Fluid Dynamics
Hard water solutions since 1973
www.treatwater.com

SKYMECH™
Engineers Pvt. Ltd.

Non-Chemical Water Treatment (NCWT) System

PRODUCTS BEAR

1 Year	10 Years	20 Years
100% Money Back Guarantee*	Prorata Warranty*	Product Life Span*

*Terms & Conditions Applied

SCALE-FREE WATER THROUGH CATALYTIC TECHNOLOGY

(The latest technology patented worldwide)

WORLD LEADER OF WATER TREATMENT TECHNOLOGIES

About the company...

Fluid Dynamics International Ltd., UK

Company Head Quoter-London Founded in 1973, Fluid Dynamics International Ltd. is UK's and Ireland's one of the most experienced water treatment product companies; Company Head Quoter-Landon. With an unmatched pedigree in the field of hard water treatment, scale prevention and water softening solutions without the use of chemicals and magnets, Fluid Dynamics is the world's oldest and largest manufacturer of catalytic hard water treatment and scale prevention systems with hundreds of thousands of units installed around the world. We manufacture scale prevention products to suit our customers' needs large and small:

Fluid Dynamics International Ltd. prides itself on being able to supply solutions to most water treatment problems. Markets served include Europe, Asia, South America, Africa, the USA and Canada - Fluid Dynamics International Ltd. has agents in more than 40 countries.

It has been manufacturing its products for over 43 years and has over 3,00,000 offshore drilling platforms, whole towns and villages and many more installations worldwide. There are many well known abroad companies i.e. Ford, General Motors, Toshiba, Coca-Cola, Guinness, Hilton Hotels, Kellogg's, US Navy, Honda, Nestle, Pfizer, Unilever, YMCA, Cambridge University, Kimberly Clark, who have used and are using our products with a wide range of case histories with savings on electricity to down-time, equipment life, and much more.

SKYMECH Engineers Pvt. Ltd.

Sole & Exclusive Business Partner of Fluid Dynamics in India

We are a Jaipur (Rajasthan) based company with an exposer of over 20 years in the business field of water treatment handed over by our group company "Unitech Energy".

After the successful service of Fluid Dynamics International Ltd. in more than 40 countries, we, since 2014, are spreading the refreshing breeze of worldwide patented **"Catalytic Technology"** in the Indian market for 100% guaranteed solution of hard water problems in collaboration with Fluid Dynamics International Ltd.

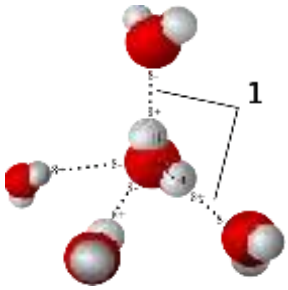
There are many well known companies in India who have used and are using our products with savings on electricity to down-time, equipment life, and much more i.e. Atlas Cycle-Sonipat Haryana, ONGC - Dehradun, Mayur Group, Niros Restaurant - Jaipur, TI Tube, Maxim, Akshay Jal - Udaipur, COATS, Hotel Minarwa - Kolkata, Hotel Rajasthali Resorts & Spa - Jaipur, Hotel Trees & Tigers - Sariska, Alwar, Solanki Hospital - Alwar, Indian Convent School - Jaipur, AKFD Studio - Jaipur, Kamla Enclave - Bhilwara, Shivmani Homes, Brahmakumari - Abu Road, Jayoti Vidhyapeeth - Jaipur, Jayshree Periwal International School - Jaipur, Ayogan Collage of Architecture - Jaipur, Vinayak Dimond Tools - Jaipur, Vidhyasthali School - Dausa, SMB Residency - Udaipur, SMB Height Apartment - Udaipur, Panchkoola Bhawan - Salasar & Vrandavan and many more…

INDEX

Our Mission
Save Nature...
Save Tomorrow...

We stick to this mission and comply with all the regulations of UNO, WHO, National, State and local laws.

About Water...



Water (Chemical Formula is H_2O) is a transparent fluid which forms the world's streams, lakes, oceans, and rain, and is the major constituent of fluid of organisms. As a chemical compound, a water molecule contains one oxygen and two hydrogen atoms that are connected by covalent bonds, water is a liquid at standard ambient temperature and pressure.

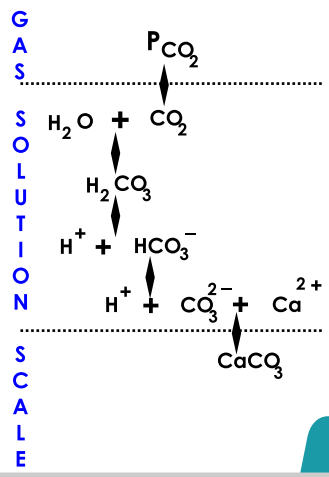
Water is sometimes referred to as the "universal solvent". This term is used as water has unique characteristics that allow it to break the bonds of larger more complex compounds. For example, place a small teaspoon of sugar or salt in a glass of water, stir vigorously and it will dissolve easily. Although the water in your home is clear, it is not pure. Being a wonderful solvent, water is very receptive and dissolves small amounts of the soluble minerals it comes into contact with in nature. Water contains elements essential for healthy living, including calcium and magnesium.

What is Hard Water...?

Hard water is water that has high mineral content. Hard water is formed when water percolates through deposits of calcium and magnesium-containing minerals such as limestone, chalk and dolomite.

Hard water generally poses serious problems in industrial settings, where water hardness is monitored to avoid costly breakdowns in boilers, cooling towers, and other equipment that handles water. In domestic settings, hard water is often indicated by a lack of suds formation when soap is agitated in water, and by the formation of lime scale in kettles and water heaters.

