

AQURON 2000®

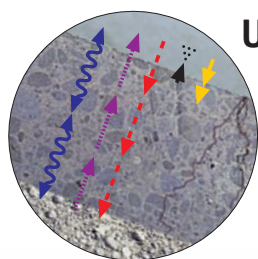
Sub-surface Molecular Bonding & Waterproofing Solution Treatment for Concrete

AQURON 2000® – The proven revolutionary concrete Cure and Sealer, surface hardener and preservation solution. **AQURON 2000®** is a colloidal silicate based solution with a highly reactive catalytic agent that is drawn towards components within the concrete much like iron is attracted to a magnet.

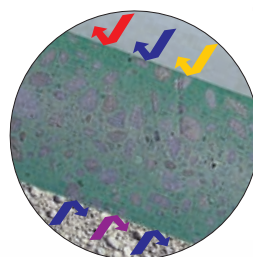
AQURON 2000® when applied to the surface of concrete penetrates very deeply into the concrete coming in contact with the free alkali and alkaline hydrates. As contact is made **AQURON 2000®** transforms from a 100% liquid to a 100% solid in the form of an insoluble colloidal silicate hydrogel.

AQURON 2000® is a clear, non-toxic, odourless, penetrating preservative and waterproofing solution that permanently seals concrete from within, making concrete impervious to hydrostatic pressure, gases, oils, salts, acids, alkalis etc. The only known substance to penetrate **AQURON** is more **AQURON!!!**

Once **AQURON 2000®** is applied, the results are:



Untreated



Treated

- COMPLETE SEAL BY INTERNAL MOISTURE BARRIER
- CURE ASSISTANCE WITH INCREASED CONCRETE STRENGTHS
- HARDENS SURFACE, IMPROVES TRACTION & ADHESION
- PREVENTS SURFACE DUSTING, REDUCES LAITANCE
- PREVENTS ENTRY OF CARBON DIOXIDE & CONSEQUENT CARBONATION BREAKDOWN OF MATRIX
- RETARDS CHEMICAL ATTACK BOTH FROM EXTERNAL & INTERNAL CORROSIVES
- INHIBITS CORROSION OF IMBEDDED REINFORCING
- ALLEVIATES "ASR & AAR"
- EASIER CLEANING - STARVES DEEP-SEATED FUNGUS, MILDEW AND DISEASE GROWTHS
- PREVENTS ELECTROSTATIC DISCHARGE POTENTIAL
- STOPS INTERNAL MOISTURE MIGRATION, & DELAMINATION OF ADHERED COATINGS (providing steps outlined in **AQURON** "KEY ISSUES" are followed)
- REDUCTION OF FREEZE THAW & WEATHERING EFFECTS

AQURON 2000™ provides

Moisture Barrier & Cure Assistance

AQURON 2000® sets up an efficient and complete interior barrier (stopping all liquid and undesirable vapour movements) within the concrete, while allowing concrete to breathe harmless oxygen and other light gases.

AQURON 2000® moisture barrier will be as permanent as the concrete itself and will not be able to be abraded off, as the concrete is sealed from within, not above or below like traditional methods of DPC underlay and



Aquron 2000 simply spray applied provides complete moisture barrier &

surface applied moisture barriers.

AQURON 2000s® interior barrier is impervious to moisture (both liquid and vapour), oils, acids, alkalis and gases.

AQURON 2000® permanently seals and does not deteriorate and cannot be compromised or destroyed without destroying the concrete, as it is molecularly bonded within the concrete matrix structure itself.

AQURON 2000® will not only halt all moisture transmission via the concrete matrix including capillary action, but will also allow the concrete to freely expand and contract.

The optimum time to apply **AQURON 2000®**

is, while the concrete is still “green” and has hardened enough to be walked on without being marred. When applied to green concrete **AQURON 2000®** will provide an unsurpassed cure assistance, at the same time accelerating the setting of the pour and maximising the developing strength of the concrete, including surface hardening.

AQURON 2000® incorporates within the matrix the moisture that would otherwise be free to migrate to the surface and evaporate.

AQURON 2000® locks up this free moisture as further hydrogel, which is very similar to the main gel component (CSH-calcium silicate hydrate) produced by cement hydration, and which is the binder within the concrete matrix.

By providing this cure assistance, **AQURON 2000®** reduces the possibility of cracking, spalling, saponification and slab curling.

The problems of slow curing concretes delaying construction time-frames are virtually eliminated! **AQURON 2000®** permanently locks up the excess moisture, stopping moisture migration and eliminates the possibility of coatings, paints, vinyls etc, delaminating or “bubbling off”. **AQURON 2000®** enhances bonding of adhesives and coatings etc (providing steps outlined in **AQURON** “KEY ISSUES” are followed), stops efflorescence by eliminating moisture movement to the surface of the matrix.

AQURON 2000® has guarantees and warranties available, see “**Producer Statement**” for **AQURON 2000®** as an alternative method to traditional DPC underlays.

Producer Statements

Changing the way the world protects concrete!



AQRON CORPORATION

CONCRETE PRESERVATION TECHNOLOGY

PRODUCER STATEMENT

Aquron 2000 correctly applied according to manufacturer's specifications on newly placed or existing concrete will set up an efficient and complete interior barrier (both liquid and moisture vapour) within the concrete.

The Aquron 2000 moisture barrier will be as permanent as the concrete itself and will not be able to be abraded (worn off).

Jointing within concrete slabs or fractures will need to be sealed with ASTC Concrete Joint Sealant or other appropriate joint sealant.

The above statement is an assured function of Aquron 2000 that is warranted to perform as stated.

Changing the way the world protects concrete!



AQRON CORPORATION

CONCRETE PRESERVATION TECHNOLOGY

PRODUCER STATEMENT

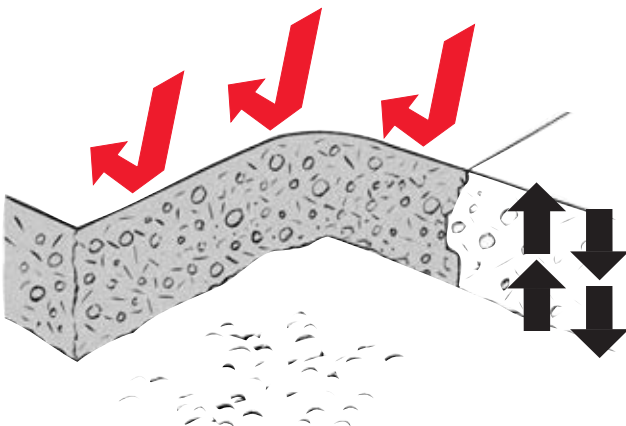
The Aquron Corporation produces the product Aquron 2000 Sub-surface Molecular Bonding and Waterproofing Solution/Treatment for portland cement concrete installations. Aquron 2000 prevents soluble chlorides entry into concrete by preventing water (solution) access.

The above statement is an assured function of Aquron 2000 that is warranted to perform as stated.

AQURON 2000[®] retards

Chemical Attack

AQURON 2000[®] when properly applied and allowed to penetrate into the concrete interior, reacts with alkalis to create a colloidal silica hydrogel. While **AQURON 2000[®]** does react with acids, it does not produce a gel reaction like it does with alkali, but reduces acid to milder forms. **AQURON 2000[®]** retards alkali and acid attack of the concrete, in most cases **AQURON 2000[®]** totally neutralises these elements. Chemical agents, when permitted access to the interior of concrete, greatly accelerate the deterioration of concrete. Acidic assault is initiated from sources as diverse as Acid rain, industrial chemicals and cleaners, milk, food waste and effluents which are similar in their ability to destroy the concrete.



Reference – see detailed Memo Page C13-14

AQURON 2000[®] stops damage from internal migration

Encapsulation

Concrete permeability allows internal movement of moisture, salts and gases. Where there is only a damp course beneath the concrete with no impermeable coating above, these migrations will exit at the surface when temperatures at the surface rise – the reverse happens when concrete retains its heat and the surface temperatures are lower. When this situation occurs with both top and bottom of concrete slabs coated with impermeable membranes, coatings etc, the resulting “encapsulated” migratory moisture, gases etc will often cause delamination of

Even water (depending on the purity and temperature) and salt solutions reacting with the calcium in the hydrated cement binder, form water soluble reactive by-products.

