EXCELLENT PERFORMANCE THROUGH EXPERIENCE

Since 1989 ETC has helped many institutional, commercial and industrial clients save many thousands of pounds. These include:

- Alsthom Gas Turbines Ltd
- Amec Construction Ltd
- Anglian Water
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- British Broadcasting Corporation
- British Sugar
- Britvic Soft Drinks
- Canary Wharf Management Ltd
- Corus UK Ltd
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- De La Rue Holographics
- Department of Environment
- Essex Police HQ
- Everest Frozen Foods
- Goodyear Tyres
- Guinness Brewing
- Guys Hospital Medical School
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- Hydro Aluminio Poralex
- ICI Agrochemicals
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- John Lewis
- Johnson & Johnson
- Kings College Hospital
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- London Bus
- Lorne Stewart plc
- Manor Bakeries Ltd
- Marriott Hotels
- McCain Foods
- Metropolitan Police
- Mid Kent Water
- Nissan Cars (UK)
- Novotel Hotels
- Nuclear Electric
- Proctor & Gamble
- Queen Elizabeth Hospital, Barbados
- RAF Mildenhall
- RHP Bearings Ltd
- Ricoh (UK)
- RN Aircraft Yard Fleetlands
- Rothmans of Pall Mall
- Royal College of Physicians
- Schlumberger Industries
- Smith & Nephew Medical Fabrics Ltd
- SmithKline Beecham
- Southern Water
- St Pauls Cathedral
- St Thomas' Hospital
- Starbucks Coffee Company
- Sun Life of Canada
- Tate & Lyle Europe
- Thames Water
- The Belfry Golf & Country Club
- The Boots Company PLC
- The Brewery Research Foundation
- The National Trust
- Timken Desford Steel Ltd
- Unilever Ice Cream & Frozen Food Ltd
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Member

BRITISH WATER
expertise worldwide

Scalewatcher™ ENIGMA
ELECTRONIC WATER DESCALER

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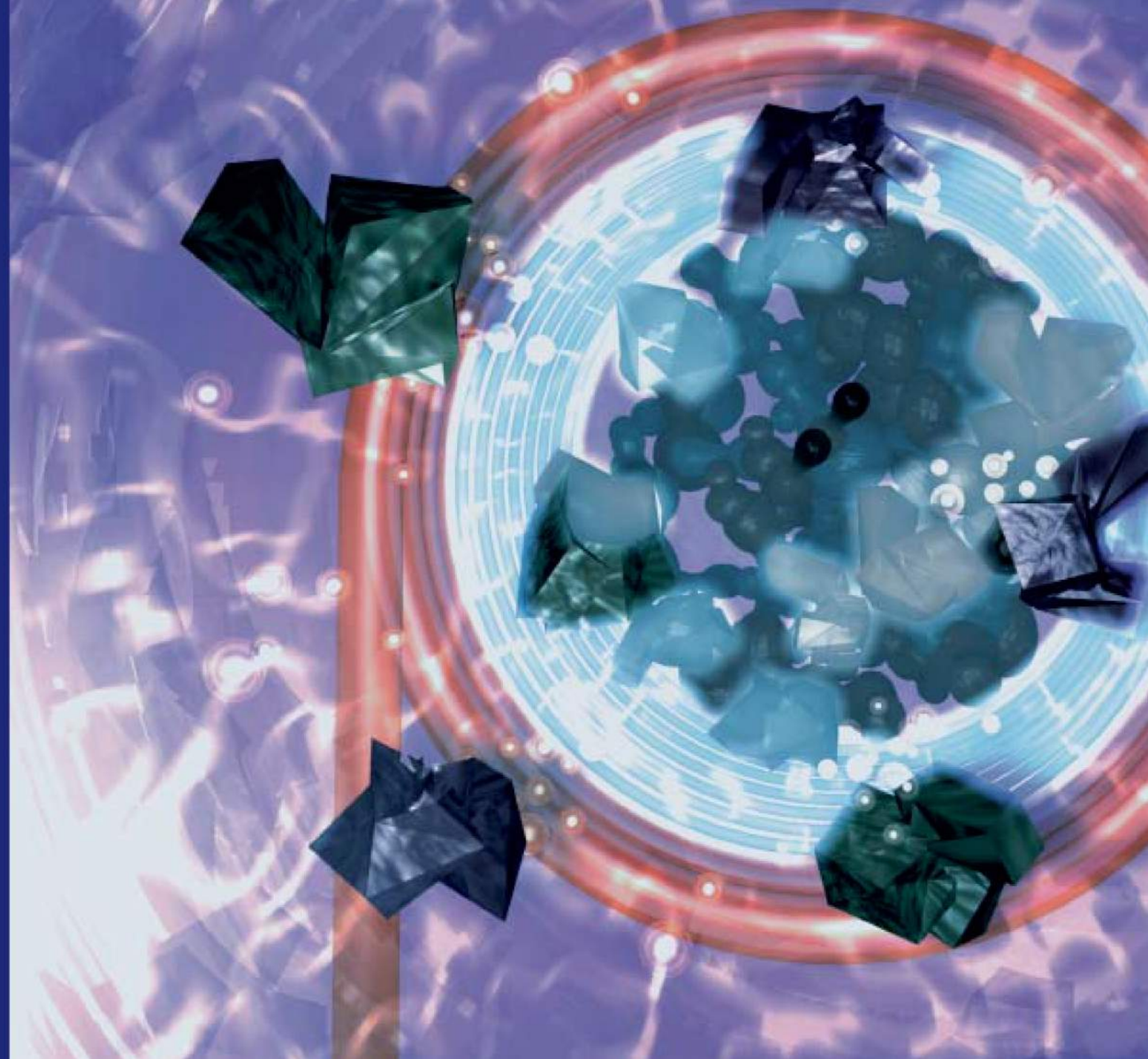
Scalewatcher™ ENIGMA
ELECTRONIC WATER DESCALER

EFFECTIVE PHYSICAL WATER TREATMENT



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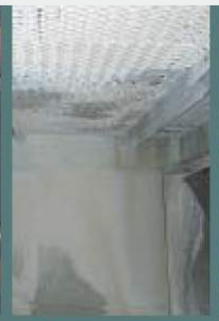
THE PROBLEM OF LIMESCALE

"6 mm of limescale will reduce energy efficiency by a staggering 40%"



Hard water

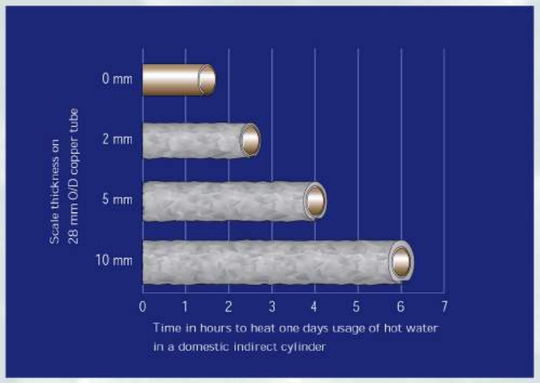
Water performs many vital functions, but not all its features are equally beneficial in all applications.

Water that is naturally hard, as in 70% of the UK and most other countries, contains dissolved calcium and other minerals. These help to build and maintain healthy bodies, but their effect on pipework and water systems can be disastrous.

When water-borne minerals, such as calcium bicarbonate, revert to their solid carbonate state, limescale is formed in water systems, and this narrows pipes, blocks jets, slows the flow, reduces thermal efficiency and provides a breeding ground for bacteria.

Research has shown that just 6 mm of limescale will reduce energy efficiency by a staggering 40%, and, in a moderately hard water area, 6 mm of limescale can form in pipework, or on heat exchangers in just 2 years.

This in turn results in higher running costs. Billions of pounds are wasted every year in increased energy bills, lost production and early renewal of capital equipment.



Increased boiler time, due to scale
With no scale on its heat exchanger, a domestic hot water cylinder takes 1½ hours to heat up. With just 5 mm of scale the boiler has to run for over 4 hours wasting over 2½ hours of fuel.
Source: University of Portsmouth

Safety considerations

Bacteria, including Legionella Pneumophila, proliferate in water systems with even moderate amounts of scaling, particularly in systems where scale prevents water reaching sufficient temperature to act as a biocide.

Isolation valves are often impossible to close due to scaling.

Safety or pressure relief valves often stick due to scale.

The chemical solution

The traditional solution to the problem of limescale has been the use of chemicals to prevent or remove scale, and to control the bacteria that thrive because of it. The use of chemicals, however, can cause or increase corrosion and create further environmental problems. It is also expensive. Descaling alone is estimated to cost industry in the United Kingdom around £1 billion a year.

The alternative to chemicals

Over the years many methods of physical water treatment have been tried. For example, placing alternate magnetic poles in parallel to flowing water induces a voltage in the water. The frequency of the voltage is dependent on the velocity of the flow. If the frequency happens to be correct for the given conditions, precipitation occurs and the resultant crystals remain in suspension in the water.

The drawback with this method is that the frequency required varies according to the conditions in the water system, e.g. flow-rate, water quality, temperature, pH etc. Therefore the results will be inconsistent, and this is the reason why Physical Water Treatment failed to gain wide acceptance.

In 1989, however, a new form of Physical Water Treatment was patented that did not involve magnets, chemicals, acids and expensive softening equipment, but achieved predictable and consistent results – the Frequency Modulated (FM) Electronic Descaler.

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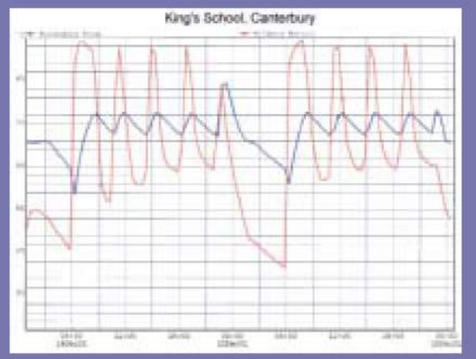
THE SCALEWATCHER ENIGMA SOLUTION

" boiler running time reduced by 61.76%, saving 3833 boiler running hours/ year"

King's School, Canterbury



Scalewatcher Enigma installed at King's School, Canterbury showing reduced boiler operation after 2 months. Boiler running time reduced by 61.76%, saving 3833 boiler running hours/ year.

Environmental Treatment Concepts

The Scalewatcher Enigma Electronic Descaler is produced by Environmental Treatment Concepts Ltd (ETC), a company that is in the forefront of the application of research into the ecological and economical treatment of hard water.

Many years of working with universities, water companies, industry and domestic users have given ETC unique specialist experience in using this technology to solve hard water problems.

ETC pioneered electronic water descaling in 1989. In 1990 ETC won the What's New in Industry Award for services to British Industry. The company believes in continuous investment in research and development; it does not merely sell equipment, it ensures that its customers receive a solution and the very best in technical support and advice.

ETC is an active Member of British Water. ETC was also a founder member of the UK Physical Water Conditioning Association (UKPWCA) which operated a strict code of conduct ensuring clients receive accurate advice and a high level of technical support.

Introduction to Scalewatcher Enigma

Scalewatcher Enigma overcomes the shortcomings of other physical water treatment systems by electronically generating the full range of frequencies required, at just the right intensity, thus ensuring consistent results over the full range of applications. In the newly developed second generation units industrial microprocessors ensure reliable signal generation and control.

Independent university tests have confirmed Scalewatcher Enigma's ability to remove existing limescale and prevent formation of new deposits.

The Scalewatcher Enigma provides a simple and economical solution to the limescale problem. It has been successfully installed for customers from all sections of commerce, industry and Government.

Wherever hard water is used, the Scalewatcher Enigma helps to maintain maximum efficiency in water heating and cooling systems.

Typical uses

- Domestic hot water systems
- Cooling systems including cooling towers
- Refrigeration and chiller systems
- Humidification systems
- Swimming pools
- Effluent treatment including lime softening
- Milk and milk product processing

Benefits of Scalewatcher Enigma

- Extends life of capital equipment, prevents limescale build-up, descales existing systems
- Achieves large energy savings
- Reduces maintenance costs
- Reduces downtime
- Short pay-back period
- Easy to install and move
- Can be installed over outside of lagging
- More than one pipe can be treated with just one unit
- Uses no chemicals – can be used for drinking water
- Reduces bacteria levels
- Can be used with any size of pipe, any material, any flow rate
- All Scalewatcher Enigma units carry 1 year manufacturer's guarantee, in addition to 12 month performance guarantee.

