CAT.NO 11.11.03

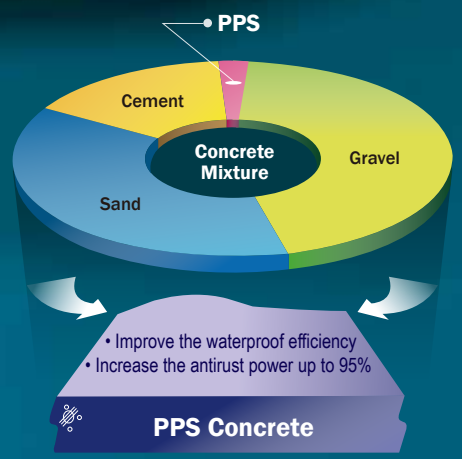
Korean Patent | US Patent | Chinese Patent | 녹색인증 Green Certification | MLTM's New Technology | Environment Certificate | ISO 9001

Accredited with the 'E' mark from the Ministry of Environment
Designated as a New Technology Company by the Ministry of Land, Transport and Maritime Affairs (No. 239)
Obtained Korean patent, US patent and Chinese patent
Green Technology Certification (GT-10-00056)

PPS Powdered Waterproof Admixture

PPS Corrosion-inhibitor & Waterproof Admixture

for Membrane-free Concrete Structures



JANGSAN CM Co., Ltd.

Protecting condensation and whitening at clean healthy houses

How to achieve condensation and efflorescence at houses

Condensation is a phenomenon of water droplets forming on the surface of concrete as a result of a difference in interior and exterior temperatures when concrete walls are not in dry conditions but hold water or moisture. And the phenomenon occurs if its construction allows parts of walls to be thinner or does not adopt heat insulators so there exists any resistance, if small, to heat transfer.

Because concrete is a water-soluble structure, it either requires anti-moisture work to prevent its surface from absorbing water or needs to become an insoluble structure that is resistant in itself to water in order to be free of whitening caused by the outflow of calcium hydroxide.

Accordingly, if this product is mixed when making concrete, it helps maximize the moisture resistance of concrete itself and achieves an insulation effect; thus, a comfortable indoor environment without condensation of dews and formation of mold and the efflorescence-free, clean external appearance of houses can be maintained.

Major Company History

- 1998.04 Obtained a patent for the powdered waterproof admixture
- 1998.05 Awarded the prize for an excellent invention by the Minister of Commerce, Industry and Energy
- 1998.11 Won the bronze price at the Exhibition for Excellent Inventions
- 1998.11 Registered as a domestic company eligible for participation in the bids tendered by the Public Procurement Services of Korea.
- 1999.04 Designated as a company that is accredited with the 'E' mark from the Ministry of Environment.
- 1999.05 Presented a thesis at the spring academic seminar hosted by the Korean Concrete Institute in 1999
- 1999.11 Received the ISO 9001:2000 Quality Certificate
- 2000.06 Designation of New Excellent Technology for construction by Ministry of Land Transport and Maritime Affairs (No.239)
- 2000.12 Accredited as an excellent product by the Public Procurement Services of Korea (No. 2015043)
- 2001.12 Awarded a prize of the Conserve-Materials-Campaign organized by the Ministry of Finance and Economy
- 2002.09 Obtained a patent for the PPS Powdered Waterproof Admixture
- 2002.11 Presented a thesis at the fall academic seminar hosted by the Korean Concrete Institute in 2002
- 2005.06 Obtained a Korean, Chinese, and US patent for the PPS Corrosion-inhibitor and Waterproof Admixture
- 2007.02 Awarded prize of chairman of Korea Rail Network Authority in Eco-friendly construction grand prize.
- 2009.07 NET with Korea Rail Network Authority (2009-0011)
- 2010.07 Obtained a Green Technology Certification (GT-10-00056)
- 2010.09 Certified as a Green Company (GE-10-00011)
- 2011.06 NET with Ministry of National Defense

