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Ministry of Land, Infrastructure and Transport

NETIS New Technology Information System

NETIS number: KT-160095-A

New technology name: Hydrofit method

(impregnated composite injection method)

Registration date: October 21, 2016

*For Professional use*

# HYDROSKY

- Permeable water absorption inhibitor
- Silicate surface impregnant
- Silane surface impregnated water repellent
- Silicone surface impregnant
- Special silane type surface impregnant
- Special silicone water and oil repellent
- Injection type water-stopping agent
- Reactive terminator
- Anti-sand prevention / weed growth inhibitor
- Asbestos hardening agent
- External wall asbestos-containing paint remover
- Hydrofit construction method

HYDROSKY

*Everything starts here*

**HYDRO** HydroSky Co., Ltd.

View of Sky Tree from our rooftop Vol.5

After the Tohoku district Pacific coast earthquake, the way of concrete construction has changed completely. Furthermore, a direct type earthquake of Kumamoto. Fragile but broken buildings and bridges, breakwaters and retaining walls. It was severely burned into this eye. In the conventional repair method, we temporarily repaired the part with petroleum organic solvent in that part. Silicate based surface impregnating agent represented by concrete deterioration prevention and protective material has been recognized for about 40 years since raising production. The knowledge and experience of many sites and affiliated companies have become fruit one by one and can supply the optimum material for construction civil engineering. Long wisdom matures and matters overseas from domestic as well as overseas. As these materials are attracting attention as infrastructure developments from various countries in Southeast Asia are attracting attention, hot questions gather in the background of technologies as they visit Japan. It is interested. In terms of global warming prevention, control of solar heat and reflection control of sunlight suppresses the rise of indoor temperature and reduces power consumption. We are convinced that we can shift to natural energy from nuclear power if we can reduce it. In addition, we have newly developed environment improvement agents in our catalog and rapid gel prevention agent during running water. The weed growth inhibitor from sand and soil exerts various effects depending on dilution ratio and additives. Preventing slides by strong winds, giving saturated water to the dirt and sand that was sprayed, and storing rainwater in the soil. The surface looks like a soft clay so that sand will not flow out even in heavy rain, and the soil will not collapse even on an inclined surface. Recent achievements make the injection process easier by instantly solidifying the two solutions into a spiral to stop water at the running water point. This solid gel becomes a glass crystal body and is immobilized without dissolving in water (seawater). New materials are about to be developed. This is also thanks to the advice of the people concerned.

**Hydroskay** is researching and developing wind damage, salt damage, frost damage prevention, etc. as well as surface protection as well as deterrence of neutralization, prevention of efflorescence, latency treatment, and environmental improvement.

**Penetration:** Hydroskay components with surface tension less than half the water penetrate deeper than water and gradually change to stable products.

**Reaction:** The infiltrated HydroSky reacts with free alkali inside the concrete and amorphous silica in the aggregate, and gradually becomes a water-insoluble inorganic compound in the voids and voids. This will be the prevention and deterrent effect of efflorescence.

**Protection:** Neutralization, which is considered to be a major cause of concrete deterioration, is mainly due to carbonation or acidification of free alkali in concrete, and this effect is mainly promoted by carbon dioxide and water. It prevents water absorption, neutralization is prevented by converting free alkali in the substrate into a stable substance. Alkalinity can be recovered by treating HydroSky on concrete that has already been neutralized.

**Waterproof:** Water permeable, waterproof and surface protected by crystal and reinforced concrete by HydroSky series by causing chemical reaction inside concrete by infiltrated HydroSky.

**Durability:** Concrete treated with HydroSky, stone quality is protected by a dense waterproof layer, eliminating the causes of various deterioration, greatly improving the durability and stability of the building.

**Hydroskay** SKY-SP crystallizes while maintaining strong alkalinity, it can prevent the efflorescence generated by the movement of water in the concrete structure, maintaining the appearance. It becomes water insoluble inorganic compound in water gap and void which increased and expanded by aggregate of aggregate due to neutralization of concrete. Reinforcing bar in concrete is filled with inorganic compound with high pH value and it has antirust effect, but if this pH falls below 10, iron gradually becomes rust and begins to inflate and destroy. SKY-SP can prevent damage of expansion due to the occurrence of rust at the missing part, and the alkaline quality can be restored. Scientifically, SKY-SP can be said to be permanent by continuing chemical reaction. This SKY-SP is a very reliable material as the "base" of all inorganic building materials. In combination with various products, we will protect the construction of new buildings and renovation of buildings for conservation protection of civil engineering buildings, protecting cultural properties without changing the landscape. We utilize these functionalities to develop anti-fouling coating agents that make use of environmental protection and improvement materials and water and oil repellency.



Packing 20kg



Packing 18kg  
(SKY-MX Color)

## Main product overview

For details, refer to each product manual

**SKY-SP** Silicate based deterioration inhibitor

**Neutralization inhibitor**

Effective for rust prevention treatment of internal rebar bombardment due to restoration of alkalinity of concrete, prevention of efflorescence and latency treatment as well as restraint of neutralization.

**SKY-GT** Silane based protective water repellent

**Super water repellent**

Super water repellent treatment agent for surface layer. Material that does not change the texture of the surface, such as mold prevention treatment such as plastering.

**SKY-HX** Hybrid type of silicate, silane protecting agent

**Water stop:water repellent**

It has the performance of the above two systems. Used for water leakage such as micro cracks.

**SKY-G1** Calcium based admixture

**Concrete admixture**

It is mainly used for filling water injection and for mixing concrete. Combined use with SKY - SP can correspond to various repair work.

**SKY-GS** Silicone based protective waterproof agent

**Protective waterproofing agent**

It consists of modified silicone and polymer compound. While impregnating the surface layer forming a dense sealing. Protective waterproofing of concrete foundation part and backfill part.

**SKY-MX** Silicone based protective waterproof agent

**Protective waterproofing agent**

Unlike silane type, SKY-MX has high elasticity due to siloxylic acid bond and prevents deterioration due to freezing. Waterproofing agent to protect weathering of soft stone etc. Hydrophilic system than water repellent system.

**SKY-MXColor** Acrylic silicone type coloring protective waterproof agent

**Colored waterproofing agent**

Add acrylic paint to the function of SKY-MX and aim for protective waterproofing of color specification. Combined use of SKY-MX color and SKY-SP realizes finish as new as construction.