Water's hardness is determined by the concentration of multivalent cations in the water. Multivalent cations are positively charged metal complexes with a charge greater than 1+. Usually, the cations have the charge of 2+. Common cations found in hard water include Ca^{2+} and Mg^{2+}. These ions enter a water supply by leaching from minerals within an aquifer. Common calcium-containing mineral is calcite.



The following equilibrium reaction describes the dissolving and formation of calcium carbonate:

$$H_2O + CO_2 + \leftrightharpoons H_2CO_3 \leftrightharpoons H^+ + {}^-HCO_3$$

$$CO_3^{--} + H^+ \leftrightharpoons {}^-HCO_3$$

$$CO_3^{--} + Ca^{++} \leftrightharpoons CaCO_3$$

The reaction can go in either direction. The calcium carbonate may be re-deposited as calcite as the carbon dioxide is lost to atmosphere, forming scale.

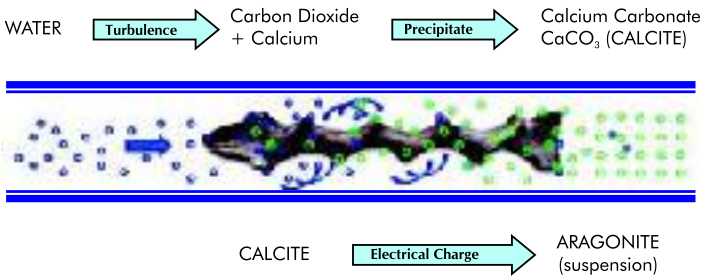
A science that support to green energy

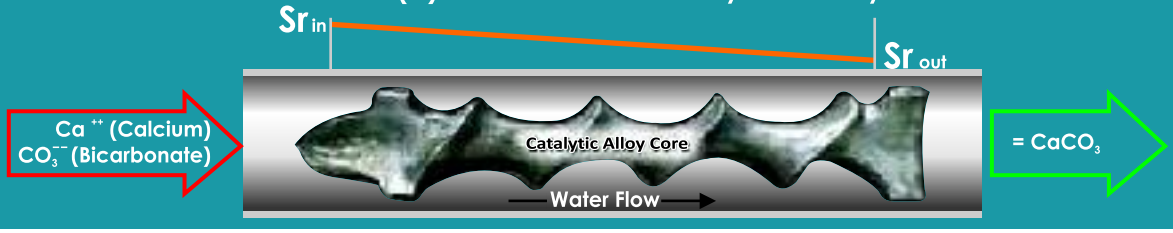
Catalytic Technology

When water enters in the device with recommended flow it creates turbulence and due to which Ca^{++} and CO_2 (Carbon Dioxide) are forced to generate $CaCO_3$ (Calcium Carbonate). Due to this process, now in the less presence of free Ca^{++} ions the nature of water becomes soft. Remember in water $CaCO_3$ is also already available before turbulence. It is in calcite form which by nature is adhesive and the main reason of scaling. When this $CaCO_3$ after turbulence passes through the Catalytic device of Fluid Dynamics it strikes (hits forcibly) to the Special Alloy present in the device and gets an small electric charge which converts it's calcite crystals in to aragonite crystals. These are suspended and non-adhesive particles of $CaCO_3$ and are called aragonite particles. This aragonite form of $CaCO_3$ does not form scaling and ultimately the water becomes soft and scale free. When $CaCO_3$ calcite form crystals convert in to aragonite form crystals then the water comes in the state of under saturation form the super saturation. When water is treated through Fluid Dynamics Catalytic Technology device and it tries to come in saturation form from under saturation form it involves the old existing scaling in the pipe lines/supply system and mixed with in. Due to this kind of nature this technology is claimed to prevent Hard Water Scaling as well as cure of old existing scaling in the system/pipe line.

Catalytic Technology के द्वारा Water Treatment में पानी एक निश्चित Flow से Device में प्रवेश करता है तो पानी में Turbulence पैदा होता है और Ca^{++} व CO_2 (कार्बन डाई ऑक्साइड) बन्धित होकर $CaCO_3$ (कैल्सियम कार्बोनेट) का निर्माण करते हैं जिससे पानी में मुक्त Ca^{++} आयन का अभाव हो जाने की वजह से पानी का व्यवहार Soft हो जाता है, पानी में कुछ $CaCO_3$ (कैल्सियम कार्बोनेट) पहले से ही विद्यमान रहता है। यह सम्पूर्ण $CaCO_3$ (कैल्सियम कार्बोनेट)अपनी Calcite अवस्था में पाया जाता है जिसकी Adhesive property होने की वजह से यह Scaling करता है।

Turbulence के बाद जब यह $CaCO_3$ (कैल्सियम कार्बोनेट) Fluid Dynamics की Catalytic Device में उपस्थित Special Alloy से टकराता है तो Alloy से इन Calcite अवस्था वाले $CaCO_3$ (कैल्सियम कार्बोनेट) Crystals को एक Small Electric Charge मिलता है जिससे ये $CaCO_3$ (कैल्सियम कार्बोनेट) के Calcite Crystal अपने Aragonite Crystals में परिवर्तित हो जाते हैं जो कि $CaCO_3$ (कैल्सियम कार्बोनेट) के Suspended एवं Non Adhesive Particles होते हैं जिनसे किसी भी प्रकार की Scaling Develop नही होती है और साथ ही पानी का व्यवहार Soft तथा Scale free हो जाता है फलस्वरूप पानी अपनी Super saturation की अवस्था से Under Saturation में आ जाता है। जब यह पानी Under Saturation की अवस्था से Saturation में आने की कोशिश करता है तो यह Water Supply System, Pipelines तथा अन्य उपकरणों में पहले से जमी हुई Scaling को भी अपने आप में घोल लेता है। जिससे Fluid Dynamics द्वारा निर्मित Catalytic Technology पर आधारित यह Device; Hard water Scale Prevention के साथ–साथ Scale Removal का कार्य भी करती है।





Conclusion:

1. **Solution of Hard Water :** Water behaves as soft water because the main factor responsible for hard water ca^{++} is mostly converted into $CaCO_3$ in the process of catalytic water treatment.
2. **Solution of scaling formation :** The treated water is 100% scale-free because all the $CaCO_3$ (Calcite form - Hard Calcium Crystal) are converted completely into it's Aragonite form (suspended form - Soft Calcium Crystal).
3. **Solution of Existing Scaling :** The treated water removes all the existing scaling because of the under-saturated condition.
4. Treated water can be stored for several months.

