Continuous Closed System Monitoring

HEVASURE
INTELLIGENT CORROSION CONTROL

WCS Group
The H_2O experts
MARLOWE Critical Services

GUARDIAN
Air & Water Hygiene Specialists

MARLOWE Critical Services

Intelligent compliance and system management

Supports BG29/2012 and BG50/2013
Heating or chilled water systems
Data analysis and transmission
Engineering integrity
Water quality assurance & system control
Corrosion and system security

The smart way to manage critical systems and prevent corrosion and system failure

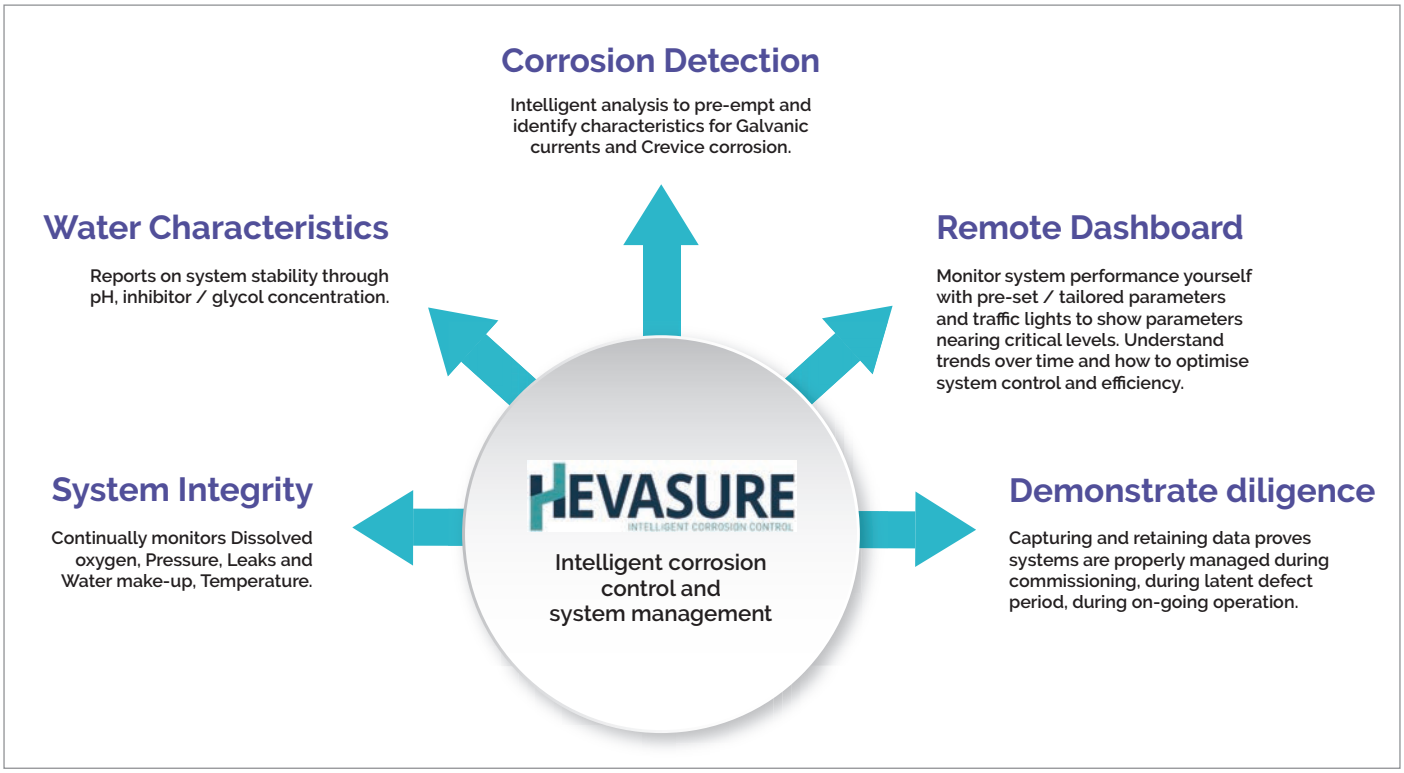
Our Hevasure monitoring system brought exclusively to you through WCS Group and Guardian Water Treatment, protects HVAC systems from corrosion damage by continuously and remotely monitoring the conditions that can cause corrosion BEFORE any damage occurs.

It prevents corrosion damage and avoids the costs of catastrophic failure, reduces call-outs, enhances compliance and on-going operation.

This smart UK-designed, built and delivered system is proven and will cut energy bills, extend asset life, reduce chemical usage and help you manage a problematic system demonstrating diligence and duty of care.