**SKY-CVL** Hybrid type silicate silicone type protective agent

**Two layer waterproofing agent**

Developed primarily as a civil engineering modifier. Hybridization of silicate type and silicone type. Priority is given to functions. Effective for refurbishment improvement work by combined use. The possibility of impregnated coating waterproofing is expanded by using in combination with SKY-G1. Slope and floor waterproofing of multi-storied floor of truck terminal for use. Prevent leakage of park pond. Leakage of the railroad deck, etc. In addition, a cement system containing silica is added, and in particular, it gives a great trust to the water stop construction work.

**SKY-CSP** Powdered silica blended blast furnace slag cement

**Cement powder**

Powder made from silica stone, most of which is made of silicon ( $\text{SiO}_2$ ). Silicon is a substance which is hardly etched by acids and chemicals among all substances, it has high physical strength, it is extremely excellent in alkali resistance, acid resistance heat resistant refractory, weather resistance, water resistance, abrasion resistance, etc. Physical strength is , High material.

**Heritage** Special silicone type protective agent

**SKY-STD**

**Cultural property protection**

Term protection by coupling with fluorine-based silane. High permeability and hydrolyzability of IPA are effective for protecting stone. The construction site is not particularly limited, but it is ideal for cultural property protection work and construction work that does not affect texture.

**SKY-PLS** Special silicone type protective agent

**Super water repellent**

A special silane is added to Sky Heritage to achieve ultra water repellency which dries quickly. Whether or not it penetrates the foundation, water repellency is given and the application for construction has been expanded.

**Made to order correspondence**

**SKY Coat Fiver**  
**Ideal for cloth, paper, leather goods etc.**

Return Sky Heritage to the starting point, pursue further functionality. We will challenge possibilities to bring changes to the base material such as wet color representation of stone materials.

Even if fluorine is not added, the applied base realizes super water repellency with or without permeation. The use applications have further expanded. Fabric does not change the texture at all, it gets super water repellent effect, water repellent paper including cardboard etc. Applicability of wood and leather products will be expanded.

**SKY Coat Modern**  
**Glass and stainless steel**

Sky coat modern further improves super water repellency and film strength, and the body of the car also demonstrates a different protective function than wax.

**SKY-QON:FEU**  
**Wood flame retardant agent**

Characteristics of waterproofing agent composed of redox substances are nonflammable. It is a material that does not harm the environment. This is SKY-QON which is waterproof. SKY-FEU is a flame retardant for the base material. The effect is clear.

Measures against heat island

**Apollo Silver**  
**Apollo MX**

High reflectance waterproof thermal barrier coating on roof and rooftop. It is effective for measures against heat island and energy saving. It kneads insulated beads of ceramics into MX color and it is effective as undercoat of Sky Apollo Silver by giving waterproof paint insulation.

**Prevention of scattering of sand by wind, weed growth inhibitor**

**SKY-RGH**

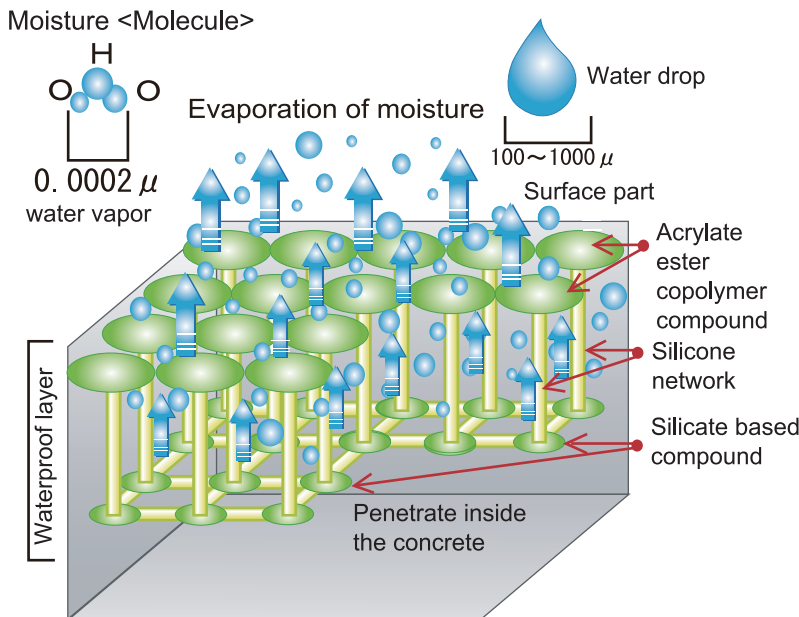
When used in combination with a herbicide, it is effective for preventing weed growth and scattering of sand by wind. It can be said that it is a material playing a part in environmental improvement to prevent collapse of inclined faces and the prevention of desertification by viscous admixture.

**SKY PROTECTOR**  
**Sky Protector PE Plus**

Removal of outer wall paint is required before dismantling. It is difficult to solidify asbestos-containing components with conventional release agents, and problems remain in processing needle fibers after peeling off paint. The sky protector PE plus makes it possible to process needle-like fibers by solidifying them by vitrification, eliminating buoyancy, and removing sprayed asbestos and ceiling materials in gel form.

