



# SCOFIELD® Formula One™

A chemically reactive treatment developed to harden the surface and increase the durability and life span of concrete floors and hardscapes.

## TECH-DATA BULLETIN B-404.02

### 1. Product Description:

SCOFIELD® Formula One™ is a penetrating, colorless, transparent liquid for use on concrete to reduce porosity, protect the surface, reduce dusting, significantly improve abrasion resistance and provide overall long-term durability. The low-odor material is a cost-effective, easy-to-apply treatment that also provides improved chemical resistance and a higher surface compressive strength. It helps reduce water permeability to hinder the absorption of water soluble materials known to be harmful to concrete and significantly extends the nominal service life of concrete floors.

SCOFIELD Formula One is developed specifically for compatibility with colored concrete, and is also suitable for use on uncolored concrete. The protective treatment produces a breathable finish that enhances the natural beauty of the concrete surface, but is not a sealer. When SCOFIELD Formula One is applied to concrete, the surface remains vapor permeable (breathable), although liquid water permeability is significantly reduced. SCOFIELD Formula One treatment is suitable for most architectural concrete floors and improves the appearance of the treated surface. The finished concrete surface is nontoxic, easy to maintain, and environmentally friendly after installation. SCOFIELD Formula One is an economical solution to providing a longer life for concrete floors or hardscapes of all types.

SCOFIELD Formula One outperforms sodium silicate products which have a tendency to leave persistent white stains and form a whitish carbonation surface bloom as the concrete ages. SCOFIELD Formula One does not contain sodium silicate and is specifically formulated for use on architectural concrete. If used properly, SCOFIELD Formula One will not leave the whitish surface bloom characteristic of nonarchitectural sodium silicate products. SCOFIELD Formula One is used to reduce the permeability of the concrete and to strengthen the treated concrete surface.

SCOFIELD Formula One is ideal for floors in warehouses, distribution centers, retail stores, shopping centers, manufacturing sites, stadiums and arenas. It is suitable for interior floors and exterior hardscapes in industrial, commercial, public and retail buildings in areas subject to heavy pedestrian use and light utility vehicle traffic.

### 2. Coverage:

The application rate of SCOFIELD Formula One is largely determined by the porosity of the concrete to be treated. Most concrete over 30 days old will require an application rate of 300–400 square feet per gallon (7–10 m<sup>2</sup>/L). Highly porous concrete may require a rate of 200–300 square feet per gallon (5–7 m<sup>2</sup>/L). Freshly placed, trowel-finished concrete may only require 400–500 square feet per gallon (10–12 m<sup>2</sup>/L). SCOFIELD Formula One is applied in slight excess and the amount that does not penetrate is pushed off with a squeegee or washed off with fresh water rinses.

### 3. Limitations:

SCOFIELD Formula One is not a membrane-forming curing compound. It does not conform to ASTM C 309 requirements.

SCOFIELD Formula One is highly alkaline and can react with glass and aluminum. Such areas adjacent to the concrete to be treated should be properly covered for protection.

**Extreme caution must be exercised while working with SCOFIELD Formula One because it can create very slippery surfaces.**

On concrete surfaces treated with SCOFIELD Formula One any subsequent acid treatments, such as the use of LITHOCHROME® Chemstain™ Classic, will leave white surface areas that are difficult to remove. On surfaces to be stained with LITHOCHROME Chemstain Classic, application must be completed prior to the use of SCOFIELD Formula One. Additional information is available in Scofield's Tech-Data Bulletin A-414 LITHOCHROME Chemstain Classic.

Concrete that has carbonated at the surface may lack the necessary components to complete the necessary chemical reactions. If surface carbonation is present it should be removed prior to application of SCOFIELD Formula One. Light sandblasting or shot-blasting can be used to remove the carbonated concrete.

### WARNING!

**SCOFIELD Formula One is strongly alkaline and can quickly damage eyes, skin and other body tissues upon contact. Use of proper safety equipment is required. Before using or handling, read the Material Safety Data Sheet and Warranty.**

### TEST SECTION

**Treating concrete flatwork takes skill and practice. Prior to general application, a representative jobsite test section must be produced and approved on each individual concrete surface as described in section 7. Jobsite Test Sections to verify and approve suitability, proper surface preparation methods, performance, wet and dry slip resistance, application techniques, and coverage.**

### 4. Composition and Materials:

SCOFIELD Formula One is a proprietary mixture of alkali silicate, a special surfactant, and other components.

### 5. Colors, Textures and Slip Resistance:

When properly applied, SCOFIELD Formula One will not alter the color or texture of architectural concrete. The treated concrete surfaces may develop a shiny, wet look, which may appear darker than the original installation. Only surfaces that have adequate texture to provide slip resistance should be considered for treatment with SCOFIELD Formula One. After application of SCOFIELD Formula One the slip resistance (Coefficient of Friction) should be determined to ensure that it is within established safety guidelines.

