



LITHOCHROME® Chemstain™ Classic

A ready-to-use, penetrating, reactive stain that chemically combines with cured concrete to produce permanent, variegated or translucent color effects.

TECH-DATA BULLETIN A-414.10

1. Product Description:

Formulated to add color to uncolored concrete or to change the color of colored concrete, LITHOCHROME® Chemstain™ Classic chemically reacts with the surface of cured concrete to produce unique and permanent color effects.

LITHOCHROME Chemstain Classic typically creates uneven, variegated or translucent color effects much like the shadings of natural stone or the aged appearance of a timeworn patina. Distinctive and lasting, the look obtained is ideal for exterior hardscapes, interior floors, walls, and artificial rock and water features. The result is unique to each concrete surface and cannot be duplicated with other coloring materials.

Chemically stained floors mimic the aged appearance of those from ancient civilizations or assume the understated aspect of modern sculpture. Walkways and eye-stopping features, such as concrete walls and drainage channels, blend environmentally into the landscape. Malls and plazas come alive with glare-reducing, subtly shaded color. Concrete water and rock features lose their commonplace appearance and assume a rich, natural beauty. Commercial installations gleam with colored, easy-to-maintain floors.

The color of chemically stained concrete is superior in durability and abrasion resistance to that of concrete surfaces coated with acrylic stains or other types of paint which can wear or weather off quickly and may delaminate. Due to their chemical reaction with concrete, Chemstain colors become part of the surface without developing a film. They will not fade, chip, crack, or peel and wear only as the concrete wears.

2. Coverage:

LITHOCHROME Chemstain Classic must be applied full-strength (undiluted). Coverage will vary widely depending on the porosity and texture of the surface, composition and age of the concrete, preparation and application techniques, number of applications, and other factors. The coverage rate is approximately 100–150 square feet per gallon (2.4–3.7 m²/L) for two applications or 200–300 square feet per gallon (4.9–7.4 m²/L) per application.

3. Limitations:

The wear resistance and durability of LITHOCHROME Chemstain Classic is dependent on the strength and abrasion resistance of the surface to which it is applied. Chemically stained surfaces subject to pedestrian and vehicular traffic will require initial application of a sealer and periodic maintenance and resealing. Refer to section 17. *Sealing* for more information.

LITHOCHROME Chemstain Classic cannot be used to hide surface blemishes or to cover construction errors. The variegated colors produced are unique to each concrete surface and depend on the chemical composition, mix design, porosity, age, texture, and color of the concrete substrate.

The surface appearance will also be influenced by the Chemstain color, use of LITHOCHROME® Chemstain™ Enhancer, preparation methods and application procedures, the number of Chemstain applications, experience in use of the material, sealing or finish-coating materials and methods, and other factors. Each will significantly affect the final appearance and performance of the chemically stained concrete. To verify and approve suitability and appearance,

representative test sections as described in section 12. *Test Sections* must be produced on each individual concrete surface for each color effect prior to general application of the chemical stain.

Mottling and wide variations in color and intensity will usually occur. The color obtained and the depth of penetration is not predictable, and it is not possible to successfully stain some concrete surfaces even when LITHOCHROME Chemstain Enhancer is used. If contaminants remain on the surface, the penetration of the chemical stain may be blocked. Older or weathered concrete or areas that are frequently exposed to runoff or dripping water may lack the ingredients necessary for reaction with the chemical stain.

Concrete from different loads or pours and in patched areas may appear significantly different in color when chemically stained from that in adjacent areas.

SCOFIELD® Overlay™ toppings are designed to produce optimum results as a base for LITHOCHROME Chemstain Classic, but many other self-leveling toppings are not suitable for chemical stain applications. Surface appearance will vary depending on the age and color of the Overlay topping.

LITHOCHROME Chemstain Classic is a waterborne solution and it must not be allowed to freeze at any time. Chemstain applications must take place on a calm day when air and substrate surface temperatures are between 50° F and 90° F (10–32° C). If the temperature is expected to drop below 50° F (10° C) during application, LITHOCHROME Chemstain Classic must not be applied. Chemstain applications made at low temperatures may not achieve the desired color effects. A jobsite test section is required as described in section 12. *Test Sections*.

