



# LITHOTEX® Top Surface Retarder

A surface-set retarder for producing exposed-aggregate finishes on freshly placed, architectural concrete flatwork.

## TECH-DATA BULLETIN T-204.04

### 1. Product Description:

LITHOTEX® Top Surface Retarder is designed to conveniently and economically produce quality exposed-aggregate concrete. Applied to freshly placed concrete, LITHOTEX Top Surface Retarder significantly delays the set of the surface without disturbing the setting rate and strength gain of the underlying concrete. When the aggregate is later exposed by hosing and brushing, aggregate displacement is minimized and depth of reveal is more accurately controlled. Compared to sandblasting, a more natural look is achieved, with no scarring of the aggregate or concrete matrix.

The use of LITHOTEX Top Surface Retarder offers results superior to those obtained when aggregates are exposed by hosing and scrubbing after the concrete is strong enough to walk on, but while the surface is still weak enough to be easily removed by water and abrasion. This method of exposure can allow aggregates to loosen or become dislodged during scrubbing or later during wear. When LITHOTEX Top Surface Retarder is used in the exposure process, the underlying concrete gains strength normally, allowing the aggregates to bond firmly to the concrete matrix, minimizing pop-outs at all ages, and creating a surface as durable as it is attractive.

Without the use of a surface retarder, exposure depths are difficult to control by hosing and scrubbing. The concrete is hardening as the work proceeds, making it more difficult to remove the surface. This often results in the production of a reveal that becomes progressively more shallow as exposure procedures continue. More uniform exposure depths are made possible by the use of LITHOTEX Top Surface Retarder, since the surface stays in the same state of retardation for an extended period. Scheduling is more flexible, adequate time is allowed for revealing the aggregates by hosing and scrubbing, and larger areas can be exposed at one time, saving labor costs.

Coloring the concrete matrix with a contrasting or blending color greatly enhances the beauty of exposed-aggregate concrete. Using CHROMIX® Admixtures for Color-Conditioned® Concrete in the matrix adds permanent, natural color while increasing concrete strength and improving freeze/thaw resistance. CHROMIX Admixtures are available in a wide range of earth-tone colors to complement any aggregate and design. Refer to the Scofield website at [www.scofield.com](http://www.scofield.com) for additional information about coloring concrete flatwork.

### 2. Coverage:

LITHOTEX Top Surface Retarder must be applied full strength (unthinned). The coverage will vary depending on the porosity and texture of the surface and the method of application. Freshly placed concrete with a flat-troweled finish will require less material than concrete having a wood-float finish.

One application of LITHOTEX Top Surface Retarder should be made at the coverage rate of approximately 100–150 square feet per gallon (2.5–3.5 m<sup>2</sup>/L). A more exact coverage rate can be determined by producing representative jobsite samples as described in section 9. *Jobsite Samples* and noting the amount of material required per square foot.

### 3. Limitations:

LITHOTEX Top Surface Retarder retards, but does not prevent initial and final set of the concrete surface. Removal must take

place approximately 8–20 hours after concrete placement or the concrete surface will harden, making aggregate exposure difficult or impossible without sandblasting.

### 4. Composition and Materials:

LITHOTEX Top Surface Retarder is a water-based surface retarder with a viscosity that is optimized for surface penetration and ease of application by sprayer, brush, or roller without thinning. Cleanup is with soap and water.

### 5. Exposure Depth:

The depth of exposure obtained with LITHOTEX Top Surface Retarder will depend primarily on the surface porosity of the concrete when the retarder is applied. The deepest exposure is produced on an open surface (wood-float finish). Closed surfaces (steel-trowel finish) produce lighter exposures. Minor variations in depth will be caused by differences in finishing, retarder coverage, length of time the retarder remains on the surface, concrete setting time, weather conditions, and other factors.

A wood-float finish will normally produce an exposure depth of approximately  $\frac{3}{16}$  inch (5 mm). A steel-trowel finish will normally produce an exposure depth of approximately  $\frac{1}{8}$  inch (3 mm).

Representative jobsite samples as described in section 9. *Jobsite Samples* must be produced to determine application and removal procedures that will produce the required depth of exposure and desired appearance.

### 6. Packaging:

LITHOTEX Top Surface Retarder is available in 1-gallon (3.8 L) and 5-gallon (18.9 L) pails.

### 7. Storage and Shelf Life:

When stored indoors in the original unopened containers the shelf life of LITHOTEX Top Surface Retarder is at least 1 year from the date of purchase. Inventory must be rotated to maintain product that is within shelf life limits.

### 8. Cautions:

#### WARNING!

**AVOID CONTACT WITH EYES AND SKIN. DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN.**

First Aid: Eyes—DO NOT RUB EYES. FLUSH IMMEDIATELY WITH WATER. Hold eyelids apart while flushing material out thoroughly with large amounts of water. Skin—Wash thoroughly with soap and water. Remove soiled clothing and footwear and wash before reuse. Inhalation—Move to fresh air. If symptoms persist or develop or if ingested, get medical attention.

Wash thoroughly immediately after handling. Close container after each use. Before using or handling, read the *Material Safety Data Sheet and Warranty*.



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**9. Jobsite Samples:**

To verify and approve performance, appearance, and safety, representative jobsite samples must be produced prior to general installation. Samples must be of adequate size to be representative and be produced by the same workers who will install the exposed-aggregate flatwork using the contemplated job materials, tools, and techniques under jobsite conditions. All samples must be finished, exposed, cured, and sealed, as specified.