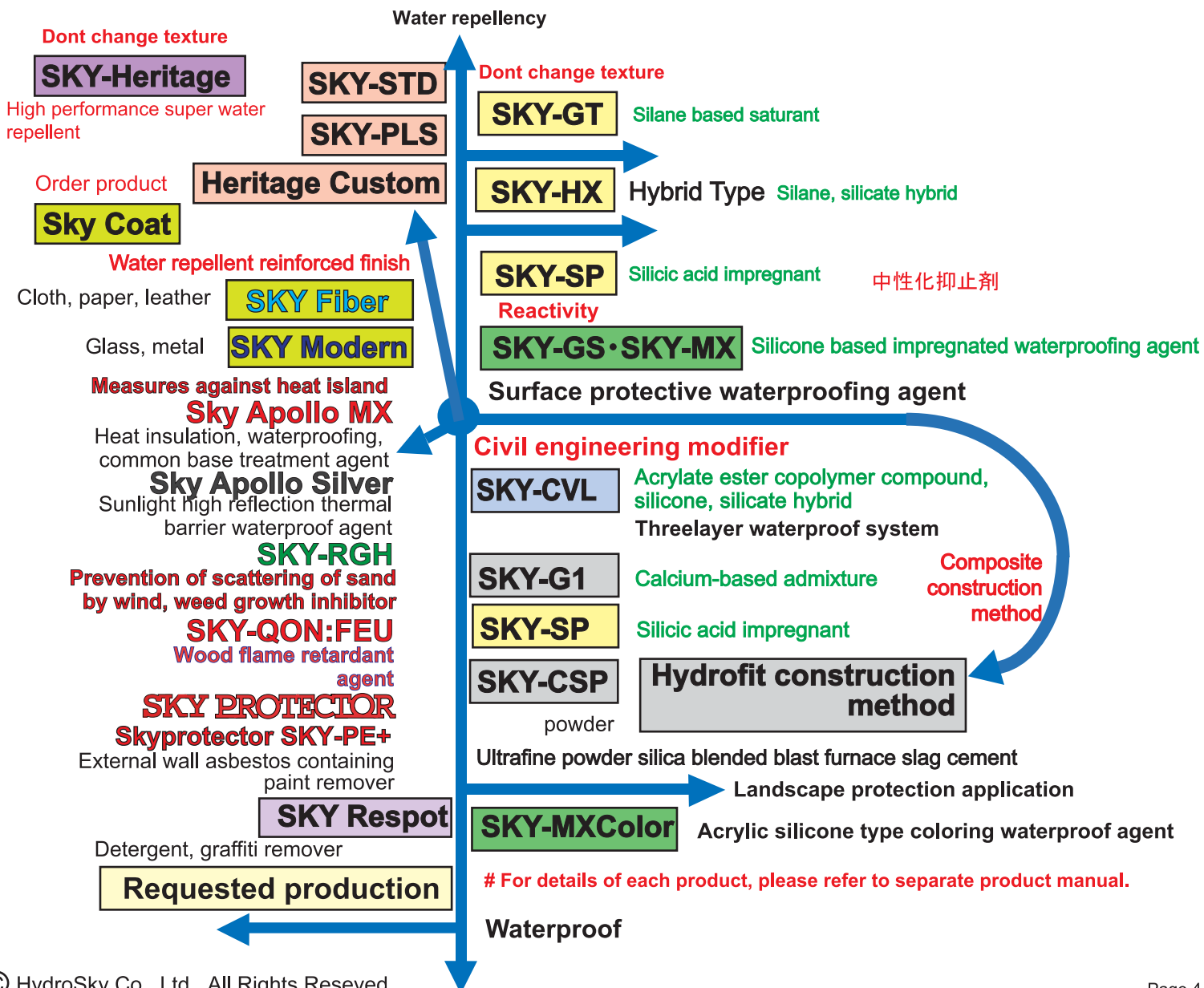
**mechanism**

Concrete deterioration prevention, protection waterproof image



# The multilayer protection function of the surface layer part is not limited to the above acrylic acid ester copolymerization compound, but also silicone oligomer, resin, acrylic resin paint Protective function finish is possible.

It is said that silicone molecules cause chemical reactions at the surface and pores and line up neatly inside the capillary. Since the free alkali in the penetrated part changes into a substance insoluble in water, for example, calcium silicate, its original properties can be maintained. The acrylic acid ester copolymer compound covers a part of it and prevents invasion of water. It is protection by hydrophilicity as an effect, it is that water can not pass through the eyes of the silicone net on the surface. After penetration, the silicone compound reacts internally to form a stable resin, and it will demonstrate water absorption prevention performance over a long period of time. Especially the hydraulic Hydrosky has surface tension less than half the water, penetrating quickly and deeply into the object. As a result, even if the object contains somewhat water, it can be applied without problem, because the permeated water and Hydrosky change. In particular, neutralized concrete recovers alkalinity by using a high alkaline (Ph 10 to 12) HydroSky. Hydrosky penetrates deep into the crack inside and gives concrete deficient calcium. It is saturated in a gel state to become a crystalline mineral, fixing heavy metals and inducing a pozzolanic reaction. As the crystal mineralization progresses, the strength increases and the permeability coefficient decreases. Moreover, this silicic acid compound is a natural curing power of deterioration and breakage of concrete. It turned out that there was. It is increasingly an important material indispensable for concrete.