WARNING!

LITHOCHROME Chemstain Classic must never be mixed with LITHOCHROME® Tintura™ Stain or any other highly alkaline chemical stain. Doing so will result in dangerous chemical reactivity.

The Chemstain colors Copper Patina, Fern Green, and Weathered Bronze must only be used for interior applications; these colors will darken or blacken irreversibly when exposed to moisture. When these colors are used, the chemically stained concrete must be protected from water from any source.

DANGER! CORROSIVE. CAUSES SEVERE EYE IRRITATION, POSSIBLE BLINDNESS. CAUSES EYE AND SKIN BURNS. MAY BE FATAL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. Refer to section 11. Cautions for more information.

TEST SECTION

Successful staining of concrete flatwork takes experimentation, skill and practice. Prior to general application, a representative jobsite test section must be produced and approved on each individual concrete surface for each color effect as described in section 12. *Test Sections* to verify and approve suitability, proper surface preparation methods, adhesion, safety, performance, wet and dry slip resistance, application techniques, and coverage.



■ 4. Composition and Materials:

LITHOCHROME Chemstain Classic is an acidic solution of metallic salts that penetrate and react with chemicals in cured concrete and some cementitious, self-leveling toppings to produce insoluble color deposits in the pores. Each color is produced from a different, complex proprietary formulation containing no pigments or resins. They lightly etch the concrete surface to remove laitance and allow a more effective chemical reaction and deeper color penetration.

■ 5. Applicable Standards:

LITHOCHROME Chemstain Classic complies with all applicable air quality management regulations.

■ 6. Color Effects:

LITHOCHROME Chemstain Classic is available in eight standard colors approximated on Scofield's Color Chart A-412 LITHOCHROME Chemstain Classic. The color effect produced is unique to each concrete surface, and may differ significantly from that shown on the color chart. Experimentation with stain colors and application methods is required. A representative test section must be prepared on the jobsite concrete as described in section 12. *Test Sections* to verify and approve suitability and color.

Wide color variations, mottling, and unevenness of color are normal and usually desired. These variations will be heightened when Chemstain flatwork is sealed with SCOFIELD® Selectseal-W™, SCOFIELD® Cureseal-W™, or SCOFIELD® Cureseal-S™. Color variations will be less apparent if COLORCURE® Concrete Sealer is used.

To produce satisfactory color effects more than one Chemstain Classic application may be required. One or two applications may be required over SCOFIELD Overlay or SCOFIELD® Texturetop® toppings, depending on their age and color and the color intensity desired. Additional applications may be needed on older or weathered concrete surfaces or to obtain a particular color effect.

For a greater selection of color effects, a single application of LITHOCHROME Chemstain Classic may be made over concrete previously colored with LITHOCHROME® Color Hardener or over SCOFIELD Overlay or SCOFIELD Texturetop colored toppings, producing a variegated surface color that is uniquely modified by the underlying concrete or topping color.

Chemstain color effects vary in intensity over color-hardened concrete, newer concrete, concrete with high cement contents, and Overlay toppings. On older or weathered concrete, the color may not fully develop. If little chemical activity takes place, chemical stain in a darker color, such as Black, or the use of LITHOCHROME Chemstain Enhancer, may produce a stronger reaction. If the concrete is so old or weathered that it is not reactive it will not be possible to successfully use a chemical stain even when LITHOCHROME Chemstain Enhancer is used.

If a more polished surface appearance is desired for new floors, LITHOCHROME Chemstain Classic should be applied over LITHOCHROME Color Hardener, followed by SCOFIELD Cureseal-W, SCOFIELD Cureseal-S or for optimum performance, SCOFIELD Selectseal-W. Due to the density of the color-hardened surface, etching will be minimized, and the sealer will bring out the full beauty of the variegated color.

Depending on the composition of the aggregate, LITHOCHROME Chemstain Classic may color the aggregate as well as the concrete matrix when applied to exposed-aggregate concrete.

■ 7. Special Effects:

Many unique design effects are possible. Experimentation with stain colors and application methods is required, and the production of test sections is a necessity.

To achieve special color effects, two or more Chemstain standard colors may be applied one over the other while wet or a sequence of applications may be made using a different color for each application.