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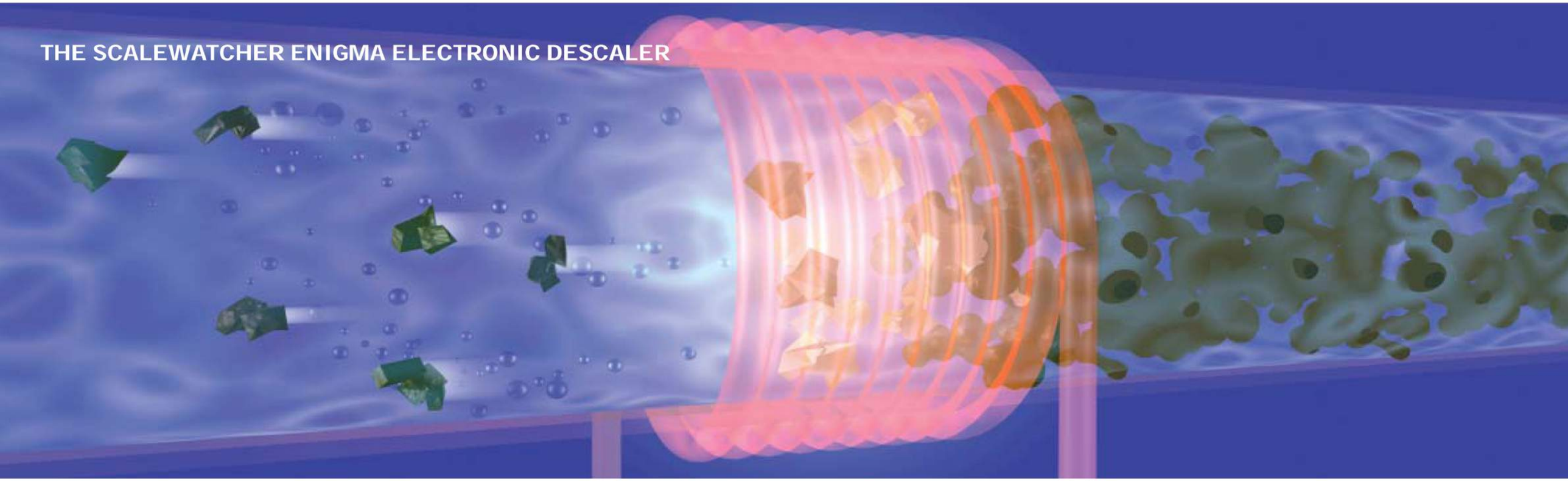
THE SCALEWATCHER ENIGMA ELECTRONIC DESCALER



Description of Scalewatcher Enigma

Scalewatcher Enigma is an electronic descaler that is applied externally to the pipework or water treatment installation.

A range of units are available to cover pipe sizes from 8 mm to 1250 mm. Treatment is applied simply by wrapping a signal cable around the outside of a pipe to form a coil.

No cutting into the pipework or additional plumbing is required.

How Scalewatcher Enigma works

To understand how Scalewatcher Enigma works it is necessary to have a basic understanding of why scale forms in water systems in the first place.

Rain absorbs carbon dioxide as it falls to earth and percolates through the ground. The resulting acidity of the water causes normally insoluble carbonate limestone to dissolve into a bi-carbonate.

Thus calcium becomes part of the water chemistry, and cannot be removed by simple filtration.

When subsequently heated the hard water releases the carbon dioxide reverting the calcium back to its carbonate state by precipitating hard, ionically charged crystals which are immediately attracted to the closest surface exhibiting an opposite ionic charge, usually the pipe wall, heater element etc. Crystals thus form together to produce scale deposits.

Using modern microprocessors and signal processing techniques, the Scalewatcher Enigma produces a complex, modulating frequency waveform (which in terms of magnetic strength is insignificant). When this is applied to the water, the energy induced in the water is sufficient to cause the premature precipitation of the calcium. Because precipitation occurs in the bulk of the water, the crystals seed onto other naturally occurring ions in the water, such as zinc, copper, iron etc. Their size and shape bear no physical resemblance to those formed in untreated water and they remain in suspension until discharged to drain.

This process naturally results in an increase in solubility, which allows the now unsaturated water to dissolve existing scale and remove it from the water system. Even deposits on the outside of the water system, on bathroom fittings for example, will soften with regular contact with the treated water and will soon be easy to wipe away without the use of chemicals.

The key to effectively making use of this process lies in understanding not only the process itself but what prevents it happening and what causes the water to revert back to its previous condition.

It is this understanding and many years practical experience that have enabled ETC to master fully this exciting new technology. ETC was the first company in the world to demonstrate publicly a change in treated hard water, whereby to date nobody else has managed to even measure a chemical change after treatment.

Calcium from untreated water

Calcium from treated water

Magnification x 1500
(Courtesy of the University of Portsmouth)

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PROCEDURES

Typical procedure

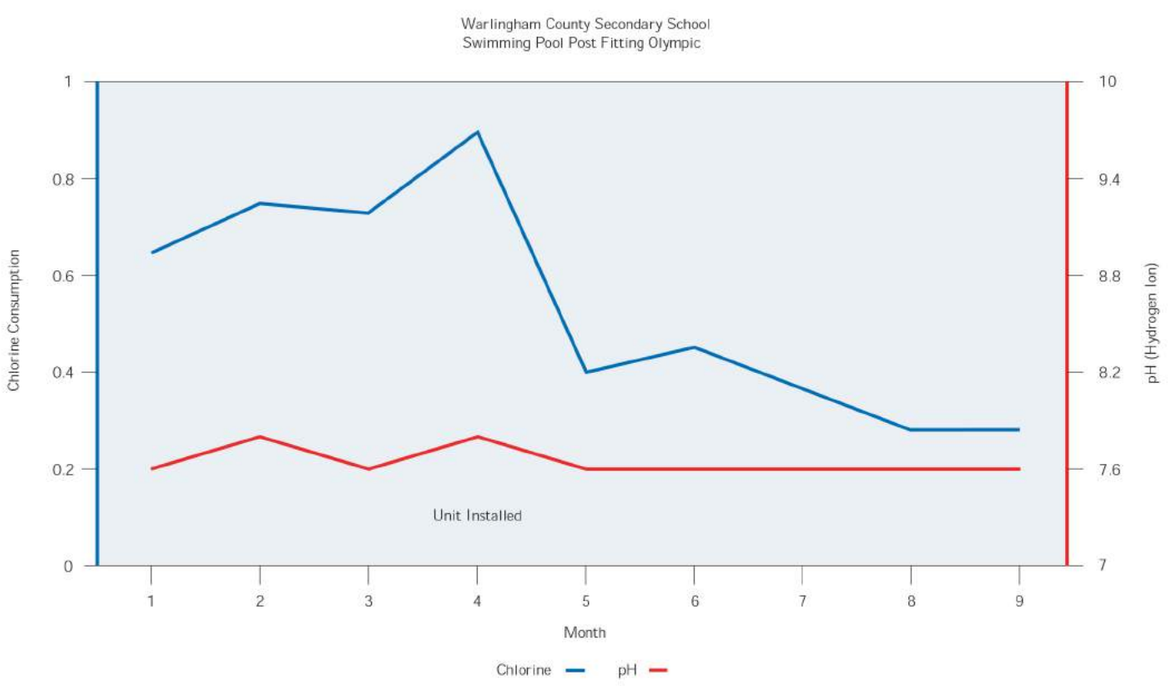
To obtain optimum effectiveness from Physical Water Conditioning (PWC) a number of factors need to be addressed. Simply putting a unit on the rising main may well give acceptable results in a small domestic dwelling application but is likely to lead to customer dissatisfaction for the larger systems.

As soon as the water is treated it begins to revert back to how it was. Treated and held in a cold storage tank the water will maintain sufficient treatment over 3–4 days to be effective in preventing hard scale formation. Heat the water and the reversion process will be accelerated. The other major cause of reversing treatment is turbulence.

This latter cause is not always easy to predict. Centrifugal pumps are an obvious source of turbulence, others, such as tortuous pipework runs are not so obvious. Spraying actions will also undo treatment, however as they are often either the last action before going to drain or the water is re-circulated (and hence can be retreated) this may not matter. The exception being the ball-cock valve, the usual route into a cold storage tank. Here both storage and turbulence combine to reduce PWC effectiveness.

The most effective siting of PWC treatment units is just prior to the problem areas. However a balance must be made against the cost of this approach. A skilled and experienced PWC Engineer will be able to weigh up the pros and cons of where best to site the units, to give a good level of treatment at the lowest cost.

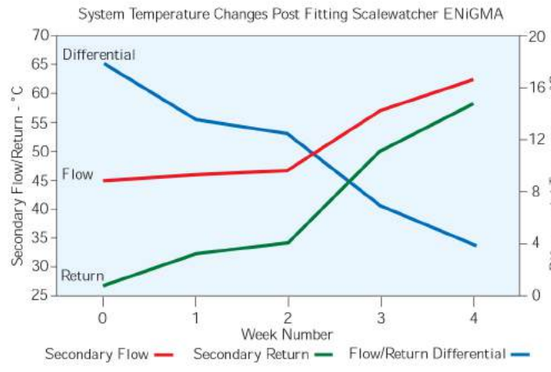
Other important considerations will also need to be addressed, such as the effect of interference of the treatment field caused by other magnetic/electro-magnetic sources, the fluid velocity and the necessary time for the treatment to be fully set, before heating takes place. Just like the use of chemical treatment, which itself is ineffective if not applied correctly, the purchaser is paying for the applications knowledge and ability of the company and person applying treatment and not what is in the bottle.



Swimming Pool Application The perfect application to demonstrate the effectiveness of this technology to control calcium. The reason for these very significant changes is simply that the calcium scale deposits within the pool environment are dissolved back into the water resulting in a dramatic reduction in bacteria levels. This leads to a reduction in chlorine consumption of between 30 to 50% and a pool that is literally easier on the eye.

To achieve optimum results it is necessary for the PWC application engineer to go through the physical and operational make-up of the system, with either the system engineer or the designer. The objective is to identify problem areas and their causes, determine such variables as how often certain repairing actions need to be undertaken and most importantly how the client can establish the baseline and then measure the effectiveness against it.

This latter objective is most important as it is essential the client is able to determine the effectiveness of the treatment. It can either be something very simple, although very disrupting such as opening up the system and carrying out a visual inspection, to something more complex but easier to implement like fitting data logging equipment.



Data logger analysis showing Scalewatcher Enigma descaling a water system

RAF Odiham Sergeant's mess calorifier (above), showing results after 6 months (right)

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APPLICATIONS OF SCALEWATCHER ENIGMA

Scalewatcher Enigma units are used in a wide range of commercial and industrial applications, including the protection of Water Companies' water treatment plant.

These applications have included every conceivable method of heating, cooling or spraying water, at temperatures ranging from just above freezing to the heat of exhaust gases from an aircraft jet engine running in a test rig.

End users have included household names in plastics, rubber and metal manufacture, electricity companies, leisure centres, nursing and care homes, hospitals, food and drink manufacturers, ships, paper and pulp manufacturers, restaurants, mining companies and farms.

New installations

Installed at the outset, Scalewatcher Enigma will extend the efficient working life of water systems and associated equipment, reducing maintenance and running costs to the benefit of the building owner, and of the environment by keeping the emission of greenhouse gases to a minimum.

Existing installations

Applied to systems that have become inefficient and costly because of the build-up of limescale, Scalewatcher Enigma removes the need for chemical descalants and the early replacement of pipework, water-fed equipment and appliances.

By dissolving the scale, Scalewatcher Enigma will restore the system back to its design performance, thereby delivering energy savings and reductions in greenhouse gases. Experience has demonstrated that scale is removed in a fraction of the time it has taken to form. The resulting pay-back period can be as little as a few months, and has rarely been longer than two years.