The consequence is the premature and often rapid degradation and decomposition of the cementitious matrix. Sulphates and sulphate solutions can form sulfo-aluminates, which together have a larger volume mass than the original materials, this internal volume increase will cause the concrete to crack open for no apparent reason.

AQURON 2000[®] is as permanent as the concrete, but of course as concrete contains lime which is readily dissolved by acid, there is no method of concrete treatment that can assure 100% protection from chemical attack. **AQURON 2000[®]** greatly increases the life expectancy of concrete already subjected to severe chemical attack. Once applied, **AQURON 2000[®]** will permanently remain in place and resist future penetration by these destructive materials. **AQURON 2000[®]** in a good quality concrete can be trusted to stop internal attack and build a matrix that is impenetrable to those corrosives even though some superficial lime (calcium outcrops) and aggregate may be “etched”.

these coatings and premature failures.

When the concrete is treated with **AQURON 2000[®]** percolation of migratory moisture and gases are permanently prevented. **AQURON 2000[®]** eliminates “drawing in” of contamination leading to destruction of the concrete and reinforcing and release of obnoxious gases, efflorescence and delaminations from the concrete (refer “Orlando’s Utilities Commission Reports” and “Gas Transmission in Concrete”, Page C7-8).

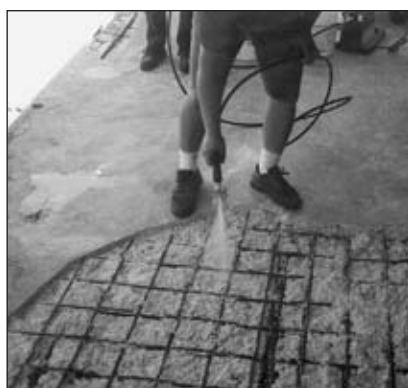
AQURON 2000® inhibits

Corrosion of Embedded Steel

The reinforcement of concrete with steel rebar introduces the problem of rebar oxidising i.e. "rusting".

AQURON 2000® applied to the surface of concrete, deeply penetrates and immediately starts to work to neutralise soluble chlorides and clean concrete's internal environment, and works to prevent the corrosion of embedded steel. **AQURON 2000®** within the concrete creates an impermeable "Gel" barrier which prevents the internal migration (and ingress) of water and all the solutions that promote the corrosion of embedded steel.

Free chloride ions in solution are commonly the agent causing corrosion. When the concrete is **AQURON 2000®** treated, soluble chloride ions present in the concrete are arrested and inactivated within the **AQURON 2000®** produced gel formation or purged to open porosities at the surface of the concrete. The important consideration is that although chlorides may still be present and measurable in crushed samples of **AQURON 2000®** treated concrete, their corrosive powers have been effectively neutralised when held in the **AQURON 2000®** produced gel formation within



the treated concrete. This gel is destroyed by crushing the sample.

Of course when **AQURON 2000®** is used as a "cure and seal", the concrete is permanently protected from chloride ingress and activity within the concrete.

Tests have shown that after proper treatment with **AQURON 2000®**, the corrosion process in existing reinforced concrete is significantly retarded and further corrosion prevented as **AQURON 2000®** neutralises existing internal corrosives and acids preventing further chemical reactions.

When correctly applied to new concrete **AQURON 2000®** will thoroughly inhibit and eliminate the rusting and corrosion of embedded steel. Where corrosion of reinforcing has become evident, spalled concrete must be removed, corroded steel de-scaled and cleaned and the concrete treated with **AQURON 7000** followed by **AQURON 2000®** before rebuilding the cavities where spalled concrete has been removed. When replacement concretes and/or mortars are placed, they also should be "cured and sealed" with **AQURON 2000®**

AQURON 2000® alleviates

Alkali Silicate Reactivity (ASR)

Similarly (AAR) Alkali Aggregate Reactivity

Some aggregates utilised in concrete, following curing are susceptible to expansion when contacted by "free" moisture migrating within the concrete matrix. Often the expansive forces are restrained within the depth of concrete but are evident at the surface as "popouts". This problem has sometimes been so serious that whole concrete structures have deteriorated with a characteristic fracture pattern.

AQURON 2000® correctly applied will alleviate this problem as it penetrates into the concrete preventing free moisture communicating with the aggregate and resulting in expansion forces i.e. **AQURON**

2000® works within the concrete in the enclosed porosity to prevent the expansive forces from developing.

In areas where "ASR & AAR" are a risk, **AQURON 2000®** used to "cure & seal" new concrete, will combat the potential of these problems developing. On existing concretes sealing with **AQURON 2000®** will be economically worthwhile to protect the concrete.



AQURON 2000™ prevents

Concrete Dusting

In sealing the concrete from within, **AQURON 2000®** eliminates dusting. Concrete dust is not a common dust. It is a silica dust which can be so fine, it is indistinguishable to the naked eye. Not only can it destroy machinery and merchandise such as computers, it is also a health hazard.

Concrete dusting is accelerated by ingress to the concrete of carbon dioxide gas. Just as oxygen combines with steel to produce rust, carbon dioxide reacts with concrete reducing it to calcified dusts and water vapour.

AQURON 2000® sets up its impervious barrier to gas ingress, and overcomes and eliminates the dusting of the concrete, improves its strength, hardness and resistance to abrasion.

Other surface sealers cannot cure this problem because of the limits of their shorter lifespan, resulting in breakdown of the seal and concrete deterioration.

Even after sealing with conventional sealants or covering with carpet etc, concrete dusting will often persist through these coverings as a threat to sophisticated computer hardware.

AQURON 2000® will permanently seal the concrete, resulting in carbonation and dusting of the surface being prevented as well as protecting the internal matrix of the concrete.



AQURON 2000™ stops

Carbonation of Concrete

One of the most common problems with reinforced concrete structures is the deterioration brought about by the corrosion of reinforcing steel and the subsequent spalling of concrete.

Spalling is most often caused by moisture penetrating to the depth of the steel, where it reacts in the presence of oxygen and chlorides to cause the steel to corrode.

This corrosion process is aggravated by the process known as carbonation, which is the result of the action of acidic environmental conditions bringing about a lowering of the alkalinity of the concrete from an initial pH of around 13.5, to around 8.5 over some years.

At this stage the steel loses the passivating gamma-ferric oxide layer which becomes unstable as this level of pore water alkalinity, and corrosive reactions start to become evident.

AQURON 2000® products work to combat this process by:-

- Sealing out moisture to a depth of 100mm or more;
- Reducing oxygen permeability by a pore-blocking process;
- Bringing up the alkalinity of the concrete as it impregnates it - **AQURON 2000®** has a pH of around 13;
- Binding chlorides in the Colloidal Silicate Hydrogel formed in the pores and capillaries of the concrete (only chlorides in solution are available to participate in corrosion reactions);
- Increasing the resistivity of the concrete, and thus inhibiting electrochemical activity.

It is well known that no carbonation takes place in concrete when the pores are completely dry, or when they are fully saturated. The effect of the **AQURON 2000®** treatment causes the pores and capillaries of concrete to be filled with an insoluble gel, which remains active indefinitely, preventing moisture migration and thus putting a stop to the whole Carbonation process.

Because of the sub-surface molecular bonding nature of the process, the treatment does not change the appearance of concrete, or affect the adhesion of subsequent coatings.

Concrete treated within 24 hours of casting will be protected for life against Carbonation problems, and aged concrete, once treated will become immune to its effects.

AQRON 2000® reduces

Laitance

Laitance is a layer of weak and non-durable material containing cement and pieces of aggregate brought by bleed water to the top of over-wet concrete. Overworking or over-manipulating concrete at the surface by improper finishing methods will increase laitance. Should a concrete's surface produce a loose powdery material when abraded, excessive laitance is usually the cause.

