

2020

Commercial Case Study & Testing Report

Aquabion UK Ltd





Contents

About Us	Page 3
Why Aquabion?	Page 4
Case Studies	Page 5-15
The Aquabion Range	Page 16
Why Choose Aquabion?	Page 17
Our Clients	Page 18





About Us

Aquabion is well established throughout Europe via a small group of separate businesses importing to their own countries. There are over 100 people who work for these businesses. Combine this with good stocking levels in all the different countries we are very well placed to serve our customers.



Above: The Aquabion is manufactured in Dusseldorf, Germany.







Why Aquabion?

The Aquabion system is based on patented technology proven to help reduce limescale build up. Installing an Aquabion Water Conditioner will prevent hard water (limescale) damage.

The Problem:

Everyday, the size of limescale deposits are increasing in buildings throughout the UK.

At an unknown point in time, this will have an overwhelming effect on the plumbing system.

7 of the problems limescale causes:

- Energy usage is increased which means you will miss energy reduction targets.
- Pipelines slowly clog, reducing the flow.
- Sudden premature mechanical failure of key equipment bringing aggravation, unexpected costs and unhappy clients.
- Legionella prevention becomes harder to manage, leading to increased treatment costs or worse!
- Customer complaints rise further increasing your aggravation.
- Cleaning takes longer, putting stress on budgets and increasing down time.
- The solution can also be problematic, costing you time and expense.

The Solution:

Aquabion is a patented galvanic and electrolytic solution in a self-cleaning package. In this process, minute amounts of high-purity zinc ions are released and react with Calcite. Calcite crystals are modified into adhesion neutral Aragonite, which is simply discharged into the water.

Different to other water treatment units, the patented Aquabion operates without current, chemicals or magnets. The two swirling chambers, upstream and downstream, agitate the water responsible for the self-cleaning effect of the Aquabion unit.



Above: Sudden premature mechanical failure of key equipment





Carried out by Lanxess Deutschland GmbH

The Problem:

Corrosion/calcification of the machines Cost of energy and operating resources

Proposed Solution:

Water treatment using galvanic element (Aquabion)

The Test Set-up and Method:

Two brand new heating devices are used to heat the injection moulding tools at the Arburg machine. Device 1 heats the ejection side, device 2, the nozzle side. The first heating device is supplied directly with process water. The Aquabion is installed between the process water supply and the second heating device.



Production is carried out with this set-up for approx. 6 months and the the heating devices are checked for limescale and corrosion.

Analysis:

Deposits are present on the heating rods in both heating devices. However, in the unprotected device, substantially more deposits have formed and the layers of these are also thicker.

The Conclusion:

The test concluded that the Aquabion provided the following results and findings:

- Reduced the area of deposit and the thickness of the layers of deposit. The deposits however, were not entirely prevented.
- An improvement over process water was proven and so extension to the entire technical centre is to be recommended.
- In addition to the savings expected on energy costs, other reductions in costs are also likely as a result of decreased component failures.
- It is questionable as to whether process water can be used in combination with Aquabion for present day devices heated with demineralised water.



Suggestion:

After the heating devices are cleaned, use the same test set-up and method with demineralised water and process water with the Aquabion .





Carried out by Riske Ingenieurburo (Consulting Engineers) for quality, environmental and engineering safety.

The Aim

To prove the effectiveness of the Aquabion active anode system for all drinking water in accordance with German drinking water regulations (TVO) in any location. Also to test the production of an objective substantiation during varying initial and general conditions for the various levels of calcium carbonate (limestone) adhesion capabilities in hot water system drinking water equipment.

The Test Set-up and Method

The test system consisted of:

- a common water feed
- a junction with circuits for untreated and treated water
- a heating unit integrated in each circuit
- merging of the separated systems into a common outflow

Analysis

The results showed that without the Aquabion, a limescale layer of 1.5mm formed on the heating elements. With Aquabion, the heating elements remained free of lime except for small points.



Fig. 6 Result: Heating elements with AQUA BION[®] (after 3 weeks)

The Conclusion



Fig. 7 Result: Heating elements without AQUABION[®] (after 3 weeks)



The following conclusions were made as a summary:

- The Aquabion system prevents aggressive lime deposits (Aragonite instead of Calcite).
- The Aquabion system prevents the formation of new lime accumulations and further growth of old accumulations.
- Existing encrustations are reduced by the use of the Aquabion system.
- The Aquabion system is approved for drinking water use certified by the German GS Association and complies with German KTW recommendations. The system is environmentally acceptable and does not change drinking water quality.
- The Aquabion system does not result in any ongoing operating costs during its service life.





