

BETON-SEAL SUPER-K

Multi-purpose chemical waterproofing and hardening compound for concrete and mortars

Product Type

Beton-Seal Super- K is a ready-for-use clear liquid compound.

Description

Beton-Seal Super-K is an economical multi-purpose chemical compound which is easily applied to new or existing concrete and masonry structures to provide a permanent waterproof barrier, to case harden and strengthen the matrix, prevent dusting, minimize wear and reduce attack by certain chemicals.

Typical Applications

Beton-Seal Super-K finds application in:

- * Bridge and road decks
- * Floors and screeds
- * Foundations and basements
- * Supporting and retaining walls
- * Aprons and runways
- * Water retaining structures
- * Silos
- * Precast concrete elements
- * Tiled decks
- * Roads and parking pavements

Action

Beton-Seal Super-K is specially formulated to penetrate untreated concrete or mortars to a depth of up to 20mm. It reacts with the calcium salts, using moisture as a catalyst, to form a gel which crystallizes and seals the pores and capillaries of the matrix. The by-products of this chemical reaction are permanently bound into the matrix and are irreversible, providing a case hardened and waterproofed surface to a depth of several millimeters. Beton-Seal Super - K effectively seals cracks up to 3mm wide.

Calcium Salts

* Calcium hydroxide is a by-product of Portland cement during its hydration. The hydration process begins when water is added to Portland cement and it continues during the curing period. The volume of calcium hydroxide in the matrix depends on the quantity of Portland cement and the curing process - that is, the lesser the Portland cement in the mix, the lower the volume of calcium hydroxide to be generated. It is therefore important to investigate the mix used (regardless of the specifications, which are not always followed), and the curing period to ascertain the presence and volume of calcium hydroxide.

* In standard concrete or mortar Beton-Seal Super-K is the calcium hydroxide component of hydrated Portland cement that is most vulnerable to dissolution and leaching, with attendant deterioration of the concrete or mortar matrix.

* Carbonation of concrete, a secondary reaction of hydration, which drops the pH level of concrete and promotes corrosion of the reinforcing steel, occurs when carbon dioxide penetrates the concrete through the pores and capillaries of the matrix and converts the calcium hydroxide into calcium carbonate.

Agents Affecting Chemical Action

* If Beton-Seal Super-K is used on its own, little or no chemical reaction will occur in concrete or mortar which may contain a high proportion of silica fume, fly-ash or slag.

* Calcium Hydroxide is largely consumed in the ensuing pozzolanic reaction when silica fume has been added to Portland cement in a mix, leaving little or no hydroxide for Beton-Seal Super - K to react with.

* Blast Furnace Slag reduces the volume of calcium hydroxide by dilution pro-rata to its percentage of Portland cement. For example, there will be approximately 15% less calcium hydroxide in the matrix of concrete or mortar using a PC 15 SL cement, which contains 15% slag (and sometimes more).

* Fly-ash has a dual effect of diluting and consuming calcium hydroxide. For example, if 30% of fly-ash is added to Portland cement (PC 30 FA) in the mix, there will be a reduction of approximately 50% in calcium hydroxide.

* A reduction of calcium hydroxide will also be felt when normal curing procedures are not adhered to and the matrix is allowed to hydrate too quickly.

Use of Activator

* The Beton-Seal Super - K Activator No 12 is needed in all cases where a lack of calcium ions in the matrix exists. Please note that calcium hydroxide will leach out of cracks and a porous matrix if the concrete is exposed to water penetration over a period of time. The more porous the concrete the greater the possibility of leaching and efflorescence.

* Similarly, the greater the content of Normal Portland cement, the greater the possibility of efflorescence. When Beton-Seal Super - K Activator No 12. is used, it must be allowed to dry completely before the Beton-Seal Super- K is applied.

Other Cements

* There should be an adequate volume of calcium hydroxide in a concrete matrix using Rapid Hardening Cement (RHC) or Sulphate Resisting Cement (SRC), providing that the cement content is adequate and the curing process has not been drastically shortened.

Durability and Improvements

* Beton-Seal Super - K becomes an integral part of the concrete and will last as long as the matrix. It is not affected by normal wear and tear or UV radiation.

* Beton-Seal Super - K, by using the available calcium hydroxide in the matrix, greatly improves the quality and lifespan of concrete and mortar.

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When to Apply Beton-Seal

- * Beton-Seal Super - K is best applied onto concrete or mortar after the full curing period of 28 days.
- * However, it may be applied sooner, but not earlier than 21 days for the waterproofing and hardening of concrete decks and walls; not earlier than 7 days for the sealing and hardening of cement render or mortar joints.

Directions for Use

Surface Performance

- * Beton-Seal Super- K must be applied onto dry concrete or mortar that is free of dust and dirt, oil, grease, laitance, mortar droppings curing compounds or any previous coatings.
- * Care must be taken when removing membranes/coatings not to allow dissolved material to penetrate the matrix.
- * Removal of laitance, mortar droppings and membranes is preferably done by mechanical means, such as high-pressure water jets or grinder. (Wet grit blasting may also be used.)

Application

- * Spray apply Beton-Seal Super- K onto the surface and allow to soak in.
- * **DO NOT** allow ponding to take place after saturation - use a broom or squeegee to brush away any excess Beton-Seal from horizontal surfaces.
- * Allow the treated area to dry over 12 to 24 hours.
- * Potable water is then sprayed gently over the area at least once a day on the 2nd, 3rd and 4th consecutive days. On the 5th day, thoroughly clean the surface if necessary, using a hard broom and water, to remove any un-reacted material from the surface.
- * Test for watertightness and/or improvements in hardness.
- * It is recommended, whenever possible, to keep the treated surface damp for a few days after the 4th treatment. In hot conditions, the surface should preferably be kept covered to avoid fast evaporation.

Treatment of Cracks

- * Allow Beton-Seal Super-K to soak in by making extra passes with the spray gun along the cracks.
- * When treating larger cracks it is best to build a "dam" with sand on either side of the crack and pour Beton-Seal into the "dam" to allow the chemical to fully penetrate the crack.

Watchpoints

- * Avoid contact with glass - splashes should be washed off immediately with clean water
- * If eye contact does occur, flush with clean water immediately
- * Avoid prolonged contact with the skin as the chemical is alkaline -use gloves and protective clothing
- * Wash equipment and tools with clean water
- * When using Beton-Seal Super-K over tiled areas, it is advisable to do a test sample on a tile to ensure staining does not occur.

Performance

The performance of Beton-Seal Super-K has been aptly demonstrated both locally and overseas through many field applications and tests. Copies of test reports by the Portland Cement Institute, Plascon-Evans Paints, etc. are available on request.

Packaging

Beton-Seal Super- K is packed in 25 and 200 litre containers

Quality Assurance

MCC LIMPOPO's production and testing programmes comply with all local and international testing standards. MCC LIMPOPO's production and testing programmes comply with all local and international testing standards.

Updates

This data sheet supersedes all previous issues prior to this date: 12/03/2001.