



SCOFIELD® Integral Color SG

An economical blend of synthetic iron oxide pigments for coloring ready-mix concrete or manufactured concrete products.

TECH-DATA BULLETIN TD-7200.03 Rev. 11.25.2014

1. Product Description:

SCOFIELD® Integral Color SG Standard Grade provides a basic, cost-effective alternative for permanently coloring concrete throughout the batch. Concrete colored with this system has maximum resistance to ultraviolet (UV) radiation and is suitable for use when minor color variation is acceptable in vertical, precast, cast-in-place, and tilt-up construction or architectural flatwork.

SCOFIELD Integral Color SG is available in 10- and 12-pound disintegrating bags to accommodate 5-sack and 6-sack mix markets. One, two or more pounds of SCOFIELD Integral Color SG are added to the ready-mix truck for each sack of cement, depending on the color desired. Where possible, the Tossin bag is normally added, unopened, directly into the mixer, minimizing dust, lowering disposal costs and reducing labor.

For best results, floors and hardscapes colored with SCOFIELD Integral Color SG should be cured and sealed using either SCOFIELD® Cureseal-W™ or SCOFIELD®

Cure-seal-S™. Additional information is available in Scofield's Tech-Data Bulletins *TD-1623 SCOFIELD Cureseal-W* and *TD-1631/32 SCOFIELD Cureseal-S*.

SCOFIELD Integral Color SG is ideal for use in the manufactured concrete products industry for the production of colored concrete block, brick, pavers, and other precast applications.

SCOFIELD Integral Color SG is not an equivalent to CHROMIX® Admixtures for Color-Conditioned® Concrete. When maximum color uniformity is essential, the use of CHROMIX Admixtures for Color-Conditioned Concrete is recommended. CHROMIX Admixtures provide permanent, fade-resistant, uniform, and streak-free integral color-conditioning, 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 while reducing color bleeding, laitance, and efflorescence. For full color development, concrete that is color-conditioned with CHROMIX Admixtures should be cured and sealed with color-matched LITHOCHROME® Colorwax™ or COLORCURE® Concrete Sealer. Additional information is available in the appropriate Scofield Tech-Data Bulletins *TD-1200 CHROMIX Admixtures for Color-Conditioned Concrete*, *TD-1580 LITHOCHROME Colorwax*, or *TD-1680 COLORCURE Concrete Sealer*.

2. Limitations:

Synthetic iron oxides have an inherent water demand, and the user may need to adjust the mix accordingly. Under certain conditions, synthetic iron oxides may agglomerate, reducing the effective tint strength. For optimum results, the use of CHROMIX Admixtures for Color-Conditioned Concrete should be considered.

Due to the base color inherent in concrete mixes, some colors are difficult to produce. Each aspect of the concrete mix design and the placing and finishing process can produce variations in the final color. These include, but are not limited to, the following: (a) variations in cement, pozzolan or aggregate, (b) variations in slump or water content, (c) timing of operations, (d) finished texture, (e) curing or forming methods used, and (f) type and use of release agents or surface treatments. Each can be expected to produce distinct, though in most cases slight, variations in the final appearance and characteristics obtained.

The same brand of cement, source of aggregates, mix design and water/cement ratio should be maintained for each load of concrete of the same color.

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.

SCOFIELD Integral Color SG must not be added to an empty drum or at the tail end of a load. Though manufactured to disintegrate in typical concrete mixes, SCOFIELD Integral Color SG bags may not completely disintegrate during mixing when certain batching and mixing procedures or equipment are used, or with some mix ingredients and proportions. A test batch may be required to determine mixing time and suitability. Alternatively, the bag may be opened and the contents combined directly into the mix.

3. Composition and Materials:

SCOFIELD Integral Color SG is a high quality coloring agent composed of pure synthetic iron oxide pigments.

4. Applicable Standards:

As a formulated coloring agent, SCOFIELD Integral Color SG conforms to ASTM *C 979 Pigments for Integrally Colored Concrete*.

5. Colors:

SCOFIELD Integral Color SG is available in a wide range of standard colors. Scofield's Color Chart *A-322 SCOFIELD Integral Color SG* depicts the colors that may be expected and correct dosages when using a medium-gray shade of cement and curing with SCOFIELD Cureseal-W or SCOFIELD Cureseal-S.

SCOFIELD Integral Color SG normally produces earth-tone colors. When more intense colors or when certain light colors are desired, the use of LITHOCHROME® Color Hardener should be considered.

6. Packaging and Dosage:

SCOFIELD Integral Color SG is packaged to eliminate weighing and measuring errors. It is premeasured and packaged in disintegrating bags for easy and accurate addition into the concrete mix.

