



# Crystalline Waterproofing



# Concrete Waterproofing

Concrete waterproofing is always a challenge as the areas to be treated are either damp or wet and not seldom easily accessible. Especially in deep excavations with dewatering the environment is elseanything but perfect for a waterproof coating or membrane. Cementitious waterproofing materials are forgiving in such situations and foremost crystalline products work especially well against negative water pressures. VELOSIT offers you a full system for the construction of such water-impermeable structures. Our crystalline waterproofing systems are designed for the treatment of cracked and deteriorated concrete structures. Our crystalline repair mortar VELOSIT® RM 211 allows you to reinstate the concrete and finish the surface with our crystalline waterproofing slurry VELOSIT® CW 111. The active ingredients in VELOSIT® CW 111 react with soluble chemicals found in the concrete matrix and form millions of crystals inside the concrete pores and cracks.

## Crystalline products for crack sealing and repair in concrete structures

Crystalline waterproofing represents a fascinating waterproofing process. After application on the concrete surface, the active substances migrate out of the waterproofing material into the capillaries of the concrete where they react with Calcium Hydroxide forming insoluble needle shaped crystals. The smallest pores and cracks are filled with these crystals and become therefore impermeable to capillary water! "An enemy becomes a friend": The water penetrating concrete element acts as a means of transportation for the active substances in the crystalline coating, carrying them deep into the substrate. Any time water penetrates into the concrete this reaction is restarted. If concrete cracks even the crack's internal surfaces starts to develop crystals that gradually fill the void and that is how static cracks up to 0.4 mm self heal.

### An additional advantage:

VELOSIT® CW 111 waterproofing is suitable for potable water structures!



### Mode of action of VELOSIT® CW 111

Untreated concrete is a porous matrix, which is prone to water penetration.

1. The pore water contains dissolved Calcium Hydroxide (yellow).
2. VELOSIT® CW 111 is applied to the concrete surface with a brush or by spray application.
3. The active ingredients of VELOSIT® CW 111 (red) start to penetrate into the capillary pores.
4. The active ingredients in the coating react with Calcium Hydroxide to form insoluble crystals filling cracks, pores and voids up to a width of 400 micrometers (0.4 mm).
5. Result: Capillaries and voids are filled with crystals. VELOSIT® CW 111 is not only a coating, it becomes an integral part of the concrete!



Jianghuacheng building, Shaanxi  
PR China

### VELOSIT® CW 111 - High Strength Crystalline Slurry

- Becomes part of the concrete creating a waterproof layer inside the concrete below the surface.
- It is especially strong against negative side water pressure.
- Cures a lot faster than all conventional products.
- Eliminates the need for days of water curing and protection against traffic.
- Creates a permanently reactive layer inside the concrete allowing the structure to self-heal shrinkage cracks when in contact with water.
- Self healing properties of static cracks up to 0.4 mm.

# Waterproofing from within

The crystalline effect can also be added to the concrete itself eliminating the need for a surface applied waterproofing. With the addition of a small amount of our crystalline admixtures of the VELOSIT® CA series concrete becomes a lot denser with a dramatic improvement of its water resistance. The penetration of water under hydrostatic pressure is significantly reduced and the structure is able to self heal minor cracks up to 0.5 mm. The mechanism works extremely well in situations where a regular waterproofing with a coating or membrane on the water facing side is ruled out by design. A pile or secant wall for example does not allow the installation of a water facing layer to protect the concrete. In other applications it is just way more economical to have the waterproofing included in the concrete. Potable water tanks or sewage treatment plants are examples for such settings. The internal waterproofing is achieved using the same mechanism like the crystalline slurry VELOSIT® CW 111. The difference is that the crystalline chemicals are added to the fresh concrete and are evenly distributed throughout the concrete matrix. During the hydration of cement the capillary water is again saturated with Calcium Hydroxide. This immediately starts to react with the chemicals forming crystals inside the pores. There are a lot of excess crystalline chemicals lying dormant in the concrete structure until they get dissolved with water. This could be from a formation of a crack or just an increase in hydrostatic pressure forcing the water deeper into the concrete. Once dissolved in water they immediately react with Calcium Hydroxide and deposit new insoluble crystals on the internal surface of the crack or capillary.

