High performance silicate material improving penetration of inorganic concrete for waterproof

Re-ConSeal

Re-ConSeal realizes the long-life concrete structure with the smart self-correction effect.

- Alkali recovery for neutralized concrete
- A colorless, odorless, eco-friendly material
- Enhancement of concrete strength
- Self-correction of the cracks
- Excellent waterproof performance









Eco-friendly construction method for the service life extension of concrete structures

Recently, there is a need for maintenance and longevity of structures. As an alternative method to reduce life cycle costs, contain deterioration, and improve durability. ILWONTECH has lined up with the Re-ConSeal series, which is a surface-active agent consisting of sodium silicate silane auxiliary agent and rebar anti-rust agents The product aims to improve the durability of new and existing concrete structures, thus increasing their lifespan with sustainability

> Scope of Application of Re-ConSeal for Concrete Structures



Re-ConSeal Construction Sites



waterproof surface

Spraying of sufficient amount of water

First spraying of the waterproofing liquid agent

Second spraying of the waterproofing liquid agent

What is **Re-ConSeal?**

The Effects of Re-ConSeal

NEW

- 01.Inhibiting salt and freeze damages and neutralization
- 02.Inhibiting wind and weathering damages 03.Curing effect
- 04.10 yrs warranty provided when applied to newly placed concrete (with the house defects warranty insurance)

EXISTING

- 01. Waterproofing of concrete rooftop and structures
- 02. Alkali recovery -> anti-rust for rebar
- 03. Enhancing tensile and compressive strengths
- 04. Self-correction of fine cracks

(Crystal of C-S-H type) (Sodium hydroxide)

- 05. Suitable for tiles and decorative bricks (reducing efflorescence but enhancing bonding strength)
- Wet concrete or concrete containing body water can also be waterproof.
- Suitable for parts that include cement systems
- The material safety has passed the standard for water supply
- The max. penetration depths : 190mm(vertical), 100mm(lateral)

📎 The Principle of Re-ConSeal

$Na_2SiO_3 \cdot nH_2O + Ca(OH)_2 + nH_2O \Rightarrow CaSiO \cdot nH_2O + 2NaOH$

(Alkali silicate)

COMMON

(Calcium hydroxide) (Water)

Aggregate Capillary space

Shrinkage caused by drying after concrete-placement and form-removal results in the fine crack and capillary space.

Due to moisture such as rainwater, the

material that did not react penetrates the

structure, and the above item 3 recurs.

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Apply Re-ConSeal on the concrete surface using a sprayer or brush.

Over time, it forms a watertight layer

The C-S-H crystals that come into contact

and prevents leakage.



0.0

Gel-state

(Structural formula)

(Structural formula)

Ca(OH)₂

Inorganic polymer (Network) Molecular mode 1



The material penetrates deeply, and products that react with calcium ions and so on close up the filling tissue for the pore or air gap. The filling area from the surface layer to the heart has a high effect of inhibiting the entry of chlorine ion.



Test Results of Re-ConSeal

1 Concrete Permeability Test Concrete waterproofing performance test

Testing Lab Engineering Test Center, Tsinghua University					
	No Application	Applied underneath the water		Applied above the water	
		Single application	Double Application	Single application	Double Application
Max. Infiltration Pressure (Mpa)	0.7	1.7	4.0	2.8	4.0
Infiltration Pressure Ratio	/	2.4	5.7	4.0	5.7

Figures in red are uncertain as they exceed the measuring limits of the device (4.0MPa).



2 Alkali Recovery Test on Existing Concrete Inhibiting rust generation on rebar

Construction Year: 1	Те	<mark>sting Lab</mark> Japan Te	esting Center for Con	struction Materials	
Test Date	2008/11	2008/12	2009/02	2009/05	211/12
Average pH	10.88	12.33	12.48	12.51	12.43
Remarks	Before application		Measured aft	er application	

Specimens extracted from 20-30mm sub-surface Criteria to determine neutralization: pH10 pH of new placed concrete: pH 12 - 13



3 Compressive strength test on the existing concrete

Construction Year: 1974 Testing Lab Japan Testing Center for Construction Materials