CALCIUM CARBONATE

CALCITE:

Under certain circumstances (temperature rise or an increase in pH levels), water is forced to discharge Calcium Carbonate. The Calcium Carbonate discharged in this way is Calcite, a hard scale. Calcite will accumulate on the nearest receptive surface, typically metallic.

In Pictures shown to the untreated form of calcium carbonate. This is the hard scale deposited by untreated water.

Calcium Carbonate Untreated 3000 x magnification

Untreated Calcium Carbonate

After depositing and bonding with oxidize iron.

ARAGONITE:

Aragonite is a form of Calcium Carbonate crystal that, unlike Calcite, prefers to stick to itself and grow attracting more Calcium. It remains suspended in water rather than depositing onto metal surfaces.

In Picture is shown the treated form of calcium carbonate. Unlike calcite, aragonite stays in suspension and is carried through the system to the drain. As a result the system does not scale.

Calcium Carbonate Treated 3000 x magnification

Treated Calcium Carbonate

Pure white showing its inability to bond with other compounds

Other Water Treatment Technologies

Traditional Salt Softeners (Ion-Exchang Technology)

Water softening is the removal of calcium (Ca^{++}), Magnesium (Mg++) and certain other metal cations in hard water. In this technology mainly calcium (Ca++) and Magnesium (Mg^{++}) are exchanged for sodium (Na^{++}) ions.

Ion exchange device reduce the hardness by replacing magnesium and calcium (Mg^{++} & Ca^{++}) with sodium or potassium ions (Na^{+} or K^{+}). When all the available Na^{+} ions have been replaced with calcium or magnesium ions the resin must be recharged to remove the Ca^{+} and Mag^{++} ions using a sodium (Na^{+}) of sodium chloride (NaCl / Salt).

Are used to prevent scaling and act as calcium filters removing calcium from the water and then required to be recharged by the addition of salt. They can cause corrosion and in parts of USA are now being banned because of their adverse impact on the environment. In UK and many other countries if a salt softener is installed then a separate drinking water tap delivering non softened water must be supplied for human consumption.

Conclusion: Through softener only the water is softened.
Nor the scaling is prevented neither the existing scaling is removed.
Harmful Chloride discharge that negatively impacts the environment & Human
The treated water is not useful to human consumption

In-line Magnetic / Electro-Magnetic Device (Magnetic Technology)

This technology is based on producing magnetic field in water which creates vibrations in water and as a result of which calcium carbonate present in the water converts into its suspended form for a very short period of time .

The product is connected with an electric circuit because in this type of system either a magnet is used or magnet is created by using electrical field.

Conclusion:

1. Just after the treatment, calcium and carbonate react and form calcium carbonate again.
2. Due to the temporary treatment of the calcium carbonate (4-6 hours approx.) scaling occurs again in the system. (Treated water cannot be stored.)
3. It can be installed only the outlet of over head tank or just before the using of water.
4. In GI pipe line it is failure.
5. If treated water will pass through pump then again water be come as normal water.
6. It can't work if water hardness is higher than 950 ppm.

Catalytic v/s other Technologies

Parameter	Catalytic Technology (Fluid Dynamics)	Magnetic / Electro-Magnetic	Ion Exchange (Softener)
ECO Friendly	✓	✓	X
No Use of Chemical/Salt	✓	✓	X
No Electricity Consumption	✓	X	✓
No Extra Space Required	✓	X	X
No Charging Required	✓	X	X
Zero Wastage of Water	✓	✓	X
Treated Water can be stored	✓	X	✓
No Maintenance Required	✓	X	X
Working in Hot Water up to 120° C	✓	X	X
Reduce Corrosion	✓	✓	X
Reduce Bacteria/Algae	✓	X	X
Elimination Existing Scale	✓	✓	X
Easy to Install	✓	X	X
Guarantee (1 Year)	✓	X	X
Money Back Guarantee	✓	X	X
Hardness Capacity	No Limit	Limit (950 ppm)	Limit (1750 ppm)
Warranty	10 Years	1 Year	1 Year
Durability (Life Span)	15 - 25 Years	5 - 10 Years	5 - 10 Years

Unique Features of Catalytic Technology

- Non - Electric
- Non - Magnetic
- No chemical / Salt required
- No Maintenance required
- No space required
- Easy to install
- Zero wastage of water
- Environment friendly
- Prevent hard water scaling
- Removal of existing scaling
- Workable in sea water
- Workable in oily water
- Constant supply of treated water
- No loss of useful component from the water
- Non - Electromagnetic
- No detrimental effect on drinking water
- R.O. Wastage water also can be reutilize
- Behave of water will be soften
- No mechanical part subject to break-down
- No back wash required
- Workable in any type of water
- Workable in sewerage or wastage water
- Workable in hot water up to 120 C
- Workable in high pressure above 16 Bar
- No limit of hardness or TDS to treatment
- Recyclable after life span
- Treated water can be stored up to couple of months.
- Product and Technology approved by NSF, USGBC, WRAS, CLT, GSA & KIWA.