# For details of each product, please refer to separate product manual.

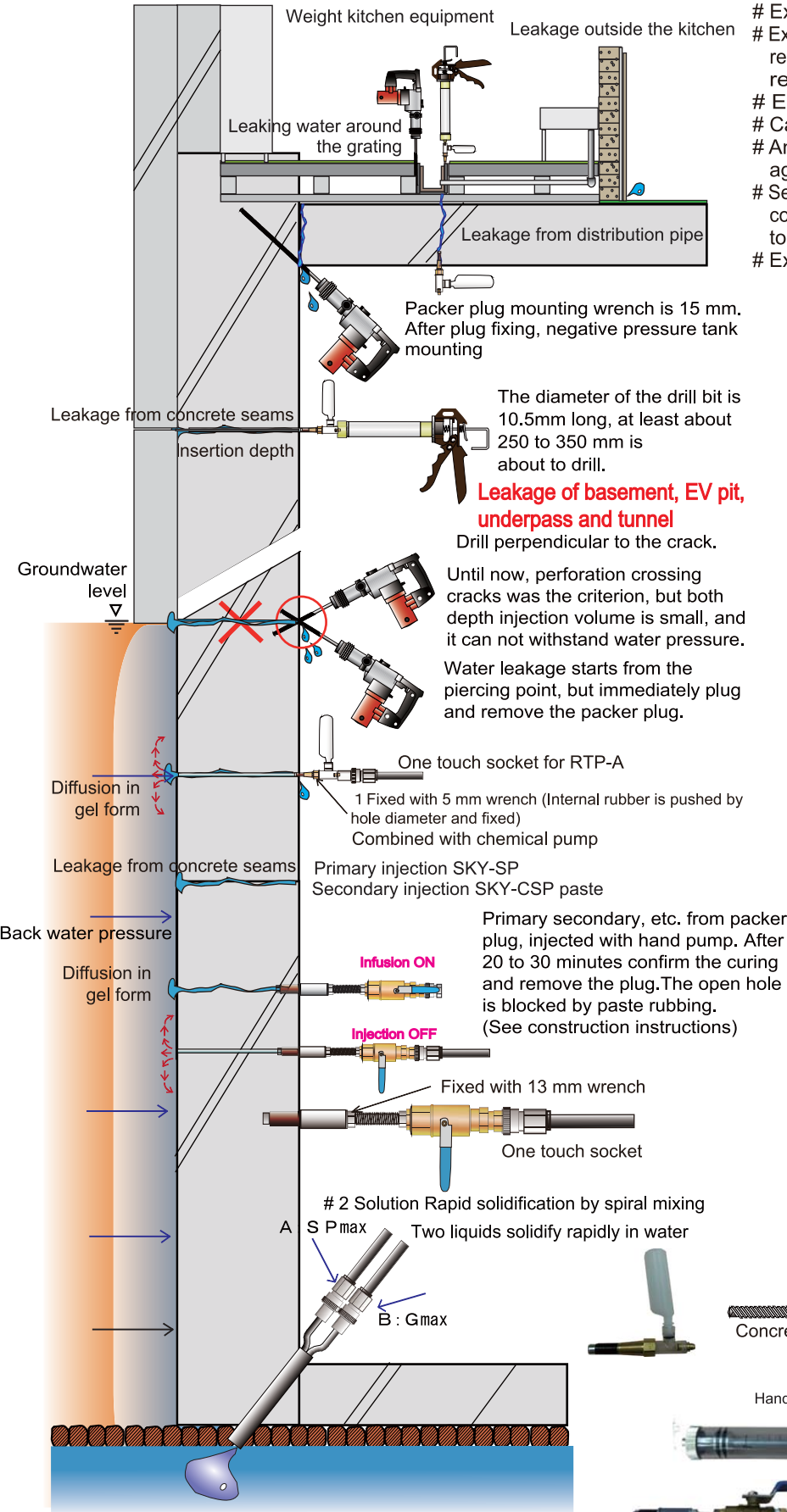
# Water leakage image and repair method

★Hydrofit construction method is a revolutionary water stop construction method.



We will increase the number of plugs according to the water leakage location and the scale, but it can be constructed by the same construction method regardless of the magnitude of the scale.

**Leakage from the kitchen of the restaurant to the lower floor requires urgent!**



## Characteristics of hydrofit method

- # Environmentally friendly fine powder silica blended blast furnace slag cement
- # Excellent durability
- # Extremely excellent in alkali resistance, heat resistance, fire resistance, weather resistance, water resistance, abrasion resistance, etc., to increase the physical strength
- # Even if there is water in the crack can be injected
- # Can also be injected into fine cracks (width 0.05 mm)
- # Anti-rust effect of steel frame and suppression of alkali aggregate reaction
- # Seawater leakage, organic waste disposal facilities leakage, contamination treatment facilities leakage also stopped due to these combinations
- # Expansion of repair by combination with other HydroSky

## Use Main crack repair object

- # Dam, tunnel, river embankment
- # Box Culvert
- Breakwater
- # Underground Passage, Subway, Highway, Pier
- # Bill Mansion
- # Concrete structure in general
- \$ Surface finish agent FRP · Water leakage due to urethane paint rupture
- \$ Degradation of elastic joints, leakage due to breakage
- \$ Pressure leakage due to rupture of concrete
- \$ Asphalt waterproof degradation Leakage due to break
- \$ Leakage due to breakage of concrete slab

## Problems of leakage!

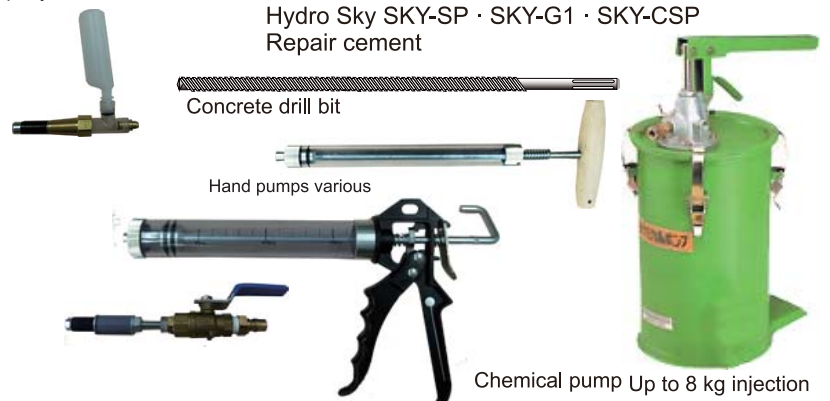
- % We do not know the cause of water leakage
- % No closure due to construction work
- % We deal with food so we can not use smelly materials
- % We can not move kitchen equipment
- % It is limited from business closing to business preparation

## Features of construction!

- # Impregnate (penetrating) and penetrate cracks
- # Unlike organic solvents, construction is possible in a wet place
- # There is no odor as it is water-based solvent free
- # Even if there is a heavy load of kitchen equipment, it penetrates
- # Does not affect sales by dividing construction site
- # Physical and chemical stopping possible so additional repair is possible

## Preparation for construction

- # Work tools, equipment, materials
- Hammer drill, drill bit diameter 10.5 mm, length 250 to 350 mm. Depends on leakage condition 800 to 1000 mm
- # Sprayer, plastering arm, cement paste, bucket for kneading
- # Injection device
- RTP-A Packer type plug (recommended item)
- Low-pressure injection pump: hand pump for SKY-SP, pump for paste
- # material
- Hydro Sky SKY-SP · SKY-G1 · SKY-CSP
- Repair cement



# Please contact us for details of construction.

# Achievements of hydrofit method

## Powdered silica blended blast furnace slag cement

Feature of blended furnace slag cement containing fine powder silica is powder made from silica stone, most of which is composed of silicon (SiO<sub>2</sub>). Silicon is a substance which is hardly eroded by acids and chemicals among all substances, has high physical strength and is extremely excellent in alkali resistance, acid resistance, heat resistance, fire resistance, weather resistance, water resistance, abrasion resistance and the like. By utilizing this feature, you can physically enhance the strength of the stuff. By utilizing sub-materials etc., as a stabilizing material at ground improvement Effect can also be expected. Also, due to low oil absorption and high whiteness, not only injection work but also good surface finish, the expressive power is expanded by combination with each product of Hydroskay.