For safety considerations, representative jobsite samples as described in section 7. *Jobsite Test Sections* must be produced prior to Formula One application. The entire surface of the sample should be inspected to verify and approve the adequacy of wet and dry slip resistance.

### 6. Storage and Shelf Life:

Under normal conditions and when kept indoors, off of the floor, and within a temperature range of 40–100° F (4–38° C), the nominal shelf life of SCOFIELD Formula One in unopened containers is 2 years from the date of purchase. Opened containers should be closed after use and then used within 1 month and must be discarded if the material becomes cloudy. Inventory must be rotated to maintain product that is within shelf life limits.



SCOFIELD Formula One should not be exposed to freezing temperatures. Once frozen, the SCOFIELD Formula One should be warmed to over 50° F (10° C) and then stirred vigorously. If cloudiness remains the product is no longer usable and must be discarded.

#### 7. Jobsite Test Sections:

To verify and approve suitability, appearance, and safety, representative test sections must be produced on the actual jobsite substrate prior to general application of SCOFIELD Formula One. Test sections should be of adequate size to be representative, and be produced by the same workers who will apply the SCOFIELD Formula One using the contemplated preparation and application equipment and techniques. All test sections should be prepared and treated as specified to verify and approve the suitability of the product for its intended purpose. The entire surface of the sample should be inspected to verify and approve the adequacy of wet and dry slip resistance.

#### 8. Cautions:

##### WARNING!

**CAUSES EYE IRRITATION. MAY CAUSE SKIN AND RESPIRATORY TRACT IRRITATION. DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN.**

Contains silicic acid and potassium salt. Use only with adequate ventilation. Do not breathe vapors or spray mist. Avoid contact with eyes and skin. Ensure fresh air entry during application and drying. If you experience eye watering, headaches or dizziness or if air monitoring demonstrates vapor/mist levels are above applicable limits wear a properly fitted P100/organic vapor respirator (NIOSH TC-84A approved) during and after application. Follow respirator manufacturer's directions for respirator use.

**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. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations. Do not reuse empty container. Before using or handling, read the *Material Safety Data Sheet and Warranty*.

#### 9. Applicable Standards:

No ASTM specifications exist at this time covering silicate treatments for concrete. Typical test results for 28 day old concrete or mortar specimens treated with SCOFIELD Formula One as compared to similar concrete or mortar control specimens of the same age and composition are given in the table below.

#### 10. Sizes:

SCOFIELD Formula One is available from stock in 5-gallon (18.9 L) pails and 55-gallon (208 L) drums.

#### 11. 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.

The use of a sandblaster, a pressure washer, a rotary floor machine, a walk-behind scrubbing machine, or a terrazzo grinder will facilitate surface preparation.

A pump-type spray can, such as a Chapin or Hudson sprayer, is required for application of SCOFIELD Formula One. In addition to a pump sprayer any type of spray equipment that minimizes atomization such as a High Volume Low Pressure (HVLP) sprayer can be used. Power spraying equipment can also be used on larger projects. Airless sprayers must not be used. Spill and spread methods using a notched squeegee or push broom are also commonly used, but such procedures may not provide uniform results. A soft-bristle or nylon bristle push broom is required to scrub SCOFIELD Formula One into the surface after spray application. Spray equipment should be rinsed with water between refillings. All equipment should be washed with soap and water after use.

**For preparation, the sandblaster** should be capable of producing a light, uniform sandblast and be equipped with a dust collector.

**For preparation, the pressure washer** should 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. Non-marking hoses are helpful.

**For preparation and for wet-scrub applications, the rotary floor machine** should be heavy duty and operate at approximately 175 rpm. It may be equipped with brushes or with a pad-driver that securely holds the pads in place.

For cleaning or stripping, a stiff-bristled bassine or nylon scrub brush is recommended. On flat interior floors, blue scrubbing or black stripping pads may be required. A walk-behind scrubbing machine should be considered for cleaning larger areas.

For application by floor machine on fully cured concrete, a fine mesh screen pad or a white buffing pad are recommended. A good-quality, soft-bristled polishing brush, such as one with a mixture of palmyra and tampico fibers, may also be used and is required for uneven floors. A high-speed concrete burnisher can also be used for application.

**For general application, the pump sprayer** must be of professional quality and equipped with a fan tip. Follow the equipment manufacturer's instructions.

**For scrubbing after application, the push broom** should be long-handled, of professional quality, with soft polystyrene or nylon bristles.