Limetron™

Specially designed for domestic applications

The Lime-tron is an in–line treatment unit that can be mounted horizontally or vertically, whichever is the most convenient, on the inlet to your home following the stop valve. Many of our customers have installed the Limetron themselves. Limetron consists of a non-sacrificial lead free catalytic core made from a special alloy housed within a non-reactive stainless steel tube.

SCALE BUILD UP IN THE HOME

- Affects system pressure and reduces flow rates
- Raises energy costs as scale insulates and reduces the efficiency of water heating appliances such as boilers, hot water tank heaters, tank less water heaters, coffee machines, kettles etc.
- Leaves unsightly deposits around baths, showers, sinks and toilets particularly around shower heads and faucets. This often requires tire some cleaning with de-scaling chemicals.

Scaled tap

Heating element

Water heater opened up revealing heavy scale accumulation

BENEFITS OF USING THE FLUID DYNAMICS LIMETRON SOLUTION

- The Limetron prevents scale build up and hard water stains when installed on new systems and gradually removes scale from previously untreated older systems (this process is gradual and it may take up to several months to de-scale a previously untreated system)
- No detrimental effect on drinking water unlike salt utilizing conventional water softeners.

Scaletron™

Specially designed for commercial or compressed & hot water applications

Scaletron is a unique catalytic scale prevention system suitable for treating potable residential and commercial water systems. Scaletron incorporates the unique catalytic alloy conditioning systems into a single stainless steel housing providing the most complete reaction available for calcium carbonate treatment.

PROTECTION FOR YOUR SYSTEMS AND EQUIPMENT

- **Water-heater Calorifier** – used to reduce energy consumption as compard to scaled up water heater, prevent need for cleaning, extend life of elements/serviceable parts.
- **Ice-machine** – used to prevent cleaning of cube trays, for more consistent shapes and cleaner looking ice.
- **Solar heating systems –** it maintains efficient heat transfer, prevents clogging and necessity of cleaning panels.
- **A/C chillers –** remove/prevent scale inside chiller, eliminate certain chemicals, prevent energy waste.
- **Hot/cold water network –** prevent scale inside pipes, prevent pressure losses, prevent need for pipe flushing.
- **U.V. sterilization equipments –** prevent need for cleaning, maintains efficient sterilization.

Choked Pipelines

Scaling on Heating Element

Scaling on Honeycomb pad

Scaling in Civil Construction

Pool-Tron™

Specially designed for Swimming Pools

- It has been launched to combat the problems associated with hard water in swimming pools.
- Scaling is a problem associated with swimming pools that use hard water.
- Not only does it look unsightly but is also costs a large amount of money to remove scale build up.
- It uses a pre-charged semi-precious alloy and comes supplied in Plastic PVC .
- It is catalytic non-chemical water treatment for scale-prevention.
- Totally environment friendly equipment, reduces your chemical use and reduces water wastage.
- Supplied in plastic housing and can be installed in new and existing pump rooms.
- Install in the pump room after the sand filters.

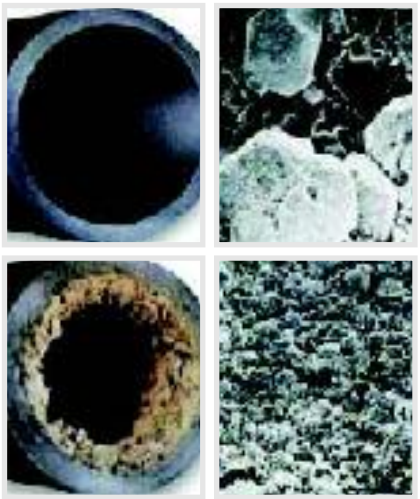
Scaling In Swimming Pool

Colloid-A-Tron™

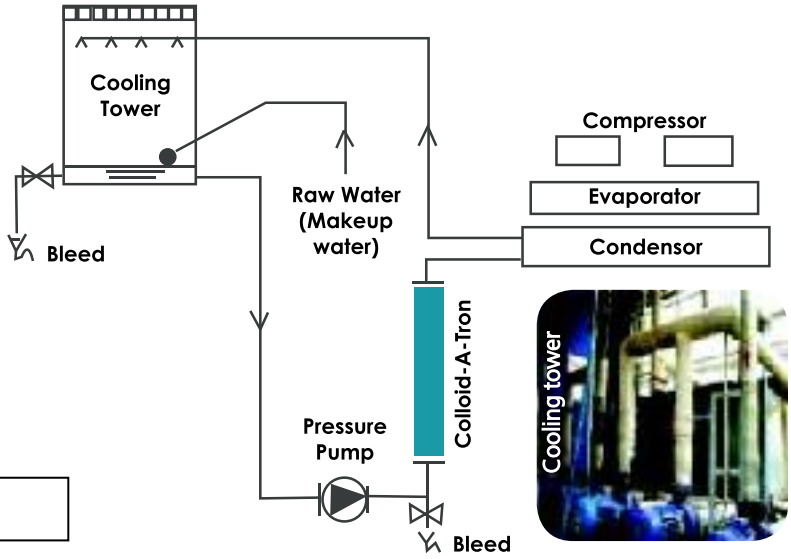
Specially designed for heavy industry and cooling towers.