- ✓ Closed Loop Systems
- ✓ During commissioning
- ✓ During latent defect period
- ✓ In on-going operation
- ✓ For problematic sites
- ✓ Performance drop-off solutions
- ✓ Expert witness
- ✓ To resolve diligence disputes
- ✓ To re-set and avoid litigation
- ✓ To demonstrate compliance
- ✓ Protection of investment

In a nutshell



Clear information, risk management and correction of problematic systems

Our system is used in commercial buildings, public sector buildings, mission critical applications (including data centres and MoD sites) as well as universities, schools, colleges and hospitals.

Applicable to both the commissioning phase and on-going maintenance, where data can be obtained and analysed on all parameters that influence system risk and corrosion.

Hevasure is an 'eyes and ears' independent witnessing tool that corroborates system installation, maintenance and management performance over time. It ensures that no adverse system control is missed. Where problems do exist, it acts a means of reliably identifying root causes and helping you rectify them quickly and demonstrably.

Early adopters

NHS · BROADGATE ESTATES · THE FRANCIS CRICK INSTITUTE · LAING O'ROURKE · wellcome trust · Marriott · SKANSKA

Collecting, seeing and managing meaningful data

The following parameters are deliberately monitored using patented probes and technology developed in the UK.

System Integrity

Dissolved oxygen	It is essential that DO is low in a closed loop system (ideally less than 0.2mg/L). Dissolved oxygen is the main driver of corrosion. Without it there is no cathodic reaction and no corresponding anodic metal loss. By measuring, you can ensure the system is airtight and that any oxygen introduced by fresh, aerated water is quickly consumed.
Pressure	A closed system must maintain a positive pressure at all times to avoid air being sucked in to the system. We monitor this at the highest point in the building using a small satellite monitoring system.
Temperature	Measuring temperature checks that the required heat is being produced. We can also benchmark heat transfer efficiency.
Water make-up	We measure water make-up volume to indicate leaks in the system or inform planned or required flushing activity.

Water Characteristics

Conductivity	For inhibited systems, measuring conductivity tells you the concentration of the water treatment products (inhibitors). You can determine if the system is being overdosed or under-dosed with inhibitor.
pH	For systems containing aluminium, you can check that the pH is not going above 8.5 (otherwise passive film can break down aluminium components such as heat exchangers, which can start to corrode).
Microbiological risk	We are working on a biofilm sensor which will be used alongside dissolved oxygen monitoring. Most bacterial problems occur when water is oxygenated and the aerobic bugs begin to take hold. By monitoring system characteristics change, and water ingress, we highlight potential risk factors that can contribute conditions favourable to bacterial growth. Data can be used to tailor sampling regimes.

Corrosion

Galvanic currents	Our galvanic current sensor measures the rate of metal loss on open (steel) surfaces. In plain water, galvanic currents increase in proportion to dissolved oxygen. However, inhibitors when at the correct strength passivate metal surfaces and can suppress galvanic currents. By using this sensor, you can check that the inhibitor is doing its job effectively, even when there is some oxygen in the system.
Crevice corrosion	This insidious form of corrosion leads to rapid pitting and pin-holing. It occurs in localised regions such as weld seams and under debris due to a micro-environment being created. A patented sensor has been specially designed to detect this.

System benefits

Risk reduction

- Monitors valuable assets 24/7
- Prevents conditions that lead to corrosion
- Reduced equipment breakdown and catastrophic failure
- Reduces call-outs
- Gives FM site managers, site engineers, peace of mind
- Source of undisputable data that will help you extend asset life and avoid system failure

Compliance

- Proves the system and being properly managed
- Commissioning aid and hand-over tool
- Identifies system / installation / set-up defects
- Provides comprehensive suite of tools for on-going operation
- Demonstrable record of diligence and duty of care

Environmental impact

- Keeping systems in pristine condition cuts energy bills
- Carbon emissions are reduced
- Reduces use of chemicals
- Enhances your reputation

Strategic application

- When FMs take over a problematic site
- When system performance is impaired
- When the site owner / manager is talking about lack of diligence
- When no-one can reliably point to equipment breakdown
- When building owners are investing in new HVAC systems
- In critical system and operating environments
- Especially in Data Centres, HM Prisons, Hospitals, Schools, Universities, Food & Beverage manufacturers, Distribution and Warehouses where on-going operating must be exacting

4 options

HEVASURE PREMIER

For new and existing buildings, this is a full, comprehensive service including provision of all monitoring equipment, installation and dashboard set-up and 24/7 monitoring of heating and / or chilled water system(s). Alerts can be sent to key duty holders announcing near critical operating parameters. Quarterly independent reports detail system performance, non-conformance, trouble-shooting and recommendations to improve system performance and restore the system to peak health. Includes recalibration of sensors (annually) and a 12-month replacement part warranty under an SLA.

