

VELOSIT® CA 117

Liquid Crystalline Waterproofing & plasticising concrete admixture



Application fields

VELOSIT CA 117 is an easy to use, economic, liquid crystalline and water-reducing waterproofing concrete admixture. VELOSIT CA 117 creates a crystalline “nano” structure within the concrete matrix, reducing the diameter of capillaries and sealing of any micro static cracks (up to 400 microns). Typical application fields include waterproofing of concrete:

- Basements and below grade parking structures
- Potable water structures
- Sewage retaining structures
- Tunnels and pipes
- On grade slabs, rafts and pile caps
- Providing waterproof shotcrete

Properties

VELOSIT CA 117 is a liquid admixture that initiates a crystalline reaction in concrete. The reaction takes place with the free lime in concrete pores and

capillaries creating a permanent reduction of water permeability. The crystalline effect allows the structure to self-heal shrinkage cracks when exposed to water.

VELOSIT CA 117 exceeds the requirements of: EN 934-2 for concrete admixtures and is classified as a water reducing additive according to table 2 and ASTM C494, Part 2, Tables 1 & 2.

VELOSIT CA 117 is mixed into the concrete either at the batching plant or in the mixer truck on site.

- VELOSIT C117-administered concrete self-seals both existing and futuristic static cracks of up to 0.4 mm
- Properly formulated mix designs result in waterproof concrete resistant against up to 13 bars
- Quick dispersion; easy to mix with no lumping or need for extensive mixing times
- Ability to reduce water/cement ratio means increased final strength and/or water tightness over control.
- Minimal influence on concrete setting time

- Increased resistance against low-ion soft water and aggressive media with a pH range of 3-12
- Suitable for potable water

Application

1.) Concrete requirements

Waterproof concrete requires several measures to ensure a dense structure.

Cement: VELOSIT CA 117 can be used with most CEM I – III R and N (ASTM Type I – V) cements. Only cement types with more than 50% pozzolanic content are not suitable. Cement content must be at least 280 kg/m³ (472 lbs. per yd³).

Fly ash: Total fly ash content must be less than 50% of the total cementitious content.

Water: potable water quality with a maximum dosage of 55% to total cementitious content (water/cement ratio < 0.55).

Pozzolans: Additives like Microsilica and slag compete with VELOSIT CA 117 for the available lime. In these cases laboratory tests should be conducted beforehand to determine suitability, especially when “pozzolanic-containing” cements are used.

Aggregates and sand: Ensure a proper sieve curve according to good concreting practice such as outlined by the ACI guidelines for example.

Admixtures: VELOSIT CA 117 is compatible with most concrete admixtures. Mixes containing strong water reducers or super plasticizers must undergo suitability tests to avoid possible segregation, especially at high dosage rates.

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 117.

2.) Processing

The water content in any concrete mix is directly related to the porosity of the resultant concrete.

Hence, the dosage depends on the amount of mixing water (aggregate moisture included) in the

batch mix. VELOSIT CA 117 is added at a rate of 5% by weight of the total water (mixing water + aggregate moisture) i.e. 5 kg per 100 liter (4.2 lbs. per 10 gal.). In a typical 300 kg per m³ (505 lbs. per yd³) total cementitious and a water:cement ratio of 0.40, use 6 kg of VELOSIT CA 117 (Please refer to the guideline table under “Estimating” later on in this technical data sheet.

a.) Batch-plant: Add VELOSIT CA 117 together with the mixing water. Water demand will be 5-10% lower than the untreated mix design. Use normal mixing procedure.

b.) Concrete truck: Add VELOSIT CA 117 into the drum when the truck arrives at the job site. Mix for 8 min. at high speed before pumping. Preliminary lab trials are mandatory for this type of administration to adjust the required mixing water at the batch plant and at the job site.

c.) Site mixes: Concrete mixed in small tumbler mixers can also be improved with VELOSIT CA 117. Add the product in the calculated amount together with the water into the mixer. Start with a semi dry mix and adjust to the desired consistency after at 3 minutes of mixing.

3.) Placing

Standard concrete placing practice in accordance with ACI Recommendations or equivalent International codes must be followed to ensure optimum results. Install joint waterproofing solutions for example VELOSIT WS 801 in any cold joints or construction joints.

4.) Curing

Follow specified curing procedures as necessary. VELOSIT CA 117 is effective whether water curing or a curing compound is used.

Estimating

Dosage per m³ (yd³) concrete

Total water percentage	40 %	45 %	50 %	55 %
CA117 dosage Rate as % of total water	5 %			
CA117 dosage Rate as % of total water	2 %	2.25%	2.5%	2.75%
280 kg/m ³ (472lb/yd ³)	5.60 kg (9.42lb.)	6.30 kg (10.60 lb.)	7.00 kg (11.78 lb.)	7.70 kg (12.96 lb.)
310 kg/m ³ (522lb/yd ³)	6.20 kg (10.43 lb.)	6.98 kg (11.74 lb.)	7.76 kg (13.06 lb.)	8.52 kg (14.34 lb.)
340 kg/m ³ (573lb/yd ³)	6.80 kg (11.44 lb.)	7.66 kg (12.89 lb.)	8.50 kg (14.31 lb.)	9.36 kg (15.75 lb.)
370 kg/m ³ (623lb/yd ³)	7.40 kg (12.45 lb.)	8.32 kg (14.00 lb.)	9.26 kg (15.59 lb.)	10.18 kg (17.13 lb.)

Cleaning

VELOSIT CA 117 spillages are easily removed with water.

Quality features

Color:	brownish
Density:	1.17 kg/l
Water impermeability acc. EN 12390-8*:	
- Positive side:	13 bar (190 psi)
- Negative side:	13 bar (190 psi)
Compressive strength compared to untreated concrete*:	
7 days:	+ 2 %
28 days:	+ 4 %
Chloride ions:	< 0.05 %
Self-healing of static cracks:	
	max. 0.4 mm (16 mils)

* Concrete mix design:

CEM I 42,5N (Milke Classic):	310 kg per m ³
Weser Fine sand 0/2:	670 kg per m ³
Weser Fine aggregate 2/8:	750 kg per m ³
Weser Coarse aggregate 8/16:	700 kg per m ³
Water:	139.5 l per m ³
w/c= 0.45	
VELOSIT CA 117:	7.00 kg per m ³

Packaging

VELOSIT CA 117 is available in two pack sizes: 25 kg (55 lb.) plastic pails 1000 kg (2200 lb.) IBC containers

Storage

VELOSIT CA 117 has a shelf life of 12 months when stored in unopened original packs between 5 °C – 35 °C (50 – 95 °F) in dry storage conditions and protected from direct sunlight.

Safety

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

Recommendations

VELOSIT CA 117 is only available for professional applicators.

Concrete treated with VELOSIT CA 117 may discolor or show efflorescence once in contact with water. This is normal and mainly caused by the crystalline reaction. The discoloration does not affect performance.

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.

Manufacturer

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