### Breakthrough injection method, hydrofit construction method.

This construction method can be done on the ground or underground. It can handle water leakage from the wall, leak from the ceiling, leak from the floor. It is possible to do the same construction without the influence of the environment to the surroundings as well as the size of the construction site. Characteristics of fine powdered silica-blended blast furnace slag cement newly developed, which are tough both in acid and alkali, are excellent in harmful chemical resistance, become stronger than ordinary concrete by releasing moisture. This effect can be expected for stabilizing agents for soil improvement and measures against liquefaction. It is a safe and economical hydrofit construction method by tightly kneading construction plan.



### As a material contributing to longer building life

SKY-CSP (blast furnace slag cement containing finely powdered silica) as a material contributing to longer building life. It can be used for repair of water leakage and insufficient strength due to weakening of concrete. When injecting cement paste, if W / C exceeds 30%, cement particles settle downward and form a fragile layer such as bleeding water and latency. In the hydrofit method, SKY-CSP and SKY-G1 are kneaded at 60 to 80%. It is very workable and its strength is increasing from the initial stage. In this slag paste, the ingredients of SKY-G1 pull back and stabilize the strong alkalinity to the same level as ordinary cement. Gaps that can not be filled with ordinary crystals are saturated, and the water holding property is high and the gas phase is small. As the crystal mineral progresses, the strength increases and the hydraulic conductivity decreases. This makes it possible to repair parts of deteriorated concrete and effectively repair the hollowed-out parts. Furthermore, by impregnating SKY-MX or SKY-CVL from the surface layer part, long-term waterproofing becomes possible, and finishing materials, waterproofing materials, repairing materials contributing to the extension of the life of buildings.

The moisture ratio of SKY-SP which is the main agent was suppressed as much as possible, the solidification viscosity was increased, and it was set as SKY-SPmax. Although it is strongly alkaline, the secondary liquid of the reactant is SKY-Gmax and it is viscous and acidic. When these two liquids mix at the injection pipe outlet, they rapidly react and gel. As it is glass crystallization, it will not dissolve again as opposed to liquid glass. As another reaction, SKY - SPmax is sprayed on contaminated soil and weak ground soil, and it permeates the soil sufficiently. Continue to chase SKY-Gmax and spray it. As a result, by wrapping and solidifying the part penetrated from the surface into a glass, it prevents odors and harmful substances from scattering or spilling out. This is because of the storage keeping property of the glass bottle. For example, it is the best method because it is preserved in glass containers such as hazardous substances and corrosive substances, and radioactive substances are also stored in glass containers. This two liquid reaction does not generate heat.



SKY -G1/SKY-CSP 60% paste specimen collection. In ordinary cement, surplus water after mixing is floated immediately after collection, and the cement paste sediments.



SKY-G1 / SKY-CSP 60% paste Specimen 1 day passed. There is no floating of the surplus water, and it does not stretch but solidifies.

### # 2 Solution Spiral Mixture Quickly Gelatinized Waterproof Material

# Hydrofit method has stopped water repair exclusively from concrete cracks, but in the case of running water slag paste will mostly leak before solidifying. From this we considered a liquefaction solidification method. At the same time, the two liquids are mixed on the spiral inside the injection pipe, and the wet surface is saturated like a gel from the outlet of the pipe. In the experimental video, it is colored red and yellow to make it easy to understand. The liquid solidifies instantaneously.



Spiral with silicone tube or aluminum pipe



# Proposal of hydrofit method

The hydrofit process crystallizes and solidifies in response to water.

From the method of stopping water in several tens of seconds, it is possible to apply a water stopping method conforming to the site while adjusting the gel time by applying vibration.

## Silicate based surface impregnation method and composite construction method

The role of concrete in social infrastructure development is extremely large, and to date a large amount of concrete structures have been supplied, supporting the prosperity of humanity from the foundation. On the other hand, the idea for the life expectancy of concrete structures totally changed, triggered by the early deterioration problem due to salt damage, alkali silica reaction, etc., which became manifested in various places from the late 1970s to the early 1980s. The silicate based surface impregnating agent is a material for improving the concrete by densifying the surface of the concrete by reaction with calcium hydroxide in the concrete. In other words, the durability of concrete structures greatly varies depending on the environment and materials used, and it became clear that appropriate maintenance and management should be planned in design and construction. The hydrofit method was able to chemically react within the concrete skeleton to achieve strength recovery and stabilization. Recovery projects after the Great East Japan Earthquake of March 11, 2011 and emergency repair work of highway tunnel collapse accident are also caused by deterioration of concrete. The more advanced hydrofit method is a combined construction method of an impregnating agent which causes chemical action and a cement type powder. HydroSky is injected with silica-blended blast furnace slag paste made into a paste after impregnation treatment into an eccentric body and cracked place Or saturate the hollowed-out part, so as to restore it to sound concrete. Moreover, by adding vibration of this silica-blended blast furnace slag paste for a certain period of time at the time of injection of softened inclined surface, under roadbed, under the foundation, we will form a densified concrete layer and solidify it steadily. They penetrate into the concrete skeleton and gaps in reaction gels with calcium hydroxide in the voids where the alkali silica reaction has occurred, filling and densifying the voids, and can compensate for the insufficient strength.

If you remove the water barrier, the groundwater will overflow vigorously



There are more than 20L. of water leakage per minute from this area



## Measurement of true strength of cement paste is extremely difficult test

With the formulation in which the ratio of water to concrete (W/C) is less than 30%, it does not matter so much but as W / C becomes larger, a separation phenomenon occurs inside the specimen, and the cement particles settle down. Then, water rises on the contrary. For this reason, there was a difference depending on whether admixture was used or not, but in the lower part of the specimen, it became a cement-rich dense paste hardened body due to sedimentation and consolidation of cement particles and on the upper part of the specimen due to sedimentation of cement particles and rise of water, The actual W / C increases as it goes upward, and in the case of blending such as W/C exceeding 60% to the surface of the specimen, it is 30% or more of the height of the specimen. It often forms a fragile layer like surplus water or latency that could not react with cement. In addition, the paste layer under this Bleeding and the lethance layer also increases W/C significantly more than the initial value due to the rise of moisture and sedimentation of cement, so the paste strength inside the specimen is not uniform, The lower part is strongest, and the strength decreases as going upward. W/C is further abruptly increased at the surface portion to form a fragile layer having extremely low strength. Therefore, in the compressive strength test, the result varies greatly depending on the extent to which this brittle layer and the large portion of W/C are treated and tested. Also, since the separation greatly varies depending on the launch height, naturally the separating process is noticeable in the latter case in which the test was performed with a 50 mm diameter 100 mm specimen and the 100 mm diameter 200 mm specimen. Because it becomes It seems that there is a high possibility that the process of decreasing degrees will become large. Sedimentation of cement particles is unlikely to occur due to constraint on the sides of the test specimen on the side of the specimen and the central part of the specimen with the smallest constraint is most likely to occur, so the intensity distribution will also be different in the horizontal direction. For this reason, it is considered that the specimen does not break down to the kinematic form or the hourglass shape like destruction at the time of uniform stress distribution, and it tends to cause the vertical crack shape like eccentric loading or partial loading. On the other hand, separation occurs even in the case of concrete with the same W / C, but as separation of water and cement sedimentation will be blocked by the fine aggregate and coarse aggregate close to the paste, paste. Because there is no difference in W / C and organizational composition due to the upper and lower specimen extremely, as compared with the case of Fig.

