VELOSIT® CA 113

Crystalline Hydrophobic Waterproofing Admixture

CE
EN934-2

Application fields

VELOSIT CA 113 is a crystalline and hydrophobic waterproofing admixture for concrete. It is very economic and easy to apply. VELOSIT CA 113 creates a crystalline structure inside the concrete reducing the amount and diameter of the capillary pores. Typical application fields besides others are as follows:

- Waterproof concrete for basements and below grade parking structures
- Usable on decorative features because of limited efflorescence compared to standard crystalline products
- Waterproofing of potable water structures
- Waterproofing of sewage structures
- Waterproofing of tunnels and pipelines
- Slab waterproofing
- Waterproofing of shotcrete

Properties

VELOSIT CA 113 is a powder admixture that initiates a crystalline reaction in concrete.

The reaction takes place with the free lime of the concrete and creates a permanent reduction of water permeability. The crystalline effect allows the structure to self-heal shrinkage cracks under contact with water. Besides that VELOSIT CA 113 treated concrete develops a strong water repellency.

VELOSIT CA 113 exceeds the requirements of EN 934-2 for concrete admixtures and is classified as a waterproofing additive according table 9.

VELOSIT CA 113 is mixed into the concrete either at the batch plant or on site into the batch truck.

- Self healing properties of treated concrete of up to 0.4 mm static cracks
- Waterproof up to 13 bars in properly formulated mix designs
- Strong hydrophobic effect
- Minimal efflorescence and discoloration
- Easy to mix
- Increased final strength

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- Little influence on concrete setting and strength development
- Increased resistance against aggressive media with a pH range of 3-12 and against soft water with low ion content
- Suitable for potable water
- Active corrosion inhibitor

Application

1.) Concrete requirements

Waterproof concrete requires several measures to ensure a dense structure.

Cement: VELOSIT CA 113 can be used with most CEM I – III R and N (ASTM Type I – V) cements. Only cement types with more the 50% pozzolanic content are not suitable. Cement content must be at least 280 kg/m^3 (472 lbs. per yd^3).
Fly ash: Total fly ash must be less than 50% of the cement content.
Water: potable water quality with a maximum dosage of 55% on cement content (water/cement ratio < 0.55).
Pozzolans: Pozzolanic additives like Microsilica or slag should be avoided as they compete with VELOSIT CA 113 for the available lime.
Aggragates and sand: Ensure a proper sieve curve according to good concreting practice as outlined for example in the ACI guidelines.
Admixtures: VELOSIT CA 113 is compatible with most concrete admixtures.
For compatibility of VELOSIT CA 113 trial mixes are strongly recommended.
Rebar: Amount and layout of reinforcement must be planned to minimize the risk of crack development. The rebar design is not influenced by the use of VELOSIT CA 113.

2.) Processing

The dosage depends on the amount of mixing water including aggregate moisture in the batch mix. Add 2.5% VELOSIT CA 113, i.e. 2.5 kg per 100 liter (2.1 lbs. per 10 gal.). In a typical 300 kg cement per m^3 (505 lbs. per yd^3) with a water/cement ratio of 0.40 this equals a dosage of 1.0% on cement.

a.) Batch-plant: Add VELOSIT CA 113 together with the aggregates. Use normal mixing procedure.

b.) Concrete truck: Add VELOSIT CA 113 into the drum when the truck arrives at the job site. Mix for 8 min. at high speed before pumping. Trial mixes with the concrete mix design are strongly recommended for this application.

c.) Site mixes: Concrete mixed in small tumbler mixers can also be improved with VELOSIT CA 113. Add the powder in the calculated amount together with the aggregate into the mixer.

3.) Placing

Concrete can be placed as specified. Take special care of the compaction by properly vibrating the placed concrete. Install joint waterproofing solutions from our VELOSIT JT line in any cold joints or construction joints.

4.) Curing

Follow standard curing procedures for the site conditions. Take the required steps by either water curing as specified or applying a curing compound.

Estimating

Dosage per m^3 (yd^3) concrete

Water Cement	40 %	45 %	50 %	55 %
280 kg/m^3 (472lb/yd^3)	2.80 kg (4.72lb.)	3.15 kg (5.32 lb.)	3.50 kg (5.91 lb.)	3.85 kg (6.50 lb.)
310 kg/m^3 (522lb/yd^3)	3.10 kg (5.23 lb.)	3.49 kg (5.88 lb.)	3.88 kg (6.54 lb.)	4.26 kg (7.19 lb.)
340 kg/m^3 (573lb/yd^3)	3.40 kg (5.73 lb.)	3.83 kg (6.45 lb.)	4.25 kg (7.17 lb.)	4.68 kg (7.89 lb.)
370 kg/m^3 (623lb/yd^3)	3.70 kg (6.24 lb.)	4.16 kg (7.02 lb.)	4.63 kg (7.80 lb.)	5.09 kg (8.58 lb.)

Cleaning

VELOSIT CA 113 can be removed in the fresh state with water. Once it has cured acidic cleaners like muriatic acid are required.

Quality features

Color:	gray
Density:	1.1 kg/l
Water impermeability acc. EN 12390-8 (concrete with 310 kg OPC per m^3, w/c= 0.45):	
- Positive side:	13 bar (190 psi)
- Negative side:	13 bar (190 psi)
Capillary absorption:	- 72% against control
Compressive strength compared to untreated concrete*:	
7 days :	+/- 0%
28 days:	+ 1%
Self-healing of static cracks:	max. 0.4 mm (16 mils)
Fire rating EN13501-1:	Class A1

*Concrete mix design:

CEM I 42.5N (Milke Classic):	310 kg per m^3
Wesersand 0/2:	670 kg per m^3
Weserkies 2/8:	450 kg per m^3
Weserkies 8/16:	700 kg per m^3
Wasser:	139.5 l per m^3
w/c=0.45	
VELOSIT CA 113:	3.49 kg per m^3

Packaging

VELOSIT CA 113 is available in two pack sizes:
20 kg (44 lb.) watertight plastic bag
20 kg (44 lb.) plastic pails

Storage

VELOSIT CA 113 can be stored in unopened original packs for 12 months at 5-35°C (40-95°F) in a dry storage place protected against sunlight.

Safety

Please observe the actual valid material safety data sheet and follow the described safety measures for handling of the product.

Used product containers must be emptied completely after use. They can be returned to VELOSIT GmbH & Co. KG on request.

Recommendations

VELOSIT CW 113 is only available for professional applicators.

Concrete treated with VELOSIT CA 113 may discolor or show strong efflorescence in water contact. This is normal and caused by the crystalline reaction.

All described product features are determined under controlled laboratory conditions according to the relevant international standards. Values determined under job site conditions may deviate from the stated values.

Please always use the latest version of this data sheet available from our website www.velosit.de.

Effective date

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