Customised applications

The Scalewatcher Enigma can be tailored to a customer's individual needs. Most installations follow a detailed survey of the problem, a discussion to agree the criteria for success, and agreement on how performance is to be monitored and measured.

If it is a completely new application, for example on a non-water application, a Rental Evaluation is proposed to allow both parties to establish the efficacy of the installation, before capital expenditure is incurred.

By this method a number of new applications have been developed, such as the treatment of other fluids, including ferric aluminium sulphate, zinc phosphate, sea water and milk.

The effectiveness of other processes, such as effluent solids/water separation using polymers for flocculation are improved by pre treating using Scalewatcher Enigma conditioning.

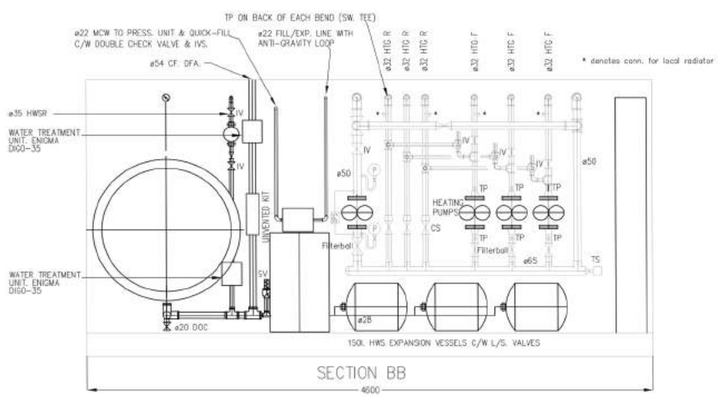
Project SLAM

Prevention is better than cure

ETC is playing a valuable role in the first five-year phase of Defence Estates' £multi million SLAM project to upgrade Single Living Accommodation for some 10,000 members of the armed forces. This is one of a series of such projects for which the government allocated £1 billion of new money in March 2001.

The specified choice for water treatment, Scalewatcher Enigma is expected to save £millions of public money over the anticipated 60-year design life of the new buildings. Occupants will be saved the considerable inconvenience and discomfort that might otherwise result from breakdowns over that time.

Importantly, the installation will enable Debut Services Ltd, who are constructing and maintaining the SLAM buildings over a seven year period, to meet a contractual requirement to hand over the buildings in as new condition.



St Paul's Cathedral 1675 Architect: Sir Christopher Wren;
Water treatment: Scalewatcher Enigma

30 St. Mary Axe (Swiss Re building) 2004 Architect: Sir Norman Foster;
Water treatment: Scalewatcher Enigma

Technical services

ETC does not merely sell equipment. Each application is assessed in detail, and a solution proposed that meets the customer's specific requirements. Both during and after installation of Scalewatcher Enigma, ETC ensures that its customers receive the very best in technical support and advice.

Customised applications

The Scalewatcher Enigma Electronic Descaler is tailored to each customer's individual requirements.

For further information on the technical support and customised applications offered, contact ETC on:

T +44 (0) 1329 836960
F +44 (0) 1329 835406

Performance guarantee

For standard applications and provided that a criteria for success agreement is made at the time of installation, ETC is willing to guarantee the performance of Scalewatcher Enigma for a period of one year from date of purchase.

This is additional to the manufacturer's guarantee.

Scalewatcher Enigma does not affect potability or the natural mineral content of the water as there is no direct contact with the water. Therefore the manufacturer accepts no responsibility for water quality.

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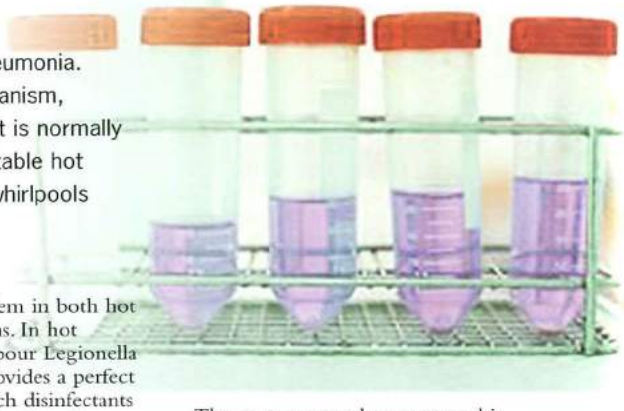
SOLUTIONS
ELECTRONIC FLUID TREATMENT TECHNOLOGY NEWS
ISSUE 1

INSIDE THIS ISSUE

WHATS NEW

ETC has launched ***ParaDox****, a technologically advanced system specifically engineered for the treatment of effluent.*

Reducing Limescale helps reduce risk of Legionella & Legionella Pneumophila



Legionnaires Disease

Legionnaires disease is a severe, progressive form of pneumonia. The Legionella Pneumophila bacteria is a water-based organism, which causes infection when inhaled in an aerosol form. It is normally associated with mains water supplies, cooling towers, potable hot and cold water systems, recirculating water humidifiers, whirlpools spas and Jacuzzis.

Prevention

Between 100 and 200 cases of Legionnaires Disease are reported each year in England and Wales. One of the major changes in the UK prevention of Legionnaire's Disease is the approach to water management programmes introduced by The Health & Safety Commission's Code of Practice L8 (previously HS (G) 70).

Conditions affecting the proliferation of legionella include:

1. The presence of scale deposits or algae growth in the water.
2. Deadlegs in the pipework or stagnation due to very low use of outlets.
3. Low temperature in potable hot water heaters and distribution systems.
4. Stratification of water in water heaters.
5. Inappropriate water treatment.

Legionella is found in many recirculating hot and cold water systems particularly in larger, complex systems such as those found in hospitals, hotels, office blocks and factories. It is transmitted exclusively by inhalation of contaminated water droplets. High-risk areas are therefore primarily associated with showers, sprays, spray taps, taps with high water pressure and refrigeration and air conditioning cooling towers.

Scale

Scale is a major problem in both hot and cold water systems. In hot systems, scale can harbour Legionella and biofilms. This provides a perfect growth medium, which disinfectants cannot penetrate. Scale deposits colonised by Legionella can continuously recontaminate a system, even after disinfection.

What is required is a method of continuously inhibiting scale deposition and a water treatment regime, which prevents the growth of biofilms, bacteria and, in particular, Legionella Pneumophila.

Electronic Water Treatment

This involves fitting the patented **Scale*watcher*-ENiGMA** at strategic points in the water system. Treated water will prevent scale from forming in pipework and on heat transfer surfaces, and will also remove existing scale deposits. Chlorinated water would then have a better chance of preventing bacteria proliferation.

There are many advantages to this non-intrusive engineering solution:

1 Energy use is greatly reduced due to heat exchange surfaces remaining free of scale deposits (just 6mm of scale increases energy costs by around 40%).
2 Corrosion caused by scale deposits is reduced.
3 Extensive downtime and labour costs involved in descaling systems are eliminated.
4 A source of colonisation by biofilms and Legionella Pneumophila is removed.
5 Water distribution efficiency and pressure is increased by removal of scale deposits which can reduce pipe diameters considerably.

Scale*watcher*-Enigma leaves pool sparkling

Fort Regent, Jersey's leading Leisure Centre, has made drastic savings on chemicals, maintenance and the early renewal of equipment following the installation of the **Scale*watcher*-ENiGMA Olympic** unit on its 25-metre pool and teaching pool. The system has saved around £1600 a year on replacement valves and bundles in the swimming pool heat exchangers.

Previously Fort Regent was using 45 litres of sodium hypochlorite a day but following the installation of the **Olympic** this has dropped by a third, saving the complex around £100 per month. As an added bonus the pools no longer have to use chemical stabilisers to correct the pH balance – a case of a win, win, win scenario.

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SOLUTIONS

St. Thomas cleans Angelerys with **Scale*watcher*-Enigma**

St. Thomas Hospital, which together with Guy's forms the largest healthcare trust in the UK, has made substantial savings on its maintenance budget by installing the **Scale*watcher*-ENiGMA** Electronic Descaling System onto four Angelery water generators. The **Scale*watcher*-ENiGMA** system has successfully removed limescale from the Angelerys, which heat domestic water for two groups of buildings within the hospital.

Administering to 101,000 in-patients, 165,000 A&E patients and 403,000 outpatients a year, St. Thomas Hospital's Maintenance Department is fully stretched maintaining facilities. One of the problems facing them was the constant scaling-up of the Angelery water generators providing domestic hot water to the North Wing for wards and laboratories and to the Lambeth Wing accommodating the Out Patients department in addition to a number of wards.

Until the **Scale*watcher*-ENiGMA** Electronic Descaling System was installed, scale build-up necessitated the frequent downtime of the Angelerys. To monitor performance of the system, ETC installed a data logger, which took temperature readings of the water every 15 minutes over a 3-month period. This data was transferred to a spreadsheet graph, which visually illustrated that the **Scale*watcher*-ENiGMA** was working successfully and removing scale from the system.

Nearly eighteen months after the **Scale*watcher*-ENiGMA** system was installed, the Angelerys were opened for inspection and found to be almost scale free.

"They provided a payback within 12 months based on labour, energy and maintenance costs", said Brian Shrubsole. "Now we only open the Angelerys for insurance purposes".

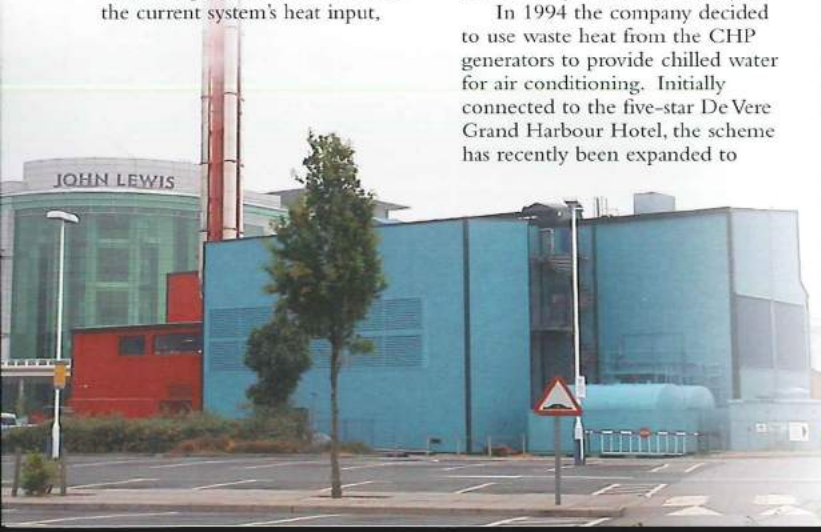
Scalewatcher™ ENIGMA ELECTRONIC WATER DESCALER

Geothermal Green Energy Provider **Solves Scaling Problems**

The UK's first geothermal energy and combined heat and power (CHP) district heating and chilled water scheme in Southampton City Centre is ensuring it maintains its environmental credentials by using state-of-the-art electronic descaling instead of chemicals to prevent scale build-up in its chillers and cooling towers. Launched in 1986, **Southampton Geothermal Heating Company's** £4 million heating, chilling and electricity generation scheme supplies 20 major consumers in the city centre as well as the newly opened West Quay shopping centre, the largest of its kind in Europe.

A well, sunk 1,800 metres below the City Centre, contains water at a temperature of 76°C. This has been utilised to supply a primary heating source for buildings in the vicinity, including Council Offices and two large hotels, the Ibis and Novotel. This well provides about a fifth of the current system's heat input, operating alongside the CHP units, whose waste heat is recovered for distribution through the 11 km mains network. The district heating scheme helps reduce Geothermal's customers' energy bills by 25% and the City's CO_2 emissions by 10,000 tonnes a year.

In 1994 the company decided to use waste heat from the CHP generators to provide chilled water for air conditioning. Initially connected to the five-star De Vere Grand Harbour Hotel, the scheme has recently been expanded to include the city's leisure centre, West Quay development and the BBC studios.



A water softener was used to control scale in the first chilling system installed. However with a tonne of salt a week being used at a cost of £250, when the chilling scheme was extended four-fold, the company decided to source an alternative means of preventing scale. This was done for cost-saving as well as operational reasons, as the softener could not keep up with peak demand of 100 tons of water per day, resulting in the system scaling.

