



## WATER CONDITIONING AND HOW IT WORKS

When water flows to a property from a river, borehole or even the municipal supplier it generally contains a host of natural dissolved minerals with the most common being calcium carbonate that has been absorbed from underground aguifers. When cold water enters a property or tank it is generally what we describe as balanced, that is to say there is harmony between the ratio of dissolved calcium carbonate in any given volume of water. However if this water is then heated or experiences a pressure change such as exiting a nozzle this balance will be upset and a small percentage of calcium carbonate can precipitate and deposit on the surface in contact with the water. The most common example of this is a kettle. As water is heated the % of calcium carbonate that can remain in solution drops with each increase in temperature. This results in the calcium depositing as a hard crust on the element and other available surfaces.

#### THE PROBLEM CAUSED BY SCALE

There are multiple problems associated with scale deposition from increased maintenance requirements, equipment breakdown leading to unplanned shutdown and ineffective heat transfer affecting heating/cooling systems. There is the associated environmental and financial costs of using traditional treatments such as ion-exchange and chemical which are being more and more heavily regulated as a result of threats they could pose to local eco systems.

## CATALYTIC AND COMBINATION TREATMENT

Pioneered by Fluid Dynamics in 1973 catalytic treatment has undergone decades of research and development to put it up there as one of the leading single treatment water conditioners. The key with most water conditioners is creating a small electrical charge in the water stream which causes calcium carbonate to precipitate out of solution into microscopic crystals, these crystal then float down stream without adhering to surfaces. What sets our catalytic treatment apart is the ability to form a more permanent insoluble crystal than other treatment method. This is achieved through our unique alloy core that acts as a catalyst when in direct contact with water. When water flows over the core if the pipe were see through you can actually see the treatment take place as tiny bubbles forming on the surface of the alloy. Catalytic treatment is suitable for around 90% of the worlds water, however is not suitable for water where the alloy can become fouled with iron or other minerals. This lead us to the development of the MagCat, combining magnetic and catalytic technology in a single housing. The Magcat offers a more powerful level of treatment suitable for whole apartment blocks or even small villages. The MagCat is also able to combat water with higher solid levels with its unique design ensuring the active surface of the alloy remains free of fouling in almost any environment.

A wide range of case studies, peer reviews and white papers have been produced on all our technologies, this information can be requested through your local agent or **enquiries@scaleprevention.com** 



# SCALETRON PRODUCT DATA SHEET



- Unique Catalytic treatment system.
- Independently proven technology for over 40 years.
- No power requirements.
- Easily installed with compression fittings
- No maintenance or servicing required
- Wras approved

Scaletron is a unique limescale prevention system suitable for treating potable residential and commercial water systems.

Scaletron incorporates the unique catalytic alloy conditioning systems into a single compact stainless steel housing providing the most complete reaction available for calcium carbonate treatment. Surface contact of water with treatment components is scientifically proven to create the most complete chemical reaction to precipitate CaCO3.

With no power requirements Scaletron can be installed in isolated areas and either vertically or horizontal. Correctly installed Sacletron will not have a dramatic effect on pressure losses with a loss of no more than 2% in most cases.

Peace of mind for contractors, no electrical connections or power requirements are required and there is no mechanical parts that are subject to breakdown. Once Scaletron is installed users can expect a minimum service of 10 years.

	SCALETRON Nominal Diameter	UNIT LENGTH MILLIMETERS	<b>MAX PRESSURE</b> BAR	<b>WEIGHT</b> KGS	
1	DN10 (3/8")	254	8	0.2	
	DN15 (1/2')	254	80	0.24	, <b>O</b>
C	DN20 (3/4")	305	8	<b>0.46</b>	
0	DN25 (1")	305	8	0.68	
· · · ·	DN32 (1.25")	609	8 8	1.96	
	DN40 (1.5")	609 <sup>6</sup>	8	2.4	
	DN50 (2")	609	8	3.35	
	SCALETRON MATERIALS: Stainless steel housing, non sacrificial cat Brass compression coupling fittings EN12	talytic semi precious alloy wras 154-2. Max operating temp 900	approved. Wras no. 101:	2363	

# COLLOID-A-TRON PRODUCT DATA SHEET

- Unique Catalytic treatment system.
- Independently proven technology for over 40 years.
- No power requirements.
- Easily installation
- No maintenance or servicing required
- WRAS approved

Colloid-A-Tron is a unique limescale prevention system specially designed for use in heavy industry. Applications range from cooling towers, heat exchangers chillers/ condensers, and many more applications.

Colloid-A-Tron is based on Fluid Dynamics unique catalytic alloy treatment system with a design inducing turbulence and surface contact between alloy and water providing a higher level of treatment than most other conditioning systems.

### **FITTING OPTIONS**

#### **BSP THREADS**

Male threaded connections can be supplied on equipment size dn50 to dn50 in diameter. These conform to BSPT (British standard tapered).

Colloid-A-Tron has been proven in industry with over 250,000 installation across more than 50 countries.



With no power requirements Colloid-A-Tron can be installed in isolated areas and either vertically or horizontal. Correctly installed Colloid-A-Tron will not have a dramatic effect on pressure losses with a loss of in most cases of no more than 2%.

Peace of mind for contractors, no electrical connections or power requirements are required and there is no mechanical parts that are subject to breakdown. Once Colloid-A-Tron is installed users can expect a minimum service of 10 years.

### **DN65 UPWARD FLANGES:**

A wide range of flanges can be specified as the fitting option for Colloid-A-Tron. The standard is the BS4504 PN16 stainless steel flanges, higher pressure ratings are available on request.