Bob Horseman - maintenance manager at The Goring Hotel originally had a problem with the water supply to the 5* hotel in Belgravia. After looking at different types of approaches, it was decided that a water conditioning solution was the best action for the hotel to use as softened water was not an option.



Situation

An alternative water conditioner to Aquabion was originally selected which included lots of extra equipment and required servicing. This was installed on the incoming MCWS supplying water storage tanks. The hotel started to experience frequent problems, including loss of incoming mains pressure which finally resulted in the inability to refill the water storage tanks, eventually leaving the hotel without water.

Mr Horseman stated: "Being able to supply water to the hotel is a critical requirement. When we removed the original water conditioner, it was found to be almost completely scaled up internally and some of the additional components were also leading to pressure loss so it was quickly removed."

Solution

Looking into the market in more detail, Mr Horseman was recommended the patented selfcleaning Aquabion system which was then fitted in place. Mr Horseman said of the Aquabion "Since fitting the Aquabion unit, we have had no issues and we are very happy with the product."



Above: Aquabion Treated Water Facial!





A busy Army training base near to Winchester in Hampshire was having trouble keeping the recruits clean. Due to heavy lime scale problems shower heads were causing severe problems requiring them to be descaled every three months. Different water treatment solutions had been tried and tested but did not stop the most serious and costly problem of continually needing to service and descale Plate Heat Exchangers every six months.

Situation

At the MOD site the main water supply pipe for the hot water feed is coming through a 54mm pipe. There are also 2 secondary hot water return pipes on the hot water system plumbed in 22mm pipes. Water hardness was measured at 252.5 ppm.



Solution

The descaling process took place to clean the Heat Exchangers. Before this was done the combined flow was measured at 20l/m. The individual recording was pump 1 = 10 l/m and pump 2 = 10 l/m. After the descaling process the pumps ran smoothly with a combined flow of 47 l/m. The individual recording of pump 1 was 25 l/m and pump 2 was 22 l/m. Two flow meters were then installed by JFK plus the two Aquabion systems - one H40 unit on the cold mains and two S20 units on the secondary return, after the pumps.







The sites hot water system had suffered from lime-scaling of the heat exchangers for many years. This had led to no end of complaints from the occupiers about lack of hot water. The problem was particularly bad as the heat exchangers blocked every 3 months. This led to emergency plumbing works, unnecessary down time and more complaints.

Situation

In March GEM EBS decided to trial the Aquabion to see if its performance would massively decrease the problem. Due to other water conditioners being installed recently at great cost on the flow, it was decided to install just 1/3 of the recommended Aquabion units to see if any cost savings could be had, however unlikely.



Left: One of the installed Aquabion units.

Solution

After 12 months there has not been another descale on site, saving the council hundreds of pounds a time. If the Aquabion had not been any more effective than the other installed system, then there should have been four descales in this period (see below graph for illustration purposes only). So during the 12 months following the installation of the Aquabion, the council had saved thousands and the tentants had a better quality of life.





WHITBREAD

Background

The sites hot water system has suffered from the lime-scaling of the water heaters for many years. This has led to no end of complaints from the guests about lack of hot water leading to some refunds for rooms totalling to more than a complete Aquabion system.

The problem was particularly bad as the site was needing monthly descaling work.



Left: The installed Aquabion in the hotel's plant room.

Situation

In September 2018 it was decided to trial the Aquabion to see if its performance would massively decrease the problem compared to what was only installed two months earlier. Before this an older version of the same system was installed.

Solution

The installation of Aquabion units on the MCWS and the HWSR means that the unplanned de-scaling visits have been stopped in the hotel.







Vattenfall is one of the largest electricity and heat producers in Europe. As a significant part of the Swedish Vattenfall Group, Vattenfall Europe in Germany acts across the complete energy industry chain. The head office is situated in Berlin. The German business accounts for approximately 60% of their total sales volume. The main supplied products are electricity, heat and gas. Vattenfall Europe is an innovative company where the protection of the environment also plays a large role within the company.

Situation

One of the buildings has a canteen with a kitchen, as well as shower rooms where approximately 40 showers are located, these were due to be renovated. As part of the renovation, the water installations needed to be protected against scale and corrosion. In the past the site had suffered with blocked pipework due to scale and had a number of burst pipes along with the standard scale build up on showers.



Above: Vattenfall cooling tower

Solution

Vattenfall chose the Aquabion as it is environmentally friendly and functions without chemicals and electricity. The Aquabion works on the basis of a pure sacrificial anode. The installation of the Aquabion was seen as a preventative option because it will protect the new pipes and fittings. Due to the effect of the scale precipitation, new scale deposits are reduced and old incrustations can be reduced.

