CHROMIX® Admixtures for Color-Conditioned Concrete

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Colored, water-reducing, set-controlling admixtures for horizontal or vertical architectural concrete.

1. Description and Uses: Time-tested and proven for over 45 years, CHROMIX® Admixtures for Color-Conditioned Concrete provide permanent, fade-resistant, uniform, and streak-free integral color-conditioning for all types of concrete projects, from floors and hardscapes to cast-in-place or precast walls. They are true water-reducing admixtures, premeasured and packaged in disintegrating bags for easy and accurate addition into the concrete mix. Producing concrete that is structurally superior as well as beautiful and cost effective, CHROMIX Admixtures not only color concrete, but increase its strength at all ages, control the set time, and improve freeze/thaw resistance. Superior workability and finishing characteristics are achieved. Color bleeding, laitance, and efflorescence are reduced.

The addition of a CHROMIX Admixture provides endless design possibilities for concrete flatwork. Hardscapes can be brought to life with rich color or be blended into the landscape. Color-conditioned floors and walks can create a warm, inviting atmosphere while offering an easy-to-maintain, wear-resistant surface. Patterns can be formed in contrasting or complimentary colors or by use of different textures and a single color. Definition can be produced by scoring or sawcutting. Texture adds depth and slip resistance when aggregates are exposed by sandblasting or use of a surface retarder, and color-conditioned concrete can achieve the look and feel of more expensive paving materials such as granite.

To allow hardscapes and floors to reach their full color potential and beauty, Scofield has developed a complete system of color-matched curing, finishing, and joint-sealing materials especially designed for use with color-conditioned concrete. Scofield products are also available for producing superior exposed aggregate flatwork. Additional information is available in Scofield's Tech-Data Bulletins *A-514 LITHOCHROME® Colorwax™, A-634 COLORCURE® Concrete Sealer,* and *S-404-3G LITHOSEAL™ Trafficalk-3G™, T-204 LITHOTEX® Top Surface Retarder,* and *A-764 CEMENTONE® Clear Sealer.*

CHROMIX Admixtures are premeasured for the concrete mix design and packaged in SCOFIELD™ Tossin™ disintegrating bags. Unlike products that increase the risk of error by requiring weighing, mathematical calculations, or the addition of multiple bags, only one bag of a CHROMIX Admixture is added for each cubic yard (meter) of concrete. Simple and easy to use, the Tossin bag is normally added unopened directly into the mixer truck, minimizing dust, lowering disposal and labor costs, and saving room in overcrowded landfills.

For some flatwork applications LITHOCHROME® Color Hardener is preferentially recommended. Applied by the dry-shake method, it produces hard, dense surfaces with increased resistance to wear, abrasion, and the effects of freeze/thaw cycles and deicing salts. LITHOCHROME Color Hardener should normally be used to color-harden flat-troweled interior floors, and although concrete color-conditioned with CHROMIX Admixture can be imprinted, the use of LITHOCHROME Color Hardener is preferred. Its rich finishing paste creates sharper patterns and its harder surface provides greater wear resistance. When a heavier-duty, more slip-resistant surface is required, the use of EMERCHROME® Floor Hardener should be considered, and for elegant, stone-like, multicolored floors and hardscapes, the possibilities of LITHOTEX® Colorstone™ should be explored. Additional information is available in Scofield's Tech-Data Bulletins *A-104 LITHOCHROME Color Hardener, A-204 EMERCHROME Floor Hardener*, and *A-904 LITHOTEX Colorstone*.

Applying LITHOCHROME® Chemstain™ over concrete color-conditioned with a CHROMIX Admixture creates uneven, variegated or translucent color effects, much like the shadings of natural stone or the aged appearance of a time-worn patina. The result is unique to each surface and cannot be duplicated by other coloring materials. When chemically staining new concrete flatwork, the use of LITHOCHROME Color Hardener provides a wider range of colors and a harder, more abrasion-resistant surface. Additional information is available in Scofield's Tech-Data Bulletin *A-414 LITHOCHROME Chemstain.*

Before using, check with your Scofield Customer Service Representative to ensure that you have the most recent Scofield Tech-Data Bulletins.