The Colloid-A-Tron is a unique lime-scale prevention system which consists of a non-sacrificial lead free catalytic core made from a special alloy housed within a non-reactive stainless steel (316) tube. Colloid-A-Tron provides the ideal solution to the problems associated with hard water scaling

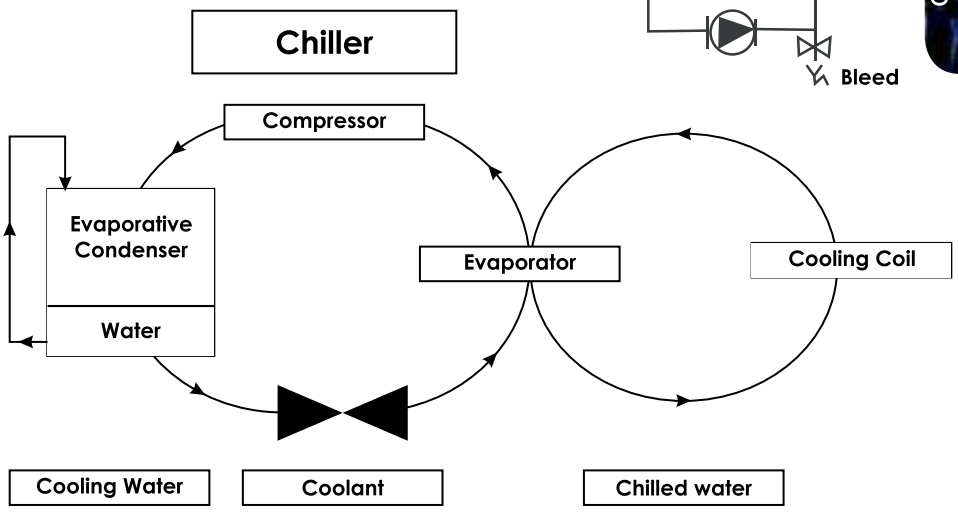
Heat exchangers	**Hot water heaters**
Injection-molding machines	**Shower systems**
Hot / Cold Water Supply in Factories	**Sea water cooling circuits**
Vacuum pumps	**Refrigeration systems / A/C systems**
Condensers	**Cooling towers**
Evaporators nozzles and humidifier sprays	



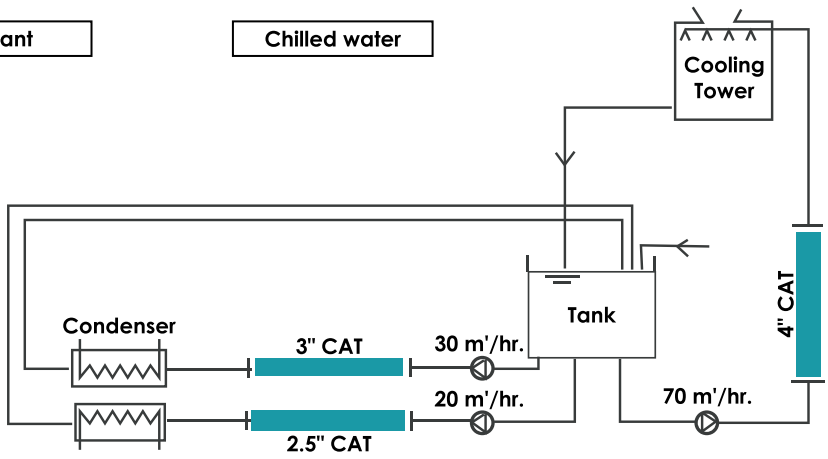
Installation



The System



Protection of a complete cooling system



MagCat™

Super product, specially designed for all types of typical applications.

"Dual treatment water conditioner, the ultimate in scale control"

MagCat is a combination of magnetic and catalytic treatment systems into a single compact stainless steel housing providing the most complete reaction available for calcium carbonate treatment. It is the cost effective answer to a problem which costs industry millions of rupees each year.

- Unique combination catalytic & magnetic treatment systems.
- Boilers run more efficiently with fewer restrictions due to scaling.
- Treats high TDS level & even sea-water.

MagCat is a two stage commercial and industrial water conditioning system suitable for treating potable, process, recycled or waste water.

Industrial / Commercial Applications

- Humidifiers (Air Washers)
- Compressors
- Condensers
- Air Conditioning
- Air Washers, Scrubbers, Humidifier Coolers
- Cooling Rods Felt Washing
- Film and X-Ray Processing Furnaces
- General Cooling Systems
- Hot Water Heaters
- Boilers, Low Pressure Calorifiers
- Ice Makers
- Machines, General Bearings, Glands and Seal Compressors
- Extruders
- Friction Brakes
- Grinders and Mixers
- Injection Molding Machines, Stationary Engines
- Presses

MagCat Range

MagCat Industrial

Designed for industrial and waste water including water that has contaminations such as oil. You can see from the picture below the layout of MagCat industrial

An ideal source to treat the typical water.

MagCat+

In some waters we found that Scaletron was not working so well because the water was very soft, but still having scaling problems. So we designed a product with more power where the water was treated. The idea was to have a magnetic chamber in the same place as the Scaletron alloy, we made some proto types and trailed in areas where we had the problems and it has been working very well. May be 5% of all waters are not suitable for Scaletron because the pH is too low or hardness is too low so in the past we say no, but now we have a solution

Scaling in Shower Head

Scaling on RO Membrane

Scaling in Compressor

Agratron™

Specially designed for Agriculture applications.

Agra-tron is unique combination magnetic and catalytic treatment systems Specially designed for agricultural applications Irrigation Systems (System and Nozzle Protection):

a. Nurseries b. Agriculture c. Turf d. Gardens

Issues

- Calcium Carbonate scale can collect inside of pumps, lines, solenoids, emitters and sprinkler heads causing blockage and premature failure.
- Calcium Carbonate scale collects on leaves and plant roots, slowing down photosynthesis and nutrient intake.
- Hard water requires larger amounts of chemicals, fertilizers to be used.
- Calcium Carbonate fill up between the soil molecule (in the capillary tube) so the capillary water can not be available for plant so the plant can not observe to water and nutrition.
- The soil surface convert into a very hard surface by calcium carbonate.