Salt damage prevention work Landscape protection and deterioration prevention construction Before construction



After construction



# Protection of historical cultural properties

## SKY Heritage

When I am invited to Beijing, I am a historical monument "Palace Museum" (**Forbidden City**) was able to undergo the exposure test as repair protection agent. Here Sky Heritage raised a spirit. The etymology of heritage was born from "**World Heritage**" the so-called World Heritage. 80% of the world heritage is said to be stone. Heritage protects waterproofing most effectively for stone products. Most of these world heritages are under various circumstances such as high temperature and high humidity and severe difference of temperature. From soft stone to hard stone, Sky Heritage penetrates deeply into the base material and has waterproof protection function for very long term. After construction in one of the features of the heritage, if the concrete or stone is broken or cracked due to some damage, the fractured surface touches the air and moisture, the hydrolysis progresses slowly and the hydrophobicity grows and the cross section broken I will protect.

Work environment is also taken into consideration under harsh conditions, especially construction at subzero is also possible. It is a protective agent that has a long-term protection function and is suitable for conditions that do not cause a change in texture.

### SKY Heritage SKY-STD

Heritage replaces the moisture inside the structure due to high penetration force, gradually forming a waterproof layer. The drainage agent used also in the gasoline tank of the car has the action of decomposing the water in the tank and applied it to the heritage. Furthermore, this alcohol has a disinfecting action and it becomes a deterrent effect of moss and mold. Since heritage is alcohol type, construction at subzero is also possible.

### SKY Heritage Plus SKY-PLS

Heritage plus dries quickly in liquid and immediately appears strong water repellency. It gives super water repellency to concrete, stone, tile and so on.

### Experiment with Heritage coated tuff



After coating, sufficiently drying

Add water to the broken part

After 10 days the whole is water repellent

After applying the heritage to tuff rock and penetrating it, it divides it as shown in the above figure, but it absorbs the inside. Heritage touches the carbon dioxide gas and moisture in the air, waterproofing with the passage of time, it will extend to the whole after 7 to 20 days. This is because the reactive catalyst hydrolyzes and the hydrophobic group grows. The cross section is waterproofed even when the building material which was water-repellent pre-coated with refractory board etc. at the construction site is cut out and processed. After a certain period of time (7 to 20 days) after cracking the part will also waterproof its cracked surface and the effect will actually last.



Osaka municipal waterway memorial hall outer wall brick protection work



Nikka Whiskey Sendai Plant Exterior Wall Brick Repair Protection Work



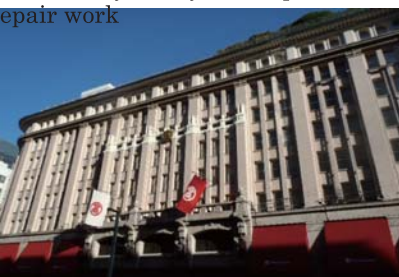
Repair protection work on outer wall tile



Important cultural property Takashimaya Tokyo store preservation repair work



Elevator hall



Jewelry shop marble floor protection work





## Prevention of scattering of sand by wind, weed growth inhibitor

- # Excellent dust prevention effect is demonstrated!
- # Sustained effect even in strong winds!
- # Weeds are less likely to grow by combining with herbicide!
- # Correspond to greening measures by water permeability and saturation!



SKY-RGH weed growth inhibitor dispersion completed.



About 1 month elapsed, the effect of the weed growth inhibitor appears.



After several months the effect of the weed growth inhibitor and the usual herbicide becomes obvious.



When it was sprayed on silica sand No. 5 and it solidified, it got soft and it sucked in water even if it solidified



12 times the spray concentration. It solidifies considerably but is not sandy.



Firstly spray all herbicide thoroughly



Secure construction area with rope



Preparation for construction. SKY-RGH diluted 10 times with water. Depending on the dilution ratio, drying time and hardness during drying change.



The application amount is scattered on the basis of 2 kg per square meter.

- # Adjust spray concentration and various effects can be expected depending on additives!
- # It is also possible to make a thick solidified layer so it can withstand strong winds!
- # You can think of a greening plan by utilizing saturation!



It is effective for weeding countermeasure of the solar power base part. Strong growing weeds, such as Solidago altissima, have various adverse effects on the panel.

### 《Construction precautions》

- # Before construction, protect firmly so that coating agent does not adhere to purposes other than purpose.
- # Do not install it under rainy weather or temperatures below 0 ° C.
- # Please use general commercial agent for the herbicide that precedes.
- # After construction, please wash appliances well with water.
- # If the liquid adheres to the skin, please wash off with running water etc. with running water.
- # Use proper working clothes, goggles, gloves, boots for construction.
- # In the unlikely event that the medicine enters the eyes, rinse with running water and consult a doctor immediately.

# Amazing super water repellent, oil repellent!

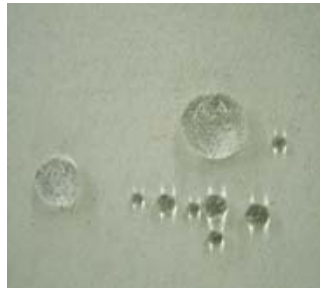
## SKY-Fiver

A waterproof super water repellent with quick drying has been made. Basically it does not choose the application. Cloth, paper (cardboard), water droplets become spherical on the base like the picture below, you can see super water repellency. Fiber type does not use fluorine at all. After the alcohol for disinfection has dried it will repel water for a long time. When used for clothes, effects are sustained even for 20, 30 washing. Easy to use according to the purpose, you can water repellent yourself.