Dramatically patterned hardscapes can be created by chemically staining adjacent sections in contrasting colors. Color variegations in alternate sections can be intensified or subdued by using a combination of Scofield's clear and colored sealers over the chemically stained surface.

Chemstain floors can be saw-cut, scored, or imprinted to achieve the look of natural-stone paving or tile. Imprinted or vertical rock patterns can be highlighted by sponge application of different Chemstain colors to individual stones.

Accent designs can be template sandblasted into the surface before or after Chemstain application to produce subtle or striking engravings. Patterns can be formed by masking areas with a sacrificial coating to prevent stain deposit. After coating removal, the unstained areas can be left their natural color or chemically stained in a different color.

A more-variegated color can be produced by uneven application of the Chemstain solution. Spotted color effects may be produced by sprinkling a granular, iron soil supplement over the surface during the staining procedure or spraying the surface with chemical stain in a darker color using a hand-held plastic spray bottle. Streaked or mottled effects may be created by laying or sprinkling absorbent materials, such as cloth or sawdust, over the surface. Darker colors are normally produced under the inert material.

■ 8. Textures and Slip Resistance:

Only uniformly slip-resistant concrete surfaces, such as broomed, swirl, sandblasted, or most imprinted concrete, interior floors resurfaced with SCOFIELD Overlay toppings, or concrete flatwork resurfaced and textured with SCOFIELD Texturetop should be considered for application of LITHOCHROME Chemstain Classic. On flat interior floors extra precautions should be taken to ensure that the surface is uniformly finished so that it will not be slippery.

For safety considerations, a representative test section as described in section 12. *Test Sections* must be produced prior to general application and the entire surface inspected after completion to verify and approve the adequacy of wet and dry slip resistance.

LITHOCHROME Chemstain Classic lightly etches the surface during application, exposing some of the fine aggregate. The depth of etch depends on the concrete strength and porosity. Since the substrate is harder and the concrete more dense, surface etching is reduced when color-hardened concrete is chemically stained. Aggregate exposure does not occur when floors resurfaced with SCOFIELD Overlay are chemically stained.

■ 9. Sizes:

LITHOCHROME Chemstain Classic is available in 1-gallon (3.8 L) and 5-gallon (18.9 L) containers. Sample sizes are available for investigational use.

■ 10. Storage and Shelf Life:

Under normal conditions when properly stored, the shelf life of LITHOCHROME Chemstain Classic is at least 1 year from the date of purchase. Containers should be tightly closed and stored upright, away from direct sunlight, combustible materials and sources of heat. Inventory must be rotated to maintain product that is within shelf life limits.



11. Cautions:

DANGER!

CORROSIVE. CAUSES SEVERE EYE IRRITATION, POSSIBLE BLINDNESS. CAUSES EYE AND SKIN BURNS. MAY BE FATAL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. CONTACT WITH BROKEN SKIN MAY RESULT IN ULCERS. PROLONGED OR REPEATED BREATHING MAY CAUSE ULCERATION OR PERFORATION OF NASAL MEMBRANES. CANCER HAZARD—CAN CAUSE CANCER. RISK OF CANCER DEPENDS ON DURATION AND LEVEL OF EXPOSURE.

Contains Hydrochloric Acid, Chromic Chloride, Cupric Chloride, Ferrous Chloride, Ferric Chloride, Manganese Chloride, and Sodium Dichromate. Use only with adequate ventilation. Avoid breathing vapor or mist. Do not get in eyes, on skin or clothing. Wear P100/Hydrogen Chloride respirator (NIOSH TC-84A approved), chemical-splash goggles, impervious gloves and protective clothing, chemical-resistant apron and boots. Follow respirator manufacturer's directions for respirator use. **DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN.**

FIRST AID: Eyes—FLUSH IMMEDIATELY THEN SEEK MEDICAL ATTENTION. Hold eyelids apart while flushing material out thoroughly with large amounts of water. Ingestion—GET MEDICAL ATTENTION IMMEDIATELY. Skin—Wash thoroughly with soap and water. Remove soiled clothing and footwear and wash before reuse. Destroy contaminated shoes. Inhalation—Move to fresh air. If symptoms persist or develop, get medical attention.

