



CWC®SMART CRYSTAL

Crystalline Integral Waterproofing Compound for Cement Concrete and Mortar

Description

CWC®SMARTCRYSTAL Crystalline waterproofing admixture protects and waterproofs concrete structures by crystallization. The active chemicals react with moisture and by product of cement hydrate in the concrete resulting in crystalline formation within the pores and capillary tracts of concrete thus waterproofing the structure against penetration of water and other liquids from any direction **CWC®SMARTCRYSTAL** gives strong and lasting waterproofing protection from harsh environmental conditions.

CWC®SMARTCRYSTAL conforms to IS 2645-2003 and ACI 212.3R-10

Indicative Characteristics

Appearance	Without CWC® SMARTCRYSTAL	With CWC® SMARTCRYSTAL
Setting Time, Initial, minutes, IS 4031	130	136
Setting Time, Final, minutes, IS 4031	170	175
3 days compressive Strength, MPa, IS4031	37.9	38.3
7days Compressive Strength, MPa, IS 4031	49.3	52.1
Permeability to Water, % (v/v) of control mix, IS 2645	100	18
Free Chloride Content, % (w/w)	N/A	0.02 (Max. 0.1% declared)
<i>Note: 53 grade OPC is used to perform all tests.</i>		

Domains of Application

•Foundations •Sewage treatment plants •Tunnels and subway systems •Underground structures •Dams •Pre-cast structures • Swimming pools and reservoirs •Plastering of exterior walls •Bridge decks, columns beams, etc. •Roof and podium slabs and any other areas where high hydrostatic pressure is present.

Typical Test Results of Fresh and Hardened Concrete Using CWC®SMARTCRYSTAL as per ASTM C 494 (compatibility test)

Tests	Reference Mix	With CWC® SMARTCRYSTAL	TEST METHOD
Dosage, by wt. of cement	-	0.8%	
Workability : Slump in mm			
0 minute	215	220	ASTM C 143
120 minutes	145	155	ASTM C 143
Compressive Strength in N/mm²,			
7 days	31.0	30.8	ASTM C 192
28 days	42.2	42.5	ASTM C 192
365 days	47.4	48.8	ASTM C 192
Reduction of Shrinkage		38%	ASTM C 157
Reduction of Chloride ion diffusion %		67%	ASTM C 1556
Alkali –Silica Reaction		No effect, Passes Test	ASTM C 1260

Water Permeability Test Results

Co-efficient of Permeability Reduction, %	-	93%	DIN 1048 Pt 5
Depth of water penetration	36mm	3mm	DIN 1048 –Pt 5
Resistance to Hydrostatic Pressure at 16 bar		No leakage	DIN 1048 Pt 5

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Method of Application

At Batching Plant

CWC®SMARTCRYSTAL is to be added to the concrete during batching process before addition of mixing water subject to the type of batching plant and operation.

At Pouring Point in Transit Mixer

Calculate total amount of cement/binder present in fresh concrete transported through transit mixer. Calculate total quantity of **CWC®SMARTCRYSTAL** required as recommended in TDS (0.8 to 1% by wt of cement or total binder). Make slurry of **CWC®SMARTCRYSTAL** with water in the ratio of approximately 2:1 by weight (i.e., 2 part **CWC®SMARTCRYSTAL** and 1 part potable water)

Example:

Suppose 1 transit mixer carrying 4 m³ Concrete Cement/binder content = 350 kg/m³

Total Cement / binder in 4m³ = 4x350kg = 1400kg

Total **CWC®SMARTCRYSTAL** requirement for 4m³ concrete @ 1% by wt of cement/binder = 14kg

To make **CWC®SMARTCRYSTAL** SLURRY, mix with 50% (by wt of **CWC®SMARTCRYSTAL**) potable water, i.e., 14 kg **CWC®SMARTCRYSTAL** shall be mixed with 7kg of water. Take 5 kg (approx. 3/4th amount of total mixing water) potable water in bucket add slowly **CWC®SMARTCRYSTAL** while mixing with slow speed paddle mixer to make a creamy paste. Add balance quantity of water to get a smooth lumps free slurry. Add this slurry into the transit mixer and mix it with 2-3 minutes in moderately high speed (12-15 rpm).

Normal Dosage

0.8 to 1 % by wt. of cement /cementitious binder.

Curing

Follow normal curing.

Packing

20 kg laminated waterproof HDPE bag

Advantages

- Mixed with concrete at the time of batching
- Sealing cracks or voids up to 0.5mm by crystal formation
- Protects concrete exposed to harsh conditions
- An integral system application
- Crystals are insoluble in water therefore voids are sealed permanently.
- Non-toxic and non-hazardous for drinking water and aquatic /marine life.
- No side effect on fresh as well as hardened concrete.
- Compatible with all types of concrete plasticizers / superplasticizers.

Shelf Life & Storage

12 months from the date of manufacturing when stored in un-opened, original sealed and dry condition at a temperature range from +5°C to 40°C

Precautions

- Preferably store in sealed conventional containers, protected from extreme weather conditions.
- Clean all tools and application equipment with water before it set. Clean immediately after use. Hardened / cured material can only be mechanically removed.

Safety

- Wear hand gloves, safety shoes and safety goggles while using and handling the product.
- In case eyes or mouth are affected wash with plenty of clean water and seek medical treatment immediately.

Before use, refer to the Material Safety Data Sheet.

The MSDS is available on www.cwcchemical.in