### COUPLING DATA

- Light weight design
- Corrosion resistant
- Fusion bonded epoxy coating
- Wide sealing range dn50 upward
- Coated bolt sets
- Total angular deflection of ±8°
- WRAS certification
- EPDM seals

#### **MATERIALS OF CONSTRUCTION**

- 1. Washer Hardened steel zinc plated & passivated.
- 2. Nuts Steel Grade 8 with sheraplex coating
- 3. Gland rings Ductile Iron GGG-40/50 BSEN 1563.
- 4. Bolts M12 Steel Grade 8.8 sheraplex coating
- 5. Centre Sleeve Ductile Iron GGG-40/50 BSEN 1563
- 6. Rubber Sleeve EPDM to BS EN 681-1 fusion bonded epoxy



#### **COLLOID-A-TRON MATERIALS:**

Stainless steel housing, 304 or 316 on request. Non sacrificial catalytic semi precious alloy. Wras no. 1012363





# **APPLICATIONS** AND INSTALLATION EXAMPLES

### **A SELECTION OF INSTALLATION EXAMPLES**

If doubt arises as the exact location of where your conditioner can be installed consult the FAQ's or contact your local sales agent.. Our water conditioners are very versatile and can provide a benefit to hard water use in almost any application.

The following list is an example of some of the common installations where our conditioners have provided a saving on energy and maintenance.

#### **RESIDENTIAL APPLICATION**

Whole house treatment, Sauna, Spa, Swimming Pools, Fountains/ Water features, Purifiers/Evaporaters/R.O Systems,Hot water heaters, Dishwashers, Solar Panel systems, Geo thermal systems.

#### **COMMERCIAL EXAMPLES**

Hot water systems, Humidifiers, Dishwashers, Water heaters, RO Systems/Purifiers, Air conditioning systems, Coolers, Solar Panel systems, Ice makers, Solar Panel systems.





#### **INDUSTRIAL EXAMPLES**

Heat exchangers, Compressors, Chillers, Condensers, Vacuum Pumps, Cooling Towers/Cooling systems, Hot water heaters, Boilers, Oil coolers, Hot water systems.



## PROVIDING A SAVING ON ENERGY AND MAINTENANCE

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# **INSTALLATION** DIAGRAM EXAMPLES



# **PRESSURE** DROP GRAPHS - SCALETRON







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# **PRESSURE** DROP GRAPHS - COLLOID-A-TRON







**16 HARD WATER SOLUTIONS SINCE 1973** 







#### sales@scaleprevention.com +44 (0) 1628 634073 treatwater.com 17

# **PRESSURE** DROP GRAPHS - MAGCAT





 Flowrate m3/hr
 0
 18.3
 29
 35.45
 41
 50.1
 57.9
 64.7
 71

 Pressure Drop bar
 0
 0.08
 0.15
 0.2
 0.295
 0.46
 0.63
 0.765
 0.92



 How rate m3/hr
 0
 10.56
 13.63
 19.15
 23.61
 34.25
 40.94
 51.78
 57.89

 Pressure Drop bar
 0
 0.02
 0.025
 0.05
 0.085
 0.15
 0.35
 0.45



# FAQ'S FREQUENTLY ASKED QUESTIONS

### **GENERAL FAQ'S**

#### **PAGES 22-23**

Is anything added to the water during treatment? What happens to the treated calcium carbonate? Why are these conditioners considered so green? What about existing limescale in my system? Why isn't there a bigger effect on pressure losses? Is treated water safe to consume? Why is selecting the right diameter so important? Mixing treated and untreated water What are the general life expectancy of the conditioners? Selecting a size without knowing the flow rate

### **COMMERCIAL FAQ'S**

#### **PAGES 26-27**

Selecting the correct products Why is no BMS required? Installation guide on recirculating hot water systems Will I need to a maintenance schedule? Steam boiler applications. Treating hotels/shopping malls What about maximum flow rates? Is treatment capabilities governed by TDS levels? Over what distance or length of time does the treated calcium carbonate remain in suspension? What effect does a temporary drop in flow rates have? What type of piping material are the conditioners compatible with?

What are the effects on corrosion?

### **RESIDENTIAL FAQ'S**

#### **PAGES 24-25**

Will one conditioner treat a whole house? Where is the best installation point if treating a whole house? How long will it take before a difference is notice following installation? What about swimming Pools? Scaling in dishwashers Scaling in kettles What if I want to keep my water softener?

### **INDUSTRIAL FAQ'S**

#### **PAGES 28-29**

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

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

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

Descaling large systems with heavy scale contamination Effect on corrosion when descaling

Can conditioning assist when blended with softened water?

Using conditioning to reduce the cost of Reverse Osmosis What are the temperature limits for conditioning? How long will treatment last/over what distance?

Cooling tower installations

Observing cycles of concentration

Installing in Chillers/Evaporative condensers

Maintenance and cleaning

Effect with algae

Treating seawater

General Guides for installing on steam boilers Acceptable pH levels for treatment

TREATED WATER IS SAFE TO CONSUME AND HAVE RECEIVED NUMEROUS SAFETY CERTIFICATIONS

SEE PAGE 23

#### WHAT ABOUT EXISTING LIMESCALE IN MY SYSTEM?

Catalytic treatment is designed to prevent lime scale from forming although in many circumstances catalytic treated water will remove existing deposits. The length of time it takes for deposits to be removed will depend on the flow rate, water temperature and frequency of use.

### **GENERAL FAQ'S**

## IS ANYTHING ADDED TO THE WATER DURING TREATMENT?

No, both catalytic and combination treatment use nonsacrifical 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.

#### WHY ARE OUR CONDITIONERS CONSIDERED 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.

## 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

#### 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 accommodating the various international standards.



## **RESIDENTIAL FAQ'S**

## 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 s e 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.