Certificates


Korean Patent


US Patent


Environment Certificate


ISO 9001


Green Technology


Chinese Patent


Korean Patent


Korean Patent


MOCT's New Technology


Green Company

Applying new technology for underground waterproofing of various structures in inland areas

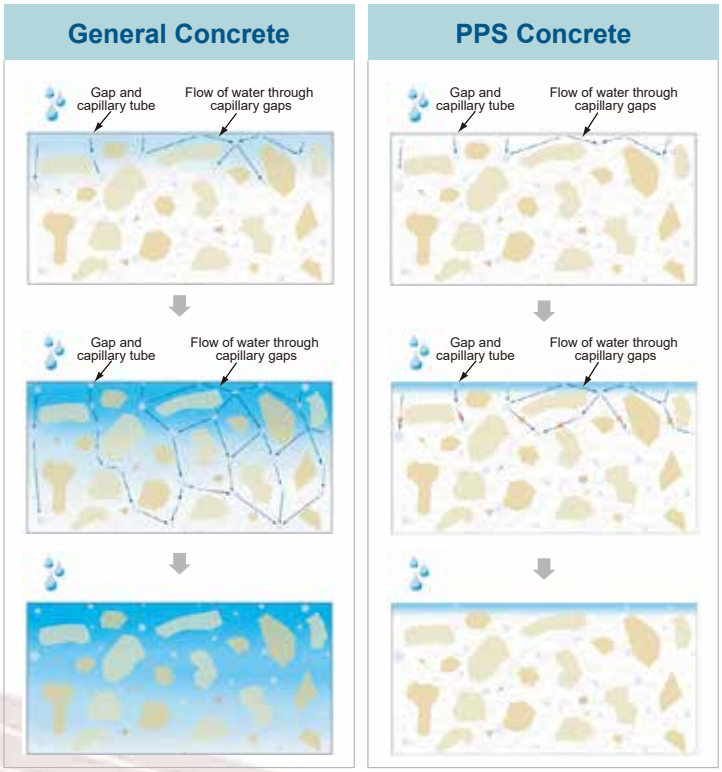
What is PPS Powdered Waterproof Admixture?

Because concrete is a water-soluble structure and generally becomes permeable in proportion to time and water pressure, underground structures facing lots of underground water shall secure waterproofness through either an external waterproofing method that can prevent water coming from outside or the installation of drain pipes that can ease water pressure to the body, or necessitate a waterproofing agent that can give concrete its own waterproofness through chemical and physical reactions.

If a ready-mixed concrete plant does not own a separate storage silo for PPS Powdered Waterproof Admixture or a small quantity of cement is needed in construction, the PPS admixture, unlike other companies' products, still can ensure the uniformity of quality when putting in a truck agitator.

The PPS Concrete Waterproofing Method using features the addition of the PPS admixture to produce a hardened watertight concrete body and water-resistant hydrated tissues. Since such structure can reduce the permeability and absorption of water, the admixture is added to make concrete so that it can achieve one-notch higher waterproofness and durability.

If the PPS admixture is mixed to make concrete intended for the deck plates of bridges that are being built in rural areas and mountain valleys where corrosion to the plates is rare, it will maximize the waterproofness and durability of concrete itself. This 'deck floor waterproofing method' of applying a certain thickness to deck plates for their protection can deal more effectively with deteriorating conditions (chemical reactions, freezing damage, abrasion, etc) of the deck floors of bridges than the invasive concrete sealer method that focuses on improving watertightness on the surface of concrete.



Effects and Features

- Easy quality control and simple work processes can cut down on construction costs
- Occurrences of inevitable cracks arising from the distortion of structures can be easily discovered and repaired.
- Waterproofing works under such poor conditions as moisture and narrow space are easy to implement
- Longer duration of structures result in less production of waste materials, which is eco-friendly
- Phenomena like efflorescence and vapor condensation can be dealt with and maintenance cost will be reduced because of the same durability as the life of concrete structures

The floor being in contact with water for 10 days after having been dried at 105℃ in an oven for 3 days and cooled in a drying chamber for 1 day