FULL SYSTEM | INSTALL* | ANALYSIS & REPORTING BY US | 12-MONTHS

HEVASURE DASHBOARD

As above but where the building owner or maintenance company wish to monitor system performance and health themselves. The dashboard uses a traffic lights reporting system to report realtime system information and performance. Parameters and alarm levels can be configured to match your specific system specification and operating regime with trend analysis over selected periods of time. Training (0.5 days) including corrosion dangers and interpretation of data. No formalised reporting is included (this is a PREMIER option).

FULL SYSTEM | INSTALL* | 12-MONTHS

HEVASURE HEALTH CHECK

This is a short, 3-month health check to understand prevailing system parameters and conditions. It includes all equipment, installation, dashboard set-up and 24/7 monitoring for 3-months. A detailed health check report in week 14 (graphic format) is provided with a formal assessment of system health. You can choose additional analysis of corrosion rates on different metals, water and microbiological analysis, physical assessment of pipework condition and components and UK-wide site visit(s) to assess aspects of design and quality of build, commissioning and diligence of system management. You can extend the health / move to 12-month support if you wish.

FULL SYSTEM | INSTALL* | 3-MONTHS | ANALYSIS & REPORTING BY US

HEVASURE TRAINING

Half day training on corrosion and closed system management, causation, good practice, limitations of water analysis, BSRIA recommended guidelines, monitoring regimes, what to look out for, top system control management tips and how to control or manage fit-out works and your HVAC systems.

ONE OR MORE DELEGATES AT OUR TRAINING OFFICES OR ON YOUR SITE

* Installation can be done by us or you can elect to retrofit yourself

System features

Feature	
Multiple sensor input digital / analogue *	Included
Data transmitted via GSM network to remote devices (laptops / mobiles)	Yes
SMS / email alerts if readings exceed critical levels	Yes
Graphical view of data over selected time period	Yes
Local display on monitoring station	Yes
Easy to install / plug & Play	Yes
Extendible number of input for digital (Modbus) sensor	Yes
Local storage of data (SD card) for improved data security	Yes
Ability to interface with external systems (e.g. BMS)	Optional extra
Ability to connect to external control systems e.g. auto-dosing systems	Optional extra
Ability to receive data from remote sensors (using LORA technology)	Optional extra
Textual based messaging based on combination of sensor readings	Optional extra
Ability to display derived parameters such as accumulated dissolved oxygen and corrosion	Yes

* Sensors – Dissolved oxygen, Conductivity (related to the inhibitor), temperature, Pressure, pH, Water make-up flow detection, Galvanic current (related to corrosion rate of steel on open surfaces), Crevice corrosion detection of steel and other metals

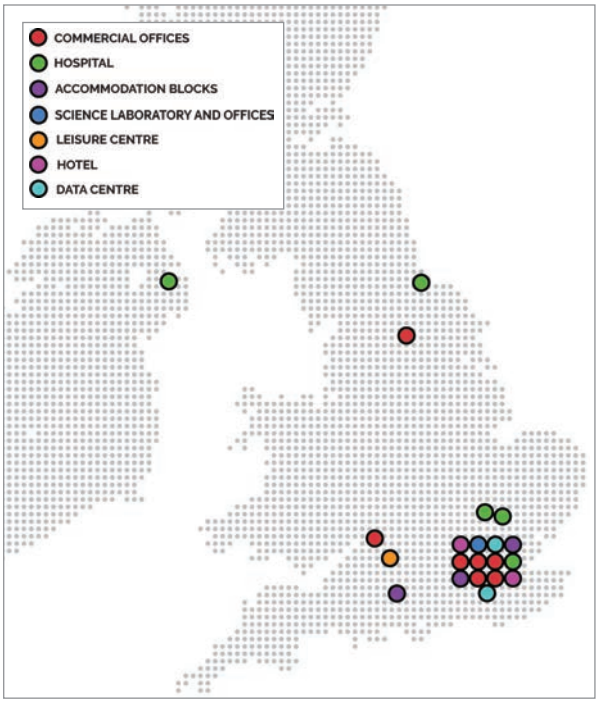
Technical pedigree

Hevasure is a spin-off from one of the UK's leading corrosion consultancies (Midland Corrosion Services) and still maintains very close ties. WCS Group and Guardian Water Treatment has teamed up with Hevasure to combine 20+ years' experience in investigating failures within commercial heating and cooling systems, offering customers deep understanding of the causes of corrosion in real systems.

