



SCOFIELD® Formula One™ Lithium Densifier MP

A chemically reactive, colorless treatment designed for colored concrete floors, especially for use in the production of ground and polished architectural concrete. It can be diluted with water on-site according to the porosity of the substrate.

TECH-DATA BULLETIN B-424.03

1. Product Description:

SCOFIELD® Formula One™ Lithium Densifier MP is a VOC-free, cost-effective treatment that will extend the nominal service life of concrete floors and reduce ongoing floor maintenance costs. It is a penetrating, semi-transparent liquid for use on architectural concrete surfaces of all types and during the grinding and polishing process to more rapidly produce a terrazzo-like floor surface with improved abrasion resistance, greater gloss retention, higher surface compressive strength and reduced dusting.

SCOFIELD Formula One Lithium Densifier MP is an economical product capable of providing longer life and higher reflectivity (gloss) for colored concrete and ground and polished concrete floors of all types. The treated and finished concrete will provide a surface that is nontoxic, easy-to-maintain, and environmentally sound with a low to moderate sheen. This product does not contain sodium silicate or potassium silicate. When properly installed, it will not leave the whitish surface bloom characteristic of nonarchitectural silicate products.

SCOFIELD Formula One Lithium Densifier MP can be used in conjunction with SCOFIELD® Formula One™ Finish Coat to provide enhanced water repellency, stain resistance and gloss development. SCOFIELD Formula One Lithium Densifier MP is also designed for use with SCOFIELD® Formula One™ Liquid Dye Concentrate to add color to the treated floor. Refer to Scofield Tech-Data Bulletins B-434 SCOFIELD Formula One Finish Coat and A-434 SCOFIELD Formula One Liquid Dye Concentrate for product information and application instructions.

SCOFIELD Formula One Lithium Densifier MP has zero VOC content and is an environmentally sound, green building material. It may contribute to earning LEED® credits for Indoor Environmental Quality, EQ Credit 4.2: Low-Emitting Materials: Paints & Coatings, based on low contribution of VOC. See the current *Material Safety Data Sheet* for exact VOC documentation.

2. Coverage:

The application rate of SCOFIELD Formula One Lithium Densifier MP is largely determined by the porosity of the concrete at the time of treatment. The porosity of the concrete will also determine the dilution rate as described in the paragraph below. Concrete must be over 28 days old prior to the application of SCOFIELD Formula One Lithium Densifier MP. Steel troweled, normally porous concrete or concrete ground to a 80–200 grit surface profile will typically require an application rate of 200–400 square feet per gallon (5–10 m²/L) undiluted.

SCOFIELD Formula One Lithium Densifier MP may be diluted with clean water up to a ratio of 1:1 when treating high-quality, hard, steel-troweled concrete floors. These floors are usually ground with soft metal bond matrix diamond tooling. Porous or low-quality floors, or floors whose characteristics are not known, should be treated with SCOFIELD Formula One Lithium Densifier MP applied full strength. These floors are typically ground with hard metal bond matrix diamond tooling. The contractor's level of knowledge and experience are key to determining the dilution rate, and the effectiveness of the resulting application must be determined by producing a representative jobsite test section as described in section 6. *Jobsite Test Sections*. Suggested dilution rates of SCOFIELD

Formula One Lithium Densifier MP to water by volume for concrete of various porosities are listed in the following table.

Suggested Dilution Rates		
Concrete Hardness	Metal Bond Matrix Diamond	Dilution Ratio Densifier:Water
Soft	Hard	Undiluted
Medium	Medium	1.0 : 0.5
Hard	Soft	1.0 : 1.0

Note: The above dilution rates must be verified by producing a jobsite test section.

3. Limitations:

SCOFIELD Formula One Lithium Densifier MP is not a membrane-forming curing compound and does not conform to ASTM C 309 requirements. It is not a substitute for proper curing procedures.

SCOFIELD Formula One Lithium Densifier MP 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.

Floors treated with SCOFIELD Formula One Lithium Densifier MP should not be cleaned with or exposed to acidic cleaners or substances without further treatment because acid will cause discoloration on the treated concrete surface.

SCOFIELD Formula One Lithium Densifier MP is not designed to provide water or oil resistance to the concrete surface without further treatment.