Protecting SOC-related facilities with green technology

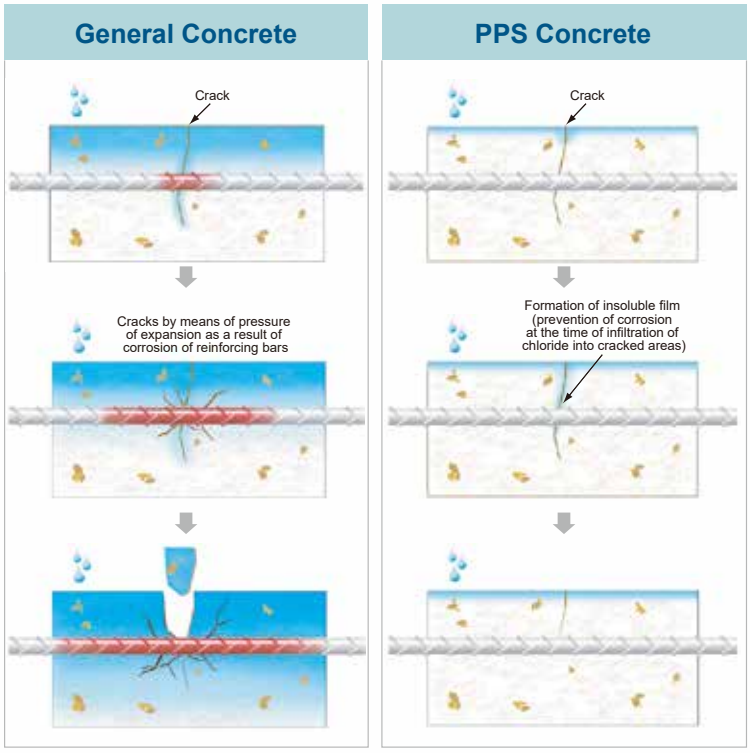
What is PPS Anticorrosive and Waterproof Admixture?

For SOC-related reinforced-concrete structures, the degradation in the durability of concrete is an inevitable process since the vibration from structural movement and driving load eventually causes cracks in their surfaces to allow water, moisture, or harmful substances to penetrate into concrete and thus result in frost expansion as well as the expansion of iron rods due to their corrosion; in the end, it develops cracks and exfoliation and thus effects deterioration in cement structures. In order to prevent this phenomenon from occurring, it is important to continue to develop and utilize advanced construction materials that enable concrete to achieve adequate waterproofness and anticorrosion in itself

The PPS Anticorrosive and Waterproof Admixture is an internationally patented, eco-friendly agent; it makes Pozzolan Polymer Stearates (PPS), composed of artificial inorganic compounds, lighter and maximizes the dispersibility so that, unlike currently available similar ones, it can achieve uniform quality when mixing it in a truck agitator.

Because this PPS Concrete Waterproof and Anti-corrosive technology maximizes the waterproofness of concrete itself and have excellent resistance to the corrosions of iron rods, it can lengthen the duration of waterproofness and anticorrosion as much as that of the concrete without any additional membrane-type waterproofing agent. In this way, structures are expected to last longer.

At the same time, this product enables the construction of structures that are highly durable to natural disasters and harsh climates. The lengthening of the lives of structures can lead to a smaller amount of construction wastes. The savings of construction resources can ensue; they would have required regular repair works, which may produce waste materials, and waterproof layer-protecting works, which may call for construction materials, if a currently available method had been used. In this respect, the method using the PPS admixture can be regarded as a resource-saving eco-friendly technology that can save both initial construction costs and life cycle costs.