By doing this, the AQUABION[®] helps reduce the formation of biofilm and legionella in the piping system because the amount of surface area in which the microbiology can grow is reduced greatly.







Collaborations and Partnerships

Rinnai water heaters are renowned throughout the world as being one of the preferred choices for energy efficient heating of water. The RINNAI INFINITY Continuous Flow Gas Water Heater offers the additional advantage of hot water provision at a predetermined temperature, which is digitally controlled and usually eliminates the need for shower mixers and additional thermostatic devices.

Multiple units can be linked via a manifold arrangement to provide an endless supply of heated water without costly storage, to the most demanding situations, such as hotels, leisure facilities, and camping sites. Rinnai has been trying to find an effective non salt based solution against limescale for several years. No reliable solution was found. Rinnai had concluded that magnetic water conditioners on the market had failed all tests.

AQUABION[®] and Rinnai had their first official meeting in December 2010. AQUABION[®]'s product range, confidence and its worldwide references impressed Rinnai. However Rinnai wanted to see the AQUABION[®] 'in action' especially protecting Rinnai's hot water heaters in some of the hardest water areas in the country, before any recommendation or corporation could be envisaged. A number of problematic sites were chosen by Rinnai in different parts of the UK, to be sure the combination was successfully tested in multiple environments, so that a positive conclusion could be reached.







The Location:

A large holiday park of static caravans and mobile caravans, located on the Dorset coast, near Weymouth.

The Problem

RINNAI Hot Water Heaters on this site have been known to stop working after just 6 weeks. Shower heads have needed descaling every week, this meant costly maintenance. Pipes on this site have had to be replaced regularly due to vast scale problems. In one location a 32mm pipe has been reduced by scale down to roughly the capacity of 15mm pipework.



Above: These pipes show the extent of the limescaling problem on this holiday site

The Solution:

An AQUABION[®] H40 was installed on the supply pipe as well as an AQUABION[®] S20 on the secondary return, after the pump. This solution was not only supposed to provide a better protection than previous technologies but also a better value for money. The contractor Norman Squire of Heatology Ltd installed the Rinnai hot water heaters, thermal stores along with the solar thermal on the roof. The AQUABION[®] units were also installed by Norman, at the same time as the new heaters.

The Testing Procedure:

An AQUABION[®] H40 was installed on the supply pipe as well as an AQUABION[®] S20 on the secondary return, after the pump. This solution was not only supposed to provide a better protection than previous technologies but also a better value for money. The contractor Norman Squire of Heatology ltd installed the Riannai hot water heaters, thermal stores along with the solar thermal on the roof. The AQUABION[®] units were also installed by Norman, at the same time as the new heaters.





The Inspections:

The shower heads no longer need the weekly descaling and the boilers have worked very well all season.

The advanced Rinnai hot water heaters have an early warning system. Once the heat exchanger starts to scale up the boiler will detect the drop in efficiency and display an error code.

It should be noted that the earth bonding was not in place when inspected on the 10/6/11. James Ridout of Aquabion-UK installed it when he did his inspection.

The Result:

The caravan site owner is very pleased with the result and is ordering more AQUABION®'s and Rinnai for other sites he owns.



Above: The advanced Rinnai hot water heaters control panels report no limescale, indicating they are running as efficiently as when they were installed.



Above: The showers no longer need to be de-scaled weekly.



M_e

The Location:

A busy McDonalds branch on the high street in Newbury.

The Set-Up:

Supply pipe is 28mm reduced to 22mm. There is a secondary return on the hot water system plumbed in 22mm. Water pressure is from the mains and is set at 3bar. The water hardness was about 340 ppm which was supplied by Wessex Water who recorded the hardness at 310ppm (17.36° dh)

The Problem:

The site has been plagued by limescaling problems during the first part of 2011. Even though other water treatment systems had been installed from the start, the boiler has had to be changed every 2 months in the first 6 months of 2011.

The Solution:

AQUABION[®] H20 was installed on the mains as well as an AQUABION[®] S20 on the secondary return, after the pump. This was not only supposed to provide better protection than previous technologies but also better value for money. Ron, a contractor from Metro Ltd replaced the scaled up heat exchanger, and also installed the AQUABION[®] on 16/06/11.

The Testing Procedure:

As this site is situated in a real hard water area, results will come in very short spaces of time (every two months).

However, Metro wanted to let the test run for at least a 4 month period before declaring it a success. Inspections were carried out weekly to get different problems under control. A quick check of the display to see if the scale warning code was flashing, shows that after a period of 4 months the full flow is still guaranteed.

The Results:

McDonalds are now ordering more AQUABION® and Rinnai boilers for their other franchises.