If residual SCOFIELD Formula One Lithium Densifier MP is allowed to dry on the concrete surface it will leave unsightly deposits that are difficult to remove. The appearance of residue on the concrete surface after completion indicates that the excess SCOFIELD Formula One Lithium Densifier MP was not removed. This residue can only be removed by mechanical means.

Extreme caution must be exercised while working with SCOFIELD Formula One Lithium Densifier MP because it can create slippery surfaces during application.

WARNING!

SCOFIELD Formula One Lithium Densifier MP 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 architectural concrete or ground and polished 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 6. *Jobsite Test Sections* to verify and approve suitability, proper surface preparation methods, dilution rate, coverage, application techniques, grinding and polishing procedures, resulting appearance, overall performance, and wet and dry slip resistance.



4. Textures and Slip Resistance:

When properly applied, SCOFIELD Formula One Lithium Densifier MP will not alter the texture of architectural concrete. The treated concrete surfaces may develop a sheen, which may appear slightly darker than the original installation. After application of SCOFIELD Formula One Lithium Densifier MP, the slip resistance (Coefficient of Friction) must be determined to ensure that it is within established safety guidelines.

For safety considerations, a representative jobsite test section as described in section 6, *Jobsite Test Sections* must be produced prior to SCOFIELD Formula One Lithium Densifier MP application. The entire surface of the test section must be inspected after completion to verify and approve the adequacy of wet and dry slip resistance.

5. 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 Lithium Densifier MP 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 Lithium Densifier MP must not be exposed to freezing temperatures. If product becomes frozen it must be discarded.

6. 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 Lithium Densifier MP. Test sections must be of adequate size to be representative, and be produced by the same workers who will apply the SCOFIELD Formula One Lithium Densifier MP and any companion products using the contemplated water dilution rate and grinding and polishing equipment and techniques. All test sections must be prepared and treated as specified to verify and approve the suitability of the product for its intended purpose. The entire surface of the test section must be inspected after completion to verify and approve the adequacy of wet and dry slip resistance.

7. Packaging:

SCOFIELD Formula One Lithium Densifier MP is available in 5-gallon (18.9 L) pails and 55-gallon (208 L) drums.

8. Applicable Standards:

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

Test results for specimens treated with SCOFIELD Formula One Lithium Densifier MP 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	* 20–50% increase in abrasion resistance
D 4541	Elcometer pull-off adhesion	* 25–75% increase in bond strength
C 805	Rebound # Compressive	* 10–30% increase in compressive strength
G-154, 1000 hr, 4/cond, 8/UV	Artificial weathering, UV	No change in color or appearance
D 523, at 60°	Specular Gloss	30–40 gloss units at 800 grit

9. Cautions:

WARNING!

EYE, SKIN AND DIGESTIVE TRACT IRRITANT. SPRAY MIST CAUSES IRRITATION TO RESPIRATORY TRACT. DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN. Contains silicic acid, lithium salt. Use only with adequate ventilation. Do not breathe vapors or spray mist. Avoid contact with eyes, skin and clothing. Possible developmental hazard. Contains lithium that may adversely affect the developing fetus. 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*.

10. 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.

For spray application pump-type sprayers, such as a Chapin or Hudson sprayer, must be of professional quality and equipped with a fan tip. Follow the equipment manufacturer's instructions. For uniform results sprayers are recommended for application of SCOFIELD Formula One Lithium Densifier MP. Airless sprayers must not be used. All equipment should be washed with soap and water after use.

For larger wet-scrub applications, the rotary floor machine should operate at 175 rpm. It may be equipped with brushes or with a pad-driver that securely holds the pads in place. A good-quality, soft-polymer-bristled brush may also be used.

For removal of wet grinding slurry and clean up of treatment and rinse water, a wet vacuum equipped with a squeegee-type attachment should be used.

For scrubbing after application, the push broom should be equipped with soft polystyrene or nylon bristles. A push broom is required to scrub SCOFIELD Formula One Lithium Densifier MP into the surface after spray application. Spill-and-spread methods using a push broom can also be used for application.



For grinding and polishing concrete surfaces with a ter-razzo grinder or concrete grinder prior to and after treatment, the grinder should be capable of being equipped with a series of progressively finer diamond grinding and polishing disks.