2. Limitations: Due to the graying effect of most cements, there are some colors that can only be produced using very light or white cements, and some light or intense colors cannot be cost-effectively achieved. Variations in slump, cement type and brand, color variations in the cement or aggregates, finished texture, timing of operations, curing or forming methods, and the choice of release agents or surface treatments will each produce distinct, though in most cases slight, variations in apparent color.

The mix should have a maximum slump of four inches (100 mm) and must contain a minimum of five sacks per cubic yard (275 kg/m^3) of cement for flatwork and six sacks per cubic yard (335 kg/m^3) for vertical concrete. No calcium chloride should be added. The same brand of cement, source of sand, and water/cement ratio should be maintained for each load of concrete of the same color.

CHROMIX Admixtures should never be added to an empty drum or at the tail end of a load. Though manufactured to disintegrate in typical concrete mixes, SCOFIELD Tossin bags may not completely disintegrate during mixing when certain batching and mixing procedures or equipment is used, or with some mix ingredients and proportions. A test batch may be required to determine mixing time and suitability, or the Tossin bag may be opened and the color-conditioning admixture batched directly into the mix.

3. Composition and Materials: Manufactured specifically for use in concrete, CHROMIX Admixtures are colored, water-reducing, set-controlling admixtures that contain no calcium chloride. They are formulated to disperse color accurately and uniformly throughout the concrete mix, with coloring agents that are limeproof and have maximum resistance to the effects of sunlight (UV).

4. Types: CHROMIX Admixtures are available in several types for specific project requirements. CHROMIX Admixture, a Type A, normal-set water-reducing admixture, and CHROMIX Admixture, Retarder, a Type D retarded-set water-reducing admixture, have a refined lignosulfonate base. CHROMIX Admixture, HCA-2 Retarder, HCA-3 Retarder, and HCA-4 Retarder are recommended when greater retardation is required and are hydroxylated carboxylic acid based. The suffix numbers refer to the rate of retardation with HCA-4 producing the greatest retardation.

5. Applicable Standards and Building Codes: As formulated water-reducing admixtures, all CHROMIX Admixtures conform to the following specifications: ASTM C 494, AASHTO M 194, and CRD C 87. As formulated coloring agents, they conform to ASTM C 979.

All CHROMIX Admixtures meet the requirements of the Uniform Building Code and the Standard Building Code for use in reinforced and prestressed concrete, and are approved by the City of Los Angeles under its classification

Admixtures for Cement Reduction. Scofield should be contacted about approvals in specific jurisdictions.

Professional concreting standards and practices, including those published by the American Concrete Institute (ACI), the Portland Cement Association (PCA), and the National Ready Mixed Concrete Association (NRMCA) should be followed.

6. Colors: All CHROMIX Admixtures are available in sixteen standard and eight designer colors classified into three price groups. Scofield's Color Chart A-312 depicts the colors that may be expected when using a medium-gray shade of cement and curing with LITHOCHROME Colorwax or COLORCURE Concrete Sealer in the matching color. Upon request, Scofield's laboratories will prepare special concrete samples using cement and aggregates furnished from the job location.

With sufficient prior notification, custom colors can be formulated with minimum orders of 50 Units (equivalent to 50 cubic yards of five-sack concrete). Higher cement contents will have lower minimum amounts. Custom colors of Scofield's color-matched curing materials are also available.

CHROMIX Admixtures normally produce earth-tone colors. When more intense colors or when certain light colors are desired, the use of LITHOCHROME Color Hardener should be considered.

7. Sizes and Dosage: All CHROMIX Admixtures are packaged to eliminate weighing and measuring errors and are sold by the bag, not by weight. CHROMIX Admixtures are premeasured and packaged in SCOFIELD Tossin bags for easy and accurate addition into the concrete mix.