Wash thoroughly immediately after handling. Close container immediately after each use. Store upright in tightly closed containers away from combustible materials and sources of heat. Do not transfer to unmarked container. In case of spillage, cordon off area if necessary to prevent unauthorized traffic or entry. Promptly dike to prevent spreading and stop spill at source. Collect with wet vacuum or absorb with inert material and place in labeled waste container for neutralization and disposal together with all contaminated matter or equipment. If unable to prevent release to soil or waters of the State, immediate notice to local regulatory authorities is required. Do not reuse empty container. Empty containers may contain hazardous product residues. Before use, review the *Material Safety Data Sheet and Warranty* for further information, including health effects.

12. Test Sections:

To verify and approve suitability and appearance, representative jobsite test sections must be produced prior to general application of the chemical stain on each individual concrete or topping surface and for each color effect. Test sections must be of adequate size to be representative and be produced by the same workers who will apply the LITHOCHROME Chemstain Classic, using the selected Chemstain colors and the contemplated preparation and application equipment and techniques under jobsite conditions. All test sections must be prepared, chemically stained, and sealed as specified.

13. Equipment for Preparation and Application:

When using equipment and materials during preparation and installation, suitable protective gear must be worn and government regulations, manufacturer's instructions, and all applicable safety requirements must be followed.

LITHOCHROME Chemstain Classic is normally brush applied and scrubbed into the concrete surface. In larger areas, an acid-resistant hand-pump sprayer may be used to transfer the Chemstain solution to the surface, while scrubbing.

Other types of equipment, such as sponges, sponge floats, lambswool applicators, or acid-resistant spray bottles may be used to create special effects. All preparation and application procedures and equipment should be tested before use.

For cleaning horizontal or vertical concrete, the pressure washer must be equipped with a fan tip and have a minimum pressure capability of 2000 psi (14 MPa). Hot water capability may facilitate cleaning of existing concrete. Nonmarking hoses are helpful.

For cleaning flatwork, the rotary floor machine must be heavy duty and operate at 175 rpm. It may be equipped with brushes or with a pad-driver that securely holds pads in place. For cleaning, a stiff-bristled bassine or nylon grit brush is recommended. Walk-behind scrubbing machines should be considered for cleaning larger areas.

For transferring and scrubbing, brushes must be of professional quality, long-handled or hand-held, with uncolored, acid-resistant nylon bristles of medium stiffness, having the ability to hold liquids. Inexpensive paintbrushes may be used when applying stain to small areas. They will be damaged by the Chemstain solution and should be frequently replaced. Brushes with colored bristles should be avoided since they may bleed, discoloring the surface. Push brooms will not retain the chemical stain when lifting it from a container or during scrubbing and should not be used. Since they splash liquids, rotary floor machines must be equipped with a splash skirt and used with caution. Rollers or mops should not be used because they cannot effectively scrub the Chemstain solution into the surface.

Containers for holding chemical stain during brush application must be acid-resistant, nonleaking, wide-mouthed plastic pails. They must be large enough to allow the entire bristle section to be dipped into the Chemstain solution. Use of a plastic mop bucket with rubber casters will facilitate application and reduce marking or ringing from liquid running down the side of the container. Metal containers should never be used as they rapidly corrode and may change the color of the Chemstain solution.

For transferring solution to the surface, the hand-pump sprayer must be of professional quality and should normally be equipped with a fan tip or a conical spray tip. All parts that will be in contact with the chemical stain must be made from acid-resistant plastic. The use of an airless sprayer is not recommended.

For residue and runoff collection, an acid-resistant wet vacuum may be used or residue and runoff can be absorbed by scattering an inert material, such as sawdust, over the surface or by wiping with rags.

14. Preparation:

Prior to stain application, a representative test section must be produced and approved as described in section 12. *Test Sections*. Concrete flatwork must be uniformly and adequately textured for slip resistance as described in section 8. *Textures and Slip Resistance*.

Surrounding areas, landscaping, and adjacent surfaces should be protected. The work area should be roped off, nearby vehicles removed, and appropriate sections closed to traffic. Needed equipment, as described in section 13. *Equipment for Preparation and Application*, should be available.

