

## GREENSEAL 200

### CRYSTALLIZATION CEMENTITIOUS WATERPROOFING

#### DESCRIPTION

Greenseal 200 is a concrete waterproofing system formulated from Portland cement, fine quartz sand and active chemicals. It is a crystallization product that offers durable waterproof protection to concrete. When applied, it penetrates into the structure and becomes an integral part of the concrete, creating a completely waterproof barrier from within to the external surface of the structure.

It is ready to mix with water and applies as slurry of mortar consistency. It can be conveniently brushed, sprayed or broadcasted to various concrete structures and surfaces.

#### **How Greenseal 200 Works**

The active chemicals -- organic and inorganic salts in Greenseal 200 require the presence of water to react with calcium monoxides and hydroxides (Free Lime) to form large complex molecules. These ions having one or more free chemical bonds will interact with each other or with other complex ions to form long chained complex chemical bonds which will then crystallize in the concrete capillary system. These molecular complexes are capable of bonding physically or chemically with a considerable amount of water. However, it still allows the passage of vapour, thus enabling the concrete to breathe. They can also exchange atom groups with nearby molecules in a similar way to ion exchange used in water softeners. Through this method, they are able to penetrate through the capillaries, deep into the substrate.

The formed crystals of Greenseal 200 will remain in the concrete and at later time when attacked by water, the crystallization process will continue, further strengthening the barrier

#### USES

- Water tanks
- Sewage Tank
- Tunnels
- Retaining Walls
- Lift pits
- Balconies
- Reservoirs
- Fish Ponds
- Swimming pools
- Concrete slab
- Planter box
- Water treatment structures
- Wet areas-toilet & bathroom
- Underground shafts
- Foundations & basements

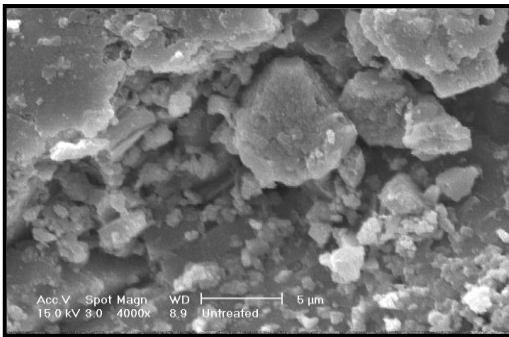
#### ADVANTAGES

- Waterproof - Prevents surface problems, e.g. fungus growth, cracking, and able to withstand positive and negative water pressure.
- Cost Effective - Repair and rehabilitate old and problematic concrete by sealing off hairline cracks.
- Corrosion Inhibitor - Removes moisture in concrete by reacting with it, thus reducing or eliminating corrosion of reinforcing steel in the concrete.
- Wide Performance Window - Easy application and suitable for various construction structures and sites.
- Protection - No special protective system is required.
- Greenseal 200 penetrates deeply and seals concrete capillary tracts or shrinkage cracks up to 0.3mm.
- Can be applied from positive or negative side. It can be applied to moist or concrete that has set but yet to be hardened.
- Increase resistance to frost, weathering, salt water, aggressive ground water and many chemicals.
- Greenseal 200 permits the concrete to breath, eliminating water vapour from building-up thus leaving the concrete completely dry.
- Greenseal 200 is non-toxic and is approved for potable water use.