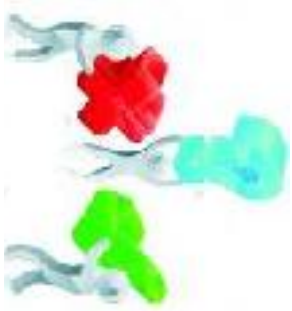
Benefits of using Agratron

- Reduced water tension requiring less chemicals and fertilizers.
- Prevention of scale in nozzles.
- Treated water prevents calcium clogging plant roots ensuring plants remain capable of maintaining efficient absorption of water and nutrients.
- Improves pH stability in water.

(Before) Plants with deposits to installation

(After) Deposit free plants following installation

Particular	Limetron	Scaletron	Colloid-A-tron	MagCat Industrial	MagCat+	AgraTron	Pool-Tron
pH Below 8.5	✓	✓	✓	✓	✓	✓	✓
pH Above 8.5	X	X	X	✓	X	✓	X
High Iron Content	X	X	X	✓	X	✓	X
High Silica Content	X	X	X	✓	✓	✓	X
Sea Water Application	X	X	✓	✓	X	✓	X
Pressure up to 8 Bar	✓	✓	✓	✓	✓	✓	✓
Pressure up to16 Bar	X	X	✓	✓	✓	X	X
Pressure Above to16 Bar	X	X	✓	✓	X	X	X
Point of use Equipment	✓	✓	✓	✓	✓	✓	✓
Recirculating System	X	X	✓	✓	✓	✓	✓
Sewerage/waste water	X	X	X	✓	X	X	X
Work in Oily water	X	X	X	✓	X	X	X
Development/Tower Blocks/Whole Village Treatment	X	X	X	✓	✓	X	X
Evaporative recirculating system e.g cooling tower, condenser	X	X	✓	✓	X	X	X



General FAQ

Is anything added to the water during treatment?

No, both catalytic and combination treatment use non-sacrifical components so nothing is added to the water during the process.

What happens to the treated calcium carbonate?

Our conditioners cause calcium carbonate to precipitate as an insoluble crystal. Calcium carbonate is still CaCo3 just in an altered way. Think of water itself, its h20 but can take the form of water, ice, steam, snow. Many other compounds are the same and our conditioners exploit the ability to create a stable non-adhering formation of calcium carbonate. Once precipitated calcium carbonate remains as microscopic crystals in suspension in the water and will float round eventually exiting a drain or bleed valve. If treated water is remaining in a static environment for a prolonged period of time then this crystal suspension can often settle out and take the form of very fine powder or soft sludge. There is no record of this deposition having enough consistency to cause blockages in valves or outlets.

Over what distance or length of time does the treated calcium carbonate remain in suspension?

Providing treated water is not mixed with untreated water then treated calcium will remain for a number of months.

Why are our conditioners consi-dered so green?

Our conditioners can be considered amongst the greenest water treatment available. It is a completely power free system and has no sacrificial components requiring regular replacement. There is no salt required, no wasted water and our conditioners require no replacement parts

Mixing treated and untreated water

Mixing treated and untreated water will have an impact on treatment quality. If two separate sources are supplying a single piece of equipment and do not mix before the area where scaling would occur both should be treated.

Why is selecting the right diameter so important?

Selecting the wrong size diameter including using a larger diameter than needed can compromise water delivery and affect treatment quality. Size should be selected based on flow rate and if required suitable reducers should be used to connect to intended pipework

Why isn't there a bigger effect on pressure losses?

Both catalytic and magcat systems have internal components designed to minimise resistance as water passes through it.

What are the general life expectancy of the conditioners

Dependant on use, a minimum of 10 years can be expected however it is not uncommon for conditioners to last between 15-20 years

Selecting a size without knowing the flow rate.

In general applications conditioners should be sized based on the pipe diameter unless the flow rate is known to be low or there is relatively heavy scale build up inside the pipe a conditioner 1 size smaller than the pipe diameter should've used. Fluid dynamics has a wide range of connection options available accomm-odating the various international standards.

Residential FAQ

What if I want to keep my water softener?

Installing a conditioner in conjunction with a water softener will provide environmental and financial benefits that will pay for the cost of the conditioner several times over throughout its life.

The CONDITIONER will reduce the amount of salt required during the regeneration in the softener and can also increase the time between regeneration reduce the amount of wasted water.

Where is the best installation point if treating a whole house

On the main cold water supply line. If s tank is present the conditioner should be installed before the tank if based on a high low level switch or if a operating on a float valve then the conditioner should be installed after the tank.

How long will it take before a difference is notice following installation?

Depends entirely on frequency of use and if there is significant lime scale deposits already present. If significant scale is already present it can take several months before any difference is noticed. However in sie cases results can be seen in a matter of weeks.

Will one conditioner treat a whole house?

In most cases yes. However some sore external applications like solar panel systems an additional unit will be required.

Scaling in dishwashers

The nature of operation of some dishwashers can have an adverse effect on treatment which means that some scaling may take place, but scale deposits will be greatly reduced and will be much easier to remove.

Scaling in kettles

Due to the rapid heat change and evaporation created in kettles non ion exchange treatment methods such as conditioners will struggle to completely prevent mineral deposits over a period of time. However benefits should be seen with an extension required between cleans and overall increase in equipment life.

Selecting the correct products

Use the product selection guide in this manual, if still in doubt then contact fluid dynamics or your local agent and provide them details of your application along with a water analysis.

Is treated water safe to consume?

Catalytic and magcat systems have been used in potable systems for over 40 years and has received numerous safety certifications some of which are listed in this handbook

Using conditioning to reduce the cost of Reverse Osmosis

Significant savings can be made by installing a conditioner prior to an RO system. Benefits include increase in pure water production and decrease in wasted water. Chemical reductions and reductions in energy use from the pumps have also been realised following installation.