**For grinding concrete surfaces with a terrazzo grinder prior to and after treatment,** the grinder should be of professional quality and equipped with a series of progressively finer grinding disks.

Test results for specimens treated with SCOFIELD Formula One compared to control specimens

ASTM Test Method	Property Measured	Test Result (*compared to untreated control)
D 4060, H-22, 1000 g, 1000 cyc	Taber Abrasion Resistance	* 10–40% increase in abrasion resistance
D 4541	Elcometer pull-off adhesion	* 25–65% increase in bond strength
C 805	Rebound # Compressive	* 5–20% increase in compressive strength
Rilem Tube Method	Water uptake	* 10–40% absorption mL/hr
G-154, 1000 hr, 4/cond, 8/UV	Artificial weathering, UV	No change in color or appearance



For excess material and water removal by squeegee, the squeegee should be of suitable size and professional quality, with a blade of neoprene or comparable material.

#### ■ 12. Substrate Preparation:

Surrounding areas and adjacent surfaces should be protected from spills, tracking, and equipment contact. The work area should be roped off and appropriate sections closed to traffic.

For optimum performance on colored architectural concrete, SCOFIELD Formula One should be applied after the concrete achieves sufficient curing and is fairly dry prior to application, a minimum of 7 days. This allows better penetration of the SCOFIELD Formula One solution into the concrete's pores. When specified on uncolored, nonarchitectural or plain concrete, SCOFIELD Formula One can be applied to the freshly placed concrete immediately after finishing operations are complete and the concrete is hard enough to walk on and scrub using a soft-bristle push broom. However, optimum results are achieved after curing and drying for a minimum of 7 days prior to application.

Concrete floors or slabs that have tight or highly burnished trowel finishes must be opened to provide water permeability prior to application of SCOFIELD Formula One. Possible methods of substrate preparation include the use of sanding or screening disks on floor machines, light sandblasting or shot-blasting, or other minimally invasive procedures that will open the substrate.

Acid etching must not be used as a means of surface preparation prior to application of SCOFIELD Formula One.

Concrete substrates that are contaminated with oil, grease or other substances should be thoroughly scrubbed using a floor machine equipped with a stiff-bristled brush and using Trisodium Phosphate (TSP) and small amounts of water. After scrubbing, all residual TSP must be completely removed by repeated rinsing with fresh water. Poultice-type commercial concrete degreasers may also be used, but care must be taken to clean all residues from the concrete by power washing.

Concrete that is not contaminated and has adequate water absorption capacity should be cleaned by power washing using a minimum pressure of 2000 psi (14 MPa) prior to application of SCOFIELD Formula One.

Wet concrete should be allowed to dry for at least one day prior to application of SCOFIELD Formula One so that the pores near the surface are not completely filled with water. During cooler temperatures or higher relative humidity conditions the drying interval should be increased to achieve the level of dryness necessary for good penetration. As a rough indicator of dryness, an 18 inch by 18 inch (450 x 450 mm) section of polyethylene sheeting can be taped down and left overnight. Test several representative areas since some may be dry and others still damp. The presence of visible condensation after 16 hours would indicate that more drying time should be allowed.

#### ■ 13. Application:

All surfaces must be properly prepared as described in section 12. *Substrate Preparation*. Surrounding areas, landscaping, and adjacent surfaces must be masked or protected from overspray, spills, tracking, and equipment contact. The work area should be roped off, nearby vehicles removed, and appropriate sections closed to traffic. The surface should be divided into work sections using walls, joint lines, or other stationary features as natural stopping points.

For freshly finished concrete, the concrete should be hard enough to walk on and scrub using a soft-bristle push broom without damaging the surface. SCOFIELD Formula One will normally be applied at the rate of 400–500 square feet per gallon (10–12 m<sup>2</sup>/L) over freshly finished concrete. The penetration and chemical reaction of SCOFIELD Formula One is reduced for freshly finished concrete as compared to concrete that has dried and has more available pore space.

For concrete that is normally absorbent, wets easily and darkens quickly with water application, SCOFIELD Formula One should be applied at a coverage rate of 300–400 square feet per gallon (7–10 m<sup>2</sup>/L). If the applied material soaks in quickly the amount applied should be increased until the surface is flooded with a visible layer of material. Adjust the application rate to provide a wet layer on the surface, approximately 2–3 mils thick, as measured using a wet film thickness (WFT) gauge.