Scale*watcher*-ENiGMA units were fitted onto five linked cooling towers, used in the condensers of six 500 ton chillers. After a few weeks one of the chillers was opened for the first time in 12 months and found to be completely scale free.

"We would have expected to see some residual scale on the chillers and inlet pipe, but both were completely clean", said Mike Zorab, Engineering Manager. "Since then the chillers and cooling towers have remained scale free resulting in reduced maintenance, downtime and less power being used. The units will provide us with a payback within 18 months based on savings in salt alone."

"This was an exciting and fascinating project", said John Thompson, Managing Director, Environmental Treatment Concepts. "We have worked very closely with Southampton Geothermal Heating Company to ensure the **Scale*watcher*-ENiGMA** worked successfully, visiting the site on a weekly basis to check and monitor unit performance.

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Cruise Line goes overboard **for Green Solution** to Water Scaling

ETC is on course to save a major cruise line substantial costs in downtime, maintenance, chemicals and renewal of water-fed equipment and pipework. The savings follow the installation of the Marine version of the patented **Scale***watcher*-**ENiGMA** Electronic Descaling system on cruise liners. The **Scale***watcher*-**ENiGMA** system has successfully treated the scale build-up in the fresh water hot and cold systems, swimming pools, chiller system and the seawater feed to the Nirex Fresh Water Generators.

Scale build-up in the potable water supply and desalination plants on the ships necessitated engineers descaling both mechanically and with acids. The Nirex desalination plant was being descaled every two months to maintain sufficient quantities of fresh water. In addition, they had to frequently renew large amounts of the 2000 metres of ship's pipework, at a cost of £30 per metre.

It was also decided to install the **Scale***watcher*-**ENiGMA** onto the desalination plant's plate heat exchanger which is housed in a vacuum chamber and regularly scaled-up. This usually needed attention every 2 months, whilst cruising, in addition to a thorough mechanical and chemical descale during docking periods, which could take up to 10 days.

Eight months after the system was installed, ETC received confirmation that the units were operating successfully on the fresh water systems. In addition, they were informed that the Nirex Fresh Water Generator had not required cleaning since the **Scale***watcher*-**ENiGMA** had been installed. The cruise line was so pleased with the results that it was decided to extend the treatment to cover all seawater services including the fresh water generators and cooling systems on main engines, shafts and electricity generators.

On one of the cruise liners, only the Alfa Laval Fresh Water Generator was treated, as ship's staff felt that it was not scale, but the growth of crustaceans inside the pipework of the sea water system that was causing greater problems.

Coincidentally, **Scale***watcher* had just produced a report on research carried out on the settlement of zebra mussels along the Welland Canal in Southern Ontario, Canada. The independent tests demonstrated that the **Scale***watcher* reduced the incidence of marine growth by up to 97%. A copy of this report was sent to the cruise line, which has resulted in ETC being asked to re-survey the ship

Twelve months after the **Scale***watcher*-**ENiGMA** Electronic Descaling systems were fitted, neither the desalination plant nor the fresh water systems on any of the ships have required cleaning.

McKay Securities chooses **Environmental Treatment**

Property investment and development company, McKay Securities PLC, has chosen the environmental route as the most cost effective way of treating the water system and air conditioning plants at its properties. To date, the company has installed **Scale***watcher*-**ENiGMA** scale control systems in 8 of its properties, which are primarily situated in the hard water area of Central Southern England.

The **Scale***watcher*-**ENiGMA** Electronic Descaling System was first installed at Chancery House, a 10-storey office block in Sutton, Surrey where despite the fitting of a water softening system, a build-up of scale on the chillers had affected the efficiency of the air conditioning system necessitating regular mechanical and acid cleaning.

McKay Securities heating contractors, Metro Heating, initially treated the **Scale***watcher*-**ENiGMA** with scepticism. However, within a matter of weeks, Michael Flannagan, Director, Metro Heating, noted that new scale was no longer forming and existing scale was being removed by the **Scale***watcher*-**ENiGMA** system.

He said: "Not only have we saved money on chemicals and expensive monitoring but also reduced the risk of legionella, as scale is a breeding ground for the legionella bacteria".

Michael Mobbs, group surveyor for McKay Securities, said: "We are now fitting **Scale***watcher*-**ENiGMA** units into all our new properties as a preventive measure, as well as retrofitting them in our older properties to remove existing scale in hot water systems and chillers. All the systems are functioning extremely well".

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Lifting the **Scale**

One of the UK's leading seafood and frozen food companies has found another way of removing scale - not from fish but plate heat exchangers and pipework. Dedicated to taking an active approach to ensure best practice in environmental matters, the company sought a "green" solution to the problems of scale build-up on its plate heat exchanger and calorifiers at its Grimsby factory.

Situated in one of the hardest water areas in the UK, with calcium levels of around 490ppm, the plate heat exchangers had to be stripped down and acid descaled every two to six weeks. The **Scale***watcher*-**ENiGMA** Electronic Descaling System was installed on a two-inch pipe feeding one of the three plate heat exchangers and was then regularly monitored to determine whether the technology could substantially extend cleaning times.

Four weeks after installing the system, the plate heat exchanger was opened for inspection. It was immediately noticeable that the level of scaling was substantially less, and when the plates were tapped, a large amount of soft scale fell away. At the same time it was reported that factory floor workers and night cleaners had commented to the engineering department on the increased levels of hot water.

The period between cleaning has more than doubled and in some cases it has been extended by 300%. In addition, scale in valves and pipework is now minimal with remaining scale being soft and easily removed.

It may be a ***paradox*** ....but it works

ETC has launched ***ParaDox***, a technically advanced system specifically designed for the treatment of effluent. Three years in the development, ***ParaDox***, uses special frequency modulated signals to both enhance polymer effectiveness and reduce fouling.

Following a number of successes using the existing patented technology to reduce costs in effluent treatment plant, it was discovered that the treated fluid often affected the performance of polymers, particularly when used for solids separation. ETC embarked on a series of laboratory and field tests in conjunction with a Process Scientist at Southern Water, resulting in the discovery of the most effective output parameters.

The result is a *patent applied for* system that is capable of improving separation, coupled with improved filtrate/centrate. In addition it is possible to reduce polymer costs very significantly and prevent or reduce scaling.

Effluent Plant ***Goes Green***

David S Smith Corrugated, part of David S Smith Packaging, has found an environmental way of resolving the scale build-up in its effluent plant by installing the **Scale***watcher*-**ENiGMA** scale control system. Not only has the company substantially improved the performance of its plant but has also received a payback on the system in just 7 months based on chemical savings alone.

Situated in the very hard water area of Newmarket in Cambridgeshire, the company manufactures around 2 million square metres of corrugated fibreboard a week. The board is sold to a wide range of end users including bakeries, pet food manufacturers and pharmaceutical companies.

As part of the process, the company produces around 25 cubic metres a day of effluent mix, comprising of wheat starch with a high pH value of 13 and print wash-down with a pH value of 4. Lime and ferric sulphate is added to the effluent mix at the treatment plant to flocculate the solids from the liquids. The combined effluent cocktail with its high pH values, together with the high levels of calcium in the mains water, caused severe scaling in the effluent plant's pumps. This necessitated the company having to regularly strip them down to acid clean.

The **Scale***watcher*-**ENiGMA** system was rented for a three-month evaluation period in order that they could appraise its benefits and was installed throughout the effluent plant to cover the complete treatment process. The system was closely monitored for scale deposition and found to be completely scale free.

"We were delighted with the results", said Ian McLaren, Engineering Manager. "Not only have we reduced our chemical usage by between 25 to 30 per cent which is far better for the environment, but we have also substantially lowered our costs on chemical disposal, downtime and maintenance."

As an added bonus, the **Scale***watcher*-**ENiGMA** system has also removed the scale from the probes, which are used by the plant to automatically measure the pH balance. They now give a more accurate measurement, which has allowed the plant to have tighter tolerance levels.

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Clear Solution **to the Belfry**

De Vere's internationally renowned hotel and championship golf course, The Belfry, has saved costs on maintenance, downtime and salt, and has also extended the life of capital equipment by replacing water softeners with the **Scale***watcher*-**ENiGMA** Descaling System providing them with a payback in less than 18 months.

Prior to the system being installed, the hotel used water-softening equipment to control scale build-up. Located on the roofs of the bedroom blocks, the softeners had to be regularly topped up with salt. This necessitated the hotel's maintenance engineer having to carry bags of salt through the hotel and up a ladder to the water softeners.

ETC's Managing Director, John Thompson, suggested that the hotel initially install a **Scale***watcher*-**ENiGMA** to one of the plant rooms, providing hot water to one of the bedroom blocks, to evaluate its effect. As part of the evaluation process, The Belfry's Maintenance Engineer cut out a section of pipework and replaced it with a piece of pipe that he could remove to assess the level of scale. Twelve months later the pipe was removed for inspection and found to be completely clean.

Following the successful evaluation, the **Scale***watcher*-**ENiGMA** was expanded to treat the plant rooms providing hot water to the Floyd and Ballesteros bedroom blocks via the Apollo bedroom block. A fourth **Scale***watcher*-**ENiGMA** system was then installed in the Leisure Centre to prevent the scaling-up of the showers.

Grant Stanton, Maintenance Manager, stated: "We remove the section of pipe every 12 months to check it for scale, but have so far found it to be clear. The Belfry will continue to expand the system on new build projects and older water systems as and when appropriate". Such has been the success of the **Scale***watcher*-**ENiGMA** system that Environmental Treatment Concepts has been asked to quote for extending the system to treat the Jacklin bedroom block, the Bel Air Nightclub as well as the Woodlands Conference Suite and Woodland Lodges.

Recommendation from The Belfry has resulted in ETC fitting systems in to the PGA (Professional Golfers Association) headquarters, located within the grounds of The Belfry. In addition the company has treated all the water systems in The De Vere Belton Woods Golf & Country Club, near Grantham and two of the Group's new Village Hotel and Leisure Centres. These installations have additionally included swimming pools and Jacuzzis. Other hotels in the group have also shown intrest.

Scale Control for Water Tanks at Wadworth Brewery

Wadworth Brewery has installed the **Scale***watcher*-**ENiGMA** scale control system onto its hot water storage tank and mains cold water supply to the Brewery. The 300-barrel hot water storage tank, heats in excess of 3000 g/hr of water via external steam calorifiers, to a temperature of 80°C. The hot water is then fed to a ring-main system for use in draught beer production, cask and keg washing as well as a limited number of hot water outlets.

Limescale was deposited on the calorifiers and pumps as well as the storage heater, reducing efficiency and costing the company £1000 a year in extra fuel charges. Descaling necessitated plant shutdown for two days whilst acid cleaning was carried out.

The **Scale***watcher*-**ENiGMA** system was installed to treat before and after the pump on the recirculating pipeline, which includes a calorifier to heat the hot water in the storage tank. An inspection of the hot water storage heater six months' later found that the cover, when lifted, had only soft calcium on the inside which could be easily wiped away. Instead of a thick covering of limescale on the inside of the tank, soft calcium fell off the walls to the floor with just a touch and was easily removed.

Following this successful application, a second unit was configured to treat both inlet water feed pipes to the storage tank as well as the ring main calorifier. A decision to purchase a third unit to treat the main cold water supply to the Brewery soon followed.

"I have calculated that the **Scale***watcher*-**ENiGMA** system has provided a pay back in just 18 months", says Robert Tyre, Chief Engineer, Wadworth Brewery. "We are now using less fuel and acid, have saved on labour costs and improved the lifespan of our pump. In addition the **Scale***watcher*-**ENiGMA** system has also removed hidden costs. These include reducing production losses and downtime due to blockages caused by the build-up of limescale".

Scale*watcher* defends its patent

Scale*watcher* has once again been forced to take legal action to defend the **Scale***watcher* patent. Previous court action taken against companies infringing the patent has resulted in substantial compensation being awarded to the owners of the **Scale***watcher* patent.

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Providing a Solution for Wastewater Treatment Plant

Southern Water is celebrating finding a solution to the scaling up of its plate heat exchanger and condensers at the new state-of-the-art wastewater treatment works at Ford, West Sussex. The company has worked closely with ETC to resolve the scale problem by installing a **Scale***watcher*-**ENiGMA** Descaling System. This has resulted in a dramatic reduction in time spent cleaning the plates from 12 hours a day to just six hours a month.

