

CAC-Crystaseal

**Cementitious Crystalline Capillary
Integral waterproofing additive
for concrete**

Primary Applications:

CAC-Crystaseal is recommended for construction of sewage water treatment plants, secondary containment structures, tunnels, subway systems, foundations, parking structures, swimming pools, reservoirs, pre-cast, shotcrete, coastal roads, highways, sea ports, harbours and other structures that are exposed to saline conditions.

Features & benefits:

- Resists positive & negative hydrostatic pressure
- Becomes an integral part of the concrete
- Highly resistant to aggressive chemicals
- Can seal hair line cracks up to 0.5mm and it is permanent
- Allows concrete to breathe
- Non-toxic, VOC free
- Added to concrete at the time of batching and therefore is not subject to climatic re-strains.

Description:

CAC-Crystaseal is a state-of-the-art Integral crystalline water proofing admixture available in dry mix powder form. The chemistry within the CAC-Crystaseal reacts moisture and free lime in the concrete, creating millions of water-insoluble nano crystalline fibers, which fill the pores, capillary tracts, minor shrinkage cracks within the concrete. Passage of water in the concrete, either from the positive or negative water pressure side is permanently blocked and the re-reinforcement

protected corrosion. The CAC-Crystaseal chemicals remain an integral part of the concrete for the life of the structure, always re-activating whenever exposed to moisture. CAC-Crystaseal can seal static cracks up to 0.5mm. It may require several weeks to reach its maximum waterproofing capability. Environmental factors like temperature, density, moisture can affect the time of sealing process. CAC-Crystaseal is compatible with all chemical admixtures as per ASTM C-494

Standard Compliance:

DIN 1048-Part 5 - Water permeability

ASTM C 1202-97 - Rapid chloride permeability

ASTM C 827 - Unrestrained expansion test

ASTM C 109 - Compressive strength

ASTM C 1556 - P4 - Co-efficient of Chloride Diffusivity

EN 480 -08 - dry material content

EN 480 -10 - water soluble chloride content

EN 480 -12 - Alkali content

EN 480 - 1 - Reference concrete & Mortar test

ISO 4316 - determination of pH

Typical dosage:

0.8% to 1.0% by weight of total cementitious. Consult CAC technical team for assistance in appropriate dosage rates.

Properties: *as tested in CAC Lab

Appearance: Light Grey powder

Air Content: <2.0 | **Chloride Content:** <0.01%

Alkali Content: <10%

	Control	CAC Crystaseal
Water permeability	15.0	6.9
Compressive strength	22.5 Mpa	24.9 Mpa
7 Days	33.2 Mpa	35.4 Mpa
28 Days	06.50 Hrs	07.20 Hrs
Setting time Initial	07.15 Hrs	08.35 Hrs
Setting time Final		

Test Performance at Independent Third Party Govt. Approved Testing Lab (StructWel)

Sr. No	Parameter to be tested	Specification Test Value	CAC Crystaseal Test Result		Test Observations
			Control	With CAC Crystaseal	
1	Permeability Coefficient Reduction as per DIN 1048 Part 5 & Darcy's formula and Valenta Equation	Material must reduce coefficient of permeability of concrete by min. 70% (preferably 90% or zero permeability), when compared to control concrete	3.32×10^{-12} (m/sec)	1.85×10^{-13} (m/sec)	Reduction in co-efficient of permeability by 94% over control concrete
2	Chloride Diffusion Coefficient as per ASTM C1556 -4	The material must reduce chloride diffusion co-efficient by minimum 45% compared with the control concrete.	4.3×10^{-12} (m ² /sec)	1.6×10^{-12} (m ² /sec)	Reduction in co-efficient of chloride diffusion by 63% over control concrete
3	Effects of Alkali Silica reaction by testing Silica content of admixed concrete	Should have no detrimental side effects in terms of alkali silica reaction (ASR)	Average Length Change of mortar Bar = 0.084%	Average Length Change of Mortar Bar = 0.070%	Reduction in length change by 19% and no detrimental side effects in terms of alkali silica reaction
4	Reduction in Shrinkage Cracks as per ISO-1920-8	Must demonstrate minimum reduction of 20% in shrinkage cracks as compared to control concrete	Shrinkage of Concrete Prism @ 112 days age = 0.1548%	Shrinkage of Concrete Prism @ 112 days age = 0.1204%	Reduction in shrinkage by 22% over control concrete
5	Sulphate resistance of the concrete as per ASTM C-1012 / SN EN 206-1	Must demonstrate no internal expansion under sulphate Attack	Change in length of mortar bar specimen @ 15 weeks = 0.5324%	Change in length of mortar bar specimen @ 15 weeks = 0.3652%	Reduction in length change by 31.4% over control and no internal expansion due to sulphate attack
6	Self-Healing of cracks up to 0.5 mm	The crystalline admixture must be capable of self-healing of cracks up to a width of 0.5mm	-	-	Demonstrated complete closure of 0.5 mm wide crack