The ability to remain bonded to the surface of concrete is a major factor effecting the performance of paint or floor coverings. If the floor covering is bonded to a laitance condition, a successful adhesion is unlikely. The weak material on the surface of the laitance will have to be removed to obtain a successful painting or floor covering.

The alternative to both excessive laitance and poor bonding of paint and floor covering is the application of **AQRON 2000®**.

AQRON 2000®, when properly applied, will add density and bonding strength (providing **AQRON "KEY ISSUES"** are followed) to the concrete. Although, it will not bond large pieces of spalled and dislodged aggregates together, **AQRON 2000®** will greatly diminish the weakening of the concrete's surface through laitance.

AQRON 2000®

Gas Transmission in Aquron 2000 Treated Concrete

Concrete Breathing and Prevention of Substance Transmission

How can concrete breathe and still exclude or prevent the transmission of so many substances like radon, methanes, carbon dioxide and other heavy gases, salt, water, acids, etc?

Part of the answer lies in the nature of gas transmission in **AQRON 2000®** treated concrete. Some gases are soluble. Gases with a low molecular weight are more soluble than gases with a high molecular weight. Molecular weight is not the only property that determines solubility. Also important is the way the configuration of the electrons of the gas combines with the configuration of the electrons of the **AQRON 2000®** hydrogel and concrete.

As a compatible gas permeates the gel, it dissolves, emerges as a gas, re-dissolves and re-emerges, dependent upon the capillary pores (interstitial pores) and the gel pores (discontinuities) that may remain. Oxygen, with an atomic number of 8, an atomic weight of 16, has a low enough molecular weight to diffuse, to dissolve and to move under partial pressure. At any given temperature, all molecules have the same kinetic energy. The kinetic energy is the energy of motion. A large molecule will have a high mass component of energy and a low velocity component. A small molecule will have a high velocity component and a low mass component. This will affect reaction kinetics and thus solubility. It will also determine the partial pressure due to the kinetic energy of a particular gas. This will determine solubility at the surface and mobility through the substance media (the **AQRON 2000®** treated concrete).

Radon, methane and other harmful gases that are "**heavier than air**" will not pass through the concrete after the "**AQRON 2000® Treatment**" seals the pores (approximately 100mm to 150mm deep). Any surface scratches, gouges that occur after sealing will not compromise the seal due to **AQRON 2000,s®** ability to deeply penetrate the concrete below the surface and into the matrix.

"**Sick Building Syndrome**" has become a relatively common complaint – i.e. "**foul off-gasing from polluted concretes**", readily overcome and resolved as testified to in these Orlando Utilities Commission memos. See Page C8.



ORLANDO UTILITIES COMMISSION

505 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407423-9100

Let me put in writing the results we have experienced with Aquaron CPT-2000 product.

The Commission has a new Engineering Office Building at 6003 Pershing Avenue, that has had a carpet failure in which the plasticiser of the carpet backing decomposed into its original chemical make up and released an assortment of chemicals in their gas state, some went into the air and some were absorbed into the concrete under the carpet. These chemicals were mainly harmless but there were a few alcohols that were very troublesome, especially the nonanol, heptanol, pentanol and hexanol. These compounds caused the employees to develop problems typical of sick building syndrome, headaches and upper respiratory problems that were serious enough to force the evacuation of the building and the removal of the carpet.

We conducted many experiments with floor sealers and found that none worked as well as the Aquaron CPT-2000. In the test of epoxy coatings we found that the off-gassing of these products equalled or surpassed the amounts of remaining carpet gasses, but with the Aquaron products off-gassing was nil while the carpet chemicals were decreased to below the levels of smell and in most cases undetectable in testing chambers.

Our chief environmental consultant on this project was GZA Geo-Environmental of Grand Rapids Michigan who used Air Quality Sciences Laboratories of Alanta to run the chamber tests. Basically the laboratory would prepare a set of absorbent tubes of various charcoal medium through which we would draw air from a aluminium tent placed over the bar concrete or sample floor sealers that has been applied to the floors in small quantities. The exposed tubes would be hooked up to a gas chromatograph-mass spectrometer at the lab for analysis. Without a doubt the Aquaron CPT-2000 was superior to the other products.

Even though the Aquaron product was not designed to purge these particular chemicals from concrete, the fact remains that it does, as our tests have shown. We are a quasi-government organisation and as such, test results are open to the public, please fell free to have any of your clients phone me at (407) 423-1900 if they have questions.

Sincerely,

Artle J. Spitzer
Sr. Engineer, Facilities Division



ORLANDO UTILITIES COMMISSION

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The Orlando Utities Commission (provides electricity and water to City of Orlando, Florida) in 1993 constructed a new office building of 65,000 sq. ft. that has Collins & Aikman carpet squares installed in it. The vinyl backing on this carpet had a mixture problem that led to a failure of the plastic: the plasticiser began to migrate out of the mixture, a combination C-9 and C-10 alcohol provided by the BASF Chemical Company. This material moved both up into the air and down through the carpet adhesive into the concrete sub-flooring. The air of the offices was reading in the 3,000 to 5,000 microns of material per cubic meter, and the concrete had alcohol down to 1-1/2 inches in depth ad was emitting back into the air at reats of 6,000 to 7,000 microns. Industrial hygienists stated that any level above 500 was unacceptable, and the alcohol was definitely the contributing factor to occupant complaints of headaches and dizziness.

To keep a long story short, the building had to be vacated, furniture removed, the interior walls and ceiling tiles discarded due to alcohol absorption. In order to remove the alcohol, and to ensure that there would be no problems in the future, a nationwide search was undertaken to find products that would seal the alcohol in the concrete. Many materials were tested on the surface: epoxy, sealers, and concrete treatments. The goal of the testing was to see if it was possible to reduce the emissions from the concrete to acceptable levels prior to replacement of finish flooring material. All of the 200 plus tests failed, with most of the tested materials actually increasing the level of emissions, except one product, AQURON 2000. This product was presented as being able to purge salts from concrete, and along with the purging action lifted the alcohol to the surface as well. Core tests showed that the AQURON 2000 penetrated to 3" in depth with a double coating (applied 20 minutes apart) and further, it sealed the concrete against moisture penetration. Emissions coming from the treated concrete was reduce to levels of between 50 and 100 microns!

It was decided that the first floor concrete would be removed for psychological reasons in order to tell our employees that we had done everything possible for their health, but the second floor system was part of the structural diaphragm of the building designed to resist hurrican winds and could not be removed. It was treated with AQURON 2000 only. After treatment, the levels of the entire second floor were below the 100 microns. The first floor, where the new concrete was poured, was treated with AQURON 2000 for moisture sealing prior to installation of 12" x 10" vinyl floor tiles (20,000 sq. ft.) with the remainder being covered with Millken Carpet, 36" x 36" carpet sections. The building has been reoccupied without complaint for over a year and a half and passed a thorough Indoor Air Quality test only last month.

I was the Project Engineer on the construction of this building and consequently the person responsible for the fix. At first I thought the Aquaron product to be a salesman's "snake oil!" I was wrong. AQURON 2000 proved by test and by experience to be everything it was touted to be, and more.

Sincerely,

Artle J. Spitzer
Sr. Engineer, Facilities Division

AQURON 2000® prevents effects of Freeze-Thaw Cycles

AQURON 2000®'s feature of eliminating free moisture within concrete, works to eliminate the effects of freeze-thaw damage. Freeze-thaw is a frequent cause of damage to concrete, when moisture in the pores of the concrete matrix freeze and expand. Because the frozen moisture must expand, the result produces cracking and spalling. Eventually these repeated cycles will encourage cracking to propagate, and the concrete matrix will fail, making replacement of concrete necessary.

AQURON 2000® provides a preventative to completely eliminate freeze-thaw damage.

AQURON 2000® for easier Cleaning & Maintenance

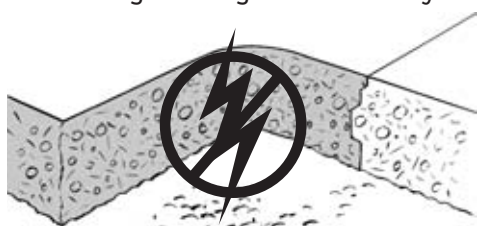
AQURON 2000® once applied, makes cleaning and maintenance easier, as no disease, fungus, mildew, oils, acids etc can penetrate below major "open porosity" of the concrete surface.