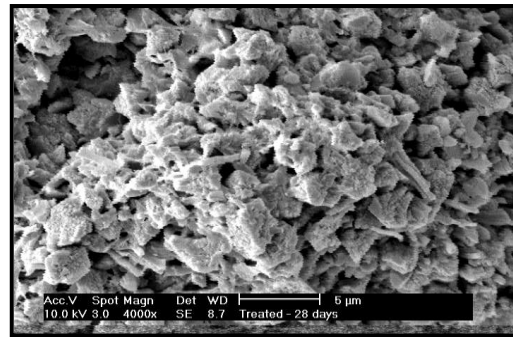
**PRODUCT PROPERTIES**

Tests	Test Results	Standard
Water Penetration Test: - Untreated (without GS200) - Treated (with GS200)	100 mm 20 mm (80% improvement)	BS EN 12390-8 : 2019
Flexural Strength (28 d), N/mm <sup>2</sup>	5.05	ASTM C 348 - 86
Tensile Strength (28 d), N/mm <sup>2</sup>	2.42	ASTM C 190 - 85
Compressive Strength (28 d), N/mm <sup>2</sup>	57.5	ASTM C 109
Coefficient of Permeability Test	1.10 x 10 <sup>-12</sup>	Cell Method
Toxicity Test	Non toxic	BS6920:Part1:2000 / WRAS
Average Water Vapour Transmission Rate (g/hour.m <sup>2</sup> )	11.773	ASTM:E96:94
Water Permeability Test under 10 bars (Coefficient of permeability, k in m/sec)	5.214 x 10 <sup>-12</sup>	-
pH Test (pH)	11.25 @ 29.9°C	-
VOC, g/L	<2	BS EN ISO 11890-2:2006
Chemical Resistance	PASS	ASTM C 267-01 (2012) (MethodB)
Scaling Resistance	No Defect	ASTM C 672-01 (2012) (MethodB)

**SEM IMAGES - Crystallization Report for GS200**



**Untreated at 4000 X Magnifications**



**Treated 28 Days at 4000 X Magnifications**

**APPLICATION INSTRUCTIONS**

**SURFACE PREPARATION**

All surfaces to be treated with Greenseal 200 must be thoroughly inspected. The concrete surface must be cleaned and free from oil, grease, paint, loose dust, mud and laitance. Horizontal surfaces should not have curing agents or hardeners applied prior to the application of GS 200.

Honeycombs should be hacked off to expose the concrete. All chipping and loose particles should be removed, clean surface with water before repairing.

Ensure all concrete surfaces are hosed down with water as moistures must be present in the capillaries prior to the application of GS 200. New concrete must be at least three days old before it should be treated.

Angle Fillet

Do an angle fillet of 25mm X 25mm at all junctions between slabs and walls, with Greenseal Injection Grout/ GS 300.

## GREENSEAL 200

Mix 3 parts of GS Injection Grout /GS 300 to 1 part water to and mix thoroughly to a mortar consistency and apply with a trowel to form an angle fillet.

### Outlet and Pipe Penetration

Mix Greenseal Injection Grout / GS 300 3parts to 1 part water in a container and stir thoroughly for at least 3 minutes until the mixture become thick mortar slurry. Filled the mixture or grout into the hacked off V grooves and level it.

### **MIXING**

Mix 2.5 parts of GS 200 to 1 part water by volume and mix thoroughly for at least 3 minutes. The mixing can be done with a slow stirrer and stirred properly into a flowable thick consistent slurry.

It is imperative to ensure that GS200 is thoroughly mixed. The mixture should be used up within half hour, after which time it will start to thicken. Never add extra water to restore workability.

### **APPLICATION METHOD**

Before applying Greenseal 200 onto the treated surface, ensure the substrate is moist but not visibly wet. To ensure that there is sufficient bond to the smooth surface, application must take place shortly. Greenseal 200 can be applied by using brush or broom with fine bristles, by spray gun as well as dry sprinkle method.

### **APPLY BY BRUSHING METHOD**

- Greenseal 200 when mixed properly looks like a flowable paint and is easy to apply. Apply Greenseal 200 at the rate of 0.75kg/m<sup>2</sup>/coat.
- It is recommended to mark-up an area approximately 33m<sup>2</sup> which is enough to be covered with one bag (25kg) of Greenseal 200 for the first coat application.
- When the first coat of Greenseal 200 starts to dry, apply the second coat in perpendicular direction at the same rate of 0.75kg/m<sup>2</sup>.

### **APPLY BY SPRAYING METHOD**

- Hose down the entire concrete surface to be treated with clean water and allow the surface to partly dry so that it is damp. Remove any surface water or ponding prior to application.
- For spraying method, it is of great importance that the mixing of GS 200 with water should be mechanically mixed by a stirrer and ensured that no lump should ever remain in the mixture.

Around all outlet, hack around the pipe sleeves to make V groove joints surrounding the outlets and pipes to a depth of 25mm. Wash thoroughly the hacked off areas to expose clean concrete surfaces between the outlet pipe and concrete.