After the proper amount is applied, brush the surface vigorously with a push broom or rotary floor machine to facilitate penetration. Allow SCOFIELD Formula One to remain on the surface for at least 30 minutes. As necessary during this 30 minute minimum penetration period, keep the surface from drying by reapplying SCOFIELD Formula One to areas that start to lose the wet-film sheen, thereby restoring the 2–3 mils wet film thickness. It is important to maintain a fluid condition of the in-place SCOFIELD Formula One so that it can penetrate properly. Once any areas begin to thicken, spray water (hot if available) in a light misting application to restore a wet film thickness of 2–3 mils, then vigorously brush again using a push broom or floor machine to facilitate penetration. Once the required treatment period is complete and the SCOFIELD Formula One has been on the concrete surface for at least 30 minutes, use a wet vacuum or a squeegee to remove excess material. After excess product removal, follow with at least two water rinses that are brush scrubbed into the surface, each of which is removed using a wet vacuum or squeegee.

Highly absorbent concrete will require two applications of SCOFIELD Formula One. In this situation reapply SCOFIELD Formula One to achieve the required wet film thickness after the rinsing cycle from the first application is complete and the surface has dried slightly but is still visibly darkened from moisture presence. Scrub the second application into the concrete surface, maintaining a wet film thickness of 2–3 mils for a least 30 minutes by reapplying SCOFIELD Formula One or by misting areas with spray water (hot if available), scrubbing the remaining wet film into the concrete surface. After the required treatment period is complete remove excess material and use at least two more water rinse cycles.

**Extreme caution must be exercised while working with SCOFIELD Formula One because it can create very slippery surfaces.**

Once adequate rinsing is complete, drying time will vary depending on relative humidity, temperature and air movement. Drying time could range from less than an hour to several hours.

When required or in certain other cases, such as during rapid drying conditions (hot, low humidity and/or windy), the concrete should be cured by moisture retention and/or temperature control processes after the SCOFIELD Formula One has been applied.

#### ■ 14. Polishing/Grinding:

SCOFIELD Formula One does not require any subsequent sealers or treatments to the surface once it is applied and time is allowed for proper reactions to occur. It will develop a low sheen on the treated surface after traffic exposure over time. Generally no other treatment is necessary to provide a slight sheen on the floor surface.

Polished or ground concrete has a distinctive look and can provide a very durable terrazzo-like floor surface after SCOFIELD Formula One application. Generally, grinding is best done after the concrete has fully cured and been allowed to dry completely. SCOFIELD Formula One should be applied after proper curing and drying followed by wet or dry grinding, with wet grinding being generally more efficient. Caution should always be exercised on ground and polished floors to ensure that adequate slip resistance is maintained. The adequacy of wet and dry slip resistance must be checked to verify that both are at safe and acceptable levels.



Medium grit wet or dry grinding (100–200M) prior to SCOFIELD Formula One treatment will help the SCOFIELD Formula One penetrate and harden the surface and will facilitate further grinding and polishing.

Additional SCOFIELD Formula One can be applied when a higher sheen is desired on the treated concrete surface. Apply a mist coat of SCOFIELD Formula One to the surface of the previously treated concrete. Using a high speed burnisher equipped with a white pad and operating at 3000 rpm, work the misted layer of SCOFIELD Formula One into the floor evenly and until dry. All treated surfaces should be thoroughly inspected to verify and approve installation and safety, including wet and dry slip resistance, prior to opening the area to traffic.

Alternatively, SCOFIELD Formula One can be buffed into a fully cured concrete floor using a 175-rpm floor machine and may even burnish if sufficient heating occurs. This burnishing effect may darken architectural concrete so care should be taken to avoid unsightly burnish marks. All residual material remaining on the surface must be removed by scrubbing and rinsing a minimum of two times. Rinse water should be removed with a wet vacuum, squeegee, or by similar means. High-speed concrete (propane) burnishers can also be used for buffing.

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

■ **15. Maintenance:**

Concrete surfaces treated with SCOFIELD Formula One are generally maintenance free. Spills should be cleaned up when they occur in accordance with good housekeeping practices. No waxes or subsequent surface treatments are necessary in most applications. However, if desired, a compatible, slip-resistant, emulsion-type, commercial floor finish may be applied and maintained following the manufacturer’s instructions and safety requirements. Recommendations can be obtained 24 hours a day by phoning the JohnsonDiversey hot line at (800) 558-2332.

After years of wear or when desired to enhance sheen or increase hardness, a maintenance reapplication can be made in accordance with section 13. *Application* on concrete treated only with SCOFIELD Formula One. This spiff coat will restore original appearance and sheen in most cases. All coatings, waxes or other materials must be completely stripped and the floor dried and checked for water absorbency prior to the reapplication of SCOFIELD Formula One.

■ **16. Availability:**

SCOFIELD Formula One 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](http://www.scofield.com) for further information.

■ **17. 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.



1 800 800 9900 or [www.scofield.com](http://www.scofield.com)

SCOFIELD PRODUCTS ARE INTENDED FOR PROFESSIONAL USE ONLY

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