Concrete is not naturally a sterile material. **AQURON 2000®** (with no residual by products) will harden, preserve, waterproof and seal concrete to prevent internal biological contamination. **AQURON 2000®** is approved by the United States Department of Agriculture and MAF of New Zealand for use in food processing facilities. **AQURON 2000®** meets or exceeds all requirements for environmental and public health issues.

NOTE: When Aquaron was tested for the United States National Foundation of Safety not only the treated concrete but the undiluted Aquaron Solution itself was tested and proved to have no contents above levels set by law as acceptable in public drinking water. Also achieved outstanding results in Australian Standards tests for potable water contaminations.

AQURON 2000® for Electrostatic Discharge Prevention

The potential of building "electrostatic" discharges of electricity from concrete storing and then releasing a charge can virtually be eliminated through applying **AQURON 2000®**.



As **AQURON 2000®** penetrates the concrete interior and uses all the "free" moisture to extend the gel formation within the concrete, the internal wetness and readiness to pass on electric current (or charge) is effectively modified, as are tendencies for the build up of static electricity, which is common in many concretes.

AQURON 2000® avoids Fungus & Mildew

AQURON 2000® is the solution treatment to avoid undesirable and unsightly streaking and discolouration made by "deep-seated" fungus and mildew etc. Alternative attacks on these problems are not environmentally friendly like **AQURON 2000®** and often fail as a result of superficial and temporary actions.

AQURON 2000® is a clear, filmless, non yellowing, non petroleum, non toxic, environmentally safe, penetrating, preservative solution which seals the concrete from within the matrix. **AQURON 2000®** consumes the water or moisture already present inside the matrix, and in doing so robs fungus and mildew of their food source, causing these unwanted stain-makers to starve and dry up.

Similarly with disease, microbial contaminations etc, the **AQURON 2000®** fills the porosity with it's hydrogel giving no place for disease to enter or exist in the concrete matrix.

Frequently Asked Questions

Can oil stains be removed entirely from concrete by AQURON 2000®?

In most cases AQURON 2000® working alone, will purge contaminants from inside the concrete matrix to the surface. However, since there are as many pre-existing conditions in a given pour as there are pours, AQURON 2000® working alone may not immediately purge all oil stains in every case. Given time, most stains will dissipate. AQURON 2000® will not remove carbon or graphite stains.

Other than alkali and lime, with what substances will AQURON 2000® also react?

AQURON 2000® must have a cementitious base with which to react. The unique catalyst has no affinity for other substances such as grease, dirt or oil. Care is needed to avoid contact with glass which is also penetrated or etched by AQURON 2000®! Wash off immediately.

What will AQURON 2000® do when used ahead of latex and polyvinyl paints?

When applied as a primer to cementitious materials, AQURON 2000 will increase the bonding strength of subsequent applications of latex and polyvinyl paints (providing AQURON "KEY ISSUES" are followed). An added benefit AQURON 2000® provides when used as a primer is that paint as well as other surface coatings will last longer.

What effect does AQURON 2000® have on asphalt, tar, metal, asbestos and paints with an epoxy, polyvinyl, acrylic, latex or cement base?

AQURON 2000® was formulated specifically for cementitious based materials. Although it has no effect on asphalt and tar, it will purge them from concrete as contaminants. AQURON 2000® will NOT penetrate oil based or water based paints. It will not penetrate epoxy, polyvinyl, acrylic, latex or polymer cement based paints. However, once AQURON 2000® has been properly applied, further topical coatings will have better adhesion (providing AQURON "KEY ISSUES" are followed).

What is the environmental impact of AQURON 2000®?

AQURON 2000® is a clear, odourless, non-toxic, environmentally neutral product which contains neither petroleum or silicone derivatives. Although it is not recommended, AQURON 2000® can be ingested (if one can get past the taste) with no harmful side-effects.

Is it possible to apply AQURON 2000® on glazed

tile or brick?

AQURON 2000® can be applied on glazed tile and brick, if it is necessary to treat the grout between tiles. AQURON 2000® must, however, be rinsed off within 8-10 minutes and should not be allowed to dry on the tile.

What are the effects of temperature on AQURON 2000®?

Temperature has no ill effect on AQURON 2000®. It can be applied to any cementitious surface as long as the surface has been cooled with water and remains damp during application. As for cold, as long as AQURON 2000® remains liquid and not frozen and the surface to which it is to be applied is damp and not frozen and remains unfrozen for at least four hours after application, AQURON 2000® is not affected by temperature. Where it is applied to surfaces which are subject to the removal of built-up ice and snow, the removal is much easier because AQURON 2000® will not permit water and moisture to penetrate the surface and freeze into the matrix. Ice and snow remain unattached to the surface and therefore can easily be removed. AQURON 2000® when stocked in inventory is unaffected by temperature variations and has an indefinite shelf-life. Should AQURON 2000® freeze in the drum, simply let it thaw completely and apply as in directions. There is no need to re-mix AQURON 2000® before application.

Why is AQURON 2000® preferable over other sealants made from petroleum distillates?

AQURON 2000® is odourless, non-toxic, non-flammable and requires only one permanent application in most circumstances, whereas materials carried into concrete by petroleum-based penetrants regularly need to be replenished by later further applications. With AQURON 2000® there are no special requirements for clothing, breathing apparatus, goggles or equipment. AQURON 2000® avoids this risk of exposing applicators and occupants to carcinogenic substances.

How should unpainted surfaces be prepared prior to using AQURON 2000®?

It is not necessary to prepare untreated surfaces before using AQURON 2000® providing moisture is readily absorbed by the concrete surface and matrix. As stated previously, a new pour is the ideal surface for AQURON 2000®. With other surfaces, common sense should be a reasonable guide. For example, it is not necessary for the surface to be pristine, but it may need to be swept before being dampened or waterblasted. Certainly, if there are materials or objects such as machinery or merchandise sitting on the area to be treated, such items should be removed.

Sub-surface Molecular Bonding & Waterproofing Solution

Technical Explanation of **AQURON 2000** Precipitate Colloidal Silica Hydrogel Desiccant

AQURON 2000® is a clean, odourless, non-toxic, non yellowing, environmentally neutral, masonry penetrating, preservative and waterproofing agent manufactured by the Aquoron Corporation.

An economical colloidal silicate hydrogel solution, **AQURON 2000**® preserves and adds years of economic life to new as well as existing concrete installations. While it is a remarkable cost effective approach to hardening, sealing, water-proofing, dust-proofing and preserving concrete, at the same time it greatly reduces the high costs of concrete maintenance.

Before Treatment



Hydrostatic weeping just below the Electric House.

Ruskin Dam

(A 75 year old Hydro Electric Facility)

Located 60 miles from

Vancouver, B.C.

with
AQURON 2000®

After Treatment



Treatment was made from the negative side against the hydrostatic weeping.

It is a well known fact of chemistry that free alkali or alkali hydrates are readily present in Portland or High Aluminate cement concrete mixtures. **AQURON 2000**® is drawn towards these alkalis much like iron is attracted to a magnet. The instant **AQURON 2000**® contacts them a chemical reaction is set up, which then causes a transformation in **AQURON 2000**® from zero solids to 100% solids. This reaction which spontaneously takes place chemically produces a precipitate of tremendous proportions. The result is a highly complex colloidal silica hydrogel or desiccant which is similar to an aerogel in its initial stages of hydration.

As **AQURON 2000**® permeates deeply into the matrix it produces this colloidal silica hydrogel or desiccant wherever it contacts free alkali. It will continue to fill the matrix pore spaces and voids around the aggregates and imbedded steel until all the

solution has been activated or has passed completely through the concrete. The volume of **AQURON 2000**® applied to the concrete's surface and the amount of free alkali to which it is available will dictate the depth of penetration.

