from the floor.

After the surface has dried, apply either the residential or commercial wax with either a sponge mop with wringer attachment, [Padco Floor Coater](#) or [Trim Pad](#). Pour the floor polish into a paint tray and use the ridges to purge the applicator of excess polish before applying. The thinner the coat, the stronger each layer of floor polish will be. For the first application, apply 2-3 thin coats floor polish allowing each coat to dry completely before applying the next. To limit the possibility of streaking, apply the first coat East to West and the second coat North to South. Before allowing traffic on the floor, test the wax by applying pressure to the surface with your fingernail. If the surface dents the wax will require more time to dry. Select commercial wax over residential wax if large dogs will routinely be on the floors. Buffing in this instance would be optional.

Depending traffic conditions, the floor should be waxed approximately every 3-8 months. Before reapplying, walk the surface of the floor to determine if spot waxing will suffice. Always clean the floor thoroughly before application.

**Cold Temperature Warning:** Water-based sealers and all DCI floor waxes must be applied to surfaces at temperatures greater than 60°F with an air temperature difference of 5 degrees or less. Central heating, radiant or convection heaters, or similar heating devices should be turned off during application. In-floor heating should be set at 60-65 degrees before application and turned off during the process.



**Material Safety Data Sheet (MSDS)**

This Material Safety Data Sheet complies with the United States Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR 1910.1200

**Section 1 Material Identification**

Product Name Patina Stain – Coffee Brown  
MSDS REVISION NUMBER 2  
MANUFACTURER Direct Colors Inc.  
11115 N. Harrison  
MANUFACTURER TELEPHONE NUMBER 877-255-2656

*EMERGENCY TELEPHONE NUMBER: Use only in the event of an emergency involving a spill, leak, fire, exposure, or accident involving chemicals. Within the U.S., Canada, or the U.S. Virgin Islands, call CHEMTREC at 1-800-424-9300, 24 hours a day. Or, outside these areas, call (703) 527-3887. Collect calls are accepted.*

REVISION DATE October 2002

**Section 2 Composition**

Component	%(w/w)	Exposure Limits
Hydrochloric Acid (CAS No. 7647-01-0)	2-3	OSHA PEL-TWA 5ppm Ceiling ACGIH TLV-TWA 5ppm Ceiling
Manganese Nitrate (CAS No. 10377-66-9)	12-14	8 hour EL 0.2 mg/m <sup>3</sup> for Mn total dust
Sodium Dichromate (CAS No. 10588-01-9)	2-3	OSHA PEL-TWA 0.1 mg/m <sup>3</sup> ceiling for chromates, as CrO <sub>3</sub> ACGIH TLV - TWA 0.05 mg/m <sup>3</sup> as Cr
Ferrous Sulphate (CAS No. 7720-78-7)	11-13	OSHA PEL-TWA 1 mg/m <sup>3</sup> for iron dusts and mists as Fe ACGIH TLV - TWA 1 mg/m <sup>3</sup> for iron dusts and mists as Fe

**Section 3 Hazards Identification**

**Routes of Entry:** (Under normal conditions of use)

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person. Ensure victim is completely at rest - allow no physical exertion. Symptoms may be delayed for up to 48 hours. Immediately transport victim to an emergency medical facility.

**Ingestion:** Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or is convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 300 mL (10 oz.) of water. If milk is available, administer AFTER the water. If vomiting occurs naturally, have the victim lean forward to reduce risk of aspiration. Repeat administration of water. Immediately transport to emergency medical facility.

**Skin contact:** Avoid direct contact. Wear impervious protective gloves if necessary. Immediately flush contaminated areas with lukewarm, gently running water for at least 20 minutes. Under running water, remove contaminated clothing, shoes, and leather goods such as watchbands and belts. **Do not interrupt flushing** - have emergency vehicle wait if necessary. Transport victim to emergency medical facility. Decontaminate clothing, shoes and leather goods before reuse or discarding.