- Mix 2.5 parts of GS 200 to 1 part water by volume and mix thoroughly with a slow stirrer for at least 3 minutes. Ensure that GS 200 mixture is stirred properly into a flowable thick consistent slurry.
- It is imperative to ensure that GS200 is thoroughly mixed. The mixture should be used up within half hour, after which time it will start to thicken. On no account add extra water to restore workability.
- Before the applicator start to spray, he has to properly map out the area to ensure that 1 bag of GS 200 of 25kg should approximately cover an area of 33m<sup>2</sup> for the first coat.
- When spraying starts, the applicator must ensure the first spray pattern to be consistent from left to right or from right to left. The pressure of air compressor should be adjusted sufficiently but not with excess air pressure. As too much air pressure will bounce GS 200 off the wall or concrete, especially during the spraying of wall. Under no circumstances, material bounced off the wall should be picked up from the floor for application. The first coat should be allowed to dry overnight or thoroughly before the second coat is applied. Pre-wet the concrete surface again as mentioned above and continue with the second coat of spraying. Ensure that the spray pattern remains consistent throughout.
- On completion of spraying, the gun shall be thoroughly wash and clean with water to ensure that no GS 200 material is left inside the gun or hose. For Airless Spray Pump Parameters, please ask for advice from our engineer.

### For airless spray method:

- Atomizing pressure: 3000psi
- Pump: 3 litres per minute at 2500-3000psi (prime pump with water before using GS 200)
- Filter: remove filters and screens
- Nozzle type: Minimum 535

### **APPLY BY DRY SPRINKLE METHOD**

The method of broadcasting of Greenseal 200 is recommended to be done by a specialized waterproofing applicator. Broadcasting of Greenseal 200 powder onto a fully laid concrete would cause a faster reaction between the chemicals since the chemicals uses moisture of hydration in the concrete. Dry sprinkle method is most likely to be employed for horizontal surfaces only.

#### Sprinkle on concrete surface method:

- When the freshly laid concrete slab has reach plasticity, the concrete must be smoothen out and flatten with a vibrating straight edge.
- When the thumb pressed hard on the surface leaves a 3-5mm deep print, this is an indication that the concrete is ready for a low speed mechanical power float trowel held flat to float the Greenseal 200 into the concrete.
- Broadcast 1.25-1.5kg/m<sup>2</sup> of Greenseal 200 in powder form to concrete surface.
- Ensure that the Greenseal 200 is thoroughly floated into the concrete.
- The power floating shall leave the concrete a smooth surface after floating with a high speed mechanical power float.
- Should some Greenseal 200 powder still remains on the surface, sprinkle to ensure the powder is wet and float into the concrete.
- The concrete slab can be used for traffic after it has set for 24 hours.
- A light mist of water may be required to allow moisture and curing of Greenseal 200.

#### Application on wall:

- Apply on the thin layer of cement slurry on top of GS 200 before plastering on top.
- For tile application, make sure to pre-wet the GS 200 surface before application of tile Adhesive.

### **COVERAGE**

#### Apply by brushing method (total thickness: 1.2mm)

1. First Coat : 0.75kg/ m<sup>2</sup>
2. Second Coat : 0.75kg/ m<sup>2</sup>

#### Apply by spraying method

1. First Coat : 1.00kg/ m<sup>2</sup>
2. Second Coat : 1.00kg/ m<sup>2</sup>

#### Apply by dry sprinkle method

1. Sprinkling : 1.25-1.5kg/ m<sup>2</sup>

### **CURING**

- Hose down the entire surface of the treated area thoroughly with water twice a day for a minimum 1 day.
- Protect it from direct sunlight, frost, wind and rain for 14 days. This can be done by covering it with polythene sheet, wet sand or gunny sacks. Regular wet the hardened Greenseal 200.

### **BACKFILLING**

Normal backfilling is allowed after the concrete is cured. However, in the event that backfilling is done less than seven (7) days upon the initial setting, it is recommended that the backfilling material be kept moist to avoid the water from evaporating from the concrete.

### **STORAGE AND SHELF LIFE**

Greenseal 200 has a shelf life of 24 months when stored in a dry place under normal room conditions in its original packing.

### **POT LIFE (MIXED)**

Greenseal 200 when mixed with water shall be applied within 30 minutes.

