Contite® HHH

A TRIPLE MECHANISM LIQUID CONCRETE PROTECTION & WATERPROOFING BY CRYSTALLIZATION SYSTEM

DESCRIPTION

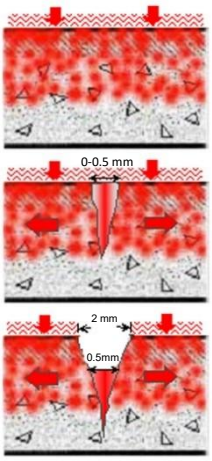
Contite HHH is a triple mechanism, unique opaque sealing and waterproofing subsurface membrane which is solvent free, non-toxic, odourless and eco-friendly. The triple mechanism effect of hydrophilic, hydrophobic and hygroscopic properties provide durable protection to the concrete against water borne chemicals, freeze thaw and other attack. It is a spray applied colloidal liquid that penetrates the concrete's surface and reacts with the cement paste matrix to form an insoluble gel sealing pores, capillaries and cracks creating a below surface barrier against water and water borne salts ingress. As long as water is present **Contite HHH** remains active and will seal hairline cracks both present and future. **Contite HHH** allows the passage of water vapour from the inside of the structure (the concrete breathes) whilst waterproofing / sealing the surface against sea water, aggressive ground waters, waste water, water and certain chemical solutions.

Complies to EN1504 Part 9 and EN1504 Part 2
- Principle 1 : Protection Against Ingress (PI).
  Method 1.1 – Hydrophobic Impregnation.
  Method 1.2 – Impregnation.
- Principle 2 : Moisture Control. (MC)
  Method 2.1 – Hydrophobic Impregnation.
  Method 2.2 – Impregnation.
- Principle 5 : Increase in Physical Resistance (PR).
  Method 5.2 – Impregnation.
- Principle 6 : Resistance to Chemicals (RC).
  Method 6.2 – Impregnation.
- Principle 8 : Increasing Resistivity (IR).
  Method 8.1 – Hydrophobic Impregnation.
  Method 8.2 – Impregnation.

USES & ADVANTAGES

Contite HHH can be used to protect various concrete structures including marine and coastal structures, water storage tanks, highways, runways, bridges, cut & cover tunnels, silos, car parks, swimming pools, precast panels, pipes, etc. Unlike solvent-based, membrane forming sealers **Contite HHH** is environmentally friendly.
Since **Contite HHH** penetrates into the concrete, it won't scratch, peel or damage.
Advantages include:-
- Reduces porosity & permeability.
- 100% Trafficable. Slip resistance improved.
- Prevents concrete cancer/corrosion.
- Improves concrete durability.
- UV resistant no topping or protection required. Heat reflective membranes may be applied over the top.
- Cannot be damaged, no debond as subsurface membrane.
- Provides water repellency.
- Cracks developing on treated surfaces may be sealed avoiding leakage through the slabs.
- Nontoxic, odorless, safe for potable water tanks.
- Fast tracks projects.
- Remains active for life of concrete.
- Overlays of asphalt do not delaminate, Ballast will not damage system.
- No protection boards required when backfilling.
- Hairline cracks up to 0.5 mm. that may develop reseal on contact with water (self-healing).
- Can use with concrete containing PFA, GBFS, or silica fume.
- Withstands thermal stresses.
- Increases useful life of structure.
- Provides additional resistance to dilute acid & alkali attack.
- Increases concrete's surface hardness.
- Very easy to apply and cannot be damaged during construction.

How Contite HHH Seals Concrete & Cracks (Not to Scale)



Contite HHH penetration is determined by concrete grade & porosity

0-0.5 mm. crack Stresses develop & cause crack. Crack sealed by **Contite HHH.**

Cracks >0.5 mm. The surrounding area of the cracks mouth is sealed. As the crack narrows it is sealed by **Contite HHH.** The cracks mouth may be sealed via a combination of calcium acetate & **Contite HHH** or **Contite HHH** on its own.

STANDARDS

- Complies to Chloride Ion Penetration: ASTM C1202 - Less than Control.
- BS EN 12390-8:2009 - Testing Hardened Concrete: Depth of Penetration of Water Under Pressure. Depth of Water penetration @ 5 bar water pressure for 72 hrs - Max 80% of Control.
- Crystal growth depth in the Concrete by SEM - TISTR lab.
- Standard Test method for examination of Water & Waste Water -APHA, AWWA- SGS lab.

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PROPERTIES AND COMPLIANCE

Appearance:	Turbid Liquid
Specific Gravity:	1.15 - 1.25 kg/ltr
Toxicity:	Non Toxic Tested by SGS
pH:	11-13
Drying Time:	min. 2 hrs
Paintability:	Excellent
Explosion Hazard:	None
Flash Point:	None

Triple Mechanism of Contite HHH

Hydrophobic ➡ provides water repellency to the substrate.

Hydrophilic ➡ provides water absorption for crystal growth.

Hygroscopic ➡ absorbs moisture form air in the form of water vapour and uses it for crystal growth formation.

COVERAGE RATES

5 m^2 / litre applied by spray.

DESIGN CRITERIA AND SPECIFICATION

The waterproofing system shall penetrate the concrete and become an integral part of it forming insoluble complexes of calcium silicate hydrate gel in the pores, cracks and capillaries. It shall be a triple action subsurface waterproofing membrane that shall impart hydrophilic and hydrophobic properties.

The material shall be nontoxic and clear. It shall reactivate to seal hairline cracks which develop in the future.

The concrete shall be placed and compacted to avoid honeycombs and shall be cured for up to 28 days prior to application. Falls shall be to drains and the concrete finished with an open textured finish or after finishing by acid etching, water blasting or grinding to provide an open pore structure.