**Eye Contact:** Immediately flush contaminated eye(s) with lukewarm, gently running water for at least 30 minutes while holding the eyelid(s) open. Take care not to rinse contaminated water into a non-affected eye. Neutral saline solution may be used for flushing if available. **Do not interrupt flushing** - keep emergency vehicle waiting if necessary. If irritation persists, repeat flushing. Transport victim to emergency medical facility.

**General Comments:** Provide general supportive measures (comfort, warmth, rest). Seek medical attention for all exposures except minor instances of inhalation of skin contact. First aid procedures should be reviewed by appropriate personnel familiar with hydrochloric acid and its conditions of use in the workplace.

**Section 5 Fire Fighting Measures**

**Flash point:** Not Applicable  
**Autoignition temperature:** Not Applicable.  
See information under "Fire fighting Instructions"  
**Lower Explosive Limit:** Not established  
**Upper Explosive Limit:** Not established  
**Sensitivity to Impact:** Not Sensitive  
**Sensitivity to Static Discharge:** Not Sensitive

**Hazardous combustion products:** None. See Hazardous Decomposition products in section 10 for information on thermal decomposition.

**Extinguishing Media:** No specific recommendation. Use media to suppress surrounding fire.

**Fire Fighting Instructions:** Wear adequate personal protective equipment. Use water to keep fire-exposed containers cool to prevent rupture. Use water spray or fog to reduce or direct

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**Skin Contact:** Moderate  
**Eye Contact:** Major  
**Ingestion:** Moderate  
**Inhalation:** Moderate

**EMERGENCY OVERVIEW:**

**Corrosive!** The severity of damage depends on the duration of the exposure. In general, solutions and mists with a pH of 3 or less are a significant health concern. Contact with alkali liquids will generate heat. Contact with most metals will generate flammable hydrogen gas.

**Effects of Short-Term (Acute) Exposure:**

**Inhalation:** Vapor or mist in the 50 to 100 ppm range can cause severe nasal irritation, sore throat, choking, coughing and difficulty breathing. Prolonged exposures can cause burns and ulcers to the nose and throat. Severe exposures for a few minutes at 1000 to 2000 ppm can cause a life-threatening accumulation of fluid in the lungs called pulmonary edema. Symptoms of pulmonary edema such as shortness of breath may be delayed for 48 hours after exposure.

**Skin Contact:** Contact with liquid can cause irritation and burns. Vapor or mist may cause redness, irritation and burns if contact is prolonged.

**Eye Contact:** Low concentrations of vapor or mist (10 - 35 ppm) can be immediately irritating and result in redness. Concentrated vapor, mist or splashed liquid can cause severe irritation, burns and permanent blindness.

**Ingestion:** Liquid can cause corrosive burns to mouth, throat, esophagus and stomach. Symptoms may include difficulty in swallowing, intense thirst, nausea, vomiting, diarrhea and in severe cases, collapse and death. Small amounts of acid which enter the lungs during ingestion or vomiting (aspiration) can cause serious lung injury and death.

**Effects of Long-Term (Chronic) Exposure:**

Repeated and prolonged exposure to low concentrations of mist or vapor can cause discoloration and damage to tooth enamel, bleeding of the nose and gums, gastrointestinal symptoms, and chronic bronchitis and gastritis. Repeated exposure to low concentrations of liquid, mist or vapor can cause redness, swelling, sensitization, and pain (dermatitis). Metallic taste and garlic breath are signs of selenium absorption. No evidence of carcinogenicity in human studies. This product does not accumulate in the body.

**Medical Conditions Aggravated By Exposure:**

Pre-existing respiratory and skin disorders.