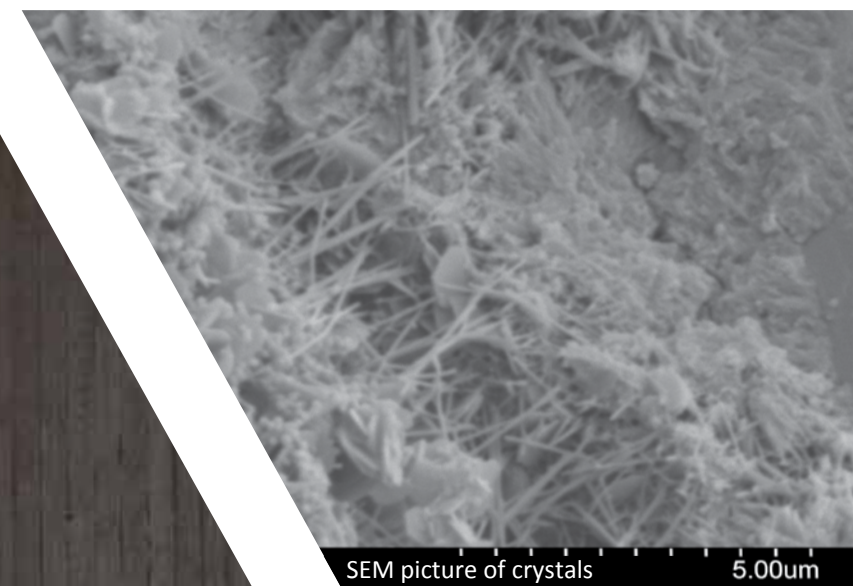
## VELOSIT® CA - Series

### VELOSIT® CA 112 - Crystalline Admixture

- Creates a crystalline structure inside the concrete.
- Reduces the amount and diameter of the capillary pores.
- Self healing properties of treated concrete of static cracks up to 0.5 mm.
- Potable water approved.

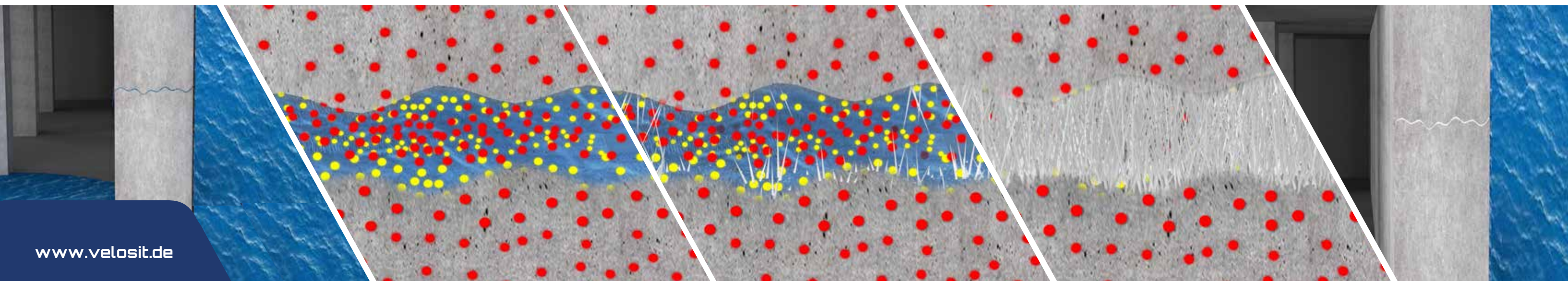
### VELOSIT® CA 113 - Crystalline and Hydrophobic Admixture

- Creates a crystalline structure inside the concrete.
- Reducing the amount and diameter of the capillary pores.
- Self healing properties of treated concrete of up to 0.4 mm static cracks.
- Strong internal hydrophobic effect.



### Self healing mechanism of VELOSIT® CA 112

1. A crack forms in a concrete wall and water starts leaking into the structure.
2. Calcium Hydroxide (yellow) and the crystalline chemicals (red) start to dissolve.
3. The reaction of these two lead to the formation of needle shaped crystals on both edges of the crack.
4. Crystals completely fill the crack forming a dense network which stops the water flow.
5. The crack has „self healed“ and the concrete structure is watertight again ...



# Concrete Waterproofing by VELOSIT®



Swimming Pool Guatemala City  
© Watermania

# Product Information



Besides the coating systems VELOSIT® has a range of integral waterproofing admixtures that use the crystalline chemistry to improve the resistance of concrete against hydrostatic pressures. These admixtures give concrete a self healing effect that seals cracks up to 0.5 mm when in contact with water.



## VELOSIT® CA 112 Crystalline Waterproofing Concrete Admixture

VELOSIT® CA 112 is an easily administered and very economic waterproofing admixture. VELOSIT® CA 112 creates a crystalline structure inside the concrete reducing the amount and diameter of capillary pores.

### Typical application fields:

- Waterproof concrete for basements and below grade parking structures.
- Waterproofing of potable water structures, sewage structures, elevator pits and shotcrete.
- Slab waterproofing.
- Self healing properties of treated concrete static cracks up to 0.5 mm.

Bags: 44 lb. (20 kg)  
BigBags: 2205 lb. (1.000 kg)



## VELOSIT® CA 113 Crystalline Hydrophobic Waterproofing Concrete Admixture

VELOSIT® CA 113 creates a crystalline structure inside concrete reducing the amount and diameter of capillary pores.

### Typical application fields:

- Waterproof concrete for basements and below grade parking structures.
- Usable for decorative features due to it's limited efflorescence compared to standard crystalline products.
- Waterproofing of shotcrete mixes.
- Self healing properties of treated concrete static cracks up to 0.4 mm.