The recommended coverage of conventional 20 mpa concrete is no more than **5.2m² per litre**. This will normally be enough to penetrate and precipitate the desiccant to a depth of at least **80mm** below the concrete's surface. **Further application will give deeper penetration if so desired.** This can occur because the solid free **AQURON 2000**® solution has the singularly unique ability to pass through its own precipitated desiccant thus allowing it to penetrate very deeply. Although the concentration of colloidal silicate in **AQURON 2000**® will decrease as it gets deeper into the dense inner matrix causing its own precipitated desiccant to become more transparent

Technical Explanation cont . . .

even at great depths in the micro-porosity it is still 100% effective.

The **AQURON 2000®** precipitated colloidal silicate hydrogel desiccant is composed of distinct spherical shaped particles. These particles have microscopic spine shaped pores much smaller than a molecule of water. "Free water" cannot pass through this **AQURON 2000®** produced desiccant since the hydrogel desiccant's pores are smaller than a molecule of water. Nevertheless, if its pores are not already filled with water and moisture/water contact subsequently occurs, some volume of water would be absorbed into the desiccant. However, any "free water" present already inside of the treated concrete will be chemically "incorporated" in the hydrogel desiccant precipitated by **AQURON 2000®**. This renders "free water" harmless to the concrete itself. Water thus chemically tied up remains in a stretched position when absorbed into the desiccant. Its density will correspond to that of ice. When and if freezing does occur no expansion is created thus reducing the severity of damages caused by recurrent freeze-thaw cycles.

There are several reasons for **AQURON 2000's®** precipitated colloidal silicate hydrogel desiccant being able to absorb and chemically tie-up water. The atoms of the precipitated mass are only partially saturated on their inner side. Therefore, they possess what is termed "residual valences", a natural ability to attract. Then this attracts substances such as moisture of water to the gel mass. These "residual valences" are responsible for the absorption on the surface of the silica gel desiccant. The absorption type is classified therefore as "chemisorption" instead of "physical absorption".

AQURON 2000's® desiccant has a surface film of "bound water" when hydrated which will only be released at very high temperatures. Unless temperatures were to exceed 115°C, water or moisture content will never be lower than 6.5% of the gel's total water capacity. However, even if dehydration should occur, the desiccant will readily re-hydrate when exposed to moisture/water. Because of this **AQURON 2000's®** desiccant is capable of being dehydrated with no significant loss of surface area.

The colloidal silica hydrogel desiccant becomes impervious to everything (including water and every known chemical) when completely absorbed into the concrete to "pore capacity". The final structure of the gel directly depends on precision blending of **AQURON 2000's®** proprietary catalyst and its colloidal silicate based solution. This proprietary catalyst when added to the silicate solution causes the colloidal silica hydrogel desiccant precipitate to be a highly insoluble network of tightly linked particles. In comparison, conventional silicate solutions such as sodium silicate, without this catalytic ingredient,

precipitate a gel which is soluble, and unfortunately, temporary. They will have larger, more loosely bound particles thus leaving more pore space as well as a weakly linked gel mass.

Conventional silicate and/or sodium silicate solutions with no catalytic ingredient which precipitate a silica gel have shown to have no essential ionic character. The absorption of cations or chloride ions, therefore, can be looked upon as a secondary absorption. This is true since the gel's surface must first absorb a hydroxyl ion (one atom of oxygen and one of hydrogen) in order to provide the anionic site needed for ion absorption. However, when **AQURON 2000's®** proprietary catalyst is introduced into the solution blend the colloidal silica hydrogel desiccant's cation and chloride ion absorption ability will immediately be present. It will manifest not only in a high pH environment but also in a neutral or weakly acidic state as well. This is an important factor when considering the use of **AQURON 2000®** on concrete installations which may potentially be exposed to chloride ion invasion such as places where road salt historically or periodically is used, or salt water exposure. The colloidal silica hydrogel desiccant which **AQURON 2000®** catalyst precipitates will also absorb acids as well as moisture and water. **AQURON 2000®** has been shown to severely retard the corrosion of imbedded steel, and in some cases, renders the causes of the corrosion completely harmless. Therefore, the use of **AQURON 2000®** on concrete in acid or chemical environments will significantly increase resistance against early deterioration.

AQURON 2000's® ability to preserve concrete has its basis in that its precipitated gel desiccant hydrostatically seals the concrete's matrix from the inside out. Thus it keeps out a large portion of the normal (or abnormal) adverse weathering factors. After an **AQURON 2000®** treatment and the subsequent encapsulation of its precipitated desiccant inside the concrete's pore space and voids **AQURON 2000's®** desiccant can virtually eliminate a major portion of the concrete's spalling or early deterioration due to the imbedded steel's corrosive and/or freeze-thaw cycles. **AQURON 2000®** has the ability to perform all the aforementioned functions for the enhancement of concrete without adversely changing its surface appearance or physical characteristics, nor does it impair surface traction quality in any way.

AQURON 2000® Sub-surface Molecular Bonding and Waterproofing Solution Treatment is NOT a sodium or potassium silicate product.

FURTHER TECHNICAL INFORMATION CALL MARKHAM DISTRIBUTING 0800 693

Technical Memo

Concrete Chemical Attack

The susceptibility of portland cement concrete to attack by chemicals generally results from three of its inherent characteristics; **permeability**, alkalinity, and reactivity. The **permeability** factor varies considerably, in different concrete installations. Even the most premium quality concrete installation will have some degree of **permeability**. **Permeability** increases rapidly with increasing water to cement ratio and decreasing moisture cure time.

The penetration of liquids into concrete is often accompanied by chemical reactions with the included portland cement, aggregates, and/or embedded steel (if present). The leaching of cement hydration compounds, or deposition of extraneous crystals or crystalline reaction products can also degrade the appearance, strength, durability and/or the integrity of the installation.

The alkaline, hydrated portland cement binder of the concrete paste reacts with acidic substances. This reaction is usually accompanied by the formation and/or the removal of soluble reaction products, resulting in disintegration of the concrete. When the reaction products are insoluble, deposits may be formed on the concrete surface or the inside of the concrete causing a considerably reduced reaction rate. Usually the rate and extent of a chemical attack will be increased by an increase in the concentration of the aggressive agent(s) in solution. The pH of a solution indicates whether the solution is alkaline, neutral or acidic. The pH value of a neutral solution is 7. An acidic solution has a pH value of less than 7 and alkaline solutions have a pH value of over 7. Subsequently, as the pH value of a solution decreases to less than 7, the solution transforms from neutral to acidic and becomes more acid as the pH value gets even lower, becoming increasingly aggressive in its attack of the concrete.

The physical state of the attacking chemical agent is of significance. Dry, non-hygroscopic solids do not attack dry concrete. A moist or wet, reactive solid will attack concrete, as will aggressive liquids or solutions. Dry gases, if aggressive will internally attack concrete when such gases come into contact with sufficient moisture within the concrete. However, already moist,

aggressive gases would tend to be more destructive.

Temperature also affects the rate of attack, in two different ways. The common affect is that chemical activity usually increases exponentially, approximately doubling with each 18PF (10PC) rise in temperature. Temperature may also affect the rate of chemical attack indirectly. As the temperature rises, the moisture content of the concrete becomes reduced, making it drier but however, more **permeable** to additional fluids. As temperature falls, it may sometimes cause sufficient normal shrinkage to create small open cracks which allow greater penetration of liquid into the concrete's interior.

Furthermore, in addition to studying the rate of attack, it may be desirable to determine how extensive the attack might be. For example, a concrete installation may be placed in an acidic soil, but if the acid source is not somehow replenished, the available acid will quickly neutralise with little or no damage to the concrete.

Alternate wetting and drying is harmful mainly due to the fact that alkali-aggregate reaction is extremely possible under these conditions. Also, dissolved substance particles may migrate through the concrete and deposit at or near a surface from which evaporation occurs. This particle may be from an original substance or some reaction product formed in the concrete. This effect can be seen in the "**efflorescence**" on walls of concrete, brick or stone. Salt solutions can be more disruptive to concrete subjected to freezing and thawing than water alone. This is commonly observed, later on, by visible and apparent damages following the application of de-icing salts to pavements.

