

BETOCRETE Brochure

BETOCRETE C-16 - BETOCRETE C-17 (BV)

Liquid Crystalline
Waterproofing Admixtures
for concrete structures



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...permanent waterproofing of concrete from within

BETOCRETE C-16 BETOCRETE C-17 (BV)

BETOCRETE C-16 is the world's first liquid crystalline waterproofing concrete admixture. **BETOCRETE C-17 (BV)** is our latest development, based on the same technology, it also provides the added advantage of plasticising/water reduction properties. **BETOCRETE C-17 (BV)** complies with EN 934-2.

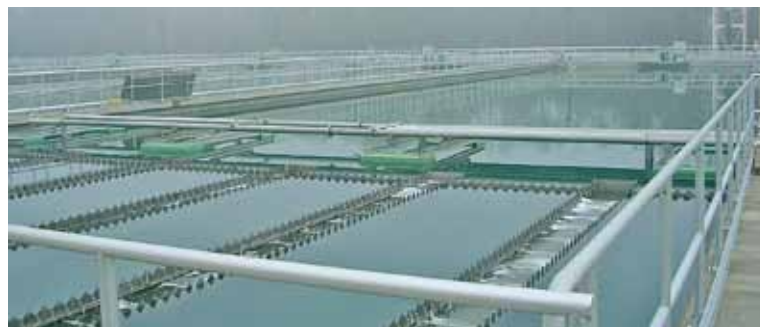
The innovative active ingredient in **BETOCRETE C-16** and **C-17 (BV)** reacts with moisture and free lime, creating millions of nanocrystals throughout the concrete matrix. This reaction continues any time the chemicals come into contact with water. The **BETOCRETE C-16** or **C-17 (BV)** treated concrete achieves the capability to self heal shrinkage cracks.

Unlike powder admixtures, **BETOCRETE C-16** and **C-17 (BV)** completely eliminate the risk of lumping, and ensure homogeneous distribution of the waterproofing admixture throughout the concrete structure. They both can be added to concrete during the batching process at the concrete plant or on the construction site to the ready-mix truck, equipped with suitable mixing capabilities.

BETOCRETE C-16 and **C-17 (BV)** form a permanent and integral part of the concrete which is extremely resistant to high hydrostatic pressures. **BETOCRETE C-16** and **C-17 (BV)** will permanently block the flow of water in the concrete, thus reducing chloride ion diffusion and hence protecting reinforcement steel. However this does not effect the absorptive properties in the top few millimetres of the concrete surface. **BETOCRETE C-16** and **C-17 (BV)** concretes exhibit improved freeze-thaw resistance due to the pore blocking properties.

Whilst **BETOCRETE C-16** will not affect compressive strength, **BETOCRETE C-17 (BV)** will increase compressive strengths by up to 25% compared to a control mix.

BETOCRETE C-16 and **C-17 (BV)** substantially reduce the amount of time and labour associated with applying traditional waterproof coatings, making a perfect waterproofing solution for large concrete structures. Typical applications include water tanks, water catchment basins, wastewater treatment facilities, parking structures, tunnels, dams and waterproofing of foundation walls and slabs.



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Typical Applications:

BETOCRETE C-16 and **C-17 (BV)** are simply added to any concrete mix requiring waterproofing properties. They have negligible air entraining effects and are compatible with most concrete plasticisers. Pre-testing is required.

We recommend the use of **BETOCRETE C-16** or **C-17 (BV)** in a wide variety of new concrete projects.

Typical areas of application include:

- Precast structures
- Foundations
- Concrete slabs
- Dams
- Parking structures
- Water tanks & wastewater treatment facilities
- Shotcrete
- Mass concrete



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Method of application:

BETOCRETE C-16 and **C-17 (BV)** are added directly to the concrete, either during the batching process or on site in a ready-mix truck, equipped with suitable mixing capabilities.

BETOCRETE C-16 and **C-17 (BV)** are added at a rate of 2 - 3 % by weight of cement based on the water/cement ratio, which should not exceed 0.55. Concrete should be placed within 45 minutes of admixture addition.

BETOCRETE C-16 and **C-17 (BV)** significantly reduce labour and time costs associated with the application of standard waterproof coatings. Application is as easy as adding any concrete admixture, allowing it to mix for 3 - 5 minutes, and then placing the concrete.

This is a very cost effective and simple solution for waterproofing new concrete structures.