Hevasure engineers have a background in materials science, electronic manufacturing, sensor development and IT systems project management working with Rolls Royce among others.

Trials of the monitoring system have been carried out in conjunction with Spirotech, Environmental Treatment Concepts, Broadgate Estates, Carillion and in conjunction with University of Derby.

HVAC Services	Pre-commission Cleaning/ Water Treatment/Failure Investigation/Consultancy				
Monitoring Services	Premier	Dashboard	Health Check	Training	
Product	Fully integrated remote monitoring system (hardware/software)				
Collaboration	Midland	WCS/Guardian Water Treatment		University of Derby/ Caption Data Ltd	
Expertise	Corrosion	Water Treatment	HVAC	Data Acquisition	Sensors



Q&A

Is your Closed System unstable?
A 3-month health check service can provide a quick assessment of the prevailing conditions and help identify causes.

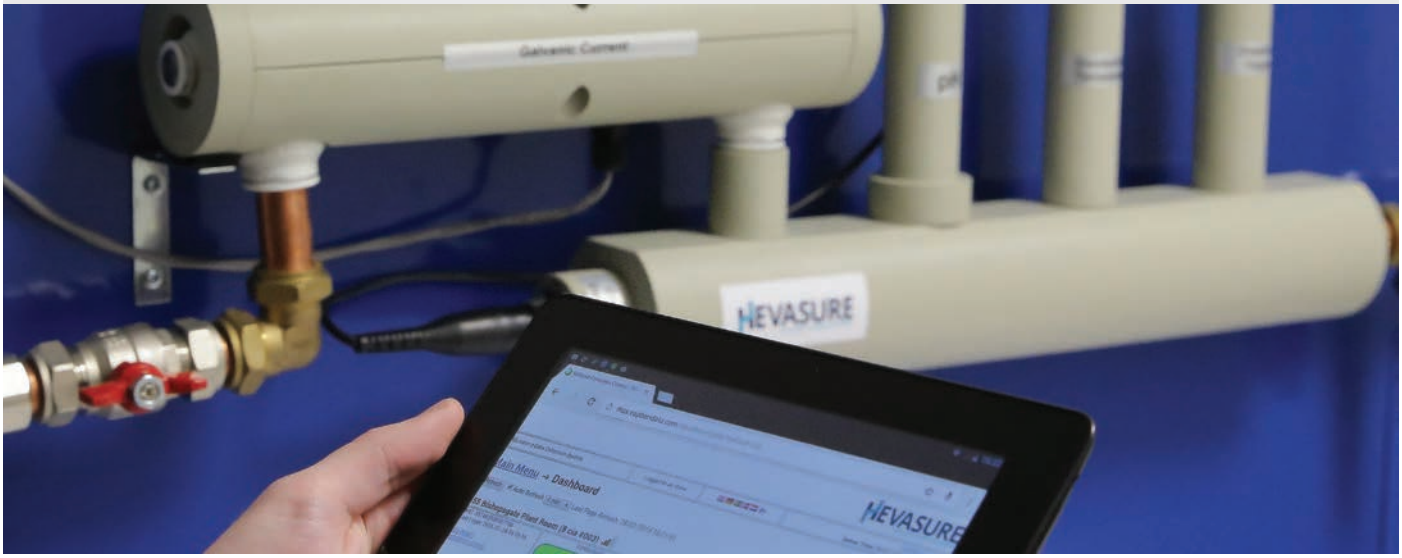
Is there equipment failure?
There could be corrosion, aeration or other problems that require addressing.

Can you demonstrate duty of care?
A monitoring service provides a realtime dashboard designed to demonstrate diligence and compliance. It can also help overcome litigation and reduce insurance premiums.

Is there a drop-off in heat exchange and efficiency?
A 3-month health check service can provide a quick assessment of prevailing conditions and identify causes.

Are you heavily investing / upgrading in critical HVAC assets?
The Hevasure Premium service is a full programme of monitoring, system alerts and prompts that protects assets, reduces risk and equipment failure and enhances compliance – reliably

Do site staff / Contract Managers need a half-day Closed System top-tips fresher training course?
Book a course in Leeds, Derby, Basildon, Swansea or an on-site course for 6+ delegates
(2.5 hour course)



Further reading

A Technical Specification and Installation Guide is available on request.

For more information, a call-back, a demo contact:
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www.wcs-group.co.uk | www.gwtltd.com | www.hevasure.com

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