Standard colors of CHROMIX Admixture are normally available in bags that contain the proper dosage for either five sacks or six sacks of cement per cubic yard (275 kg/m^3 or 335 kg/m^3) of concrete. On special order, any type of CHROMIX Admixture can be packaged for a cubic yard or cubic meter of concrete having any specified cement content. If the mix contains cement substitutes, such as flyash or blast-furnace slag, their weight should be added to the weight of the cement when determining the correct CHROMIX Admixture dosage.

CHROMIX Admixture, Retarder and HCA Retarders are not stocked but custom-manufactured on order. The minimum order for CHROMIX Admixture, Retarder is 50 Units (equivalent to 50 cubic yards of five-sack concrete or 42 cubic yards of six-sack concrete). The minimum order for any CHROMIX Admixture, HCA Retarder is 200 Units. Higher cement contents will have proportionally lower minimum amounts.

8. Shelf Life: Under normal conditions when kept dry and moisture free, the shelf life of all CHROMIX Admixtures is at least one year from the date of purchase. Inventory should be rotated.

9. Cautions: Add bag unopened to minimize dust. Use with adequate ventilation. Should dusty conditions develop, a dust mask (NIOSH/MSHA TC 21C approved) is recommended. Before using or handling, read the *Material Safety Data Sheet and Warranty*.

First Aid: Eyes—DO NOT RUB EYES. Immediately flush thoroughly with plenty of water. Skin—Wash thoroughly with soap and water. Inhalation—Move to fresh air. If symptoms persist or develop, or if ingested, get medical attention. Wash thoroughly immediately after handling. DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN.

10. Technical Data: All CHROMIX Admixtures increase concrete strength at all ages, control the set time, and improve workability and freeze/thaw resistance. Mixes containing CHROMIX Admixture or CHROMIX Admixture Retarder exhibit higher 28-day and one-year compressive strengths when compared to control mixes containing no admixture. Compressive strengths of concrete with various, representative cement contents are given in the table below. All values are typical of those obtained when tested by ASTM testing methods.

11. Concrete Mix Design: Irrespective of strength requirements, minimum cement contents are required to assure adequate fines for finishing and texturing architectural concrete. For flatwork, the cement content must be a minimum of five sacks per cubic yard (275 kg/m^3) of concrete. The American Concrete Institute in ACI 302 IR *Recommended Practice for Concrete Floor and Slab Construction* recommends a minimum of five and one-half sacks per cubic yard (5$^1/_2$ sks or 305 kg/m^3) for concrete floors and slabs containing one inch (25 mm) aggregate. For vertical concrete, the cement content must be a minimum of six sacks per cubic yard (335 kg/m^3).

The dosage rate used in designing the mix must be as specified by Scofield for the particular color and type of CHROMIX Admixture designated. CHROMIX Admixture, Retarder, or one of the HCA Retarder types, should be considered for use in vertical concrete, to facilitate continuity of placement and consolidation, and in concrete flatwork placed during hot weather. Because of the substantial retardation achieved with HCA-3 and HCA-4 Retarder they should be used only after consulting Scofield for suggestions.

Under average conditions, concrete containing CHROMIX Admixtures will entrain 1–3 percent air and have a water-requirement reduction of 7–8 percent. An air-entraining admixture complying with ASTM C 260 should be used in all concrete flatwork subject to freeze/thaw cycles and as specified or required by the engineer for workability or durability.

Addition of supplemental admixtures or cement substitutes may affect the color, finishing characteristics, and other qualities of the concrete. Calcium chloride should not be added to the mix since it causes mottling and surface discoloration. Supplemental admixtures, such as additional water-reducing admixtures, waterproofing agents, and super plasticizers, or cement substitutes, such as flyash or slag, should not be used unless Scofield is consulted for suggestions. If a supplemental admixture or cement substitute is used, it must be added to all mixes on the project having the same color.

The mix should contain only nonreactive aggregates and have as low a slump as possible. A four inch (100 mm) slump or less is recommended.