Bags: 44 lb. (20kg)



## VELOSIT® CA 115 Liquid Crystalline Waterproofing Concrete Admixture

VELOSIT® CA 115 is an easy to use, economic, liquid crystalline, waterproofing concrete admixture. VELOSIT® CA 115 creates crystalline "nano" structures within the concrete matrix, reducing the diameter of capillaries and sealing of micro static cracks (up to 400 microns).

### Typical application fields:

- Waterproof concrete for basements and below grade parking structures.
- Waterproofing of potable water structures, retaining sewage structures, tunnels and pipes.
- Waterproof slab-on-grade concrete, rafts and pile caps.
- Waterproofing of shotcrete mixes.

Plastic pails: 55 lb. (25 kg)  
IBC containers: 2205 lb. (1.000 kg)



ANALYSIS CERTIFICATE																			
Initial Report: REP-VELOSIT-17-001																			
Sample Identification:																			
Sample ID:	Control mix Vj Control mix with VELOSIT CA 113																		
Customer Name:	VELOSIT																		
Sample observation:																			
No abnormal findings:																			
Concrete Analysis Result:																			
Control Mix (kg)	Control Mix (kg)	Control Mix (kg)	Control Mix (kg)																
Ingredients	Total wt. (per kg)	Ingredients	Total wt. (per kg)																
Concrete	470 kg	Concrete	470 kg																
Silica Fume	100 kg	Silica Fume	100 kg																
Water Total	140.5 kg	Water Total	140.5 kg																
Aggregate Size 1	400 kg	Aggregate Size 1	400 kg																
Aggregate Size 2	155 kg	Aggregate Size 2	155 kg																
Sand	675 kg	Sand	675 kg																
Water/Gypsum ACE	5.50 kg	Water/Gypsum ACE	5.50 kg																
Water/Gypsum ACE	5.50 kg	VELOSIT CA 113	3.95 kg																
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# System Products



Integrally treated concretes with crystalline admixtures like VELOSIT® CA 113 gives concrete a self healing effect of cracks up to 0.4 mm width (16 mils). The same effect can be achieved with the crystalline waterproofing coating VELOSIT® CW 111 which does not require post application water curing.



## VELOSIT® CW 111 High Strength Crystalline Waterproofing Slurry

VELOSIT® CW 111 is a crystalline waterproofing slurry for concrete substrates. It is very economic and easy to apply. VELOSIT® CW 111 becomes part of the concrete and creates a waterproof layer inside the concrete itself. It is especially strong against negative side water pressure.

### Typical application fields:

- Waterproofing of basements, below grade parking structures, potable water structures, sewage structures, tunnels, pipelines and elevator pits.
- Protection of dams and spill-ways.
- Slab waterproofing (dry shake application).
- Self healing properties of static cracks up to 0.4 mm.

Bags: 55 lb. (25kg)



## VELOSIT® PC 221 Plug Cement

VELOSIT® PC 221 is a rapid setting cement for concrete and masonry. The product is used to waterproof water leakages, as an anchoring mortar and as an accelerator for other VELOSIT®-mortars. It is especially strong against negative side water pressure.

### Typical application fields:

- Waterproofing of punctual water leakages for example in concrete pipes, water tanks and basement walls.
- Mortar for anchoring of starter bars, radiator mountings and similar.
- Repair mortar for small surface repairs.
- Set accelerator for VELOSIT®-repair mortars.

Plastic pail: 26 lb. (12kg)



## VELOSIT® PC 222 Plug Cement and Starter

VELOSIT® PC 222 is a flash setting cement for concrete and masonry. The product is used to waterproof water leakages and as an accelerator for other VELOSIT®-mortars. It is especially strong against negative side water pressure.

### Typical application fields:

- Waterproofing of punctual water leakages for example in concrete pipes, water tanks and basement walls.
- Set accelerator for VELOSIT®-repair mortars.
- It is especially strong against negative side water pressure.

Plastic pail: 26 lb. (12kg)



## VELOSIT® RM 211 Crystalline Concrete Repair Mortar, 1 – 25 mm

VELOSIT® RM 211 is a fibre-reinforced, crystalline cementitious repair mortar for concrete restoration acc. to EN 1504-9. It creates a structural grade, smooth surface for crystalline waterproof coatings.

### Typical application fields:

- Overlays and repairs on concrete structures like dams, bridges, beams, balconies and facade.
- Filling of blow holes, honeycombs and surface roughness.
- Repair of surface defects on concrete.
- Application thickness from feather-edge to 25 mm (1").

Bags: 55 lb. (25kg)





**VELOSIT** is a young and innovative company. We combine decades of experience in R&D, production and consulting for high performance construction materials which are fully conversant with modern construction techniques.

Our mission is to make construction faster, easier and less tedious. **VELOSIT** products allow you to finish your project significantly faster without compromising on quality.

**VELOSIT** supplies the construction industry with state-of-the-art alternative solutions. Production „made in Germany“ stands for uniform quality to the highest standards.

If you have questions - just give us a call!

We can individually tailor a suitable solution for you. Our service and technical support will gladly help.