### PACKAGING AND APPEARANCE

- Greenseal 200 is packed in 25kg/bag
- Special packing in the plastic pail is available subject to additional cost incurred.

### CLEANING EQUIPMENTS

Wash the tools and equipment with clean water. If using spraying method, ensure no Greenseal 200 material is left inside the gun or hose.

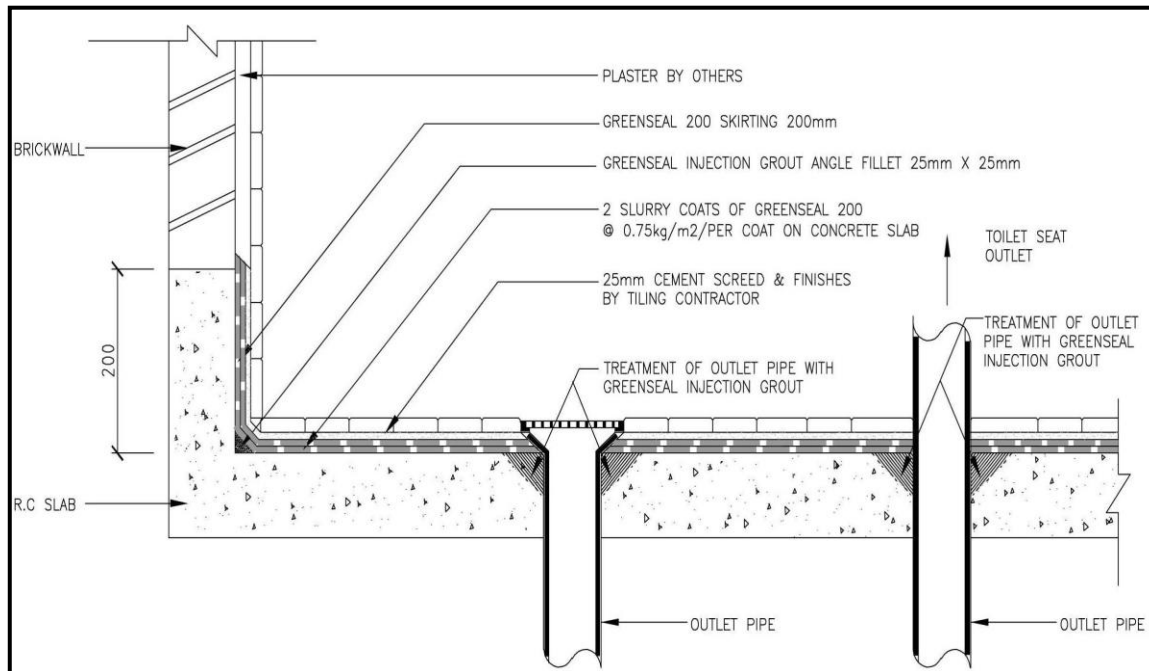
### PRECAUTIONS

- Plastering & Tiles – After the application of Greenseal 200, apply a thin layer of cement slurry on top of it before plastering or Tiling work is done.

### HEALTH, SAFETY AND CLEANING

Greenseal 200 contains cements which may cause skin irritation. For precaution, protective gloves and goggles are recommended to be worn when handling of this product. Always allow air to ventilate in the basement or in an enclosed area. If ingested, do not induce vomiting but seek medical attention. In case of eye contact, rinse thoroughly with abundant waters. If case of skin contact, wash affected areas with soap and water. Change to clean clothes and shoes. Wash contaminated clothes/shoes thoroughly before reuse.

### TECHNICAL DRAWING USING GREENSEAL 200 CRYSTALLIZATION WATERPROOFING SYSTEM



### Guarantee

The information contained in this leaflet is based on our experience and technical knowledge, obtained through laboratory testing and from bibliographic material. GREENSEAL reserves the right to introduce changes without prior notice. Any use of this data beyond the purposes expressly specified in the leaflet will not be the Company's responsibility unless authorized by us. Our guarantee covers exclusively the quality of the manufactured product. We will not accept any responsibility exceeding the value of the purchased product.

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Greenseal is certified by  
MS ISO 9001:2008 Quality Management System  
ISO 14001:2004 Environment Management Systems