CAC-Crystaseal

Cementitious Crystalline Capillary
Integral waterproofing additive
for concrete

Application instructions

A. Ready Mix Plant - Wet Mix Operation

Mix 25kg of CAC-Crystaseal powder with 16.5Ltrs of water to get a thin slurry consistency. Pour the required amount of mixed CAC-Crystaseal in to the drum of the ready-mix truck. Produce the concrete as per the mix design in the batching plant, and take in to account the amount of water already placed in the ready-mix truck. Drop the concrete mix in to the ready-mix truck. Mix at least 5minutes to assure homogeneous distribution of the CAC-Crystaseal in the concrete.

B. Ready Mix Truck - Job Site Mixing

Mix 25kg of CAC-Crystaseal powder with 16.5Ltrs of clean water to get a thin slurry consistency, and take in to account the amount of water already placed in the ready-mix truck. Pour the required amount of mixed CAC-Crystaseal in to the drum of the ready-mix truck, containing the wet concrete mix. Mix at least 5minutes to assure homogeneous distribution of the CAC-Crystaseal in the concrete.

C. Ready Mix Plant - Dry Mix operation

Add CAC-Crystaseal powder in to the drum of ready-mix truck. Drive the truck under the batch plant and add 65% to 70% of the required water along with 165 to 215kg of aggregates.

Mix the materials for 2 to 3 minutes to ensure the CAC-Crystaseal is distributed evenly throughout the mix water. Add the balance of materials to the ready-mix truck in accordance with standard batching practices.

D. Precast batching plant

Add CAC-Crystaseal to the aggregates and sand, then mix thoroughly for 2-3 minutes before adding the cement and water. The total concrete mass should be mixed as per standard method.

Note: To obtain a homogeneous mixture of CAC-Crystaseal with the concrete. Therefore do not add dry CAC-Crystaseal powder directly to wet concrete as this may cause clumping and full thorough dispersion will not occur.

Setting Time & Strength.

CAC-Crystaseal will provide a normal set concrete. Concrete containing CAC- Crystaseal will develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine setting time and strength of the concrete. The concrete treated with CAC-Crystaseal should be placed and finished in accordance with good concrete practices.

CAC-Crystaseal

**Cementitious Crystalline Capillary
Integral waterproofing additive
for concrete**

Joints & Pipe Penetrations

Cold joints and pipe penetrations should be designed using CAC water-stop.

CAC-Crystaseal does not prevent defects in concrete. Consult CAC on the particular applications. Through penetrations must be securely sealed to maintain water tightness. CAC-Crystaseal is designed to waterproof for rigid concrete structures only and will not reliably seal cracks and joints which are subjected to variable loading or repeated movement. Contact CAC Technical Team for project specific recommendations.

Packing:

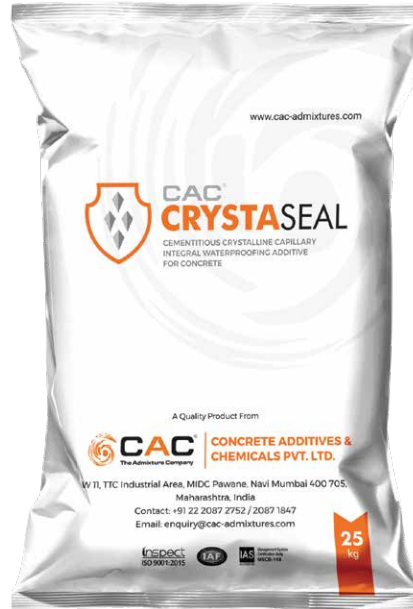
CAC-Crystaseal is supplied in 25kg Bag

Shelf Life:

CAC-Crystaseal has shelf life of 12 months if kept in a dry store in unopened condition.

Health and Safety:

CAC-Crystaseal crystalline integral waterproofing system contains chemicals that may cause irritation to the eyes and skin. Goggles, rubber gloves and long sleeves should be worn when working with these products. Read warnings noted on product package and refer to the product MSDS (Material Safety Data Sheet) prior to use.



Concrete Additives & Chemicals Pvt. Ltd.

Plot No. D-9/4, Chemical & Alkali Complex, Turbhe MIDC,

Navi Mumbai - 400 080

Tel + 91 22 2087 2752 / 20871847

email: enquiry@cac-admixtures.com | www.cac-admixtures.com