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Advantages:

- Easy to use
- Extremely cost effective
- Significantly reduces labour and time costs
- Self healing of static cracks up to 1/64" - 0,4 mm
- Increases concrete strength and freeze/thaw resistance
- No lumps during batching
- Protects reinforcement from corrosion due to reduced chloride ion diffusion
- Negligible air entrainment
- Compatible with most plasticizers and water reducers
- Forms a permanent and integral part of the concrete matrix
- Additional waterproof coatings generally not needed
- Environmentally safe; Zero VOCs
- Treated concrete withstands high hydrostatic pressures
- BETOCRETE C-16 is permeability tested to Army Corps of Engineers CRD-C 48-92 up to 200 psi (14 bar) = 460 ft (140 m) head pressure.
Result: drastic reduction of permeability compared to untreated concrete
- BETOCRETE C-17 (BV) complies with DIN EN 934-2



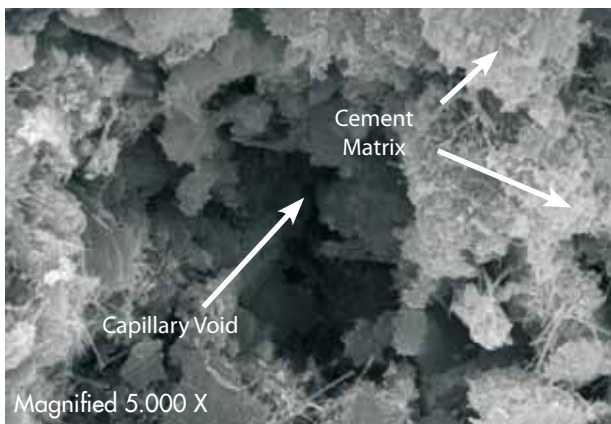
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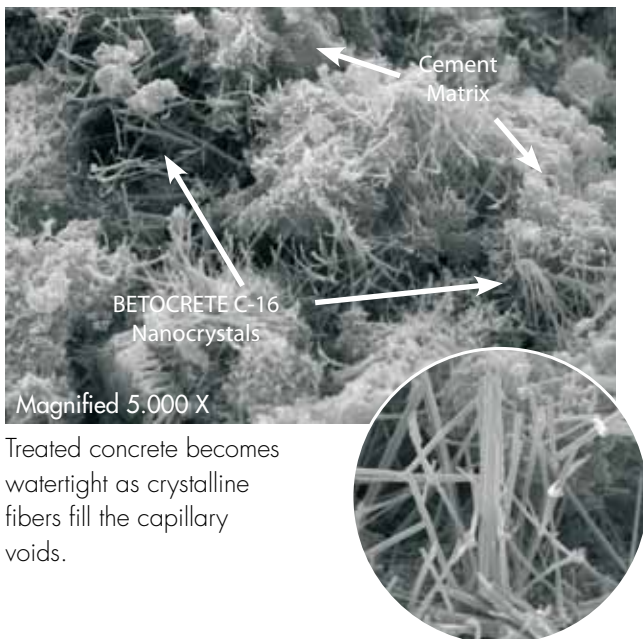
The Chemistry of BETOCRETE C-16 and C-17 (BV)

The innovative chemistry of **BETOCRETE C-16** and **C-17 (BV)** reacts with moisture and free lime to form millions of crystalline fibers (nanocrystals) within the capillary pores. These fibers reduce the pore diameter, permanently blocking the flow of water through capillaries and voids (up to 0,4 mm), yet allowing the concrete to breathe.

The pictures below illustrate the basic behavior of **BETOCRETE C-16** within the concrete.



Without **BETOCRETE C-16**. Untreated concrete is a porous system, prone to water infiltration.



Treated concrete becomes watertight as crystalline fibers fill the capillary voids.



Magnified picture (10,000 X) of BETOCRETE C-16 nanocrystals

Result: **BETOCRETE C-16** or **C-17 (BV)** become an integral and permanent part of the concrete matrix.

The following photos illustrate the crack-sealing capabilities of **BETOCRETE C-16** and **C-17 (BV)**.



Example of a naturally occurring shrinkage crack in red pigmented concrete. (Magnified approx. 32 X)



Shrinkage typically produces static hairline cracks. With static cracks up to 1/64" - 0,4 mm, **BETOCRETE C-16** and **C-17 (BV)** will produce nanocrystals in the crack, sealing it and preventing further flow of water.

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