Prior to making Chemstain applications, precautions should be taken to prevent water penetration into the concrete from any source. Sprinklers and fountains should be adjusted to avoid wetting the surface. In hard-water or high-alkali areas, soft water should be considered for use in water features to reduce discoloration of the surface.

The Chemstain colors Copper Patina, Fern Green, and Weathered Bronze are water reactive after application and are suitable for interior use only. The Warning Section on page 1 should be read.



Though the effect achieved is primarily dependent on the surface of the concrete to which it is applied, weather conditions should also be considered when planning Chemstain applications. The chemical stain will dry faster and may require more material or additional applications to produce the desired results in hot, dry, and windy weather. Applications made at low temperatures may not achieve the desired color effects. Rain will wash the chemical stain from the surface prematurely and runoff may stain adjacent areas or damage landscaping.

All surfaces must be sufficiently cured and completely clean, sound, and free of any debris, contamination or weakly bonded surface material. Before chemically staining the concrete surface all dirt, form oil, plaster stains, oil, and grease must be completely removed by cleaning. Coatings, water repellents, previously applied adhesives, and curing membranes must be removed by sandblasting, though small spots of paint may be removed with a scraper and a commercial paint stripper. Acid washing should normally not be used as a cleaning procedure, since it removes necessary reactants from the surface. Failure to remove all contaminants and coatings that impede the penetration of LITHOCHROME Chemstain Classic into the concrete will cause appearance defects.

Older or weathered concrete surfaces or areas that are frequently exposed to runoff or dripping water may have lost some of the chemicals needed to produce a reaction with the chemical stain. In these instances, the use of LITHOCHROME Chemstain Enhancer should be considered. LITHOCHROME Chemstain Enhancer replaces some of the chemicals lost in normal weathering of the surface, allowing the Chemstain solution to react. Additional information is available in the Scofield Tech-Data Bulletin A-454 *LITHOCHROME Chemstain Enhancer*.

In some instances, on dense concrete surfaces, mechanical means to open the concrete surface such as light sandblasting or shot-blasting, high-pressure water-blasting, or use of a rotary floor machine with a nylon grit attachment may be needed and are preferable to acid washing to make the surface sufficiently penetrable for the chemical stain to react. However, if mechanical means to open the surface are not practical or acceptable due to potential surface texture variations, acid washing with a solution of one part muriatic acid (20° Baume or 31.4% hydrochloric acid) to 20 parts of water may be considered.

Newly placed concrete must be sufficiently cured, a minimum of 14 days. However, on interior applications of the Chemstain colors Copper Patina, Fern Green, and Weathered Bronze, the concrete must be sufficiently dry (typically 14–28 days) so that the Moisture Vapor Emission Rate (MVER) is less than 5 pounds per 1000 square feet per 24 hours (2.5 kg/100 m²/24 hr) based on a 72 hour test period per ASTM F 1869 *Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride*. The Warning Section on page 1 should be read.

Liquid curing materials must not be used. Concrete flatwork should be cured with new and unwrinkled, nonstaining, high-quality curing paper conforming to ASTM C 171 *Sheet Materials for Curing Concrete*. Overlapping the curing paper should be avoided when possible, since the color may appear different under the overlapped sections. For a more similar color appearance, all surfaces should be cured by the same method and be chemically stained when the concrete is the same age.

Immediately prior to chemically staining, the concrete must be thoroughly cleaned. The surface should be swept and then pressure washed or scrubbed using a rotary floor machine. Use of a suitable, high-quality commercial detergent will facilitate cleaning. The surface must be rinsed after cleaning until the rinse water is completely clean.

Existing, older concrete must be cleaned so that the surface is completely penetrable before receiving the initial application of LITHOCHROME Chemstain Classic. An indication of whether the concrete is penetrable can be obtained by spotting the surface with water. The water should immediately darken the substrate and be readily absorbed. If the water beads and does not penetrate or only penetrates in some areas, additional surface preparation and testing must be performed.

The cleaning method to be used depends on the condition of the concrete. To remove dirt and other contaminants, detergents and other commercial cleaners should be considered and tested. Pressure washing or scrubbing with a rotary floor machine is normally required. After cleaning, the surface must be rinsed to remove any remaining residue. Rinsing should continue until the rinse water is completely clean. Wet vacuums may be helpful to remove dirty water, particularly from interior floors. After drying, the surface must be carefully inspected and retested for penetrability. If necessary, additional general or spot cleaning and rinsing should be performed.

