CRYSTALGUARD

Self-healing Cementitious Crystalline Waterproofing Coating

PRODUCT DESCRIPTION

SUPERSHIELD CRYSTALGUARD is a single-compound cementitious crystalline waterproofing coating that is mixed with water and applied as a slurry coat to the positive or negative side of the concrete to waterproof and protect it. It is either applied as a two-coat application or as the first coat of a two-coat application. SUPERSHIELD CRYSTALGUARD waterproofs concrete by penetrating deep into the concrete and chemically reacting with the by-products of cement hydration creating a non-soluble, highly resistant, needle-like crystalline structure. This makes the concrete highly durable and impermeable to water and other liquids from any direction, even under extreme hydrostatic pressure. It also protects the concrete from the various harsh environmental conditions that it is exposed to.

The crystalline structure occurs where moisture is present, so at any later stage, if cracks form due to settling or shrinkage, the incoming water triggers the crystallization process and additional crystals begin to grow, and it has the ability to self-heal cracks. However, the SUPERSHIELD CRYSTALGUARD layer will still allow the passage of water vapor through the structure, allowing the concrete to breathe.

FEATURES AND BENEFITS

- Unique ability to become a truly integral part of the concrete substrate
- Provides permanent internal waterproofing and moisture blocking from both positive and negative sources
- Unique crystallization process reactivates at any later stage in the presence of moisture and water
- Permanent and eco-friendly with self-healing capabilities
- Can heal hairline cracks up to 0.5 mm
- Enhances concrete durability and reduces concrete permeability
- Can be applied to either the pressure or non-pressure concrete face
- High chemical resistance
- Non toxic and approved for potable water
- Allows concrete to breathe
- Does not puncture, tear, or become damaged
- Does not require sealing, lapping and finishing of seams
- Cost-effective and time-saving than most other methods

RECOMMENDED USES

- Basements
- Concrete Water Tanks
- Tunnels and Subway Systems
- Roof Slab
- Sewage and Water Treatment Plants
- Reservoirs
- Sunken Portion
- Foundations & Elevator pits
- Ground Parking Structures
- Bridges and Dams
- Viaducts

TECHNICAL DATA

General Characteristics		
PROPERTY	**VALUE**	
Color and Appearance	Grey Powder	
Bulk Density	~ 1.25 g/cm^3	
Chloride Ion Content	< 0.1% by weight	
Performance Characteristics		
TEST NAME	**TEST METHOD**	**PERFORMANCE**
Depth of Water penetration	EN 12390-8	> 50% decrease in permeability compared to untreated concrete
Resistance to Chloride Ion	ASTM C1202	70% increase in resistance than untreated concrete
Self-healing Concrete	CRD C48 - 92	Showed high reduction in permeability with self-healing capability
Compressive Strength	EN 12190	Class R3 ≥ 25 MPa
Capillary Absorption	EN 13057	≤ 0.5 kg/m^2 h$^{0.5}$
Adhesive Bond	EN 1542	≥ 0.8 MPa
Modulus of Elasticity	EN 13412	≥ 20GPa
Reaction to Fire		Class A1
Potable Water Test	D.Lgs. 31/2001	Complies with the parameters

APPLICATION GUIDELINES

Surface Preparation

The substrate intended for the application of SUPERSHIELD CRYSTALGUARD must be clean and free from laitance, loose particles, curing agents, dirt, oil, grease, asphalt, and paint. The substrate should be thoroughly saturated with water and then allowed to dry to a damp surface before applying SUPERSHIELD CRYSTALGUARD.

Caution: Ensure there is no standing or excessive water on the substrate before application.

Structural Repair

Rout out cracks, faulty construction joints, and other structural defects to a depth of 1.5 inches (37 mm) and a width of 1 inch (25 mm). Apply a brush coat of SUPERSHIELD CRYSTALGUARD and allow it to dry for 10 minutes. Fill the cavity by tightly compressing Supershield Crystalmix Ultra, prepared in a putty consistency, into the groove using a pneumatic packing tool or a hammer and woodblock. To prepare Supershield Crystalmix/Ultra, mix four parts of the powder with one part water to achieve a thick, putty-like consistency.

