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Structures

# SUPERSHIELD

## CRYSTALMIX ULTRA

Cementitious Crystalline Mortar for Structural Repair  
of R4 Standard



### PRODUCT DESCRIPTION

Supershield CRYSTALMIX ULTRA is a structural R4-class, high-strength, thick repair mortar designed for the patching, resurfacing, and repair of deteriorated concrete. It is reinforced with fibers to enhance its durability. The formulation of Supershield CRYSTALMIX ULTRA provides exceptional bonding, minimal shrinkage, resistance to chemicals, and high strength. The mortar is a single-component material that offers the flexibility of being applied either through spraying or troweling. Supershield CRYSTALMIX ULTRA's high-performance features are further enhanced by Supershield Crystalline Technology.

### RECOMMENDED USES

- Water Tanks and Reservoir
- Sewage Treatment Plants
- Concrete Water and Sewer Pipes
- Bridge Structures
- Tunnels and Parking Garages
- Foundations
- Hydropower Plants
- Manholes and Vaults
- Marine Structures

### FEATURES AND BENEFITS

- Excellent adhesion and bond to concrete substrates
- Structural class R4
- Low shrinkage, fiber reinforced
- Low chloride penetration
- Ready to use – just add water
- Vertical and overhead concrete repair; sprayable
- Non-toxic and VOC compliant
- High early Strength



## TECHNICAL DATA

### General Characteristics

PROPERTY	VALUE
Color and Appearance	Grey Powder
Bulk Density	~ 1.25 g/cm <sup>3</sup>
Chloride Ion Content	< 0.1% by weight

### Performance Characteristics

TEST NAME	TEST METHOD	PERFORMANCE
Compressive Strength	EN 12190	≥ 45 MPa
Chloride ion Content	EN 1015-17	≤ 0.05%
Adhesive Bond	EN 1542	≥ 2.0 MPa
Modulus of Elasticity	EN 13412	≥ 20 GPa
Thermal Compatibility Part 4: Dry Thermal Cycling	EN 13687- 4	≥ 2.0 MPa
Carbonation resistance	EN 13295	dk ≤ control concrete
Skid Resistance	EN 13036-4	NPD
Capillary Absorption	EN 13057	≤ 0.5 Kg/m <sup>2</sup> h <sup>0.5</sup>
Potable Water Test	D.Lgs. 31/2001	Complies with the parameters



## APPLICATION GUIDELINES

### Consumption

The calculated quantity of dry mortar per square meter is 1600 kg, or approximately 16 kg/m<sup>2</sup> per centimeter of thickness.

### Surface Preparation

Remove loose, delaminated, or unsound concrete using high-pressure water blasting, chipping, or other suitable methods. Complete any necessary structural repairs or corrosion repairs to reinforcing steel. Saw cut the perimeter of the repair area to a depth of 3/8 inches (10 mm). Clean the repair area thoroughly by removing dust, microfractured particles, and any foreign material using pressure washing or other appropriate methods to ensure a clean surface and optimal bond.

### Mixing

To repair concrete and create water stop profiles, mix SUPERSHIELD CRYSTALMIX ULTRA by adding 1 part water to 4 parts powder by volume. For a stiff putty consistency, follow these steps: Start by mixing 3 parts powder with 1 part water by volume until smooth, mixing for at least 2 minutes. Then, add an additional 1 part of powder (for a total of 4 parts powder to 1 part water) and continue mixing until a workable mortar consistency is achieved. Apply the mixture with a trowel as required.

### Applying Supershield Crystalmix Ultra

Saturate the repair area with clean water and allow the surface to reach a "saturated, surface dry" (SSD) condition. Apply SUPERSHIELD CRYSTALMIX ULTRA using low-pressure spray equipment with enough velocity to compact and build the thickness of the mortar. To prevent clogging, use a spray nozzle with a minimum orifice size of 0.5 inches (12.5 mm). Spray SUPERSHIELD CRYSTALMIX ULTRA at a right angle to the surface, maintaining a distance of 18 to 24 inches (450 mm to 600 mm). Complete finishing operations promptly. SUPERSHIELD CRYSTALMIX

ULTRA can be finished with various surface textures: a rough finish directly from the spray nozzle, a semi-smooth finish using a wood or rubber float, or a smooth finish with a steel trowel.

Notes: 1) An application of Supershield Crystalspray or Supershield Crystalguard Ultima may be specified by an engineer or design authority for enhanced waterproofing and chemical protection in extremely harsh conditions.

2) If an overcoat of Supershield Crystalguard Ultima is specified over SUPERSHIELD CRYSTALMIX ULTRA, it can be applied immediately after moist curing (3 days). Ensure that the SUPERSHIELD CRYSTALMIX ULTRA surface is rough or scored and saturated to provide sufficient "tooth and suction" for the SUPERSHIELD coating.

3) Supershield Crystalspray can be applied before SUPERSHIELD CRYSTALMIX ULTRA. After 10 minutes of applying Supershield Crystalspray, SUPERSHIELD CRYSTALMIX ULTRA can be applied. If Supershield Crystalspray is specified as a top coat over SUPERSHIELD CRYSTALMIX ULTRA, it can be applied after 12 hours.

### Application Thickness

The required thickness of SUPERSHIELD CRYSTALMIX ULTRA will depend on specific job site conditions and requirements. Generally, the application thickness should range between 10 mm and 50 mm. For spray applications, the single-layer thickness will vary based on the equipment and applicator skill, but it may be up to 50 mm on vertical surfaces and 40 mm overhead. Roughen or score the surface before applying successive layers, and apply immediately after the initial set.

### Curing

Proper curing is essential for achieving the optimum quality and durability of the repair mortar. SUPERSHIELD CRYSTALMIX ULTRA should be cured using moist curing methods. Maintain a continuous source of moisture on the surface by using spray,



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wet burlap, polyethylene sheets, or other suitable means for a minimum of 3 days. For containment structures such as reservoirs and tanks, these can be filled with water after 3 days of moist curing of the SUPERSHIELD CRYSTALMIX ULTRA coating.

Note: 1) In hot, dry, or windy conditions, special curing procedures may be necessary before the final set, such as using fog spray or suitable curing compounds immediately after finishing.

2) SUPERSHIELD CRYSTALMIX ULTRA should not be mixed or placed when temperatures are below 38°F (3°C) or above 86°F (30°C). Protect the mortar from rapid evaporation in extreme weather conditions.

### HEALTH AND SAFETY

SUPERSHIELD CRYSTALMIX ULTRA 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 eyes, flush immediately with clean water. Seek medical assistance if symptoms persist.

### STORAGE

When stored in a dry place in its unopened, undamaged original packaging, SUPERSHIELD CRYSTALMIX ULTRA has a shelf life of 12 months.

### PACKAGING

SUPERSHIELD CRYSTALMIX ULTRA 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.