One, two, or more pounds of SCOFIELD Integral Color SG per sack of cement are added to the ready-mix truck to achieve the desired color. If the mix contains supplementary cementitious materials (SCMs) such as flyash or blast-furnace slag, their weight must be added to the weight of the cement when determining the correct SCOFIELD Integral Color SG dosage.

7. Storage and Shelf Life:

Under normal conditions when kept dry and moisture free, the shelf life of SCOFIELD Integral Color SG is at least 2 years from the date of manufacture. Inventory must be rotated to maintain product that is within shelf life limits.



8. Cautions:

WARNING!

DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN. Use only with adequate ventilation. Add bag unopened to minimize dust. Should dusty conditions develop, wear dust (particulate) respirator (NIOSH TC-84A approved), safety goggles and gloves. Follow respirator manufacturer's directions for respirator use.

First Aid: Eyes—DO NOT RUB EYES. Immediately flush thoroughly with large amounts 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. Store in a cool, dry, well-ventilated area, in unopened original packaging or in tightly closed, labeled containers. Avoid generating dust during recovery or disposal. Disposal of all residual or recovered product must be in accordance with all applicable federal, state, and local regulations. Before using or handling, read the *Material Safety Data Sheet and Warranty*.

9. 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 samples must be produced and approved at least one month prior to concreting. A separate sample must be cast for each color and mix design. Each sample must be of adequate size to be representative, be made with the job materials, and use the contemplated construction techniques. For accurate color, the minimum quantity of concrete mixed should be as stated in section 2. *Limitations*.

Concrete construction materials and methods must follow established ACI practices and those as described in sections 10, 11, 12, 13, and 14 of this Tech-Data Bulletin. All surfaces should be textured as specified. Prior to the final concrete installation, verify overall safety and approve the adequacy of wet and dry slip resistance.

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.

10. Concrete Mix Design:

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 5 sacks per cubic yard (275 kg/m³) of concrete. For vertical concrete, the cement content must be a minimum of 6 sacks per cubic yard (335 kg/m³).

The mix design must not permit segregation of components during pumping, placing or consolidation of the concrete. In the absence of a specific mix design, a 4-inch maximum slump is recommended. No calcium chloride should be added, as it causes mottling and surface discoloration. The mix should contain only nonreactive aggregates.

Addition of supplemental admixtures or supplementary cementitious materials (SCMs) may affect the color, finishing characteristics, and other qualities of the concrete. Admixtures and SCMs should only be used after conducting appropriate batch tests and a competent engineering assessment. If any such materials are used, they must be added to all mixes on the project having the same color.

11. 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.

Before batching, the drum must be thoroughly clean and wet. The measured starting quantity of the mix water for the batch and preferably, a portion of the aggregates should be batched into the mixer drum. Then the correct number of unopened bags for the specified color of SCOFIELD Integral Color SG should be added. The remaining ingredients should be added, and the load mixed at the specified mixing speed for a minimum of 130 revolutions, before discharging. SCOFIELD Integral Color SG should never be added to an empty drum or at the tail end of a load.

When pumping, the pump should be capable of handling a low-slump concrete mix containing 1-inch (25 mm) rock and must be primed with an identically colored slurry mix. The SCOFIELD Integral Color SG bag must not be added to the slurry mix but opened, and the contents 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. 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.

The addition of SCOFIELD Integral Color SG into a block or precast mixer should occur after all other mix materials have been batched. For best results open the bag and sift the SCOFIELD Integral Color SG into the mix evenly and mix until the color is fully dispersed. Do not deposit the bag into the mixer.

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.

12. 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. Adequate precautions must be taken to ensure that the surface is not slippery. Representative jobsite samples as described in section 9. *Jobsite Samples* should be produced prior to concrete installation to verify safety and approve the adequacy of wet and dry slip resistance.

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 over soft, muddy or frozen ground.

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 of architectural concrete 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. 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. Flatwork that is air cured may exhibit some whitening of the surface and be less brilliant in color.

Freshly placed concrete should be cured with SCOFIELD Cureseal-W or SCOFIELD Cureseal-S. Scofield's curing materials have been specially formulated for use with colored concrete and conform to the moisture retention requirements of ASTM C 309 *Liquid Membrane-Forming Compounds for Curing Concrete*. When curing with SCOFIELD Cureseal-W, an optional thin seal coat may be applied, if needed or desired. The appropriate Scofield Tech-Data Bulletin *TD-1623 SCOFIELD Cureseal-W or TD-1631/32 SCOFIELD Cureseal-S* must be read completely before using.