In addition to individual organic and mineral acids which may attack concrete, acid-containing or acid-producing substances such as acidic industrial wastes, silage, fruit juices, sour milk, salts of weak bases, and some untreated waters may also cause deterioration of concrete integrity. Most ammonium salts are destructive because in the alkaline environment of concrete they release ammonium gas and hydrogen ions. These are replaced by dissolving calcium from the concrete. The end result is a leaching acting, much like an acid attack.

Animal wastes contain substances which may



Technical Memo

oxidise in air to form acids which attack concrete. The saponification between animal fats and the hydration products of portland cement consumes these hydration products, producing salts and alcohols, in a reaction analogous to that of acids.

Concrete attacked by sulphates has a characteristic "whitish" appearance, damage usually starting at the edges and corners and followed by cracking and spalling of the concrete. The reason for this appearance is that the essence of sulphate attack is the formation of calcium sulphate (gypsum) and calcium sulphoaluminate (ettringite), both products occupy more space volume than the original compounds which they replace so that expansion and disruption of hardened concrete takes place, such as, delamination, crumbling, cracking, etc.

A small percentage of gypsum is normally added to portland cement clinker in order to prevent flash set by the hydration of the tricalcium aluminate (C3A). Gypsum quickly reacts with C3A (tricalcium aluminate) to produce ettringite which is harmless because at this stage, the concrete is still in a semi-plastic state so that expansion can be accommodated.

A similar reaction takes place when hardened concrete is exposed to sulphates from external sources. A typical sulphate solution is the groundwater of some clays which contain sodium, calcium or magnesium sulphates. The sulphates react with both Ca(OH)^2 (calcium hydroxide) and the hydrated C3A (tricalcium aluminate) to form gypsum and ettringite, respectively.

Magnesium sulphate has a more damaging effect than other sulphates because it leads to the decomposition of the hydrated calcium silicates as well as of Ca(OH)^2 (calcium hydroxide) and of hydrated C3A (tricalcium aluminate); hydrated magnesium silicate is eventually formed and it has no binding properties.

The extent of sulphate attack depends on its concentration and on the **permeability** of the concrete, ie. on the ease with which sulphate can

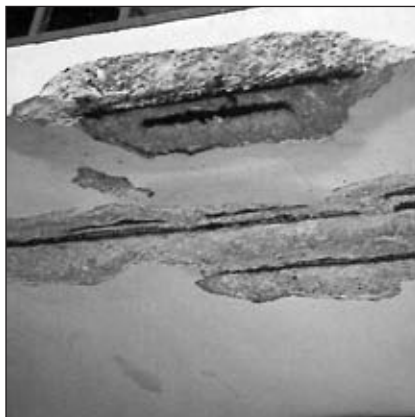
travel through the pore system. If the concrete is very **permeable**, so that water can percolate right through its thickness, Ca(OH)^2 (calcium hydroxide) will be leached out. Evaporation at the "far" surface of the concrete leaves behind deposits of calcium carbonate, formed by the reaction of Ca(OH)^2 (calcium hydroxide) with carbon dioxide (CO^2): this deposit, of "whitish" appearance is known as efflorescence. Efflorescence is not generally harmful. However, extensive leaching of Ca(OH)^2 (calcium hydroxide) will increase porosity so that concrete becomes progressively weaker and more prone to chemical attack. Crystallisation of other salts also causes efflorescence.

Salts attack concrete only when present in solution, and not in solid form. The strength of the solution is expressed as concentration, for instance, as the number of parts by mass of sulphur trioxide (SO_3) per million parts of water (ppm). A concentration of 1000 ppm is considered to be moderately severe, and 2000 ppm very severe, especially when magnesium sulphate is the predominate constituent.

Many agents attack concrete and destructively alter its chemical composition by means of reaction mechanisms which are partially or incompletely understood. **Seawater**, perhaps largely because of its sulphate content, may be destructive to **permeable** concrete or those made with cement having a high tricalcium aluminate content. Some polydioxal organic compounds

such as glycols, glycerol, and sugars slowly attack concrete.

Please Note: Permeability is the ease with which liquids or gases can travel through concrete. For normal portland cement concrete, permeability is governed by the porosity of the cement paste and the aggregates, normal weight aggregates have a permeability similar to that of cement paste. Chemical attack by sulphates, acids, sea water, and also by chloride, induce electrochemical corrosion of steel reinforcement. Since this attack takes place within the concrete mass, the attacking agent must be able to penetrate throughout the concrete, which therefore has to be permeable.



Permeability is, therefore, of critical importance. The impermeable barrier provided by **Aquron 2000** is the economical answer for concrete protection.

MANUFACTURER:

Aquron Corporation, Rockwall, Texas, U.S.A.

Product Description

AQURON 2000® is a colloidal silicate solution with a catalyst system which draws the product deeply into the matrix of the concrete soon after **AQURON 2000®** is applied to the surface.

Within the concrete, the **AQURON 2000®** and components of the concrete including free moisture are incorporated into an extensive impermeable gel formation. As a result the concrete becomes waterproof and has significantly improved strength development and durability.

1. Basic Use — Cure & Seal for New Concrete (0-24 hours)

When **AQURON 2000®** is applied as a CURING COMPOUND to the concrete surface it quickly penetrates into the porosities by the unique catalyst system and reacts internally with components of the concrete's matrix to form an extensive hydrogel formation that "envelops" free moisture, changing its state, and how it is held within the concrete.

As moisture is held in chemical combination in the **AQURON 2000®** gel it cannot evaporate or migrate within the concrete as would occur in untreated concretes.

During the curing process, moisture can only escape from the concrete where there is an excess of liquid which is displaced by the **AQURON 2000®** gel as it forms within the concrete or as a restricted vapour release from the interface of the **AQURON 2000®** gel formation and the atmosphere. i.e. at the open surface of the concrete. This is in contrast to untreated concrete where moisture release is uncontrolled and is progressively released from deep within the concrete.

The important consideration is that following the application of **AQURON 2000®** an optimum available moisture content is sustained within the concrete to maximise hydration of all the available cement and consequently the development of the concrete's strengths.

Applied **AQURON 2000®** solution has a direct influence on "inciting" the hydration process. This is in addition to converting how internal moisture is held available for maximised hydration.

Early strength gains are accelerated and shrinkage reduced, as **AQURON 2000®** accelerates, increases and extends the hydration process. This has often been observed in crushing strength measurements taken before and after a **AQURON 2000®** application on poorly developed concretes and where the **AQURON 2000®** has been applied long after the ideal curing period.



These gains are achieved as a result of the production of additional calcium silicate hydrate (CSH) growths which are recognised as the effective binder of the concrete.

With moisture availability maintained within the gel, hydration continues as long as there is space (voids and capillary porosity) for hydration product available. Generally the more hydration product (C-S-H) produced, the stronger, harder, more durable, more impermeable etc. the concrete becomes. **AQURON 2000®** solution provides concrete with

a superior cure, producing greater volumes of hydration products and reinforcing its C-S-H gel component, lowering its total percentage of capillary voids and reducing drying shrinkage through increased hydration product (C-S-H production). Concrete is permanently integrally sealed to prevent water and other contaminants from entering or passing through its matrix except for restricted movement of light atomic weight gasses such as oxygen, achieving results which comply with codes requiring a breathable surface. The end result is more durable concrete that is impermeable, freeze-thaw damage resistant, resistant to dusting and abrasion, unlikely to have detrimental internal chemical reactions, and easier to keep clean. Vapours such as radon gas are forced to seek other avenues of escape instead of passing through the concrete, because **AQURON 2000®** creates a sub-surface barrier consisting of uniform-size micropores and that is impermeable to all but the lightest harmless gases. Embedded steel is protected from corrosion potentials.

AQURON 2000® does these many beneficial things to concrete while enhancing bonding of adhered topical coatings (providing **AQURON** Key Issues are followed) without impairing the surface traction quality.