■ 11. Substrate Preparation:

Surrounding areas and adjacent surfaces must be masked or protected from overspray, spills, tracking, and equipment contact. The work area should be roped off 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 optimum performance on colored architectural concrete, SCOFIELD Formula One Lithium Densifier MP must only be applied to fully cured concrete that is a minimum of 28 days old to allow for adequate penetration of the surface.

Wet concrete should be allowed to dry adequately prior to application of SCOFIELD Formula One Lithium Densifier MP so that the pores near the surface are not 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.

■ 12. Initial Grinding:

Grinding the concrete to an initial surface profile (80–200 grit) is required prior to the application of SCOFIELD Formula One Lithium Densifier MP. If wet grinding, concrete that is not contaminated and has adequate water absorption capacity after being ground to 80–200 grit should be allowed to dry prior to application of SCOFIELD Formula One Lithium Densifier MP.

Concrete substrates that are contaminated with oil, grease or other substances after grinding to the initial surface profile (80–200 grit) should be thoroughly cleaned before continuing.

■ 13. Application:

All surfaces must be properly prepared as described in section 11. *Substrate Preparation* and when applicable, ground to initial surface profile (80–200 grit) as described in section 12. *Initial Grinding*. Apply SCOFIELD Formula One Lithium Densifier MP at the coverage rate described in section 2. *Coverage* that is correct for the substrate condition.

After the proper amount is applied, brush the surface with a push broom or rotary floor machine equipped with a brush or pad. Allow SCOFIELD Formula One Lithium Densifier MP to remain on the surface for at least 30 minutes. Add more SCOFIELD Formula One Lithium Densifier MP as needed to maintain a wet film approximately 1 to 3 mils thick during this period. Adjust the application rate to provide a wet layer on the surface. If the applied material soaks in quickly, additional material should be applied until the surface is flooded with a visible layer. As necessary during this 30 minute minimum penetration period, keep the surface from drying by reapplying SCOFIELD Formula One Lithium Densifier MP to areas that start to lose the wet-film sheen. It is important to maintain a fluid condition of the in-place SCOFIELD Formula One Lithium Densifier MP so that it can penetrate properly.

Once the required treatment period is complete and the SCOFIELD Formula One Lithium Densifier MP has been on the concrete surface for at least 30 minutes, use a wet vacuum or auto-scrubber to remove excess material. The concrete surface must then be rinsed with fresh water unless additional grinding is intended. While rinsing, scrub the rinse water into the surface to remove any residue and then completely remove the rinse water with a wet vacuum before

it dries. Additional water can be used to keep the excess material from drying during the removal process. If residual SCOFIELD Formula One Lithium Densifier MP is allowed to dry on the concrete surface it will leave unsightly deposits that can only be removed by mechanical means. The appearance of residue on the concrete surface after completion indicates that the excess SCOFIELD Formula One Lithium Densifier MP was not removed.

Extreme caution must be exercised while working with SCOFIELD Formula One Lithium Densifier MP because it can create slippery surfaces during application.

Allow the SCOFIELD Formula One Lithium Densifier MP treated concrete to dry thoroughly. Drying time will vary depending on relative humidity, temperature and air movement. Drying time could range from less than an hour to several hours. After drying is complete, the floor is ready for use or to continue the grinding and polishing process. To obtain additional hardening, allow the densifier to set overnight before continuing.

■ 14. Polishing:

After treatment, continue grinding, honing and polishing the treated concrete to the intended final finish profile (400–1500 grit) using progressively finer polishing disks. If wet polishing, remove the slurry residue between diamond changes using a wet vacuum or squeegee and rinse thoroughly, removing excess water and slurry. After the final finish profile is achieved, allow the polished concrete to dry completely prior to any further surface treatment.

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

■ 15. Maintenance:

Ground and polished concrete surfaces treated with SCOFIELD Formula One Lithium Densifier MP are generally very durable and require little maintenance other than scheduled scrubbing with water and a neutral or alkaline cleaner. This recommended cleaning process provides water to hydrate the reactive components of the treatment and to further harden and cure the treated concrete. 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 but if wax or floor finish is used it should be tested for compatibility prior to use.

■ 16. Availability:

SCOFIELD Formula One Lithium Densifier MP 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 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.



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SCOFIELD PRODUCTS ARE INTENDED FOR PROFESSIONAL USE ONLY

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