Simple waterproof scarf



Expansion of water repellency



Water repellent for sneakers  
Published on YouTube



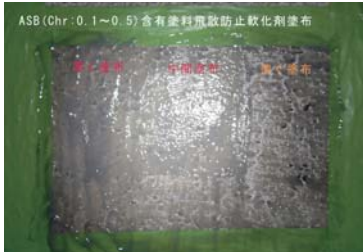
In a short period of time you can draw or carry water with a large cloth such as wrapping cloth or scarf. When narrowing down, water goes through the cloth and water repellent again by squeezing the water. It can also be used as a substitute for umbrellas and rain boarding in sudden rain, and can be waterproofed by lightly spraying with a hand spray such as cardboard if it is thick paper.

## SKY Modern

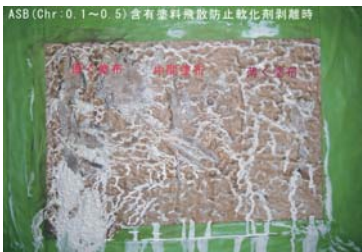
Fluorosilane properties and special silicone firmly protect the surface. It prevents scale and dirt by super water repellent action. Cleaning effect and mildewproof effect by IPA disinfection effect can be expected.



## SKY PROTECTOR Sky protector peeling plus



(24 hours passed after application)



### Part of asbestos use case



## [Asbestos-containing paint peeling spray treatment agent]

- # Sky Protector PE Plus does not contain any strongly toxic (methylene chloride).
- # Instead of dissolving the old coating film, it softens and peels off so it is easy to recover without scattering.
- # It has biodegradability, sky protector PE plus in wastewater decomposes and decontaminates bacteria in soil.
- # Enough fish poisoning safety.
- # Sky protector PE Plus does not damage the surface of the frame.
- # Even when high-pressure cleaning is performed on removal work, since the paint after peeling does not dissolve in water, washing water and waste are separated, so it can be safely processed.
- \$ Protect protective film (such as polyethylene film) to prevent scattering of coating film and coating film dust out of the work area.
- \$ Application: Since the coating amount differs depending on the state of the corresponding coating film, test is carried out beforehand. Approximately 0.3to1.0 kg (exterior thick paint material) per Square meter. Stir the material well before construction.
- \$ put: Let it penetrate to the old coating and interface and leave it until the coating softens.
- \$ Removal: Remove softened coating with scraper, ultrasonic isolator and so on.
- \$ Waste material treatment: Waste material removed is treated according to the Industrial Waste Act.

### Product Summary

pH 9.8 Occupational Safety and Health Law Not applicable Fire fighting designation combustible material PRTR law Not applicable Appearance Green White Viscous liquid Specific gravity 1.08

### Handling Precautions

1. When using, use protective gloves, protective glasses, foreclosure and so on. Polyethylene gloves and foot covers are effective.
2. Handle according to organic solvent poisoning prevention regulations.
3. Ventilation is adequate during work, gas in the solvent is heavier than air so invite people under work well enough.
4. Protect against work area and its surroundings because it is a polyethylene film in the range of scattering and contact.
5. Do not use it within the usual storage condition for less than half a year, and do not return the used material to the original can.
6. The contents of this material may differ depending on the conditions of use at the site.

## Solar heat blocking and waterproof paint on roof and outer wall



By fusing heritage with aluminum cutting powder, we have completed a revolutionary protective material that realizes a thermal insulation effect by highly reflective waterproof finish. By combining with Hydro Sky products, the roof While repairing the leakage of water from the outer walls and leakage from the outer wall, you can obtain heat shield and heat insulation effect. By only applying reflection and heat insulation of sunlight, indoor temperature change is reduced by about 30%, and by setting reasonable air conditioning temperature, electricity charge can be drastically reduced.

**In addition to the roof of the factory, the gymnasium, the warehouse, it is effective also for the outer wall of the building, the makeup of the siding**

Refurbishment of the slate roof and Galvannum roof. Sky Apollo MX ceramic hollow beads amplify the insulation effect. After drying it protects with reflected heat with Sky Apollo Silver. Apollo silver is liquid aluminum and protects from rust such as salt damage and maintains aesthetic appeal. Also concerned asbestos are comprehensive and will not be scattered. Since it is covered with aluminum unlike ordinary paint, the protective effect will continue for a long time. By utilizing the rust prevention function, we also protect screws and bolt parts in factories and equipment in coastal areas. We are proud to contribute to environmental improvement by reflecting the direct temperature and expecting the heat island deterrent effect by connecting the apollo silver-plated roof and the outer wall.

Measurement of irradiation temperature by 100 W Ref Light bulb



Untreated plate: irradiation test plate back temperature

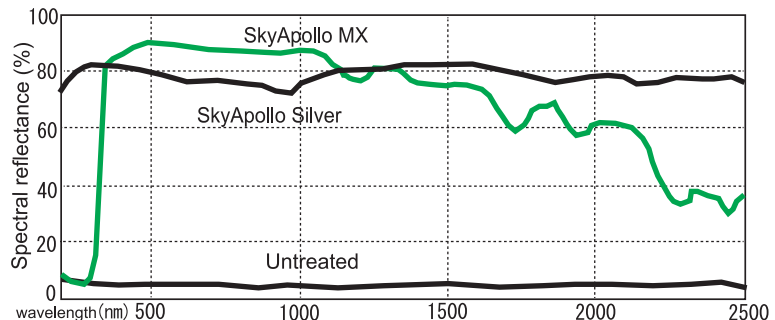


Irradiation test plate backside temperature

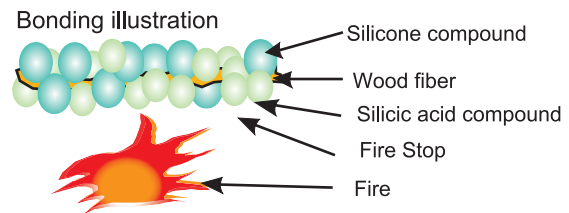


# In house experiments are transparent acrylic board, thickness 5 mm, height 150 mm, width 200 mm, depth Temperature sensor was installed in a location that was sealed 200 mm tightly and located on the back of the irradiation specimen and irradiated with a 100 W Ref bulb on a 5 mm thick slate roofing material as shown in the photograph. confirmed in about 30 minutes.