Concrete that has been previously coated with liquid curing materials, paints, coatings, waxes, or water repellants, or surfaces that cannot be successfully cleaned by other methods must be sandblasted. Sandblasting must be sufficient so that the coatings or contaminants are completely removed. Sand remaining on the surface must be removed by sweeping, vacuuming, or pressure washing before the concrete is chemically stained.

Exterior flatwork or interior floors topped with SCOFIELD Texturetop must be sufficiently cured to walk on without damage prior to staining, at least 4–8 hours after installation at 70° F (21° C). SCOFIELD Texturetop cures at a rate similar to concrete and retains moisture which, when using the LITHOCHROME Chemstain Classic colors Copper Patina, Fern Green, or Weathered Bronze, can in some instances cause darkening if the Chemstain solution is applied too early. Prior to using these colors, the Texturetop topping must be sufficiently cured, normally 14–28 days, and the Moisture Vapor Emission Rate (MVER) of the topping must be less than 5 pounds per 1000 square feet per 24 hours (2.5 kg/100 m²/24 hr) based on a 72 hour test period per ASTM F 1869.

Dust, slurry residue, or other contaminants must be removed from the SCOFIELD Texturetop surface before LITHOCHROME Chemstain Classic is applied. Do not use aggressive removal methods before the Texturetop topping is fully cured, a minimum of 14 days after installation.

For interior floors topped with SCOFIELD Overlay, refer to Scofield's Tech-Data Bulletin C-504 *SCOFIELD Overlay* for further information.

■ 15. Application:

All surfaces must be dry and properly prepared as described in section 14. *Preparation*. Surrounding areas, landscaping, and adjacent surfaces must be masked or protected from spills, overspray, tracking, equipment contact, and runoff. The work area should be roped off, nearby vehicles removed, and appropriate sections closed to traffic. Adjoining walls of porous material, such as masonry, should be masked. The surface should be divided into small work sections using walls, joint lines, or other stationary features as natural stopping points. This allows for easier control of coverage, wet edge, and overlap. For safety and appearance, application procedures should be planned so that the wet surface is not stepped on. Safety precautions must be followed and full protective gear must be worn.

LITHOCHROME Chemstain Classic must be applied full strength (undiluted) at the coverage rate given in section 2. *Coverage* and using the equipment described in section 13. *Equipment for Preparation and Application*. The color of the liquid Chemstain solution will have no resemblance to the final color produced on the concrete surface. The solution will appear transparent when first applied but will assume a cloudy or muddy appearance as the chemical reaction occurs.



For applications on SCOFIELD Overlay toppings, the Chemstain solution should be applied sparingly for best results.

LITHOCHROME Chemstain Classic normally fizzes while reacting on concrete. If fizzing does not occur, the surface has not been adequately prepared or the concrete is not sufficiently reactive to be chemically stained. If contaminants are preventing the chemical reaction from occurring, additional cleaning as described in section 14. *Preparation* must be performed.

The Chemstain solution should be transferred to the surface by brush or spray and immediately scrubbed in as soon as it touches the concrete, using a circular or figure eight motion. For most applications the solution should be poured into a wide-mouthed container and then lifted from the container to the concrete surface with the brush, keeping bristles upward to reduce splashing. In larger areas or on vertical surfaces, spray equipment may be used to transfer the solution to the concrete. Working as a team, one workman should spray the Chemstain solution evenly a few inches ahead of the brush while a second workman scrubs it into the surface.

Work in small sections, keeping the brush in constant contact with the surface and in continuous motion. The Chemstain solution should be gradually spread until all fizzing action ceases. To avoid lap marks, reacted solution should not be spread to new work sections, but should be brushed back over the section just treated. New applications of chemical stain should be overlapped with and worked into the edges of adjacent, still-wet, previously treated areas. A wet edge must be maintained.