Effects and Features

- Simple construction method and easy quality control are ensured by means of process rationalization
- Constructability and compatibility with other chemical admixtures for concrete are excellent
- It has an excellent resistance to chemicals, rust, freezing and thawing, and abrasion
- Additional work for corrosion inhibition is not necessary thanks to inherent antirust and waterproof abilities
- Longer duration of structures reduces waste materials, which is eco-friendly

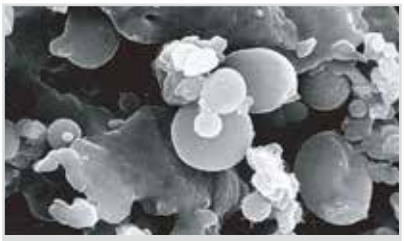
The inner surface of the cut test piece after undergoing iron rod corrosion-promoting tests using an autoclave

Exhibiting excellent performance
that does not require additional waterproofing agents

Principles of Resistance to Corrosion and Water

1. Improvement in strength

Artificial Pozzolan activator and fine siliceous powder improve fluidity through ball-bearing effects, when mixing with cement, and increase resistance to watertightness and separation from raw materials. These chemical reactions will result in improvement in quality such as concrete's compressive strength, anti-corrosion, chemical resistance, and resistance to freezing and thawing damage.



Inner Texture of PPS-applied Cement Paste (4,000 multiplications)

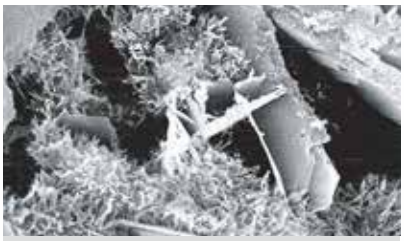
2. Resistance to permeability

When cement meets with water, calcium hydroxide (Ca(OH)2) generates; calcium ions react to silicate gel and silicon ions which are soluble and contained in Pozzolan activators to produce activated silicon in air voids. Calcium silicate hydrate crystals, an insoluble compound, produced through this chemical reaction come to fill extremely small gaps, which, in turn, can increase watertightness and thus resist water permeability.

Test piece of general cement (5,000 multiplications)

3. Resistance to absorption

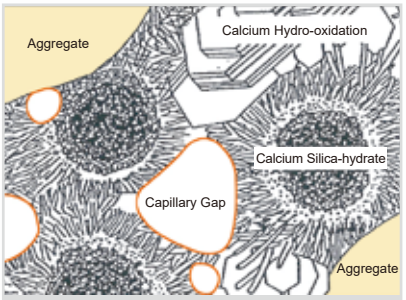
The gelated surface having watertight and airtight textures is formed on cement through the sealing effect of polymer films during the hydration process of cement. In addition, water-repellent high fatty acid calcium that is produced in combination with calcium hydroxide and zinc stearic acid fills small air voids and also produce hydrophobic compounds on the surface of concrete so as to prevent infiltration of water and moisture and reduce absorptive actions.



Test piece of PPS waterproof admixture-applied cement (5,000 multiplications)

4. Anticorrosion

Bipolar inorganic nitrous ions that function to both recover alkalinity and resist corrosion of iron rods in concrete structures produce nitrogen oxides and ferric hydroxides that are deposited on the surface of iron rods, reacting with ferrous oxides and ferrous ions in the process of corrosion of iron rods. Since the oxidation process of ferric ions by nitrous ions is faster than the outflow of ferric ions on corrosion-developing areas, it is possible to protect the outflow of the latter through the oxidation of nitrous ion and, at the same time, prevent the corrosion process of iron by quickly creating insoluble films on the surface of the iron.

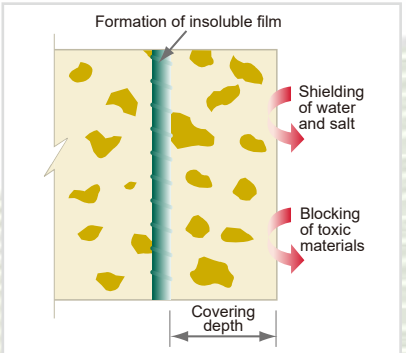


Shape of texture inside cement

Application Test for Water Permeability

Application Test for Water Absorption (immersion method)

A test piece is immersed in water for ten days and then cut off. The result shows that the standard concrete is moist but the inner part of the waterproofed piece remains dry even though its surface is moist.