The plant's recycling process involves blending the different sludges to produce a homogenous mixture of water and solid material. Polymers are added to thicken the mixture and this is fed into one of three large digester tanks where it remains for up to 14 days. During this time a temperature of 35°C is maintained, allowing bacteria within the waste to break down organic matter to water, carbon dioxide and methane gas. The methane gas is stored on site in a gasholder. A proportion of the gas is used to provide the necessary heat to maintain the temperature of the digestion process with the remainder being used to heat the dryer.

The second stage of digestion cools the material and feeds it into a centrifuge dewatering plant, which separates the solid material from the water and creates a "cake". The "cake" is fed into a huge drying machine, which heats the "cake" to temperatures of 90°C. This evaporates the remaining water to produce virtually odour-free, dry granules that are then sold as fertiliser to customers for £10 per tonne. This is a major financial saving for Southern Water, which would have had to transport solids to landfill at massive cost.

Prior to the **Scale***watcher*-**ENiGMA** being installed, the plate heat exchangers were producing high differential pressures every 24 hours that necessitated the plates having to be individually descaled with jet washing and wire brushing. This procedure took 12 hours each and every day.

"We were initially sceptical", says Mark Day, Process Scientist. "However, the **Scale***watcher*-**ENiGMA** Electronic Descaling system has now been installed for two months and instead of having to shut down everyday for up to 12 hours we now just wash down the heat exchanger plates every couple of weeks which takes just 3 hours. In addition, we have seen a remarkable change in the condensers, which, during inspections, show that the existing scale is now getting soft and being removed from the sides."

Now that the **Scale***watcher*-**ENiGMA** is working efficiently, the dryer is able to operate a 24-7 system, which has enabled the Ford wastewater treatment site to expand throughput which will enable it to produce 7,500 tonnes of pellets a year, the maximum production for the plant.

"The thermal drying is a critical section in the recycling system and one that we cannot afford to shutdown", concludes Mark Day. "The **Scale***watcher*-**ENiGMA** Electronic Descaling System is working way beyond our expectations and will in the long term save us costs on preventative maintenance, labour and downtime".

New Sales Support Manager

Yvonne Houlders has joined the ETC team as Sales Support. Yvonne's extensive experience in Field Sales, Customer Service and Support is a welcome addition to the already strong team.

Her career to date has encompassed a variety of industries from Financial Planning for NatWest, Interior Plant design for Green Team Interiors, designing horticultural displays for shopping centres and offices and promoting 'Clean Air' to Recruitment and Helicopter Charter for Atlas Helicopters. She has a passion for the unusual which makes her an ideal candidate to champion the Scalewatcher ENiGMA.

Yvonne's role is to seek out and develop new business, ensure relationships are maintained with existing clients and support the Applications Engineers and Management Team.

Yvonne said "I am delighted to be working for such a progressive company with such an exciting product. The Scalewatcher ENiGMA is an amazing piece of technology that can reduce the cost of maintenance and increase the life of both equipment and plant. With today's emphasis on sustainability looking at the whole life costs for equipment plays a major factor in buildings and their services. I was so impressed with the ethos of the company and the strong family culture combined with the technology that my husband, Brian, decided he didn't want to miss out and has also joined the team".

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SOLUTIONS
ELECTRONIC FLUID TREATMENT TECHNOLOGY NEWS
ISSUE 2

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ETC Wins Industry Award With Great Acclaim

ETC are finding cause for great celebration after their patented Electronic Descaler was awarded the 100% Detail/RIBA Journal Innovation Award for Best Product.

100% Detail is a selected exhibition sponsored by the Royal Institution of British Architects and is attended by over 12,500 representatives of the UK's building industry. John Thompson, Managing Director of ETC, said,'Initially, we were honoured to be given the opportunity to attend the event and showcase the technology's ability to eliminate limescale in water systems, but to win a prestigious award from such a distinguished panel was almost overwhelming.'

*"The Scale*watcher™ *ENiGMA was outstanding in its own right - when ETC made their presentation, our jaws dropped. We referred to it as the 'unsung hero'. It was extremely good value at a very fair price."*

Megan Yates, Director, Techniker

Awarded at the exhibition that took place at Earls Court in London, **Scale***watcher*™**ENiGMA** was voted for by an expert panel of architects and eminent figures in the building industry. Megan Yates, Director of Techniker, a leading firm of consulting structural engineers, commented, 'A lot of products are gimmicky, but the **Scale***watcher*™**ENiGMA** is simple, inexpensive and makes a real difference. We felt that ETC needed to be awarded for getting to the 'nitty gritty' of a problem and offering a responsible, straight forward solution.'

*"I thought the Scale*watcher™ *ENiGMA was a worthy prize-winner because of its effectiveness and economy. You get a lot of 'bangs for your bucks'!"*

Jack Pringle, President Elect of the RIBA

Jack Pringle, the Royal Institute of British Architects (RIBA) President Elect felt that the **Scale***watcher*™**ENiGMA** was a worthy prizewinner because of its effectiveness and economy. 'It's an extremely clever product. A simple installation at one point will treat an entire system and cure the curse of limescale, which is like a thrombosis in a building's circulation system. I also like the way it will act retrospectively and gradually clean up a system that is already clogged up. It's a great example of British ingenuity.'

RIBA have also awarded their Stirling Prize for architecture to one of ETC's most prestigious clients: 30 St Mary Axe (Swiss RE) in London (more commonly known as 'The Gherkin') with their first unanimous decision in nine years. ETC has also fitted units to protect The Gherkin's Restaurant's hot water generators. As a direct result of this, an installation has been commissioned for the water and air conditioning systems of one of its neighbours, the tallest building in The City of London, Tower 42, (formally The Natwest Tower).

*"We were impressed by a well researched, simply presented and neat solution to a problem that frustrates all building owners and managers. I believe the Scale*watcher™ *ENiGMA will save a lot of wasted energy and money - we all wanted to order one right away for our homes and offices!"*

Robin Nicholson, Chairman of the 100% Detail Judging Panel

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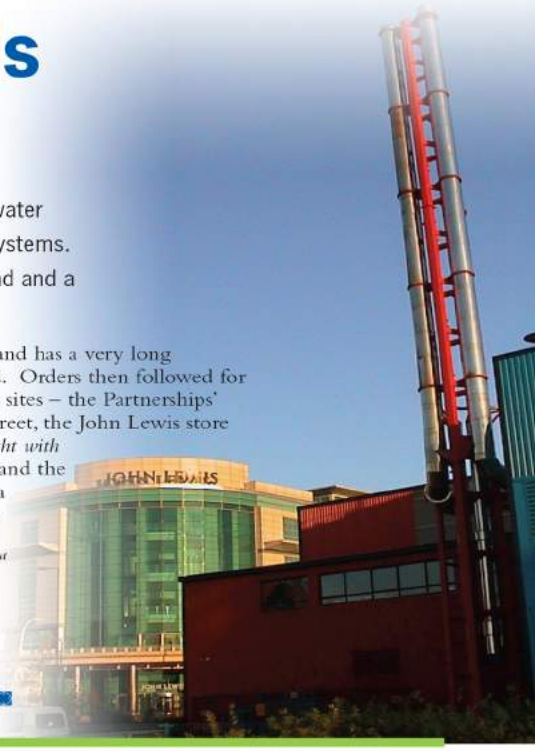
Cash Back for John Lewis through Energy Savings

One of the UK's biggest department store and supermarket organisations has turned to electronic water treatment technology to help reduce its maintenance and running costs for cooling and hot water systems. Units have already been installed in stores and staff facilities in hard water areas of southern England and a rolling program of installations will continue into the future.

The John Lewis Partnership's heating, ventilating, air conditioning and electrical surveyor Graham Mappledoram was fairly sceptical when a colleague first recommended **Scale***watcher*™***ENiGMA***. Nonetheless, he accepted an invitation from ETC and gained a good first impression on seeing the technology in action at Southampton Geothermal Heating Company Ltd.

This led to an initial installation at the Waitrose supermarket in Caversham. After three months the calorifier was opened to reveal that the interior surfaces were no longer coated with hard limescale. Instead there was just a soft powdery sludge that would be flushed away in the normal use of the system. It would no longer be necessary to use acid or chip off limescale, enabling the system to operate in a more energy and cost efficient way and greatly prolong its active life.

"I was thoroughly convinced by the experience we had in Caversham and was doubly attracted by the fact that the technology required no maintenance and has a very long working life," Graham said. Orders then followed for installations at three major sites – the Partnerships' flagship store at Oxford Street, the John Lewis store in Southampton *(shown right with Southampton Geo Thermal)* and the JLP staff club on Brownsea Island off Poole in Dorset. Through this inexpensive method, the **Scale***watcher*™ ***ENiGMA*** has helped to make some of the Partnership's premises more comfortable, cost effective and environmentally friendly.



Sweet Success at Caribbean Hospital

ETC has gone tropical! Electronic water treatment units have been installed in the Queen Elizabeth II hospital on the Caribbean island of Barbados.

Eighty-six percent of the island of Barbados is made up of a karst landscape of deeply fractured and gullied limestone laid down in a series of limestone terraces, deeply incised by numerous gullies and underlain by a complex underground cave system. Water drawn from deep underground is, therefore, exceedingly hard.

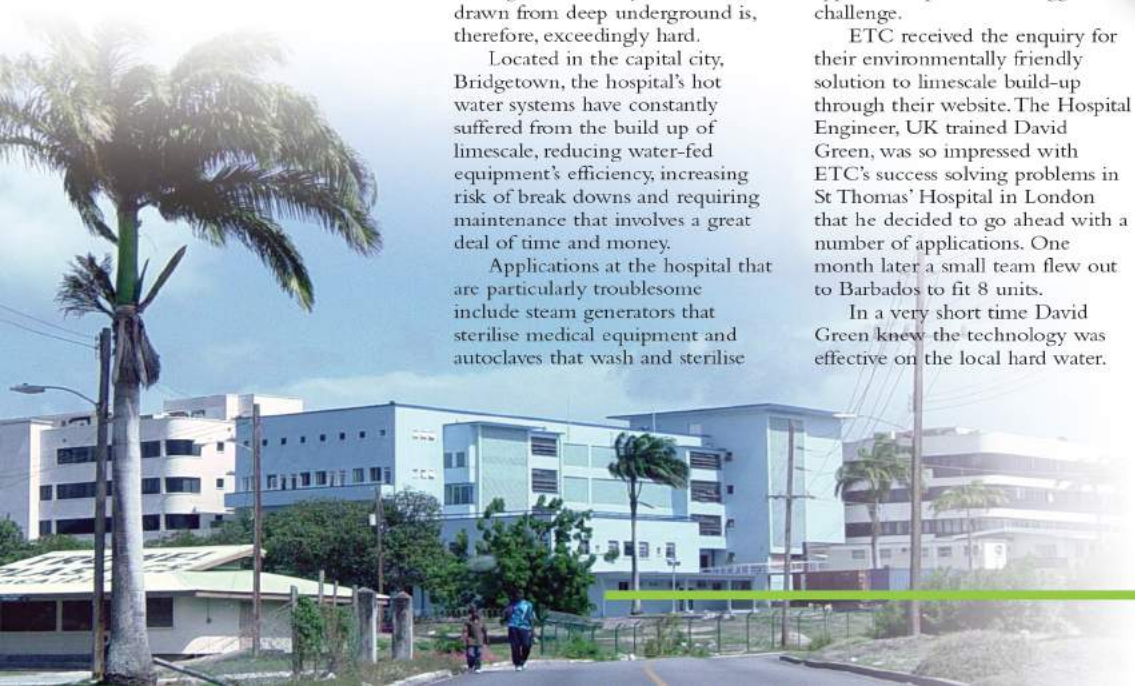
Located in the capital city, Bridgetown, the hospital's hot water systems have constantly suffered from the build up of limescale, reducing water-fed equipment's efficiency, increasing risk of break downs and requiring maintenance that involves a great deal of time and money.