During brushing the surface should be thoroughly and uniformly saturated with the liquid Chemstain solution, but it should not be splashed, dripped or allowed to puddle in joint indentations and depressions unless desired for the color effect. Stepping on wet surfaces must also be avoided. Such irregularities or footprints will remain apparent in the surrounding surface and should be brushed out immediately and permitted to dry evenly.

The Chemstain solution should be applied to vertical surfaces in the same manner, starting at the bottom and proceeding upward. Overapplication leading to rundown should be avoided.

Reaction time depends on wind conditions, temperature, and humidity. Whether the Chemstain solution remains wet or dries on the surface, it should be allowed to remain in contact with the concrete until the desired effect is obtained, a minimum of 4 hours. Proper safety precautions must be taken to prevent contact with the surface until the stain residue is removed and the surface rinsed.

For one-color or mixed-color applications, the chemically stained surface should be washed between applications so that the color effect can be evaluated before another coat or color is applied.

■ 16. Rinsing:

After the final application of LITHOCHROME Chemstain Classic has remained on the surface for a minimum of 4 hours, all unreacted Chemstain residue must be neutralized and then removed completely prior to sealing. A solution of baking soda (sodium bicarbonate) and water, using 1 pound of baking soda per 5 gallons of water (454 g/19 L), can be used to neutralize the residual Chemstain acid. Apply the solution until it stops fizzing. After neutralization, the surface must be rinsed thoroughly with clean water several times to remove soluble salts. While rinsing, lightly abrade the surface using a low-speed floor machine equipped with a white pad to remove any residue and/or weakened surface material. Runoff may stain adjacent areas or harm plants. It should be collected by wet-vacuuming or absorbing with an inert material.

After rinsing is complete, a pH test using litmus paper, pH paper or a properly calibrated surface pH meter must be performed to verify that no residual acid is present. A pH value of 7 or higher indicates that all acid has been neutralized. If the tested pH value is below 7 the neutralization step outlined above must be repeated until a pH value of 7 or more is obtained. After completion of neutralization, rinsing, and verification that no acid is present, the stained surface must be tested for cleanliness by wiping the surface with a white cloth. If residue appears on the cloth, additional surface cleaning must be performed.

Failure to completely remove all residue prior to sealing the surface will cause appearance defects, adhesion loss or peeling, reduced durability, and possible bonding failure and delamination of the sealer.

All stain residue, runoff liquid, rinse water, absorbent materials used during application, and discarded equipment must be collected and disposed of in accordance with local, state, and federal regulations. All chemically stained surfaces must be protected from traffic until they are sealed.

■ 17. Sealing:

As soon as possible after the procedures described in section 16. *Rinsing* have been completed, the surface should be sealed with one of the following: SCOFIELD Selectseal-W, SCOFIELD Cureseal-W, SCOFIELD Cureseal-S, or COLORCURE Concrete Sealer. Where a lower-cost sealer is desired, the use of CEMENTONE® Clear Sealer may be considered. Failure to completely remove all Chemstain residue and rinse the surface clean prior to sealing will result in performance problems with the sealer. The appropriate Scofield Tech-Data Bulletin *B-504 SCOFIELD Selectseal-W*, *B-204 SCOFIELD Cureseal-W*, *B-604 SCOFIELD Cureseal-S*, *A-634 COLORCURE Concrete Sealer*, or *A-764 CEMENTONE Clear Sealer* must be read completely before using.

For optimum performance and durability SCOFIELD Selectseal-W is recommended for sealing and protecting chemically stained flatwork.

Before application of SCOFIELD Selectseal-W, the Moisture Vapor Emission Rate (MVER) of the concrete or cementitious topping must be measured and be less than 5 pounds per 1000 square feet per 24 hours (2.5 kg/100 m²/24 hr). The Scofield Tech-Data Bulletin *B-504 SCOFIELD Selectseal-W* must be read completely before using.

Care must be taken when using any kind of adhesive tape on surfaces stained with LITHOCHROME Chemstain Classic and sealed with a recommended Scofield sealer. The sealer could disbond from the surface in areas where adhesive tape has been applied when the tape is removed.

All sealed or coated surfaces must be thoroughly inspected to verify and approve installation and safety, including wet and dry slip resistance, prior to opening the area to traffic.