See **Application Instructions"** C17

2. Basic Use — Concrete Preservation for Cured/ Existing Concrete (24 hours +)

AQURON 2000® applied to existing (including very old as well as new concretes,) performs to develop many benefits even though it may primarily be applied for only one or some of these features:- waterproofing, protection of embedded steel, surface improvement, easier cleaning, resistance to chemical attack and improved bonding of impervious coatings or membranes applied to the surface. In many instances the product has successfully been used to purge oil and other contaminants from within the concrete and seal it to allow coverings to be installed.

AQURON 2000® has a highly reactive catalytic agent and the solution is drawn deeply into the concrete as it reacts with alkaline components within the matrix forming an extensive hydrogel formation that "envelops" free moisture both changing its state and how it is held in the concrete and within the **AQURON 2000®** produced molecular bonding hydrogel.

When the concrete is **AQURON 2000®** treated, all the moisture is held in the gel formation developed within the concrete preventing problems caused by evaporation and liquid release.

The **AQURON 2000®** gel formation quickly develops an internal moisture equilibrium and will quickly displace or



"purge" to the surface any excess moisture and oils or other extraneous substances. Providing the surface of the concrete is in a suitable condition for impermeable coating/membrane to "cure" and develop satisfactory adhesion (and providing **AQURON** Key Issues are followed), then this "purging" action can no longer occur and the adhesion of the coating/membrane will be substantially improved. This is in comparison to the untreated concrete where "bubbling" delamination occurs as vapour pressures build in the concrete or "free" moisture damages the adhesion.

Treating with **AQURON 2000®** is a proven reliable method of controlling internal moisture migration within concrete. This includes eliminating seepage and vapour release from concrete subject to hydrostatic pressure and/or raised humidity levels that are universally accepted

to cause inevitable delamination problems where adhered coatings/coverings are installed on the concrete surface.

AQURON 2000® will permanently enhance the natural appearance of the concrete without the artificial surface effect of superficial type sealers. Surface strength, abrasion resistance and "traction grip" properties will be improved following **AQURON 2000®** treatment. This can be even more obvious on concretes with poorly developed finish. **AQURON 2000®** will arrest deterioration of concrete and prevent potential Alkali-Aggregate (AAR) & Alkali Silicate (ASR) reactivity and freeze-thaw damage.

The use of **AQURON 2000®** will protect concrete from the damage caused by soluble chloride ions, acids & chemical attack which are commonly the agents for corrosion of both concrete and embedded steel. **AQURON 2000®** gel formation effectively inactivates, neutralises or purges these contaminating corrosives. In projects subject to aggressive acid or salt contamination (higher levels of chloride), the use of **AQURON 7000®** as a system in combination with **AQURON 2000®** is recommended.



See **Application Instructions"** C18

When used as Cure & Seal on New Concrete (0-24 hours)

1. Apply **AQURON 2000®** to concrete surface with a **low pressure garden type sprayer** with a fan spray tip, (do not apply with brush or roller).
2. Start application as soon as concrete has reached initial set or as soon as can be walked on without imprinting surface.
3. **AQURON 2000®** should be applied at a rate of no less than 1 litre to 5 sq/m. Sufficient **AQURON 2000®** must be applied to satisfy the absorbency of each particular concrete. Normally to achieve this rate of application of **AQURON 2000®**, two coats will be needed. Apply first coat covering area in one direction, then apply second coat (once first has penetrated surface, normally 10 – 60 mins, do not allow to dry), in a direction 90° to the first, in result forming an even coverage with this crisscross type pattern.
4. Start application holding spray tip approximately 200mm – 300mm from concrete surface, make application using overlapping spray pattern with a fanning motion at the end of each pass.
5. Entire area being treated is to be saturated, but do not allow **AQURON 2000®** to puddle, if so disperse puddled area with broom 20 mins – 4 hours after application is completed (do not allow puddles of **AQURON 2000®** to dry). Once forms are removed, treat exposed concrete.
6. When temperatures are extremely hot, the surface to which **AQURON 2000®** is to be applied may need to be cooled with water following application. Surface cooling operation should only commence after surface sheen of **AQURON 2000®** application has diminished.



Aquron 2000 simply spray applied provides

When used as Concrete Preservation for Cured/ Existing Concrete (24 hours +)



1. **AQURON 2000®** must be applied to existing concrete with a **high pressure airless sprayer** with using a 0.13-0.19 Spray Tip with 25P-40P Fan .
2. Pre-wet with water the area of application to dampen, all pooled and puddled areas must be dispersed, continue to keep area damp until **AQURON 2000®** has been applied.
As **AQURON 2000®** is a water-borne product, any previous coating or heavy build-ups of oils or grease must be removed.
3. Apply **AQURON 2000®** at a rate no less than 1 litre to 5 sq/m or 20 litres to 100sq/m. Sufficient **AQURON 2000®** must be applied to satisfy the absorbency of each particular concrete . Normally to achieve this rate of application of **AQURON 2000®**, 2 coats, at least will be needed. Apply first coat covering area in one direction, then apply second coat once first has penetrated surface (normally 10 – 60 mins, do not allow to dry). Achieve an even coverage by applying second coat at 90° to the first i.e. a crisscross pattern!
4. Start application holding spray tip approximately 200mm – 300mm from concrete surface, make application using overlapping spray pattern with a fanning motion at the end of each pass.
5. Entire area being treated is to be saturated, but do not allow **AQURON 2000®** to puddle, if so disperse puddled area with broom 20 mins – 4 hours after application is completed (do not allow puddles of **AQURON 2000®** to dry).
6. Always start application at lowest possible area first and proceed to higher elevations. On vertical application (walls) start at the bottom and proceed up the vertical surface with horizontal strokes.
7. When application is to weeping hydrostatic walls or floors, at least two coats are necessary with second applied immediately following the first and further coats after 1 – 2 weeks if necessary.

On all Application Note:

- If water will not penetrate surface, preparation to provide absorbancy must be completed prior to **AQRON 2000®** application.
- Caution should be taken in windy conditions as **AQRON 2000®** if allowed to dry can etch glass or dull shiny aluminium. If contact is made with glass or aluminium rinse surface immediately with water before Aquron dries on surface.
Do not proceed with application of
- **AQRON 2000®** when ambient temperature and/or substrate temperatures are less than 4°C or forecasted to drop below 4°C during the next 6 hours.
- DO NOT dilute.
- Check whether **AQRON 2000®** has purged to the surface of the concrete, any gas, greases or salts – these must be thoroughly washed or abraded away before adhesives or coatings are applied.



- Remove all previous coatings giving **AQRON 2000®** access to cementitious matrix.
- Once **AQRON 2000®** is applied wait a minimum of 28 days on **new** concrete and 72 hours on **existing** concrete before applying impervious coatings, coverings etc. (providing **AQRON** Key Issues are followed)
- **AQRON 2000®** only seals the concrete itself. **AQRON** treatment may provide a limited capacity to seal cracks. Where there are significant voids, filling them with an **AQRON** treated cementitious grout and then applying **AQRON 2000®** will seal many fractures and cold joints restrained with reinforcing.
- Concrete blocks are not a continuously cementitious material therefore **AQRON 2000®** may require repetitive applications to seal and waterproof. **AQRON 3000®** is

recommended for concrete block.

Clean-up & Safety

AQRON 2000® is environmentally neutral, and requires no special precautions with personnel or equipment, clean-up using mild soap and water.

No special clothing, breathing apparatus, goggles and gloves are necessary but in enclosed areas it is advisable to wear a simple dust mask to avoid possible irritation to breathing. Contaminated existing concretes – special breathing apparatus maybe required to protect from dangerous gases purged from concretes during treatment.

Attention should be given to watches, spectacles, windows etc as AQRON 2000® can etch glass or discolour aluminium if allowed to dry.