Commercial FAQ

Treating hotels/shopping malls

Comprehensive conditioning systems can be designed specifically for unique complexes send s CAD drawing along with water schematics to your local agent or fluid dynamics and they will spec in the most cost effective system design for your project. Our conditioners have been installed in many prestigious locations around the world (see commercial client list for some examples)

Why is no BMS required?

BMS (building management systems are only required where conditioners require power from an external source and factors such as power cuts, tripped fuses or poor electrical connections can all cause an immediate halt in treatment. Both catalytic and magnetic systems do not rely on external power source an work on a continuous basis without the requirement for ongoing maintenance nor replacement parts.

Installation guide on recirculating hot water systems

If installing conditioners for treating a recirculating hot water system the general practice is to ensure the supply to the water heater is treated and it is goo practice to ensure that the return part of the recirculating system also has a conditioner on it. This can be avoided in some modern systems where the water is kept at a relatively consistent temperature and where there is fast rate of water consumption. Where water is continually circulated and heated and cooled eventually if not used treatment efficiency we start to degrade.

What effect does a temporary drop in flow rates have on treatment?

Providing the flow rate remains within the optimum range for the majority of the operation, if flowing outside the optimum range this will have no significant impact on the threat of increased scaling.

Will I need a maintenance schedule?

Maintenance schedules are not required unless treating water with very high concentration of minerals or where iron may be present in the water and advice can be sought from your local agent for frequency of maintenance based on the water analysis.

Is treatment capabilities governed by TDS levels?

No, there is no limit in terms of the level of TDS that can be treated. Generally the more TDS the more effective treatment will be. Parameters such as pH and the balance of ions dictate the compatibility of treatment.

What about maximum flow rate

Size should always be chosen based on optimum operating flow rate, however if the flow does temporarily exceed the maximum stated acceptable flow this will not have any impact on conditioning but may cause noticeable reduction in pressure.

How long will treatment last/ over what distance?

Whilst many conditioners have a treatment period of only 48 hours our conditioning has been proven to maintain its treatment for over 3 months. Whole towns and villages have been treated using our conditioners with benefits being felt across over 5000 homes using a single system.

Industrial FAQ

What detergents and chemicals can or cant be used with treatment?

Some chemicals and detergents can be used withconditioning. Generally bleaching agents and filmingagents are not suitable for catalytic treatment. Some domestic washing additives such as calgon are not suitable for treatment. For specific details on chemicals/ additives being used contact Fluid Dynamics

I have a bank of compressors,should I use one large conditioner on the main feed or several small conditioners on each compressor inlet?

Depends on flow rate. If all compressors operate at a consistent rate then yes. If compressors operate independently then each compressor should be protected individually.

I want to test a conditioner for industrial use what is the best application to see the fastest results?

Single pass heat exchanger, steam mixing valves or nozzle scaling.

Observing cycles of concentration

Fluid Dynamics has developed expert 5 unique to the water treatment industry which can be used to calculate the optimum level of concentration. Once installed further water analysis should be sent on a quarterly basis to observe water quality levels.

Effect on corrosion when descaling

Existing scale may be covering old corrosion and this should be a concern for very old heavily scaled pipe work.

Can conditioning assist when blended with softened water?

Yes, a conditioner installed ahead of the softener will reduce salt use and protect the percentage of water that is not being softened.

Installing in Chillers/ Evaporative condensers

Chillers and evaporative condensers should be treated in the same manner as cooling towers and an application form available from your agent should be submitted for a proposal.

Maintenance and cleaning

Systems are designed to be maintenance free, in some circumstances such as over concentration in cooling towers can lead to mineral deposition inside the conditioner. If deposition develops inside the conditioner then the conditioner should be cleaned according to the cleaning schedule.

Treating seawater

Colloid-A-Tron and MagCat systems have both successfully treated seawater applications for both cooling and as pretreatment for desalination.

General Guides for installing on steam boilers

The Steam boiler guidelines should be followed when installing on steam boilers.

Descaling large systems with heavy scale contamination

Ideally heavy scale accumulation should be removed using chemicals or mechanically. If this is not possible then outlets and valves should be monitored for blockages as large chunks of scale may drop off and block lines.

Approvals

NSF/ANSI 61 & 372

National Sanitation Foundation International – USA.

The NSF mark is the assurance that the product has been tested and complies with all standard requirements. NSF conducts periodic unannounced inspections and product testing to verify that the product continues to comply with the standard.

Water Regulations Advisory Scheme - U.K.

Any water related fitting, which when installed, will carry or receive water from the public main water supply in the UK, must comply with the Water Supply (Water Fittings) Regulations or Scottish Byelaws. Products undergo mechanical and water quality testing. This type of approval demonstrates full compliance with requirements of the regulations and byelaws.

Kiwa - U.K.

KIWA is a pan-European certification institute assisting clients worldwide with internationally recognized certification of systems, products, processes and staff. As an independent expert it also carries out inspections and investigations.

kiwa approved product

UK WATER SUPPLY REDULATIONS

General Services Administration - USA

For the whole story visit below the link:


GSA Public Buildings Service

GSA

FINDINGS #19, JANUARY 2015

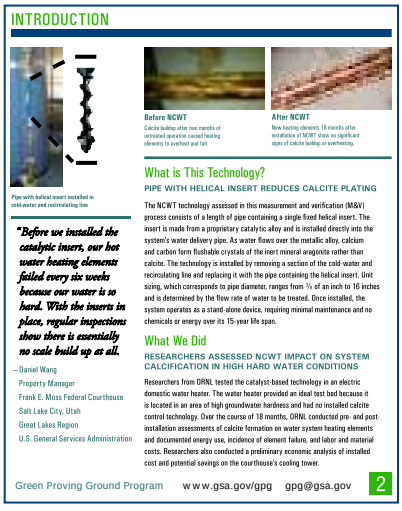
CATALYST-BASED NON-CHEMICAL WATER TREATMENT