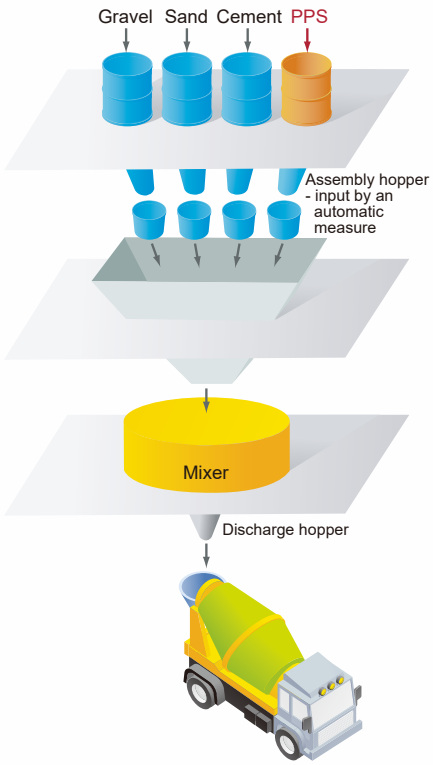


Schematic diagram for PPS waterproof and anticorrosive concrete

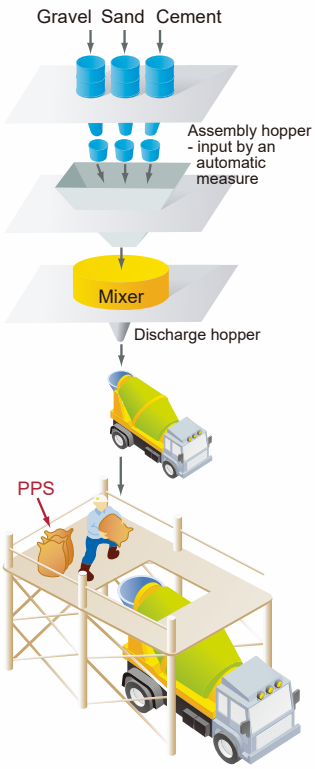
Lowering life cycle costs,
which is economical compared with other methods

Construction Method

Mixing Method ①



Mixing Method ②



Mixing Method ①

Mix the cement & aggregate simultaneously inside the Batcher Plant installed with powder storage silo and execute casting.

Mixing Method ②

In the event PPS admixture is input into a truck agitator on its way from the ready mixed concrete production plant or it is added after the truck agitator arrives at the construction site, the compound should be mixed at a high-speed rotation (8-10RPM) for more than 2.5 minutes so as to become homogenous before it is cast.