Physical Properties

Physical	liquid
Colour	clear
Odour	none
Specific gravity	1.12±
Flash Point	none
Ph	11.5±
Toxicity	none
Boiling Point	230°F
Freeze Temperature	0°C
Hazardous Vapours	none
Weight per Gallon	9.18 lbs
Environmentally	neutral
User	friendly
Shelf life	indefinite
Freeze Harm	non
(allow to thaw completely)	
Surface Bond Quality	excellent
Flammability	none
VOC/VOS Content	none
Resistance to UV	excellent
Paintable	Yes
Pollutants	None
Waste Disposal Methods	Non-hazardous
Resistance to Abrasion	excellent
Polymerisation	excellent
Solids before applied	Nil
Solids after applied	100%
R-Factor	Increase Up to 20
Recommended Coverage	1 litre per 5q/m or 20 litre per 100 sq/m

Applicable Standards

Aquron CPT-2000 meets or exceeds the following standards:

- | | |
|----------------------|---|
| • ASTM C-67 Sect. 7 | Water absorption |
| • ASTM-67 Sect. 9 | Suction |
| • ASTM C-67 Sect. 10 | Efflorescence |
| • ASTM C-666 | Freeze-thaw resistance |
| • ASTM C-23-69 | Artificial weathering |
| • ASTM C-666 | Salt attack resistance |
| • AASHTO T260 | Chloride ion content |
| • AASHTO T259-78 | Chloride ion penetration |
| • ASTM C-309-93 | Curing compound |
| • USDA + MAF | Approved for use in food processing areas |
| • ASTM D-56-91 | Flash point (none) |
| • ASTM-D-1644-91 | Non volatile |
| • ASTM-97-91 | White pigmentation-reflectance |
| • ASTM-D-5084-91 | Permeability |
| • ASTM-C-518 | Thermal conductivity-resistance |
| • EPA Complaint | |

Flooring Preparation Treatment

AQURON 2000® is a colloidal silicate based solution with a reactive catalytic agent which converts moisture within the concrete into a silica hydro-gel that fills the pore spaces up to 150mm below the concrete surface and throughout the matrix, providing a permanent hydrostatic seal from within.

This clear, non-toxic, odourless, penetrating, preservative and waterproofing solution is easily applied to concrete. **AQURON 2000®** adds greater density, additional bonding strength (providing **AQURON** Key issues are followed) and improves surface resilience.

To the Flooring/Coatings industry **AQURON 2000®** offers clear advantages and cost savings while preventing moisture related delamination of coverings/coatings from concrete.

AQURON 2000® is applied as a "Cure & Seal" on curing concrete or as "Concrete Preservation Treatment" on cured/existing concrete.

BENEFITS INCLUDE:

- **COMPLETE SEAL BY A PERMANENT INTERNAL MOISTURE CONTROL (SUB-SURFACE & CANNOT BE ABRADED or WORN OFF)**
- **STOPS INTERNAL MOISTURE MIGRATION & DELAMINATION of ADHERED COVERINGS/COATINGS** (providing **AQURON** Key Issues are followed)
- **ALLOWS COVERINGS/COATINGS TO BE ADHERED, 72 HOURS (EXISTING) or 28 DAYS (FROM POUR) AFTER TREATMENT**
- **SUPERIOR BONDING FOR ADHESIVES/COATINGS**
(providing **AQURON** Key Issues are followed)
- **HARDENS SURFACE, PREVENTS DUSTING, REDUCES LAITANCE**
- **PREVENTS DAMAGE FROM SALTS, CHEMICALS, FREEZING & CARBONATION**
- **SAFE & COMPLETELY ENVIRONMENTALLY FRIENDLY**
- **OFFERS SUPERIOR CURE ASSISTANCE TO "NEW CONCRETE"**
- **MORE ECONOMICAL AND EASIER TO USE THAN ALTERNATIVES**

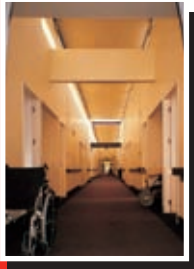
AQURON 2000® Flooring Preparation Treatment

AQURON 2000® has a proven record of superiority to the previous methods of applying Aqueous Epoxies or other Polymer Coating systems on concrete to overcome the problem of elevated moisture levels (above accepted industry standard of 75% RH), which with temperature differentials cause delamination of floor coverings and coatings.



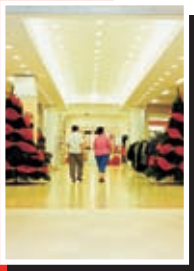
When untreated concrete is "beneath", "above" or "encapsulated between" a lower and upper impervious membrane and/or coating, temperature variations cause internal moisture to migrate and build pressure immediately next to the impervious barrier and results in failure and delamination.

Treating with **AQURON 2000®** is a proven and reliable method of controlling "free" moisture within concrete. This includes eliminating internal migration, seepage (including hydrostatic pressure) and vapour release from concrete exposed to raised humidity levels (above accepted industry standard of 75% RH), that are universally accepted to cause inevitable delamination problems where adhered coatings are installed on the concrete surface.



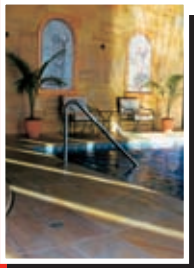
After **AQURON 2000®** treatment the moisture is transformed to become part of the permanent and impervious "hydrogel" within the concrete. This "hydrogel" is very similar to the main gel produced by hydration of cement and which is the binder that holds concrete together.

The **AQURON 2000®** gel formation develops an internal moisture equilibrium and will quickly displace or "purge" any excess moisture, oils or other extraneous contaminations to the surface. With a normal level of sub-floor preparation and "good practice" (as outlined in **AQURON** Key Issues), providing the surface is satisfactory for adhesives or impermeable coatings to "cure" and develop adhesion, this "purging" action can no longer occur and adhesion of the coating/covering will be substantially improved.



After **AQURON 2000®** treatment on concrete where no impermeable covering/coating is installed, moisture release can only very slowly occur at the "gel interface" with the atmosphere. As soon as an adhered impermeable covering is installed, moisture release cannot occur as the "gel" no longer has an open interface with the atmosphere.

In contrast to "free" moisture (liquid or vapour), the **AQURON 2000®** "gel" formation will not affect the adhesive or release moisture beneath a bonded coating/covering. All applications must have a complete covering of adhesive to complete the **AQURON 2000®** "mode of action". Some un-bonded coverings e.g loose-laid wood floors require an **AQURON** surface sealing component for the **AQURON 2000®** to function.








AQURON 2000® has been outstandingly successful in overcoming "sick building syndrome" which is the result of "off-gasing" from concrete, where migratory moisture and other contaminants have caused decomposition of adhesives and release of hazardous vapours. **AQURON 2000®** has a well proven record in resthomes of preventing entry of spills and excreta, and the consequent ongoing emission of offensive odours.

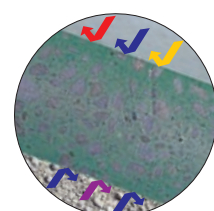
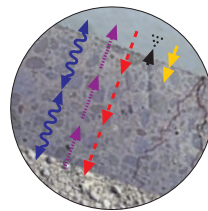
AQURON 2000® is the most effective and economical solution for moisture control, bonding and durability problems in concrete with elevated moisture levels (above accepted industry standard of 75% RH).



Untreated

Treated

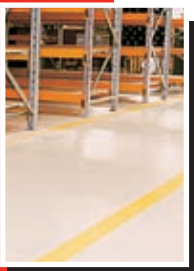
-  Moisture
-  Dusting
-  Chloride Ions & Corrosives
-  Gases & Vapours
-  Salts, Effluents & Acids



Instructions for Application & Precautions

AQURON 2000 FLOORING PROTECTION TREATMENT is a "quality controlled, supply and apply" application that can be applied to curing concrete (see tech data pages C15 & C17) or to cured/existing concrete (see tech data pages C16 & C17).

Providing AQURON Key Issues are followed, manufacturer offers a 15 year guarantee that AQURON 2000 will protect adhered coatings/coverings from damage by moisture migration from within the AQURON 2000 treated concrete, but still with elevated moisture readings ie above 75% RH. See **AQURON** Key Issues for Information Relating to floor coverings and coatings "before and after" **AQURON 2000®** treatment



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