12. Jobsite Samples: Producing architectural concrete requires skill and practice. For vertical precast or cast-in-place concrete, tilt-up concrete, and for architectural flatwork, representative jobsite

Compressive Strengths and Water/Cement Ratios

Average of three tests. Slump 4" ± 0.25". Maximum aggregate size: 1" for 5.0 and 5.6 sack mixes; $^3/_8$" for 7.5 sack mix.

	Control No Admixture	CHROMIX® Admixture (Normal Set)	CHROMIX® Admixture Retarder	CHROMIX® Admixture HCA-2 Retarder
5.0 sacks/cubic yard				
28 day compressive, psi	3,592	4,350	4,765	5,105
1 year compressive, psi	4,993	6,020	5,965	5,922
W/C Ratio	0.64	0.61	0.60	0.59
5.6 sacks/cubic yard				
28 day compressive, psi	3,993	4,717	4,885	5,497
1 year compressive, psi	5,700	6,880	7,212	6,503
W/C Ratio	0.62	0.55	0.53	0.54
7.5 sacks/cubic yard				
28 day compressive, psi	5,954	6,626	6,331	6,803
1 year compressive, psi	7,497	7,863	7,805	8,090
W/C Ratio	0.48	0.47	0.45	0.47

samples should be produced and approved at least one month prior to concreting. A separate sample should be cast for each color and mix design. Each sample should be of adequate size to be representative, be made with the job materials, and use the contemplated construction techniques. For accurate color, the quantity of concrete mixed should not be less than one-third of the capacity of the mixing drum (a minimum of three cubic yards in a nine cubic yard load) and should always be in full cubic yard (cubic meter) increments.

Vertical and tilt-up sample panels should be made using the selected form materials, snap-ties, spacers, inserts, pickup bolts, release agents, and surface treatments. Areas to be patched should be included so that patching techniques may be developed. Horizontal samples should be cured and if specified, finished with the appropriate, color-matched curing and finishing material or clear sealer. All surfaces should be textured as specified.

Portions of the actual cement and aggregates used to cast the jobsite samples should be retained. Cement and aggregates from the same source should be used throughout the job and periodically sampled for comparison of color and gradation with the material used in the approved sample.

13. Batching and Depositing: Weather conditions should be considered when planning installation. Professional practices as described in ACI standards 305R *Hot Weather Concreting* and 306R *Cold Weather Concreting* should be followed.

The concrete mix should be controlled to provide good batch-to-batch uniformity. Ready-mix trucks should be in good condition. The cement should be weighed accurately. The same brand of cement, source of sand, and water/cement ratio should be maintained for each load of concrete of the same color. A method is available for wet-checking the approximate color of each load before placing. Scofield should be consulted for details.

Before batching, the drum must be thoroughly clean and wet. The quantity of colored concrete mixed should not be less than one-third of the capacity of the mixing drum (a minimum of three cubic yards in a nine cubic yard load) and should always be in full cubic yard (cubic meter) increments. Approximately 40 gallons (150 L) of the mix water, and preferably, a portion of the aggregates should be batched into the mixer drum. Then one unopened Tossin bag of the specified CHROMIX Admixture, correctly packaged for the mix design, should be added for each cubic yard (meter) of concrete. The remaining ingredients should be added, and the load mixed at the specified mixing speed for a minimum of 130 revolutions, before discharging. CHROMIX Admixtures should never be added to an empty drum or at the tail end of a load.

When pumping, the pump should be capable of depositing a low-slump concrete mix containing one-inch rock and must be primed with an identically colored slurry mix. The SCOFIELD Tossin bag should not be added to the slurry mix but opened, and the color-conditioning admixture batched directly into the mix.

When depositing, the concrete should be deposited near its final position to avoid segregation due to rehandling or flowing. If held-back water is added at the jobsite, the concrete should be mixed at mixing speed for a minimum of 30 revolutions after addition of the water and before depositing. The slump of the concrete should be consistent throughout the project at four inches (100 mm) or less, and in no event should exceed five inches (125 mm) for any load. No water should be added after a portion of the load has been discharged. Measuring and adjusting the air content of the load is recommended immediately prior to placement. Concrete that has started to set must not be retempered, but should be discarded.