■ 18. Maintenance:

A maintenance application of the same Scofield sealer originally used should be made periodically as the sealer is worn off the surface. Instructions for the maintenance and resealing of concrete surfaces are available in the Scofield Tech-Data Bulletins *B-504 SCOFIELD Selectseal-W*, *B-204 SCOFIELD Cureseal-W*, *B-604 SCOFIELD Cureseal-S*, or *A-634 COLORCURE Concrete Sealer*, which must be read completely before using.

Interior floors sealed with a recommended SCOFIELD sealer should be protected with a compatible, slip-resistant, emulsion-type, commercial floor finish following the manufacturer's instructions and safety requirements. For recommendations, based on extensive product testing, or answers to your floor care questions, call the JohnsonDiversey 24-hour hot line: 800-558-2332.



■ **19. Availability:**

LITHOCHROME Chemstain Classic is marketed nationwide and internationally, directly to the user and through strategically located warehouses, dealers, and representatives. Contact Scofield for its nearest representative.

Scofield offers a complete line of engineered systems for coloring, texturing, and improving performance in architectural concrete. Scofield Systems address specialized requirements for interior, exterior and vertical uses with compatible systems of complementary products including coloring admixtures, color hardeners, colored cementitious toppings, stains, curing compounds, sealers, coatings, repair products and texturing tools. Visit the Scofield website at www.scofield.com for further information.

■ **20. Warranty Summary:**

For the complete warranty statement and important limitations, read the *Material Safety Data Sheet and Warranty*. Generally, Scofield represents and warrants only that its products are of consistent quality. No other oral or written statement is authorized. Any liability is limited to refund or replacement of defective product. The end user shall determine product's suitability and assume all risks and liability.

Suggested Short Form Specification for Chemically Staining Concrete Flatwork:

All concrete surfaces designated in the plans or specifications as being chemically stained shall receive two applications of LITHOCHROME® Chemstain™ Classic in _____ color after the concrete has cured a minimum of 14 days (*or has cured sufficiently to meet moisture vapor emission requirements, a minimum of 14–28 days, for the Chemstain colors Copper Patina, Fern Green, and Weathered Bronze*). The surface shall be prepared and LITHOCHROME Chemstain Classic shall be applied in accordance with Tech-Data Bulletin A-414 using the recommended minimum coverage rate. The contractor shall submit the final stain color and application techniques on jobsite test samples to be approved by the architect prior to installation. All chemically stained surfaces shall be sealed with SCOFIELD® Selectseal-W™, SCOFIELD® Cureseal-W™, or SCOFIELD® Cureseal-S™ in accordance with Tech-Data Bulletin B-504, B-204, or B-604 (*or COLORCURE® Concrete Sealer in the matching color in accordance with Tech-Data Bulletin A-634*). All joints in chemically stained flatwork shall be sealed using LITHOSEAL™ Trafficalk-3G™ in the blending color in accordance with Tech-Data Bulletin S-404-3G. All products shall be manufactured by L. M. Scofield Company, (800) 800-9900, Los Angeles, CA, (323) 720-3000 and Atlanta, GA, (770) 920-6000.

Suggested Short Form Specification for Chemically Stained, Interior Overlayment Floors:

All interior floor areas designated in the plans or specifications as having a stained, overlayment surface shall be primed with SCOFIELD® Epoxy Primer in accordance with Tech-Data Bulletin C-914. An overlayment of SCOFIELD® Overlay™ shall be placed in accordance with Tech-Data Bulletin C-504, using _____ color at a minimum thickness of _____ inches. The overlayment surface shall be stained with LITHOCHROME® Chemstain™ Classic in accordance with Tech-Data Bulletin A-414 using _____ color(s). The contractor shall submit the final stain color and application techniques on jobsite test samples to be approved by the architect prior to installation. All overlayment surfaces shall be sealed with SCOFIELD® Selectseal-W™ or SCOFIELD® Cureseal-S™ in accordance with Tech-Data Bulletin B-504 or B-604. All products shall be manufactured by L. M. Scofield Company, (800) 800-9900, Los Angeles, CA, (323) 720-3000 and Atlanta, GA, (770) 920-6000.



1 800 800 9900 or www.scofield.com

SCOFIELD PRODUCTS ARE INTENDED FOR PROFESSIONAL USE ONLY

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