Applications at the hospital that are particularly troublesome include steam generators that sterilise medical equipment and autoclaves that wash and sterilise surgical instruments used in the operating theatres. The higher the water temperature, the greater the amount of precipitation, so at running temperatures of 130°C these applications present the biggest challenge.

ETC received the enquiry for their environmentally friendly solution to limescale build-up through their website. The Hospital Engineer, UK trained David Green, was so impressed with ETC's success solving problems in St Thomas' Hospital in London that he decided to go ahead with a number of applications. One month later a small team flew out to Barbados to fit 8 units.

In a very short time David Green knew the technology was effective on the local hard water. The mechanic who maintained the autoclaves previously had to acid clean the elements every 6 weeks. After 18 weeks he inspected them out of curiosity and they were found to be still quite clean. ETC has since installed further units on a second visit to the island.

The hospital engineer is now keen to help ETC extend their services in Barbados, alerting other interested industries such as the island's dairies, sugar cane processing, breweries, distilleries and ice makers, to the benefits of reducing limescale in their water supply. An ice cream manufacturer has subsequently placed an order for treating and protecting a refrigeration cooling system.



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ETC Announce **Office Expansion**

As a result of increased business activity, ETC has expanded their headquarters in Hampshire. Having been based at the rural North Park Business Centre near Fareham for the past 6 years, ETC has taken over adjacent offices and orchestrated a complete restructuring of the company to reflect rapidly growing sales and wider acceptance of its unrivalled electronic water descaler.

After attracting a great deal of attention from architects, builders and engineers from across the world, an increasing number of companies are turning to the **Scale***watcher*™**ENiGMA** in an effort to save the time, labour and money used when elements of their water systems need to be replaced.

'Being in a position to expand our offices is obviously a tremendous boost to the company and the morale of our staff,' says John. 'We are finding that the positive word of mouth and winning awards such as the national 100% Detail/RIBA Journal Innovation Award for Best Product is contributing to our great increase in sales.'

New staff are welcomed **to the ETC team**

The recent office expansion at the headquarters of ETC in Hampshire has come at the best possible time. To maintain the service of a company renowned for its high levels of customer care and support for a rapidly increasing client base could only have resulted in the need for recruitment.

One of the first steps was the promotion of Samantha Thompson to the position of Director in the business. Sam has undertaken responsibilities for administration, sales and marketing, as well as the internal co-ordination of ETC's numerous activities not just in the UK, but across the world.

In addition to Sam's administration support team increasing in number, a new stock controller has been added to the finance department to manage the increasing demand for ETC's revolutionary water treatment product, the **Scale***watcher*™ **ENiGMA**.

'In our industry, it is always tempting to focus on the client-facing engineers and the product, but without an enthusiastic, dedicated support team and structured internal procedures, companies can jeopardise their customer service,' explains Sam. 'It is my job to make sure that never happens.'

ETC has also welcomed two new engineers into the fold. Taking responsibility for areas in the north east and western regions of the UK, the company is now in an even stronger position to deal with clients across the country.

'Welcoming new faces is always exciting and we can already see the benefits of the additional experience and expertise that compliment our highly skilled team of specialists,' concludes Sam.

Jolly Hockey Sticks from ETC

Environmental Treatment Concepts is proud to announce the sponsorship of Fareham Ladies 1st XI hockey team. Samantha Thompson, Director of ETC, who plays left back for the squad and is Captain, is delighted that the company is supporting both her and her team in their impressive recent track record.

'I've played hockey since I was in senior school and played at County level for Hampshire's under 18 team,' recalls Sam. 'After a break of a few years to start my career, I began playing again three years ago with the Fareham Ladies.'

'I initially found the training regime rather gruelling - we have a weekly fitness session, two hour training practice once a week, then play our matches every Saturday - but now I feel great and am pleased with my performance on the pitch.'

Sam isn't the only one to recognise her greatly improved hockey skills. Awarded 'Ladies Player of the Year 2004', she plays for a team that is going from strength to strength – it was recently promoted to the premier Hampshire division after winning its spring season.

"Obviously we are proud of both Sam and the Fareham Ladies' achievements, says John Thompson, Managing Director of ETC, whose contribution will provide new shirts for the players. 'It is always important for companies to support local talent and we are extremely pleased with our sponsorship of the team.'

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Business enhanced at Barnham Mill

A grade II listed building, Barnham Windmill in West Sussex is both a tourist attraction and a successful tearoom and restaurant. However, the key to its success lies as much in its use of technology as its olde worlde charm, with electronic water treatment units protecting the restaurant's two steam ovens from the effects of some of the hardest water in the UK.

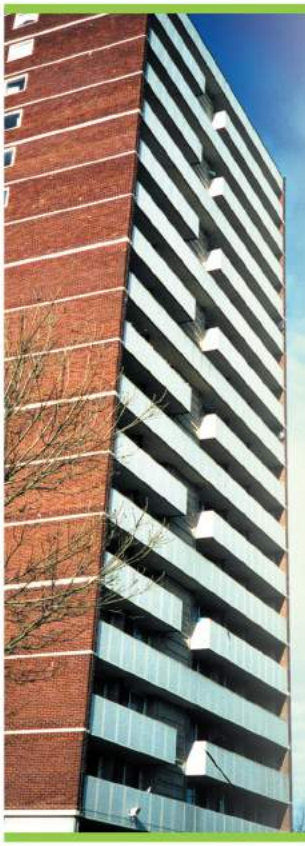
Owner, Barry Lee – a chartered mechanical and electrical engineer who has spent most of his career in the construction industry – bought the windmill ten years ago. The task was to restore the buildings, taking advantage of an existing planning consent for a tearoom, and enter the restaurant business.

In order to operate the restaurant more effectively during peak periods, Barry purchased two Rational steam ovens to heat pre-cooked and refrigerated plated meals quickly.

However the hard water from the solid chalk Sussex Downs was potentially a serious problem. "There had to be a better solution than buying a set of new elements for each oven every year," said Barry. Even then, the ovens had to be stripped down and descaled twice a year to remove the limescale deposited by the hard water. Having read about **Scale***watcher*™**ENiGMA**, Barry contacted ETC and purchased units for use on the boiler and calorifier as well as in the kitchen. He estimates that the saving on maintenance costs for his steam ovens is some £1,400 a year, while the running costs of the treatment units is just £5 per unit per year, and the ovens work as well as if they were operating with a new element all the time.

In addition, the old cast iron radiators, in use in the main restaurant area, function room and bar, are now free of limescale, despite the use of some of the hardest water in the UK. Barry has been able to turn the boiler down as a result because the heating is now more efficient. He also saves on the cost of heating and the emissions that contribute to global warming.

"Initially I was slightly sceptical. Now I cannot imagine life without this water treatment system. There are no longer worries over possible breakdowns, while ETC provides excellent support and advice. **Scale***watcher*™**ENiGMA** has made all the difference to my business."



London Borough Cuts Costs of District Heating

Southwark Council has embarked on a scheme to improve the performance of their district heating systems serving its residential estates, through the installation of Electronic DeScalers. Benefits will range from more reliable heating and hot water supplies for tenants to a combination of major cost savings and fewer operational headaches for the council departments involved.

In the 1960s and 70s when large estates were built in Southwark, to house London's burgeoning post-war population, district heating was considered the best way to provide heating and hot water to hundreds of flats. Unfortunately, the impact of hard London water on the district heating infrastructure was either not fully considered or not seen as a potential problem in the economic climate of the time.

Over the years, however, limescale has been deposited in the water pipes and the heat exchangers serving the individual blocks of flats. This reduces the efficiency of the heating systems so that it costs the council more than it should to provide the services residents need. It also damages plant and equipment, leading to higher planned maintenance costs and more frequent break-downs.

However, the installation of the patented electronic water treatment units is quite literally dissolving the problem. To the delight of Heating Manager, Phil Barnes, an inspection just a few months after installing the initial units revealed that limescale had been removed from heat exchangers serving the Brimmington estate.

"The difference was dramatic as a badly 'furred' heat exchanger was made quite free of limescale within four months," he said. "We liked the look of **Scale***watcher*™**ENiGMA** from the specification we received from ETC and it has certainly performed beyond what we expected," Phil added.

Initially 33 units were installed on the Brimmington, Silverlock, New Place and Aylesbury estates and to serve residents in Ullswater Court, and the Pedworth sheltered housing schemes. Following excellent results achieved by these units, Southwark has decided to proceed with the second phase and have commissioned a further 45 units.

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The M.O.D's choice of Water Treatment

ETC is playing a valuable role in the success of Defence Estates' multi-million pound SLAM project to upgrade Single Living Accommodation for members of the Armed Forces. Currently, four hotel-standard barrack buildings per month are being equipped with electronic water treatment units. This 10-year project will eventually supply 30,000 much improved en-suite bed spaces to SLAM sites across the UK.

The **Scale***watcher*™**ENiGMA** units will be used to protect hot and cold water systems from deterioration and loss of performance due to limescale. It is estimated that the installations will save £millions over the life of the buildings.

While there are no figures available for military establishments, it is estimated that limescale costs UK industry over £1billion a year in descaling alone. Further £billions are wasted through lost production, higher energy bills, and early renewal of capital equipment. There are also environmental costs linked to the higher fuel consumption necessary when pipes and heat exchangers are heavily fouled with limescale.

Prime Contractor, Debut Services Ltd, (jointly owned by Bovis and Babcock), designs, constructs and maintains the SLAM buildings. They became concerned about the damage to water systems due to limescale as they are required to hand over SLAM buildings in an 'as new' condition after seven years. Not wishing to incur the considerable cost of replacing hot water systems, they first considered conventional means of water treatment, using salt-fed softeners,

however **Scale***watcher*™**ENiGMA** proved to be more convenient, more compact and better value. It was doubly attractive because ETC focuses on product and service quality and high standards of installation, commissioning and long term monitoring.

The system was chosen because of ETC's unrivalled success in providing a real and effective alternative to base exchange salt softeners. This would have cost around £188,000 over the design life of each building. In comparison the whole life cost (WLC) of the non-chemical method was estimated to be just 1.6% of that amount, with the added benefit of it not destroying the potability of the drinking water. When looked at in terms of the overall project, Debut's figures indicate a saving of some £75million.

Inspection of the calorifier's heat exchanger

SLAM update!

Despite carrying out 'due diligence' enquiries, there often remain a few people who are still sceptical, which is why ETC has developed successful techniques for performance monitoring of its installations, using sophisticated temperature data logging etc. However, there is nothing quite like 'the mark-1 eyeball' for confirming the efficacy of the treatment. In the case of SLAM, this was achieved by opening up one of the first installations, at Royal Marine Poole, after 9 months in operation in one of the UK's hardest water areas. To the delight of the SLAM compliance team, and the quiet satisfaction of ETC, the calorifier and its heat exchanger had remained exceedingly clean.

The successful working relationship with the MOD, developed since 1989, and the more recent success with the SLAM team has led to many other installations at prestigious military sites in the UK, saving the taxpayers many millions of pounds. In addition to significantly reducing CO_2 emissions, other environmental benefits have been realised, such as reduced use of chemicals and not having to replace water-fed appliances and equipment so often.

ETC contributes to London's first environmentally friendly skyscraper

For three years London watched the Swiss Re Tower gradually spiral out of the ashes of the bombed Baltic Exchange site in the heart of the financial district. 30 St Mary Axe, or 'The Gherkin' as it is better known, is London's first environmentally friendly skyscraper. Within months of its opening it has already established itself as an iconic architectural structure, looming 180 metres high in the city skyline.

The tower that covers 76,400 square metres was designed by Lord Norman Foster to embrace the latest in environmental planning that reduces energy consumption. Its uncompromising modernity is allied toward a sensitivity to the natural environment and a comprehensive range of sustainable measures which mean that the building uses up to 50% less energy than a traditional prestige office building.

One of these measures was the introduction of the Scalewatcher™ ***ENiGMA*** into the hot water system situated in the 35th floor plant room. ETC engineers installed the water treatment units to ensure the prevention of limescale build up was in keeping with the high efficiency and low energy waste philosophy of the building.

The ground-breaking structure won the Stirling Prize in 2004, a top architectural award from the Royal Institute of British Architects (RIBA). For the first time in the award's nine-year history, the jury's decision was unanimous.