Note: For areas with direct water flow (leakage) or excessive moisture due to seepage, first use Supershield Crystalpatch, followed by Supershield Crystalmix/Ultra, and finish with a brush coat of SUPERSHIELD CRYSTALGUARD. (Refer to the Supershield Specifications and Applications Manual for complete details.) For expansion joints or cracks with chronic movement, flexible materials such as expansion joint sealants should be used.

Wetting Concrete

SUPERSHIELD CRYSTALGUARD requires a saturated substrate with a damp surface. Ensure the concrete surface is thoroughly saturated with clean water before application to promote proper curing and the growth of crystalline formations deep within the concrete pores. Remove any excess surface water before application. If the surface dries out before application, it must be rewetted.

Mixing For Slurry Coat

Mix SUPERSHIELD CRYSTALGUARD powder with clean water to a slurry consistency in the following proportions,

Brush Application

Consumption	No of Coats	Water	Powder
1.25–1.5 lb./sq. yd.(0.65–0.8 kg/m^2)	One Coat	2 Parts	5 Parts
2.0 lb./sq. yd.(1.0 kg/m^2)	One Coat	1 Part	3 Parts

Spray Application

Consumption	Water	Powder
1.25–1.5 lb./sq. yd.(0.65–0.8 kg/m^2)	3 Parts	5 Parts

Note: Prepare only the amount of SUPERSHIELD CRYSTALGUARD material that can be applied within 20 minutes. Do not add water to the mix once it begins to harden. Protect your hands by wearing rubber gloves during application.

Applying Supershield Crystalguard

Apply SUPERSHIELD CRYSTALGUARD using a semi-stiff nylon bristle brush, a push broom for large horizontal surfaces, or specialized spray equipment. Ensure the coating is applied uniformly to a thickness just under 1/16 inch (1.25 mm). If a second coat of SUPERSHIELD CRYSTALGUARD or Supershield Crystalguard Ultima is required, it should be applied after the first coat has reached its initial set but while it is still "green" (within 48 hours). Light pre-watering between coats may be necessary if drying occurs. The SUPERSHIELD CRYSTALGUARD treatment should not be applied under rainy conditions or when the ambient temperature is below 40°F (4°C). For recommended equipment, please contact SUPERSHIELD or your nearest SUPERSHIELD distributor.

Curing

Once the SUPERSHIELD CRYSTALGUARD treatment has set to the point where it won't be damaged by water, a fine mist of clean water should be used for curing. Under normal conditions, curing can begin 24 hours after application. The treated surface should be cured twice daily for three days, and the structure should be allowed to set for a minimum of 18 days before being filled with liquid. In hot climates, more frequent curing may be necessary. Additionally, the freshly applied SUPERSHIELD CRYSTALGUARD must be protected from direct rain for at least 48 hours after application.

HEALTH AND SAFETY

SUPERSHIELD CRYSTALGUARD contains chemicals that may cause skin irritation. It is recommended to wear protective gloves and goggles when handling this product. In case of contact with the eyes, flush immediately with clean water. If irritation persists, seek medical assistance promptly.

STORAGE

When stored in a dry place with unopened and undamaged original packaging, SUPERSHIELD CRYSTALGUARD has a shelf life of 12 months.

PACKAGING

SUPERSHIELD CRYSTALGUARD is available in 25 kg (55.1 lb) pails and 25 kg (55.1 lb) PE-lined paper bags.

WARRANTY

Supershield warrants that its products will be free from material defects and will comply with the specifications provided in their respective technical data sheets. If any product is proven to be defective, Supershield's liability will be limited to the replacement of the product. Supershield will not be liable for any incidental or consequential damages. No other warranties, express or implied, shall apply, including warranties of merchantability or fitness for a particular purpose. It is the user's responsibility to determine the suitability of the product for their intended use and to assume all risks and liabilities associated with its application. Supershield reserves the right to alter the properties of its products without prior notice.