**Section 4 First Aid Measures**

**Inhalation:** Take precautions to ensure your own safety before attempting rescue. Wear appropriate personal protective equipment and use the 'buddy' system. Remove the victim to fresh air. If breathing has stopped, begin artificial respiration, or if the heart has stopped, begin cardiopulmonary resuscitation (CPR) immediately. Oxygen should be administered by a trained

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vapors. Do not direct water at source of leak. Trained professional may neutralize a spill. Contact with common metals produces hydrogen gas that may form explosive mixtures in air.

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD INDEX:**

**HEALTH:** 3 - Very short exposure could cause serious temporary or residual injury requiring immediate attention.  
**FLAMMABILITY:** 0 - Will not burn.  
**REACTIVITY:** 1 - Normally stable but can become unstable at elevated temperatures and pressures, or may react non-violently with water.  
**SPECIFIC HAZARDS:** CORROSIVE, OXIDIZER.

**Section 6 Accidental Release Measures**

**Personal Protection:** Evacuate unnecessary personnel from spill area and keep unprotected persons upwind. Wear appropriate personal protective equipment. Ventilate area. Vapor is heavier than air and will collect in low areas. Do not touch spilled hydrochloric acid.

**Environmental Precautions:** Implement spill control plan. Stop or reduce leak if safe to do so. Prevent from entering sanitary or storm sewers, waterways, or confined spaces. Use inert materials such as earth or sand to form a dike.

**Remedial Measures:** Restrict access to area until completion of cleanup. Ensure cleanup is conducted by trained personnel only. Use all appropriate personal protective equipment. For small spills: absorb with neutralizing materials such as soda ash or lime and collect in sealed containers. Flush area with water. For large spills, contain and collect spilled material if possible. Notify government occupational health and safety and environmental authorities as per applicable regulations. In the United States, releases over 5,000 pounds must be reported to the National Response Center at 1-800-424-8802.

**Section 7 Handling and Storage**

**Handling Procedures:** Prevent release of vapor or mist into workplace air. Ensure adequate ventilation. Have emergency equipment readily available. When diluting, slowly add acid to the water to avoid boiling or splattering. Keep containers closed when not in use. Wash face and hands thoroughly after handling and before eating, drinking or using tobacco products.

**Storage:** Store in cool, dry, well ventilated area, out of direct sunlight and away from heat sources. Store away from incompatible materials such as oxidizing materials, reducing materials, and strong bases. Keep storage area separate from populated work areas.

**Section 8 Exposure Controls, Personal Protection**

**Engineering Controls:** Use general or local exhaust ventilation to maintain exposure below the exposure limits.

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**Respiratory Protection:** If respiratory protection is required, NIOSH recommends for hydrogen chloride in air:

Up to 50 ppm: Chemical cartridge respirator with hydrogen chloride cartridge(s), powered air purifying respirator with appropriate cartridges(s), Supplied Air Respirator (SAR), or a full face piece SCBA

IDLH Conditions (50 ppm) or planned entry in unknown concentrations: Positive pressure, full face-piece SCBA, or positive pressure full face-piece SAR with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister, or escape type SCBA.

NOTE: Air purifying respirators do not protect against oxygen deficient atmospheres.

**Skin Protection:** Wear impervious gloves and boots and/or other protective clothing according to circumstances.

**Eye and Face Protection:** Eye protection is required. Chemical safety goggles are recommended. The wearing of contact lenses is not recommended.

**Footwear:** As required by worksite rules.

**Other:** Have a safety shower and eye wash station readily available in the immediate work area.

### Section 9 Physical and Chemical Properties

<b>Appearance:</b>	Clear brown colored liquid (Coffee Brown)
<b>Odor:</b>	Acrid odor
<b>Odor Threshold:</b>	Not determined
<b>pH:</b>	<1
<b>Vapor Pressure:</b>	Not determined
<b>Solubility:</b>	Completely soluble in water
<b>Vapor Density:</b>	Not Determined
<b>Freezing Point:</b>	Zero Degrees Celsius
<b>Boiling Point:</b>	108 Degrees Celsius
<b>Critical Temperature:</b>	Not applicable.
<b>Relative Density:</b>	1.22 (water = 1)
<b>Partition Coefficient:</b>	No data
<b>Evaporation Rate:</b>	Not Determined