30 St Mary Axe is a radical building: socially, environmentally, technologically, spatially, and architecturally. The design is a paradigm of the responsible environmental practice that is a quest for both the client and architect.

'We are delighted to have contributed to such a pioneering architectural project that focuses on the environment,' said MD John Thompson. 'To be associated with such a national icon is a tremendous boost to the company.'

SOLUTIONS
ELECTRONIC FLUID TREATMENT TECHNOLOGY NEWS
ISSUE 3

INSIDE THIS ISSUE

Sustainability ...and hard water

The amount of damage caused by hard water is enormous, however advice on how to prevent it is sadly lacking from all the relevant Agencies. Search for the term *water treatment* on The Carbon Trust and/or Energy Savings Trust's website and no guidance is given to businesses, organisations or indeed consumers. Indeed these Organisations hardly recognise there is any problem with hard water or limescale whatsoever.

The Carbon Trust does state that 1mm of limescale causes 7% increase in energy within their **Low Temperature Hot Water Boilers** document (CTV008), but their advice appears to be - *let the problem happen and then annually use chemicals to remove it*. Now that very effective non-chemical methods exist for preventing, indeed removing, limescale, surely this should be the preferred ***sustainable solution***.

Of course, energy is only part of the equation. Scaling and chemical treatment methods both cause premature failure of water-fed equipment, appliances and sanitary-ware. Take for example direct-fired gas boilers. These have a very much shortened life in hard water areas. Scale builds up on the bottom surface, above the hottest part, causing the casing to split and emptying the contents on the plant room floor.

"Sustainable development is development that meets the needs of the present without compromising the needs of future generations to meet their own needs."
Brundtland (1987)

The boiler then has to be replaced. This involves mining raw materials somewhere in the world, processing them into components, then assembling and transporting the replacement across the globe. Now multiply this simple example with all the other items requiring premature replacement and plain common sense would conclude that this has an immeasurably massive impact on every aspect of sustainability.

In an effort to influence the various Agencies, ETC is an active member of three key organisations: British Water, Environmental Industries Commission and the UK Green Building Council. These are proving to be excellent forums for lobbying Government to achieve recognition of the need to consider water treatment. Some success was achieved in getting a change made to Part L of the Building Regulations.

ETC also offers approved CPDs (Continuing Professional Development) to members of RIBA and CIBSE. This is proving to be an excellent method of getting the message across to those who can influence the adoption of a clean and green way to prevent the many problems caused by limescale.

Thermal expansion has already raised the oceans 4 to 8 inches (10 to 20 cm)

"A 1mm layer of limescale will cause a 7% increase in energy input to the boiler to meet demand"
The Carbon trust

"1 in 10 irons sold are returned within 1 year; 65% of these are due to limescale damage"
Chemical Competitor

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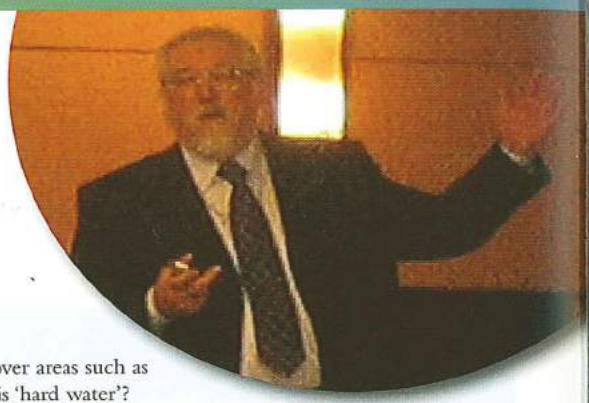
CPD Seminars address the key issues



CPD (Continuing Professional Development) the by-word for many - from Central & Local Government to local companies and partnerships - as the means by which to promote and enhance staff skill, expertise and knowledge across the professions.

Designed as a means to promote vocational development and growth with a definite slant towards application in the 'real world', the CPD initiative also effectively serves to help keep Britain at the forefront of delivering robust projects and services via a capable, efficient and confident staff base.

Via its accredited seminars, ETC is proud to be part of this initiative, addressing not only the skills question but also such potent and key issues as **sustainability** and **energy efficiency** – areas which *must* be addressed in view of current environmental and economical predicaments.

To this end, ETC Ltd is delighted to present its own seminar, "*Saving Energy and Water Through Effective Electronic Water Conditioning*", accredited via both RIBA (Royal Institute of British Architects) and also more recently CIBSE (Chartered Institution of Building Services Engineers) – leading players in the field of building management and design.

ETC looks forward to sharing its knowledge and experience with those wanting to participate in these valued forums.

Add value to future development within your chosen field of knowledge – enquire via cpd@electronicdescaler.com or simply phone us (01329 836960) for more information. We will be pleased to help!

The Seminars cover areas such as

- what is 'hard water'?
- the problems and consequences of hard water
- chemical water treatment methods
- physical water treatment methods
- typical application sites
- Health & Safety considerations
- case studies

and address the inherent consequences

- damage to water systems and appliances, increasing:
  - *maintenance loading*
  - *equipment downtime*
  - *lost production*
  - *capital equipment replacement costs*
- energy wastage
  - *just 2mm of scale can double the time to re-heat water*
  - *0.036 inches (36 thou) of scale in a 500 ton chiller condenser increases annual energy cost by £25,000*
- sustainability & environmental issues
  - *increased toxic chemical storage and handling problems*
  - *increased amount of toxic chemicals getting into the environment*
  - *decreases worldwide stocks of raw materials*

A Continuing Relationship

John Lewis & environmental treatment concepts

The John Lewis Partnership, one of the top 10 UK retailers, has maintained its faith in the ETC technology with a rolling program of installations across the country, in both stores and staff facilities..

A number of residential clubs offering subsidised holiday accommodation to Partners with at least three years service are owned by the John Lewis Partnership. Two of these in the south of England, - Brownsea Castle in Poole Harbour, Dorset and the Odney Club in Berkshire - have been fitted with **Scale***watcher*™ ***ENiGMA*** units.

The Odney Club, Berkshire

Brownsea Castle, also called Branksea Castle, is a mid 16th century square blockhouse built by Henry VIII to guard the entrance to Poole Harbour. It was renovated during the 19th century as an impressive residence but was badly damaged by fire in 1895. Brownsea Island, a haven for wildlife and an area of exceptional natural beauty, has been the responsibility of the National Trust since 1961 and the castle then leased to the John Lewis Partnership. The 30 bedrooms of the Castle are offered to the Partners at a reduced cost for holidays. ETC have provided units for cottages and the laundries.

The Odney Club in Berkshire is near to the company Winter Hill Golf Club. The club has a conference centre and apartments and cottages. **Scale***watcher*™ ***ENiGMA*** units have been installed in the homes of two of the onsite staff as well as the kitchens and conference centre.

Brownsea Castle, Poole Harbour, Dorset

The initial installation at the Waitrose supermarket in Caversham has lead to an ongoing relationship between JLP and ETC as the latter is specified as a provider of water treatment in Waitrose stores across the country, responding sometimes at very short notice, supplying an effective, sustainable, environmentally friendly solution to the problems of hard water.

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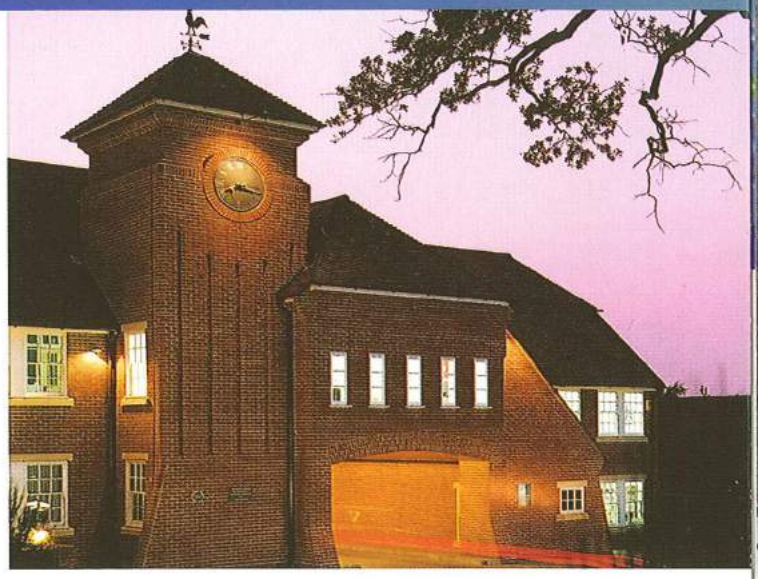
Moving back – **Moving Forward**



After nine comfortable years at North Park Business Centre, August 2008 saw ETC return to its spiritual home and take up residence at Funtley Court in Fareham. Naturally this resulted in a few weeks of upheaval, but with the cheerful co-operation and endeavour of staff the new offices were in a workmanlike state within a few days, despite some teething problems with communications.

As the new premises are spread across three floors, as opposed to one, the members of staff are hoping to get fitter as they go about their daily business! The move has facilitated an opportunity for the office space to be reorganised, which currently is proving efficient and successful with all.

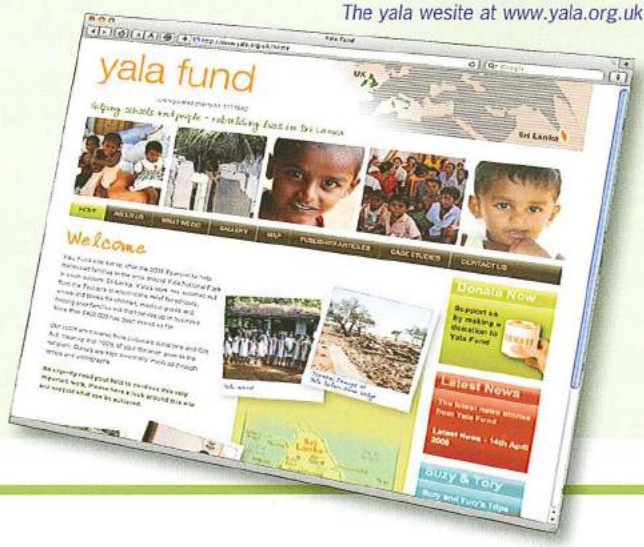
The Yala Fund Sri Lanka

It was a holiday at the Yala Safari Lodge Hotel on the beach in November 2003 that first attracted MD John Thompson and his wife Bev (company bean counter) to Sri Lanka. They particularly experienced the warmth and friendliness of the people and their obvious acceptance of high standards of behaviour learnt from the years of British influence. This was clearly demonstrated at the lovely Mount Lavinia Hotel, which had originally been the Residence of the British Governor of Ceylon, Sir Thomas Maitland.

John and Bev befriended their safari jeep driver, Kalu, during a number of trips into Yala National Park in a quest to see the unique and shy Sri Lankan leopards. They stayed in touch on their return to the UK, - then came the Boxing Day Tsunami!

They just felt they had to try and find out what had happened to Kalu. Using the internet for information, their paths crossed with The Times business features editor Jon Ashworth, seeking info about the region as he had booked a holiday prior to the disaster.

The yala wesite at www.yala.org.uk



Bev asked Jon to look up Kalu whilst he was there in Feb 2005. This led to Kalu taking Jon to a devastated fishing village in Kirinda, Tisssamaharama, where the villagers were now living in emergency accommodation. Although they had shelter, there was nowhere to sit, or for the children to do their homework. This prompted Jon to try to help, so he went to the nearest town and bought a number of plastic garden tables and chairs and shoes for some of the children to wear to school

On his return to the UK he realised that his destiny was to help these gentle people, so he resigned his position at The Times after 17 years and set up a registered charity, Yala Fund and asked John and Bev to become Trustees.

Four years and 15 visits later Jon has raised more than £300,000 and has really made a difference in many areas of this beautiful, but extremely poor island. Jon soon found that the larger NGOs had not managed to identify the really needy people, those that lived inland. Many had lost parents who were visiting markets on the coast when the tsunami hit and were now left with no way to rebuild their shattered lives.