Above: Installation of the Aquabion



Above: The Aquabion now in place, protecting the Rinnai hot water heater





THE RANGE

Email commercial@aquabion-uk.com to get your site sized.

As with all water conditioners going line-size can lead to oversizing, excessive cost and potentially lower performance.

Types	D10	S15	S20	H20	H25	H32	H40	H50
Cold water applications	N/A	small family house	large family house	3 Apartments	6 Apartments	12 Apartments	25 Apartments	50 Apartments
Hot water applications	1 apartment	2 Apartments	6 Apartments	10 Apartments	20 Apartments	40 Apartments	100 Apartments	N/A
Internal diameter	15mm / ½"	15mm / ½"	20mm / ¾"	20mm / ¾"	25mm / 1"	32mm / 1 ¼"	40mm / 1 ½"	50mm / 2"
Minimum flow rate*	0.025 l/s 1.5 l/m	0.33 l/s 1.98 l/m	0.13 l/s 7.51 l/m	0.22 l/s 13 l/m	0.4 l/s 24/lm	0.58 l/s 35 l/m	0.92 l/s 55 l/m	1.66 l/s 100 l/m
Optimal maximum flow rate	0.083 l/s 5 l/m	0.11 l/s 6.6 l/m	0.42 l/s 25 l/m	0.77 l/s 42 l/m	1.38 l/s 83 l/m	1.95 l/s 117 l/m	3.05 l/s 183 l/m	5.5 l/s 330 l/m
Peak flow rate	0.108 l/s 6.5 l/m	0.17 l/s 10 l/m	0.62 l/s 37 l/m	0.92 l/s 55 l/m	1.78 l/s 107 l/m	2.25 l/s 135 l/m	3.33 l/s 200 l/m	6.33 l/s 380 l/m
Overall length	100mm	120mm	180mm	260mm	300mm	330mm	360mm	390mm
Body diameter	25mm	30mm	45mm	45mm	57mm	65mm	70mm	80mm
Net weight	0.24kg	0.44kg	1.64kg	2.28kg	3.82kg	4.81kg	5.95kg	7.85kg

F50 F65 F80 F100 F125 F150 F200 F250 Types Internal 90mm 100mm 125mm 150mm 190mm 220mm 275mm 335mm diameter Optimal 5.55 l/s 8.33 l/s 11.1 l/s 16.67 l/s 22.22 l/s 33.33 l/s 50 l/s 91.67 l/s maximum 333 l/m 500 l/m 666 l/m 1,000 l/m 1,333 l/m 2,000 l/m 3,000 l/m 5,500 l/m flow rate 6.66 l/s 10.83 l/s 15.83 l/s 23.33 l/s 46.67 l/s 66.67 l/s 106.67 l/s Peak flow 28.33 l/s rate 650 l/m 400 l/m 950 l/m 1400 l/m 1700 l/m 2800 l/m 4000 l/m 6400 l/m Overall 445mm 445mm 445mm 445mm 445mm 445mm 445mm 560mm length Body 100mm 110mm 135mm 160mm 200mm 240mm 295mm 360mm diameter 42.40kg Net weight 16.88kg 19.25kg 23.80kg 27.25kg 67.56kg 90.96kg 158.20kg

All units: Max pressure 16bar, larger sizes available on request, in central hot water circulation an additional unit must be installed after the pump.



WHY CHOOSE AQUABION?

Our top benefits of The Aquabion. The best alternative to a water softener.

PROBLEM FREE WATER

The Aquabion takes away all the negatives of hard water but still provides you with the positives such as naturally occurring minerals and no added salt.

HEALTHY HAIR

The Aquabion does not interfere with the chemicals in your shampoo and conditioner, leaving you with softer and healthier hair.

SAFE FOR BABIES

The Aquabion does not add salt to the water which means even the little ones can drink and bathe in the water.

APPLIANCES LAST LONGER

Due to the non-adhering lime, your appliances will not scale which means no breakdowns and no replacements.

EASIER CLEANING

The Aquabion creates a non-adhering lime which means it simply wipes away with very little effort and scrubbing required.

SUITABLE FOR ALL SKIN

The Aquabion is safe for all skin types including those that may suffer with eczema. It is safe for the skin of everyone in the family.

NO SALT NEEDED

Unlike salt based water softeners, the Aquabion does not require salt to be added or ongoing maintenance.

SAVES YOU MONEY

From using less energy, using less cleaning and toiletry products to your appliances lasting longer - the Aquabion offers a whole load of overall cost savings.

1 YEAR GUARANTEE

Not happy within the first year? Not a problem, simply return the unit and get your money back.



Our Clients

Just a few of our clients that we have been fortunate enough to work with.