Producing architectural, exposed-aggregate concrete requires skill and practice. Timing, mix design, aggregate choice, concrete color, concrete finishing and application techniques, experience in use of the material, weather conditions, curing, sealing, and other factors will each affect the final performance and appearance of exposed-aggregate flatwork.

For safety considerations, the entire surface of the jobsite sample must be inspected after completion to verify and approve the adequacy of wet and dry slip resistance.

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**10. Concrete Mix Design:**

If designing a concrete mix using CHROMIX Admixtures to color-condition the concrete, completely read Scofield's Tech-Data Bulletin *A-304 CHROMIX Admixtures for Color-Conditioned Concrete*.

A normal or retarded-set, water-reducing admixture may be used in uncolored concrete. An air-entraining admixture should be used in all concrete flatwork that will be subject to freeze/thaw cycles and as specified or required by the engineer for workability or durability. Since they interfere with the chemical action of the surface retarder and may discolor the concrete matrix, accelerating admixtures, such as calcium chloride, should not be used.

When the aggregates used in the mix are to be exposed, a sufficient and uniform amount of coarse aggregate must remain near the surface. For best appearance, the mix should be extremely harsh, containing the highest possible percentage of coarse aggregate and having the lowest possible slump.

When special aggregates are used, they are normally graded to one size and are hand-seeded over the surface of the concrete after floating. No special aggregate grading in the concrete or mix proportions is required. A slump of 4 inches (100 mm) or less is recommended.

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**11. Concrete Installation:**

Prior to placing concrete, representative jobsite samples must be produced and approved as described in section 9. *Jobsite Samples*. 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.

Weather conditions should be considered when planning installation. Climatic conditions such as wind, high temperatures, or low humidity will affect the length of time the concrete surface is retarded.

The concrete should be placed and consolidated so that it completely fills all space inside the forms and provides a suitable surface for finishing. When the aggregates used in the mix are to be exposed, tamping or vibrating should be minimized so that coarse aggregate remains near the surface.

The concrete should be screeded to the finish grade specified by the architect and wood floated to the required flatness and levelness. If special aggregates are specified, they should be hand-seeded over the surface, then tamped and floated in. The aggregates to be exposed should be completely embedded in the plastic concrete but remain close to the surface. The wood-float finish may be the final finish, or the concrete may be steel troweled, depending on the depth of exposure desired, as described in section 5. *Exposure Depth*.

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**12. Retarder Application:**

The concrete should be designed and installed as described in section 10. *Concrete Mix Design* and section 11. *Concrete Installation*. LITHOTEX Top Surface Retarder (a red liquid) is normally spray applied by use of a hand-pump sprayer, but application may be made by roller or soft-bristle brush. An airless sprayer will facilitate application in larger areas. The surface retarder should be stirred thoroughly immediately prior to using and applied full strength (unthinned) at the coverage rate given in section 2. *Coverage*.

LITHOTEX Top Surface Retarder should be applied uniformly over the surface as soon as concrete finishing is completed and the bleed water has disappeared from the surface. It retards, but does not prevent the initial and final set of the concrete surface. After application and before removal, the retarded surface should be protected from damage and from contact with water from any source.

The length of time the surface remains retarded is influenced by ambient conditions. If windy conditions, high temperatures, or low humidity exist or are expected, surface retardation can be extended by covering the concrete with new, nonstaining, kraft curing paper until the aggregates are exposed.

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**13. Aggregate Exposure:**

Surface removal must take place approximately 8–20 hours after concrete placement or the concrete surface will harden, making aggregate exposure difficult or impossible without sandblasting.

A section of the retarded surface should be tested prior to general aggregate exposure to determine if the underlying concrete has reached sufficient strength so that the aggregates will not be loosened or dislodged during removal procedures.

The retarded surface may be removed by use of a long-handled, stiff-bristle brush and a pressure washer or a strong jet of water from a hose. Pressure washing will facilitate removal, especially in larger areas. Runoff should be controlled in accordance with local, state, and federal regulations.

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**14. Curing and Sealing:**

After aggregate exposure, the concrete should be cured with new and unwrinkled, nonstaining, high-quality curing paper conforming to ASTM *C 171 Sheet Materials for Curing Concrete*.

To seal and protect the exposed-aggregate surface after curing, use one of the following: SCOFIELD® Selectseal-W™, SCOFIELD® Cureseal-W™, or SCOFIELD® Cureseal-S™. Where a lower-cost sealer is desired, the use of CEMENTONE® Clear Sealer may be considered. The appropriate Scofield Tech-Data Bulletin *B-504 SCOFIELD Selectseal-W*, *B-204 SCOFIELD Cureseal-W*, *B-604 SCOFIELD Cureseal-S*, 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 exposed-aggregate concrete flatwork.** The Scofield Tech-Data Bulletin *B-504 SCOFIELD Selectseal-W* must be read completely before using.

All exposed-aggregate surfaces must be thoroughly inspected to verify and approve installation and safety, including wet and dry slip resistance, before opening the sealed surface to traffic.

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**15. Availability:**

LITHOTEX Top Surface Retarder is marketed nationwide and internationally, directly to the user 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](http://www.scofield.com) for further information.

■ **16. 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](http://www.scofield.com)

SCOFIELD PRODUCTS ARE INTENDED FOR PROFESSIONAL USE ONLY

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