14. Flatwork Installation and Curing: Only uniformly slip-resistant textures, such as broom, swirl, sponge float, exposed-aggregate, or sandblasted should be considered for concrete flatwork. When a flat surface is required, extra precautions should be taken to ensure that the surface is uniformly troweled so that it will not be slippery. Representative jobsite samples as described in *12. Jobsite Samples* should be produced prior to concrete installation to verify safety and approve the adequacy of wet and dry 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.

The subgrade should be well drained and have adequate and uniform load-bearing characteristics. It must be moist, completely consolidated, and free of frost at the time of concreting. If necessary, the subgrade may be dampened with water in advance of concreting, but concrete should not be placed over freestanding water or muddy, frozen, or soft spots.

The concrete should be placed and consolidated so that it completely fills all space inside the forms and provides a suitable surface for finishing. Concrete adjacent to the forms should be spaded.

Hard steel troweling should be minimized to avoid trowel burns. For uniformity of appearance, consistent finishing practices should be used when applying the specified texture. The edges should be finished first. All surfaces should be finished within reasonably the same time after placing. Water must not be sprinkled or otherwise added to the surface of the slab while finishing. Long-handled fresnos must not be used. All final hand-finishing should be done in the same direction.

When concrete is placed and finished in hot windy weather, precautions must be taken to prevent plastic cracking resulting from excessively rapid drying at the surface as described in CIP 5 *Plastic Shrinkage Cracking* published by the National Ready Mixed Concrete Association.

Until it is completely cured, the color of concrete is normally less uniform and appears darker than the final color. Use of one of Scofield's color-matched curing materials enhances the depth of color, produces more uniformly colored concrete, and provides surface protection.

LITHOCHROME Colorwax should be used to cure exterior flatwork that will be allowed to weather naturally or that will only receive occasional maintenance and recoating. Interior floors and exterior flatwork that will receive regular maintenance and recoating should be cured with COLORCURE Concrete Sealer. Both curing materials have been specially formulated for use with colored concrete and exceed ASTM *C 309 Liquid Membrane-Forming Compounds for Curing Concrete*. When curing with LITHOCHROME Colorwax, an optional thin finish coat may be applied, if desired. When curing with COLORCURE Concrete Sealer, one thin finish coat is required. Scofield's Tech-Data Bulletin *A-514 LITHOCHROME Colorwax* or *A-634 COLORCURE Concrete Sealer* must be read completely before using.

Though not normally recommended for colored concrete, when curing color-conditioned concrete that is to be chemically stained or have the aggregate exposed, new and unwrinkled, nonstaining, high-quality, kraft curing paper should be used. Additional information is available in the appropriate Scofield Tech-Data Bulletins *A-414 LITHOCHROME Chemstain* or *T-203 LITHOTEX Top Surface Retarder*, and *A-764 CEMENTONE Clear Sealer*.

Scofield should be consulted prior to curing by other methods. Curing with water is usually detrimental to color uniformity. Curing with burlap and other wet coverings, plastic sheeting, or other liquid-membrane type curing compounds is not recommended as mottling or staining normally occurs.

All surfaces should be thoroughly inspected to verify and approve installation and safety, including wet and dry slip resistance, before opening the area to traffic.

15. Tilt-Up Concrete Installation: Prior to commencement of construction, a representative sample panel should be cast as described in *12. Jobsite Samples*.

Following the procedures in ACI *551 Tilt-Up Concrete Structures* is suggested. The casting slab should be flat, level, and of adequate strength to support the panels. Casting over joints should be avoided when possible to prevent transferring (shadowing) to the bottom of the panels. If panels must span a joint, plastic zip strips are recommended to form the joints, alternately the joints must be taped or otherwise sealed.