Catalyst-Based Device Reduces Calcite Buildup, Requires Minimal Maintenance

According to the US Geological Survey, more than 85 percent of the United States has hard water. [1] In plumbing, hard water leaves calcite deposits that restrict water flow by occluding pipes. In water heaters, calcite coats heating elements, causing them to overheat and eventually fail. Standard approaches to calcite mitigation rely on chemicals, which must be replenished frequently, or ultra-fine membrane filtering, which uses large amounts of water and energy. GSA's Green Proving Ground (GPG) program commissioned Oak Ridge National Laboratory (ORNL) to assess the effectiveness of a catalytic insert that alters the chemistry of hard water to prevent calcite buildup. Researchers assessing the technology at the Frank E. Moss Federal Courthouse in Salt Lake City, Utah, found that catalyst-based non-chemical water treatment (NCWT) dramatically reduced calcite buildup and had immediate payback when compared to a chemical (salt-based) system. Payback at other locations will depend on the ongoing remediation costs of calcite buildup. Catalyst-based NCWT should be considered for deployment in any heating system that is subject to calcification, including hydronic heating systems and boilers, condensing boilers, and gas and electric water heaters.

GPG Green Proving Ground Program

The Green Proving Ground program leverages GSA's real estate portfolio to evaluate innovative sustainable building technologies. The program aims to drive innovation in environmental performance in federal buildings and help lead market transformation through deployment of new technologies.


INTRODUCTION

Pipe with helical insert installed in cold-water and recirculating line

Before NCWT

Calcite buildup after two months of untreated operation caused heating elements to overheat and fail.

After NCWT

New heating elements 18 months after installation at NCWT show no significant signs of calcite buildup or overheating.

What is This Technology?

PIPE WITH HELICAL INSERT REDUCES CALCITE PLATING

The NCWT technology assessed in this measurement and verification (M&V) process consists of a length of pipe containing a single fixed helical insert. The insert is made from a proprietary catalytic alloy and is installed directly into the system's water delivery pipe. As water flows over the metallic alloy, calcium and carbon form flushable crystals of the inert mineral aragonite rather than calcite. The technology is installed by removing a section of the cold-water and recirculating line and replacing it with the pipe containing the helical insert. Unit sizing, which corresponds to pipe diameter, ranges from ¾ of an inch to 16 inches and is determined by the flow rate of water to be treated. Once installed, the system operates as a stand-alone device, requiring minimal maintenance and no chemicals or energy over its 15-year life span.

"Before we installed the catalytic insert, our hot water heating elements failed every six weeks because our water is so hard. With the inserts in place, regular inspections show there is essentially no scale build up at all."

–Daniel Wang
Property Manager
Frank E. Moss Federal Courthouse
Salt Lake City, Utah
Great Lakes Region
U.S. General Services Administration

What We Did

RESEARCHERS ASSESSED NCWT IMPACT ON SYSTEM CALCIFICATION IN HIGH HARD WATER CONDITIONS

Researchers from ORNL tested the catalyst-based technology in an electric domestic water heater. The water heater provided an ideal test bed because it is located in an area of high groundwater hardness and had no installed calcite control technology. Over the course of 18 months, ORNL conducted pre- and post-installation assessments of calcite formation on water system heating elements and documented energy use, incidence of element failure, and labor and material costs. Researchers also conducted a preliminary economic analysis of installed cost and potential savings on the courthouse's cooling tower.

Green Proving Ground Program www.gsa.gov/gpg gpg@gsa.gov 2

http://www.gsa.gov/portal/mediaId/211899/fileName/GPG_Findings_19_-_NCWT.action

The GSA is the authority responsible for the maintenance of all US government buildings. "The Technology and its effectiveness both have been demonstrated in this study, and should be considered for adoption by GSA facilities that are experiencing scaling issue in water heating systems. Mostly larger GSA facilities use cooling towers and hydraulic heating systems to meet HVAC needs. There also would benefit from this technology." - GSA

U.S. Green Building Council - USA

Better Buildings CHALLENGE
U.S. DEPARTMENT OF ENERGY
LOS ANGELES
TECHNOLOGY PARTNER

Applies to buildings that are being newly constructed or going through a major renovation. To have strong bonding in concrete (in between sand and cement) and to protect building from falling of cement and plaster.

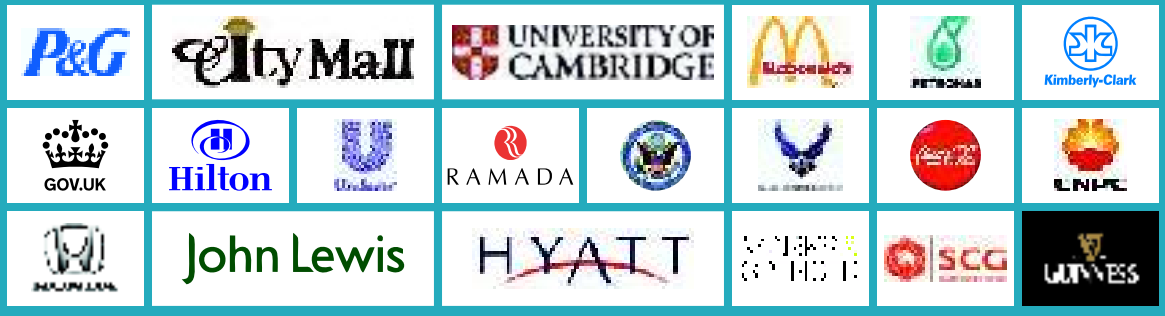
Carbon Limiting Technologies –UK

For clean nature, energy saving and low carbon technology.

CREDENTIALS AT A GLANCE :

INDIA

ABROAD



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