Object Structure to be Applied

Underground Passage

High-speed Railway PCL Slab

General Railway Bridge Slab

Underground Car-parking

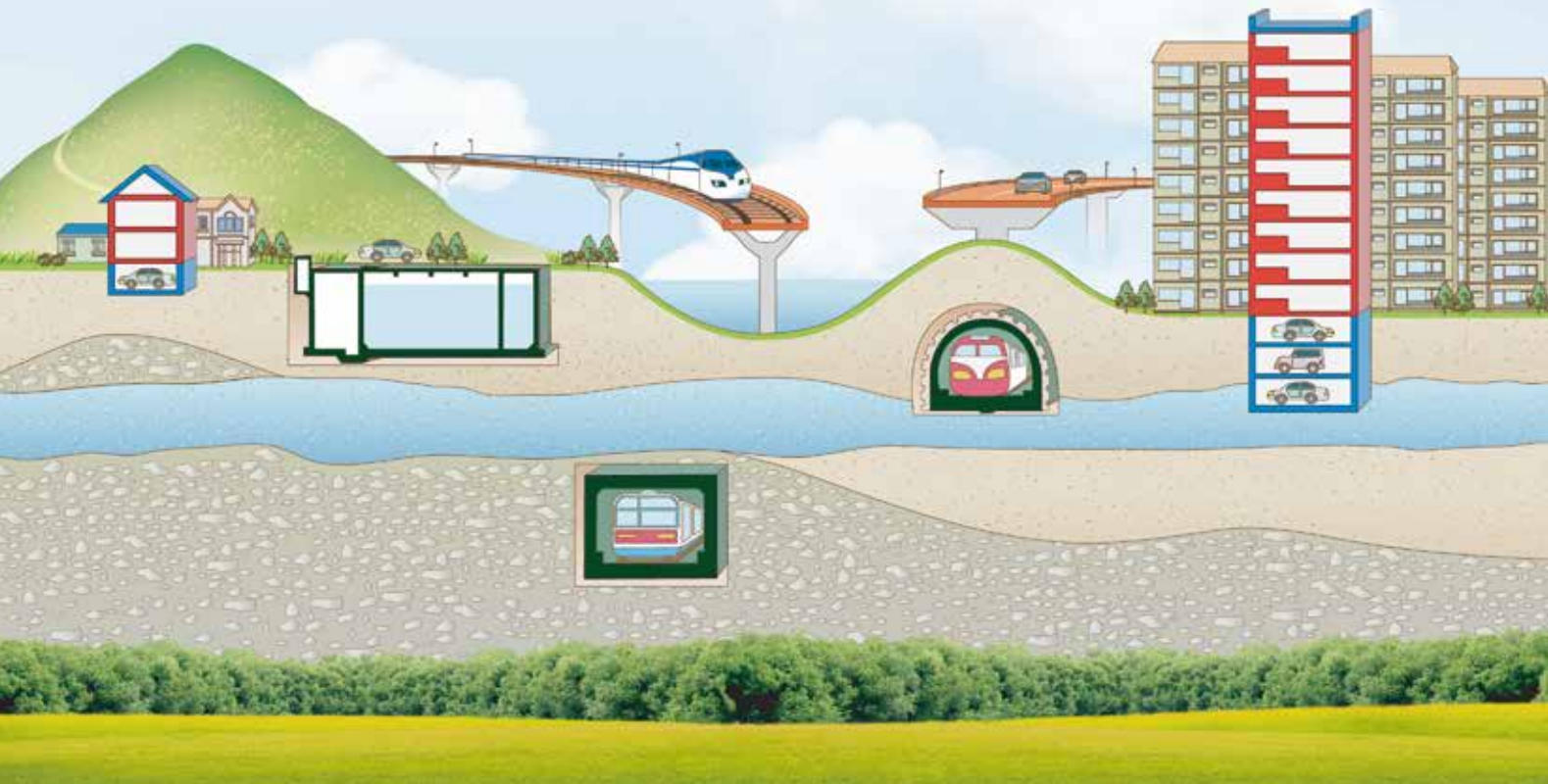
Water Reservoir Tunnel

Sewage Treatment Plant

Ensuring as long durability as the life of concrete

Types and Uses of Products

Product name	PPS Admixture		
	PPS Powdered Waterproof Admixture		PPS Powdered Anticorrosive & Waterproof Admixture
Method	PPS Mortar Waterproofing Method	PPS Concrete Waterproofing Method	PPS Anticorrosion & Waterproofing Method for concrete
Model	Altong JSM-33	Altong JSC-55	Hipermix JSCI-99
Use	For making mortar	For making concrete	For making reinforced concrete
Usage	Cement quantity x 5.0%	<27MPa: 12kg/㎥ ≥27MPa: 13kg/㎥	<27MPa: 11kg/㎥ ≥27MPa: 12kg/㎥
Application	• Floor-leveling of concrete and masonry works • Coating of surfaces and repair of sections • Waterproofing of inside and outside walls of concrete structures • General waterproofing work using mortar	• Floor of basement and wall • Underground water tanks and water purification plants • Distributing reservoirs and swimming pools • Tunnel and subway • All kinds of underground structures	• Concrete structures in offshore and coastal areas • Waste water treatment plants • Tunnels and subways • Waterproofing of concrete bridge decks in areas where corrosion to rods proceeds fast. • Precast concrete products that require anticorrosion and waterproofness
Packing unit	24kg/pack, 400kg/Bag Bulk	24kg/pack, 26kg/pack 400kg/Bag, Bulk	24kg/pack, 400kg/Bag Bulk



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