All concrete panels that are to serve as a casting bed should be trowel finished to produce a flat, level surface. The casting surface must be coated with a nonstaining, surface-sealing release agent capable of preventing the passage of any moisture into the casting bed. Otherwise, curing of the bottom surfaces will be uneven, creating discolorations that cannot be removed by sandblasting. Panels that are stacked, normally do not exhibit as uniform a color and should be placed in less visible areas of the building.

The pour for each panel must be continuous to prevent cold joints. To prevent uneven distribution of the aggregates near the bottom or top surfaces, the

concrete must be vibrated evenly. Stubby vibrators, approximately two inches (50 mm) in diameter and four inches (100 mm) in length should be used. The vibrator should be inserted perpendicular to the top of the panel without touching the reinforcing steel and must not be used to move the concrete. Vibration should continue only to the extent needed to achieve proper consolidation.

After lifting, the outside surface must be textured, usually by light sandblasting, to remove all release agents and curing compounds. The interior surface may be painted or textured by sandblasting. All pickup bolt holes or damaged areas should be patched with CHROMIX™ Conpatch™ in the matching color. Scofield's Tech-Data Bulletin *M-304 CHROMIX Conpatch* must be read completely before using.

16. Vertical Concrete Installation: Prior to the start of construction, a representative sample panel should be cast as described in *12. Jobsite Samples*.

Formwork for architectural concrete must be of the highest quality to obtain smooth, straight, nonyielding surfaces. Unless a form liner has been specified, a resin, high-density overlay or an epoxy or urethane-coated plywood should be used. Alternatively, all plywood plugs (boats) must be filled and the forms coated with a material that is sufficiently heavy to prevent unwanted grain transfer, such as a polyurethane. If the grain pattern is meant to transfer and a natural wood-grain form is to be used, the forms should be seasoned prior to their first use with a cement slurry containing the specified CHROMIX Admixture so that the same color is achieved with new forms as with forms that have been repeatedly used. For color uniformity, procedures and materials used in preparing the forms must not be varied during the job. All forms should be cleaned thoroughly prior to use or reuse. Release agents must be nonstaining.

Any leakage causes the water/cement ratio of the cement paste to vary near the leakage points and discoloration of the finished concrete will result. This staining will not be removed by sandblasting or bush-hammering. All plastic snap-tie cones should be of the nonleaking type. After cleaning, joints in the forms should be sealed with a two-inch wide vinyl or polyester tape. Alternatively, the joints may be sealed with a silicone sealant applied to the edges during assembly.

To prevent staining of the finished concrete surface, form ties should leave no metal closer to the surface of the concrete than 1½ inches. The location of tie holes is normally selected so as not to detract from the overall appearance of the structure, since it is virtually impossible to conceal them completely.

All walls should be cast to their full height between engineered horizontal joints. For design reasons, a taper-cut recessed chamfer strip is often placed at the horizontal joint locations.

All concrete should be placed carefully so that surface grinding can be avoided and a minimum of patching will be required. When possible, both external and internal vibrators should be used. Over-vibration should be avoided, and internal vibrators must not be used to move the concrete.

To produce more uniform color, all forms should be stripped when the concrete is the same age. All vertical surfaces should be sandblasted sufficiently to remove minor form marks and any colored residue resulting from water, cement, and coloring agents migrating (bleeding) toward the forms during concrete placement, vibration, and compaction.

After the concrete has been textured, patching, if required, should be performed using CHROMIX Conpatch. Scofield's Tech-Data Bulletin *M-304 CHROMIX Conpatch* must be read completely before using.

To protect the finished surfaces from dirt and moisture penetration, a high-quality, clear water repellent should be applied after the walls have been textured, patched, and allowed to cure for a minimum of 28 days. Prior to general application, a test section should be applied to the jobsite sample described in *12. Jobsite Samples*, following the manufacturer's instructions and safety requirements.