Particular	N/mm²	Strength after Application
Strength of the 5cm sub-surface (before the application in Oct. 2014)	15.4	Improved by
Strength of the 5cm sub-surface (after the application in Dec. 2014)	21.7	

Test Results of Re-ConSeal

4 Tensile Strength of the existing concrete surface

Construction Year: 1968 Testing Lab Japan Testing Ce	enter for Construction Materials		
Particular	N/mm²	Strength after Application	
Before applying Re-ConSeal (Oct.2014)	2.97	Improved by	
After applying Re-ConSeal (Dec. 2014)	3.99	34%	Testing of suface tensile

Goncrete Tensile Strength Test

Test specimen: 15 x 15 x 52Cm

Modifier Application: based on the 14-day strength concrete, standard curing

Unit:ε	Testing Lab Japan Testing Center for Construction Materials			truction Materials		
Specimen	1	2	3	Average	Tensile Strength	
No application	157.2	162.3	139.0	152.8	by	
Application	197.7	165.6	199.6	187.6	Z5%	

6 Scaling Test on Re-ConSeal

Deterioration of the surface layer and peeling due to freezing and thawing

Prevention of freezing and salt damages

The Re-ConSeal series makes concrete structures meticulous and inhibits the intrusion of water or chlorine ions. The gel-state reaction products (inorganic polymer) created in the air gap are highly resistant to the freezing, and even if it freezes, its volume expansion is one-fifth of the water's freezing point depression action. Since the gel structure flexible, expansive force is low, and durability against freezing damage is improved.

Testing La	D Japan Testing Center for Construction Materials		
Туре	Accumulated scaling (loss) after 60 cycles, g/mੈ	Durability against Freezing Damage	
The specimen as is	1,641.71	E 10 ^{by}	
The impregnated specimen	320.86		

The work-procedure of Re ConSeal (waterproof)

Prior Pro	Check the scope of operation.	Check for safety and the scope of construction. [Caution] Do not apply the product if the temperature of the construction surface is below 5°C or above 40°C.	Cleaning
	Repair defective parts.	Repair the corner or crack or penetration of 0.2mm or above with mortar, etc. Determine the drying time for the repair material, if any. [Caution] Use the repair material that contains cement (calcium).	1
cess	Cure	Wait until the area around the construction surface is cured. [Caution] Protect glass and metal parts carefully.	-1
	Clean	Clean the construction surface with a low- or hi-pressure cleaner or brush. [Never use acid detergent.]	

Initi	Spray	Spray water to the construction surface. [Caution] It can be done by cleaning during the Prior Process.
al Applicat	1st Application of the Product	Dilute the product with water on a 1:1 ratio and apply it uniformly to the construction surface using a spray, roller, or brush. Use 0.25 liter per m ⁴ [Caution] Shake well the product and dilute it with the same amount of water. [Caution] Stir well again after the dilution.
ion	Wet Curing	Determine the penetration hours depending on the season of the year (to be 0.5 ~1 hour). Make sure that the construction surface does not get dry after applying the product. If necessary, spray water.

Secondary Applica	Spray	Spray water uniformly at low pressure to promote the permeation of the product. [Caution] Use care to avoid the remaining material to scatter around.	10T
	2nd Application of the Product	Dilute the product with water on a 1:1 ratio and apply it uniformly to the construction surface using a spray, roller, or brush. Use 0.25 liters per m	Seco
ion	Wet Curing	Determine the penetration hours depending on the season of the year (to be 0.5 ~1 hour). Make sure that the construction surface does not get dry after applying the product. If necessary, spray water.	

Final F	Spray	Spray water to the construction surface. [Caution] It can be done by cleaning during the Prior Process.
Process	Cleaning	Wipe the remaining material on the construction surface with a brush to prevent it from being slippery. We recommend that you use the Litmus test paper if you are uncertain whether any material remains on the surface. If you see that the material is dispersed around the construction surface, wash it with running water. [Caution] Care must be taken for glass or steel when cleaning.

Checking Process	Check the construction.	Check if there are any contaminated areas on the construction surface.
	Cleaning	Dispose of the used curing materials at the designated site.
	Final Check	Once again, make sure the material is well applied to the curing area.
	Clean	Check again if the curing material has been removed.
	Completion Inspection	Have the supervisor or manager perform the completion inspection.













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