### Section 10 Stability and Reactivity

**International Air Transportation Association (IATA):** Corrosive Liquid, Acidic, Inorganic, n.o.s. (contains ferrous sulphate and hydrochloric acid), Class 8, UN 3264, P.G. II

**International Maritime Organization (IMO):** Corrosive Liquid, Acidic, Inorganic, n.o.s. (contains ferrous sulphate and hydrochloric acid), Class 8, UN 3264, P.G. II

### Section 15 Regulatory Information

#### UNITED STATES - FEDERAL REGULATIONS:

**TOXIC SUBSTANCES CONTROL ACT (TSCA):** All components are listed in the inventory.

**OSHA, 29 CFR 1910, Subpart Z:** Meets the criteria for a hazardous substance.

**CERCLA, 40 CFR 302:** Hydrochloric Acid, 2270 Kg (5000 pounds), Sodium dichromate 4.54 kg, (10 pounds)

**SARA 302, 40 CFR 355:** No ingredients listed

**SARA 313, 40 CFR 372:** Hydrochloric Acid is subject to reporting requirements.

**SARA 311/312, 40 CFR 370:** Immediate (Acute) Health, Delayed (Chronic) Health.

### Section 16 Other Information

**Preparation Date:** July 15, 2002

**Comments:** This Material Safety Data Sheet was prepared using information provided by Direct Colors Inc. The information in the Material Safety Data Sheet is offered for your consideration and guidance when exposed to this product. Direct Colors Inc., expressly disclaims all expressed or implied warranties and assumes no responsibilities for the accuracy or completeness of the data contained herein. The data in this MSDS does not apply to use with any other product or in any other process.

**Revisions:** 2

**Chemical Stability:** Stable. Avoid heat - releases toxic gases with heat

**Incompatibility:** Very corrosive to most metals, producing flammable hydrogen gas. Reacts violently with bases to produce heat. Reacts with reducing agents to produce heat, fire and flammable hydrogen gas. Reacts with oxidizing agents to produce heat. Reacts with carbides, turpentine, phosphorus hydrogen sulphide, organic materials, and alkalis. Contact with explosives may cause detonation. Reacts with cyanides to produce toxic cyanide gas, and sulphides to produce toxic hydrogen sulphide gas.

**Hazardous Decomposition Products:** Thermal decomposition liberates toxic corrosive fumes of hydrogen chloride, chlorine, manganese, iron and chromium oxides.

**Hazardous Polymerization:** Will not occur

### Section 11 Toxicological Information

**Acute Exposure:** The theoretical LD 50 (rat/oral) for Patina Stain is > 3000 mg/kg

<b>Chronic Exposure:</b>	See Section 3
<b>Exposure Limits:</b>	See Section 2
<b>Irritancy:</b>	See Section 3
<b>Sensitization:</b>	See Section 3
<b>Carcinogenicity:</b>	None reported for this valence of chromium
<b>Teratogenicity:</b>	None
<b>Reproductive toxicity:</b>	Not Available
<b>Mutagenicity:</b>	None
<b>Synergistic Products:</b>	None reported

### Section 12 Ecological Information

**Environmental toxicity:** Moderate toxicity to aquatic life.

**Biodegradability:** Expected to bioaccumulate

### Section 13 Disposal Considerations

Place used contaminated material and packaging into suitable containers and dispose of as controlled waste. Review and follow all local, state, and federal regulations.

### Section 14 Transportation

**Department of Transportation (49 CFR):** Corrosive Liquid, Acidic, Inorganic, n.o.s. (contains ferrous sulphate and hydrochloric acid), Class 8, UN 3264, P.G. II, RQ 4.54 kg(sodium dichromate), or 550 liters of Patina Stain.