Construction Joints, Parapets, and Penetrations:

Ensure all construction joints are roughened, clean & well prepared with exposed aggregate. Install **Contite Waterstop**. At parapets either pour insitu or treat surface before installing the parapet with **Contite Seal** and install **Contite Waterstop** in the joint.

All drains, pipes, penetrations shall be sealed with **Contite Waterstop** or **Conflex PS** polysulphide joint sealant. Design detailing is important, **Contite HHH** seals cracks, capillaries and pores in concrete. It does not seal major honeycombs, voids or large structural cracks.

APPLICATION & SURFACE PREPARATION

- It is desireable to apply **Contite HHH** at least 2 weeks after pouring concrete, 4 weeks is recommended. It may be applied at any later time and is especially effective on old concrete.
- **Contite HHH** may be applied to concrete immediately after forms are stripped acting as a curing compound and sealing material. Performance is not as effective as when applied after 2 weeks. A second treatment is recommended 28 days later.
- **Contite HHH** may be applied to concrete treated with other compounds providing, these are removed properly, however, oils or paints may prevent penetration.
- Existing cracks up to 2 mm. may be sealed by flooding on to the crack in conjunction with calcium acetate in some circumstances.

Before any concrete is treated the area must be thoroughly cleaned. The surface should be first swept with a broom to remove loose dirt. Then wet and scrub with soap or cleaning compound wash off and ensure clean. Allow concrete to dry thoroughly for at least 24 hours depending on humidity before applying **Contite HHH.**

Contite HHH can be applied by spray, brush and roller applications.

A back pack spray will achieve 100-150 m^2 per hour.

Eye protection should be used when spraying.

Contite HHH should be flooded onto the concrete surface. If applied by brush or roller the product must be flooded on first. For vertical surfaces spray equipment is only appropriate.

Agitate material in drum before application. Apply only to concrete which is dry to touch (no damp patches). If it rains before **Contite HHH** has dried reapplication is required.

Sealing of joints etc should be carried out before application. Apply with low pressure in low wind conditions and allow to dry for 2-6 hours before flooding with water.

Re-spray water/flood with water on the second and third day.

In below ground backfilled concrete surface applications ensure concrete surfaces are dry before application. If high hydrostatic pressure is anticipated consult Cormix first in these instances.

Contite HHH should not be applied at temperatures below 5ºC (in high temperatures apply in the morning or late afternoon) if it is about to rain or in high wind conditions. At low temperatures stir well before use.

Cracks must be located & flooded with material at one litre per 3-4 linear metres.

Pond testing will determine if leaks are apparent and should be continued for at least 12 hours. Retreat the area if leaks are found.

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Equipment:
Use simple hand spraying knapsack for small areas or motorized sprayers for large areas. A simple knapsack spray can achieve 100-150 m^2 per hour.

IMPORTANT NOTES AND LIMITATIONS

Contite HHH should not come into contact with glass. Paint in general will not be effected by **Contite HHH**, however, if
Contite HHH comes into contact with paintwork remove with water. Before applying **Contite HHH** where tiles or other material may come into contact with **Contite HHH** consult Cormix's technical department.
Contite HHH is not designed to be highly resistant to strong acid or alkali attack. It provides water repellency. The ability of **Contite HHH** to seal concrete does not include leaks due to structural faults or mechanical damage. The repair of leaking structures will generally take 3 days to achieve a seal, however, the seal may take longer.
If other waterproofing additives have been used in the concrete or mortar consult Cormix. If curing compounds are used they should be degradeable and removable.
The concrete or mortar surface to receive **Contite HHH** must be clean and free of all oils and grease. If floor hardening is the main consideration use **Contop S**.
Contite HHH should not be used on the negative side of structures which are continuously damp. Consult with Cormix if to be used with pigmented concrete.
Detailing is important e.g. construction joints, penetrations, fixtures, expansion joints etc. must be adequately sealed. Contact Cormix for details.
The surface treatment of the concrete by power floating or vacuum dewatering can make the surface of the concrete very dense and impermeable. After such treatment it is advisable to test a small area of concrete prior to the application of **Contite HHH** to ensure that impregnation occurs and that the surface is not made glassy or white.
Consult Cormix before application in cases of high hydrostatic pressure.
Agitate material in drum before application, especially at low temperatures. **Do not apply below 5ºC**

PACKAGING

25 litre plastic pails or 200 litre drums.

STORAGE AND SHELF LIFE

Store in the shade, do not allow to freeze. Shelf life is 12 months in original sealed containers. Stir before application.

HEALTH AND SAFETY

If swallowed increase liquid intake for 24 hours. Consult a doctor. Eye contact should be avoided by the use of eye protection if contact is made flush with large amounts of water continue for several hours. Where in contact with skin remove with water. Avoid direct contact with eyes at all times. In enclosed environment use breathing apparatus.

TECHNICAL SERVICE

The Cormix International Technical Service Department is available to assist you in the correct use of our products and its resources are at your disposal entirely without obligation.

QUALITY ASSURANCE

ISO 9001: 2015 verified by TUV Nord.
ISO 14001 : 2015 verified by Lloyd's Register International.

DISCLAIMER

Performance data is achieved testing in accordance with International Standards. Testing by others may result in different results from those published as a result of external factors such as poor sampling, incorrect mixing, varying temperatures, curing, crushing procedures etc.
Cormix does not take responsibility nor need to defend others testing that does not achieve the published data. The user must test the products suitability for the intended application and purpose. Cormix reserves the right to change the properties of the product.
Site conditions and differences in materials are such that no warranty or fitness for a particular purpose, nor liability can be inferred from the published data sheet, written recommendations or from other advise offered.

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