17. Joint Sealing: Scofield manufactures a complete line of joint sealants optimized for specific applications. LITHOSEAL™ Trafficalk-3G™ is color-matched to the CHROMIX Admixture colors and specially formulated for high-performance in pedestrian and vehicular traffic areas. LITHOSEAL™ Buildingcalk-3G™ is a color-matched, three-component sealant formulated for dynamically moving vertical joints in buildings and structures, and LITHOSEAL™ Buildingcalk-1G™ is an oxygen-curing, one-component sealant for the same use, packaged in LITHOSEAL™ Easipaks™ for ease of loading. The appropriate Scofield Tech-Data Bulletin *S-404-3G LITHOSEAL Trafficalk-3G*, *S-304-3G LITHOSEAL Buildingcalk-3G*, or *S-304-1G LITHOSEAL Buildingcalk-1G* must be read completely before using.

18. Availability: CHROMIX Admixtures are marketed nationwide and internationally, through strategically located ready-mix firms, dealers, and representatives. Scofield should be contacted for its nearest representative.

19. Costs: CHROMIX Admixtures are normally purchased with the concrete from the ready-mix plant. Prices vary with the cement content of the mix, CHROMIX Admixture color, and other factors. Standard and designer colors are divided into three price groups, with Group 1 colors being the lowest in cost. For standard colors, the group number appears as the first digit in the color number preceding the color name. For designer colors, the group number appears on the CHROMIX Admixtures Color Chart A-312. Prices are subject to change.

Custom colors are priced similarly to standard and designer colors. Blues and greens are higher. Scofield should be consulted for the prices of specific custom colors.

20. Maintenance: Color-conditioned concrete flatwork or floors should be maintained by sweeping. Spills should be cleaned up when they occur. Dirt may be hosed off with water. Heavily soiled areas may be cleaned by wet mopping or scrubbing with a stiff-bristle brush and a properly diluted, high-quality commercial detergent. For larger areas, walk-behind or ride-on scrubbing machines are efficient and cost effective.

For concrete flatwork finish-coated with COLORCURE Concrete Sealer or LITHOCHROME Colorwax, a maintenance application may be made after the original coat has weathered or worn from the surface. The appropriate tech-data *A-514 LITHOCHROME Colorwax* or *A-634 COLORCURE Concrete Sealer* must be read completely before using.

Damaged areas in new or old concrete, color-conditioned with a CHROMIX Admixture, can be patched using CHROMIX Conpatch in the matching color. Tech-Data Bulletin *M-304 CHROMIX Conpatch* must be read completely before using.

21. 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 Color-Conditioning Concrete Flatwork: All concrete designated as colored in the plans and specifications shall contain the proper proportion of CHROMIX® Admixture for Color-Conditioned Concrete,_____ color, manufactured by L. M. Scofield Company, (800) 800-9900, Los Angeles, CA, (323) 720-3000 and Atlanta, GA, (770) 920-6000. The color-conditioning admixture shall be a single-component, colored, water-reducing, set-controlling admixture, factory formulated and packaged in cubic yard dosage increments, not multiple additives and pigments added separately into the mix. It shall comply with ASTM C 494. The concrete shall contain _____ sacks of cement per cubic yard. No calcium chloride shall be used. The slump shall not exceed four inches. All surfaces shall be finished uniformly. All colored concrete shall be cured *(optional: and finished)* with LITHOCHROME® Colorwax™ *(or cured and finished with COLORCURE® Concrete Sealer)* in the matching color and the joints sealed with LITHOSEAL™ Trafficalk-3G™ in the matching color. The concrete shall never be covered with plastic sheeting. All mix design, batching, placing, finishing, curing, joint sealing, and patching shall be in accordance with the Scofield Tech-Data Bulletins *A-304 CHROMIX® Admixtures for Color-Conditioned Concrete*, *A-514 LITHOCHROME® Colorwax*™ (or *A-634 COLORCURE® Concrete Sealer*), *S-404-3G LITHOSEAL™ Trafficalk-3G*™, and *M-304 CHROMIX™ Conpatch*™.