Concentrating mainly on poor schools it was felt that the fund would have a greater impact on both the children and their parents. Repairing the schools, providing uniforms, shoes, books and even daily rations of food, none of which the Government provides, takes the burden off the parents and gives the children a better chance of a decent education.

The central philosophy of the charity, again nothing like the NGOs, is to spend as much as possible in the locality and to feed back to donors just where their hard-earned cash had been spent.

In addition to helping Sri Lankans, Jon has made two trips to the region with children and teachers from the Harris Academy, Bermondsey, generously funded by the Worshipful Company of Chartered Accountants, giving students from a relatively poor background in the UK a life-changing insight into just how lucky they actually are compared to many others on this planet.

ETC would like to give a massive thank-you to all their staff, suppliers, and associates, who have given so generously to the Yala Fund.

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Hot water flows freely again at **Chilworth Manor Hotel**

Chilworth Manor Hotel, an Edwardian Manor House set in 12 acres of landscaped gardens, is located in central Hampshire in the middle of southern England's hard water area. The setting plus dedicated conference and training facilities make it a popular venue for team building events, fun days, fund raising events, product launches and corporate hospitality.

Following many years dealing with the hard water and limescale problems associated with the hotel's gas fired hot water heaters, Stephen Axton, Maintenance Manager at Chilworth Manor Hotel, contacted Jan Rowles, one of the applications engineers at Environmental Treatment Concepts Ltd. A site survey and period of consultation resulted in the formation of an action plan to provide a quick and effective solution to the lime scale problems at the hotel.

Within a short period of time the installed **Scale***watcher*™**ENiGMA** units, fitted to treat the cold water services to the gas fired water heaters and the secondary recirc return, provided evidence suggesting improved hot water circulation at the premises. When the water heaters were opened, as part of the hotel's routine maintenance policy, it was found that the surfaces of the tubes within the hot water heaters were no longer coated with hard lime

scale deposits, instead there was just a soft powdery sludge that was easily flushed away.

To the delight of the on site maintenance team, the time consuming and expensive planned maintenance costs and the risk of break downs have been considerably reduced or eliminated due to the technology of Environmental Treatment Concepts Ltd.

The descaler units fitted have particularly impressed Stephen Axton, Maintenance Manager at Chilworth Manor:

" I am very pleased with the results achieved and will highly recommend this product to companies and maintenance peers who suffer similar scaling problems. I would encourage Maintenance Managers to contact ETC Ltd in assisting with any of their water treatment problems."

As for the future, with Chilworth Manor Hotel's newly opened £3 million leisure club, ETC Ltd are currently planning a comprehensive support package in assisting the leisure club with all of its water treatment maintenance programme.

Clear sighted decisions for CooperVision (UK)

The registered office of Coopervision (UK) is to be found in Fareham, Hampshire, an area noted for its hard water. A contact lens pioneer for decades, CooperVision has become the second largest contact lens maker in the world and the number one manufacturer of toric lenses.

From their network of facilities in 12 countries across five continents, CooperVision distributes high-quality lenses virtually everywhere contact lenses are worn, with a special focus on premium speciality lenses.

Since 2001, ETC units had been fitted to the humidifiers in the company building, with great success. In 2007 a different scaling issue presented itself in the four autoclaves, which produced steam, resulting in extra maintenance as the autoclaves needed to be stripped down and cleaned every four to six weeks. As the company operates continuous manufacturing, producing thousands of contact lenses daily, this naturally affected productivity.

In early December 2007 Mark Potter of Coopervision was referred to ETC. After consultation, and with knowledge of the success of the humidifier treatment, **Scale***watcher*™ **ENiGMA** units were fitted to the autoclaves. By January 2008 a significant change had been noticed and by February it was confirmed that the loss of productivity was greatly reduced and less maintenance was required. A 750ml water sample was taken from the steam generator prior to the fitting of the **Scale***watcher*™ **ENiGMA** unit and then again six weeks later. A vast improvement was clearly seen in the reduction of scale in the beakers after evaporating the sample.

Minerals in steam carry over before (top)... and after (above) treatment

Mark Potter was " amazed and pleased" at the efficacy and efficiency of the treatment and the ensuing increased productivity.

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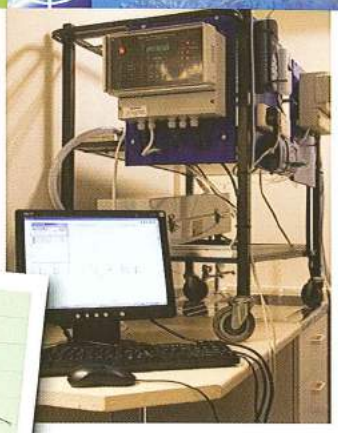
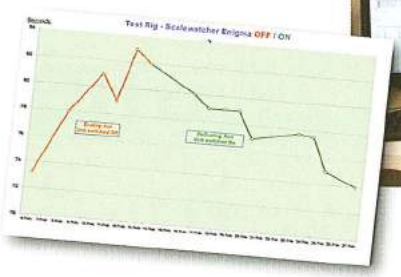
Research & Development

In 20 years of pioneering electronic water conditioning, ETC has developed a number of methods of demonstrating the efficacy of their patented technology, however despite an overwhelming amount of evidence many people remain totally sceptical. This remains the case, even though electron-microscope scanning carried out at the University of Hull conclusively confirmed that the coil causes calcium to be precipitated in the bulk of the water and not on a surface.





Attempts at formal testing have been made, but nobody appeared to be capable of designing a test that could be used to demonstrate just what electronic conditioning is capable of, without taking months, using many thousands of litres of water, a great deal of energy and many hours of an operative's time monitoring, recording and analysing the data.

ETC decided to bite the bullet and perfect its own test rig that would use minimal amounts of water and power and give results in just a few weeks. The objective would be to hone the operation of the rig so that constant and repeatable results could be obtained.

The result - a test rig that is capable of creating significant scale in just a few weeks and also able to prove that the electronic descaler is capable of removing that scale over a similar period, using minimal water, energy and time.

Using a circular electric heater clamped around a 15mm copper tube, water is heated by maintaining the pipe wall temperature at 85° C. The water is kept in the tube for a fixed time to heat water to 60° C then replaced with fresh water. By measuring the time to heat the water from 20 to 60° C it is possible to show that significant scale is formed inside the pipe (increasing the heat-up time) and that scale is then removed when the coil is turned on (reducing heat-up time).

Once clear evidence of repeatability can be demonstrated the rig will be handed over to an independent organisation for an unbiased assessment of the descaling technology.

Going green in the Algarve

Based in the Algarve town of Estói, Portugal, TÁI – Ibérica, Lda was formed in 2006 by brothers David and Ian Kelly to market the **Scale***watcher*™ ***ENiGMA*** range of products and to provide permanent solutions to the severe scaling problems encountered across the country.

Working closely with the British Embassy in Lisbon and UKTI (UK Trade & Investment), and backed by professional performance monitoring, TÁI have established a strong reputation in energy saving for their clients who include hotels, construction companies, cement manufacturers, mining companies and the British Embassy itself.

One of the largest contracts for TÁI so far is "The Keys" in the spectacular Quinta do Lago, one of the world's most sought-after luxury resorts set in nearly 2000 acres of Portugal's Algarve. Here, **Scale***watcher*™***ENiGMA*** systems have been specified for around 250 properties. With building work due to start this year, "The Keys" will add a new and exciting dimension to Quinta do Lago. Like their Florida namesakes, Key Lago, Key Pointe and Key Verde will straddle the landscape like a chain of islands

Leading The Keys development is international property investment company, E3 Property. Their chosen partner for the very best in environmental technologies and swimming pools is the Enova Group based in Lagos who have incorporated into the project the very latest in renewable energy and energy efficient systems.

Just some of the features of these spectacular properties include private roof top pools and sky gardens in most properties, waterfall and steam showers, firepits and rooftop snugs and hidden underground parking and roads.

With the emphasis very much on an environmental approach to building, and with the water of Quinta do Lago being notoriously hard, the Enova Group has asked TÁI – Ibérica, Lda to install **Scale***watcher*™***ENiGMA*** Digital Electronic Water Descaler units to protect both hot and cold water systems.

Replacement of pipes and hot water tanks of this specification is very costly in the Algarve and, as such, Enova intend that their clients experience a smooth and trouble free lifestyle. Enovagroup's Technical Director, Colin Reid says "We decided to recommend the **Scale***watcher*™ ***ENiGMA*** systems because we needed a compact and reliable solution for water treatment with minimal maintenance and a proven track record in the industry".

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SOLUTIONS

Effective Solution for Southern Water Struvite problem

East Worthing Treatment Works has been suffering from struvite build up in system pipework, causing major problems within the digestion process. This has not only impacted on the business financially, but carried a high level of risk to compliance. The impact has been no centrifuges running to produce sludge cake and intern odours *(sic)* created from sludge holding tanks, which had a detrimental effect on local residents.

Glen Stock from Southern Water

This has meant Southern Water Mechanical Technicians spending on average 20hrs a week using mechanical aids to chip away scale from pump bowl and impellers, resulting in reduced running time of the plant.

A short term solution was introduced which involved dosing with chemicals; this began to emulsify the scale enabling the digestion process to be restarted and compliance maintained, but this was financially expensive and not economical over a prolonged period. Southern Water staff felt sure there had to be another, more successful, cost effective method available.

Research online and exploring the experiences of other companies steered Glen Stock, Southern Water Area Process Initiatives Manager, towards Environmental Treatment Concepts Limited.

Following an initial meeting he felt confident about what he had seen and heard, and deciding he had nothing to lose, as using chemical treatment was estimated to be costing £4k - £6k a month, he decided to install **Scale***watcher*™ ***ENiGMA*** units.

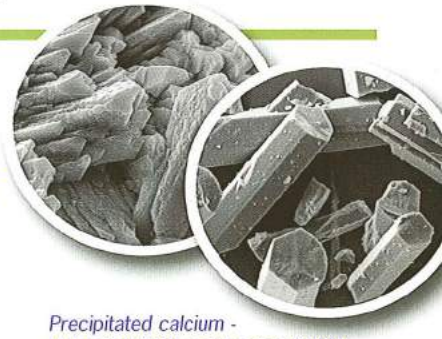
Commissioned at a price of £12k, the equipment has now been running for six months to date with no apparent problems with either pumps blocking or process issues. The total saving for Southern Water at this site is estimated around £100k per year.

Glen is very pleased with the level of service given and the results to date: " A simple solution has been provided by **Scale***watcher*™ ***ENiGMA*** making savings for our company whilst reducing a heavy maintenance load / labour costs and in the process improving working efficiency. As a company we are thrilled with the results."

During current ongoing consultations with staff from ETC, Glen is now exploring using this patented technology on other fluid systems that could save Southern Water further time and money, whilst improving operational and equipment efficiency.

That Eureka Moment!!

Now we have independent evidence of effectiveness



Precipitated calcium - Untreated (left) and treated (right)

Since first introducing the world to SWE in 1989, ETC has searched for a method of measuring or demonstrating the ability to actually change the condition of water. Many chemical tests, carried out by a number of different institutions and organisations, have never detected a change in treated water, with the exception of a tiny increase in CO_2, found by Portsmouth Water and Portsmouth University.

ETC has always considered the theory of operation to be that varying frequencies, applied by the technology, caused the precipitation of calcium, which was borne out by the CO_2 increase, post treatment, and observations from treated systems in the field.

However, thanks to a long term association with the University of Hull's Department for Chemistry in Industry, managed by Ian Dobson, clear evidence has now been produced to support this theory.

Taking a sample of soft calcium deposits from the bottom of one of the many MOD accommodation block calorifiers currently being treated and observing it with an SEM (scanning electron microscope), clearly showed a massive difference between untreated water's precipitated calcium and calcium crystals formed within treated water.

Commenting on the resulting photographs, Ian commented, "This is the first time I have seen visible evidence that **Scale***watcher*™ ***ENiGMA*** has made a change to water. What you have in your treated-water images is fine rod like crystal that have formed in 'free space' ie not at surfaces as ordinary limescale does. So instead of forming on surfaces it has formed in the bulk of the water and will be mobile in a flowing system."

The conclusion of the SEM comparisons clearly explains why SWE treated water is able to prevent hard scale formation

environmental treatment concepts limited