Though not normally recommended for colored concrete, when curing colored concrete that is to be chemically stained or have the aggregate exposed, new and unwrinkled, non-staining, high-quality kraft curing paper should be used. Concrete curing paper should conform to ASTM C 171 *Sheet Materials for Curing Concrete*. Additional information is available in the appropriate Scofield Tech-Data Bulletin *TD-1320 LITHOCHROME® Chemstain® Classic* or *TD-3640 LITHOTEX® Top Surface Retarder*.

Scofield should be consulted prior to curing by other methods. Curing with water is 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, streaking or staining normally occurs.

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

■ 13. Tilt-Up Concrete Construction:

Prior to commencement of construction, a representative sample panel should be cast as described in section 9. *Jobsite Samples*. Follow the procedures set forth in *ACI 551 Tilt-Up Concrete Structures*. The casting slab should be flat, level, and of adequate strength to support the panels. Avoid casting over joints to minimize variations in the down face of the panel.

All concrete surfaces that are to serve as casting beds must be trowel finished to a flat, level surface. All casting surfaces must receive the same bond breaking system, one that prevents the passage of any moisture into the casting bed. Otherwise, curing of the down faces will be uneven, creating discolorations that cannot be removed by sandblasting. Stacked panels generally do not exhibit as uniform a color as panels poured directly on casting beds. The placement for each panel must be continuous; any interruptions in the process are likely to cause visible differences in the color.

■ 14. Vertical Concrete Installation:

Prior to the start of construction, a representative sample panel should be cast as described in section 9. *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 epoxy- or urethane-coated plywood should be used. Alternatively, all plywood plugs (boots) must be filled and the forms coated with a material such as polyurethane that is sufficiently heavy to prevent unwanted grain transfer. 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 color of SCOFIELD Integral Color SG 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 be permanent and not subject to removal by sandblasting or other mechanical means. All plastic snap-tie cones should be of the nonleaking type. After cleaning, joints in the forms should be sealed with a 2-inch (50 mm) 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 (38 mm). 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.

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.

■ 15. Maintenance:

It is recommended that a routine maintenance schedule be developed and followed after placing colored concrete in order to maintain its appearance. Colored concrete should be inspected at least once a year. When needed, depending on wear caused by traffic conditions or weather, it should be cleaned and resealed.

For exterior concrete hardscapes cured or sealed with SCOFIELD Cureseal-W or SCOFIELD Cureseal-S, a maintenance application should be made periodically to protect the base sealer. Instructions for the maintenance and resealing of concrete surfaces are available in Scofield's Tech-Data Bulletins *TD-1623 SCOFIELD Cureseal-W* and *TD-1631/32 SCOFIELD Cureseal-S* which must be read completely before using.

Interior concrete floor surfaces colored with SCOFIELD Integral Color SG and cured or sealed with a recommended Scofield product should be protected with a compatible, slip-resistant, emulsion-type, commercial floor finish following the manufacturer's instructions and safety requirements.

■ 16. Availability:

SCOFIELD Integral Color SG is marketed nationwide through strategically located ready-mix firms, dealers, and representatives. Contact Scofield for ordering information.

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.

■ **17. Limited Warranty:**

Since no control is exercised over product use, L. M. Scofield Company (Scofield) represents and warrants only that its products are of consistent quality within manufacturing tolerances. NO OTHER ORAL OR WRITTEN REPRESENTATION OR STATEMENT OF ANY KIND, EXPRESS OR IMPLIED, NOW OR HEREAFTER MADE IS AUTHORIZED OR WARRANTED BY SCOFIELD, INCLUDING THOSE OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Liability for breach of contract, negligence, or on any other legal basis is limited to the lesser of refund or replacement of defective materials. SCOFIELD WILL NOT BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING FOR DELAYS OR LOST PROFITS. Communication of this warranty and its limitations to end users is not the responsibility of Scofield, but should be communicated by those in direct contract with the end user. Any claim regarding product defect must be received in writing within one year from the date of manufacture. No claim will be considered without such written notice or after the specified time interval. The end user shall determine the suitability of the products for the intended use and assumes all risks and liability in connection therewith.



1 800 800 9900 or www.scofield.com

SCOFIELD PRODUCTS ARE INTENDED FOR PROFESSIONAL USE ONLY

■ **L. M. Scofield Company customer service:** 1 800 800 9900

Western Headquarters: 6533 Bandini Blvd., Los Angeles, CA 90040 **voice:** 323 720 3000 **fax:** 323 720 3030

Eastern Headquarters: 4155 Scofield Road, Douglasville, GA 30134 **voice:** 770 920 6000 **fax:** 770 920 6060

www.scofield.com