In addition, similar results were obtained in aluminum plate of 5 mm thickness, galbarium steel sheet of 3 mm thickness. From such test results you can check the high reflectance of Sky Apollo. It surely prevents external solar radiation and does not store heat inside. Normal heat insulation is very easy to install, as it is often thick-coated to thicken sheets or mortar to thicken. In Sky Apollo Silver, since aluminum metal powder is applied, there is no worry of fading, and it is excellent in waterproofness and rust prevention effect due to strong water repellency. It can be said that it is a material that played a major role in environmental improvement, such as the gymnasium roof and factory, the roof of the logistics warehouse and the outer wall, excellent in cost performance.



The characteristic of **SKY-QON** is aqueous mineral. It penetrates deep into the base material and gradually eliminates water solubility, first prevents water from penetrating from the surface layer and releases the internal moisture. As a result of this, the hydrophobicity that started waterproof has flame retardancy, you can earn time to evacuate and rescue when a fire occurs, possibly stopping burns to others to a minimum. **SKY-QON** does not contain organic solvents or hazardous substances at all, it has no smell and it does not emit toxic gas even in case of an emergency fire.



**SKYFEU** applies a flame retardant treatment to a 3 mm thick plywood board, but burns simultaneously at 1400 °C without color change of the base. The unprocessed board burns out without waiting for 2 minutes. The surface burns only for 6 minutes. There is no bending or distortion. You can earn time for evacuation or rescue in case of emergency.



### Why will not it burn?

**SKY-QON** is made of silicone resin called inorganic organosiloxane and inorganic catalyst. Silicone alkoxide is incorporated in this silicone resin as part of the structure. Alkoxides are hydrolyzed to form siloxane bonds (-Si-O-Si-). The siloxane bond is an oxide in the first place, it is not oxidized any more and is incombustible. It is the same thing as stones and sand do not burn. In addition, **SKYFEU** developed this time was developed as a base material for thin veneer boards. I removed the waterproofness and increased the adhesiveness of cloth etc. It can be applied easily without any smell with aqueous inorganic matter. Workability is good even if it is applied beforehand and even at the site. **SKY-QON** is alkaline with **SKYFEU** acidic. Be sure to wear rubber gloves. # There is a bidet in the combustion experiment. It is open to the public on the website.



# HYDROSKY

Ministry of Land, Infrastructure and Transport NETIS New Technology Information System  
NETIS number: KT-160095-A New technology name: Hydrofit method  
(impregnated composite injection method) Registration date: October 21, 2016

HydroSky series Each product has a protective function for a long time and has been used in many fields as a condition that does not bring about a change in texture and especially as a material most suitable for prevention of degradation of stone materials and protection and refurbishment of historic buildings It was. We have further developed and become a new group of materials that has been enhanced as HydroSky. Hydrofit construction method is further evolving. We accurately grasp the causes of various leaks in the basement and instantaneously vitrify a large amount of water leakage into the structure, which is heavily loaded with groundwater, especially the water flowing part into a gel. After the reaction, it did not dissolve in water (seawater), making injection work easier, it became possible to stop water in a short time. It can be constructed without problems if there is an environment where people can work. The applicability of this construction is also suitable for strengthening soft ground and for strengthening inclined surfaces and retaining walls. Now that the memories of the Tohoku Region Pacific Offshore Earthquake do not disappear, the scope of application will be further expanded for bridges and road collapses again in the Kumamoto earthquake, restoration work, repair work of facilities. In addition, we are visiting from overseas, separately from Southeast Asian countries, expected in the renovation method, and we pride ourselves as an indispensable construction method for future infrastructure development projects.

## @ Product overview

# Characteristics: Performance 1. Improve moisture resistance, waterproof 2. Prevent and protect the surface from deterioration 3. Reduce penetration of grease, oil, acid 4. Prevent cracking due to freezing 5. Prevent mold and algae. 6. Cure from the surface to the inside 7. Improve the heat and cold resistance 8. Make the ice easier to take 9. Increase the elasticity of concrete 10. Waterproof and surface protection effect of all inorganic building materials 11. Have complex Various constructions possible by application of materials and equipment such as construction method

@ Even when using this product, the breathability of the surface of the structure is not impaired and SKY type and heritage do not change hue or texture. @ Hydro Sky can combine various products, various effects and expression methods can be done, not only civil engineering and construction, but also environment improvement and abundant construction are possible.

### Usage amount: Water type

4 to 8 m<sup>2</sup>/kg, 0.12 to 0.25 kg/m<sup>2</sup> (depending on the material)

Packing: 20 kg cardboard, MXColor 18 kg pail can

### Amount used: alcohol type

6 to 12m<sup>2</sup> per liter, 0.05 to 0.20 liters per square meter

Packing: 18 liters (14 kg) Royal can PE plus 16 kg pail can

Besides this, we will supply you according to your needs, such as research and development of products that meet the needs of the field and materials of environmental improvement.

## Construction method

@ Clean the coated surface well for both new installation and repair. Remove it with paint, efflorescence, grease etc. with a wire brush, scraper etc. or perform high pressure washing. @ Fissure cracks, concrete placement defects, holes etc are filled with mortar, mortar sealing material etc. @ Hydro-Sky SKY-SP, HX strongly adheres to glass and aluminum, so it needs sufficient protection. Also be careful not to stick to plants etc. @ When using water-based paint and finish material (top coat) Avoid using other than SKY-SP.

## A coating

@ SKY-SP, HX, when the temperature of the construction surface is 50 °C or more, please apply after plenty of water and cool.

@ Please apply the coating equipment plenty with a brush, roller or spray gun depending on the construction situation. @ When working, wear appropriate protective equipment and use protective equipment such as shocks, static electricity, etc. that do not generate sparks, so that you do not touch them directly, wear protective glove protective glasses and breathing protection equipment to keep in mind Let's see.

**Construction conditions:** Within the temperature range of 5 °C to 35 °C, do not snow or rain.

Depending on the applied material and the substrate, crystals may appear on the surface, so wipe it off thoroughly with a cloth moistened with water at the time of semi-drying.

For other functional materials and ordered production materials, please contact the product manual or contact us.

**#Notes** This product is the attached installation instructions. If you swallow this product or get into your eyes, please consult your doctor by washing with plenty of water.

**\$\$** The contents of this printed matter are based on the materials of our Technical Development Department. In addition, some changes may be made due to new construction, improvement, abolition etc. of products without prior notice.

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