Preventing corrosion by continuous monitoring

Corrosion is the invisible enemy of water systems. It has few visible symptoms but its consequences are costly in both time and money. Building owners tend to rely on sporadic sampling tests, or only react once the system has failed. It's time to look at advancements in tech and implement methods of prevention, rather than cure, to avoid the expense and inconvenience of corrosion.

Heating technology is advancing all the time. Pumps and boilers are becoming smaller and more efficient. New materials are introduced and applied to components such as pipework and fittings, as well as heat exchangers and valves.

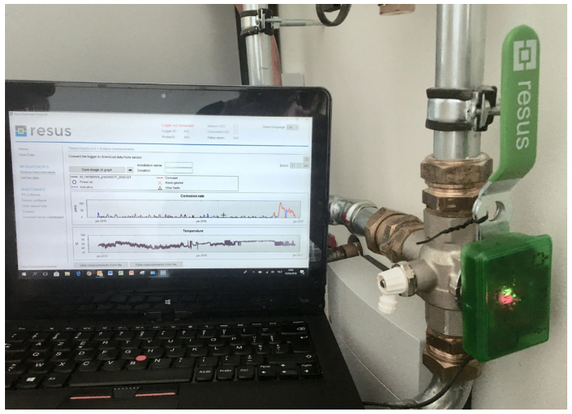
In general, these advances can be seen as a positive. They make systems more energy efficient and allow more space for offices or living accommodation. Yet no progress comes without down sides or without the need to adapt. We must then question whether systems are still as reliable as they used to be, whether they last as long, and if they need more or less maintenance.

Progress means that systems and their components are becoming increasingly more complex, yet skills levels in the industry are dropping. As a result, systems often don't operate anywhere near their designed efficiency. They suffer frequent breakdowns and, like modern cars, can only be fixed by experts.

One thing is certain, modern heating and cooling systems need high quality, clean water as a means to transfer energy efficiently. Even relative small amounts of dirt or sludge can cause costly breakdowns. It is then no coincidence that dirt separators of all kinds have proliferated in recent years. Whether fine mesh or bag filters, in line, side stream or with magnets, they are all designed to do one thing – keep the water clean.

Insurance companies have been seeing a massive increase in claims for water loss and boiler and pump manufacturers have been receiving more and more warranty claims. Most, if not all, of these issues can be traced back to corrosion problems. Corrosion is often not recognised as the cause for system problems, which leads to people fighting the visible symptoms and not the cause. Even if it is recognised to be corrosion, the response is all too often a chemical one, which still fails to tackle the underlying cause.

By the time the problems have become visible, through failing components or blockages, costs will be spiralling. What is needed is an early warning system – something that will send a warning if corrosion levels are increasing to the point where it is damaging the system.



Traditional methods of testing for corrosion are the use of corrosion coupons or analysis of water samples. A key problem with these methods is that they only give an indication as to what the current state of the water is. The **real** problem is that they rarely get done at all.

Wouldn't it make sense, therefore, to have an online system that continuously measures corrosion rates, without the need for coupons or samples?

Until recently, equipment to measure corrosion, such as the LPR method, was prohibitively expensive for HVAC systems. Indirect measurements, such as pH or conductivity, have been possible for some time, but require specific expertise in order to evaluate the results.

Fortunately, like heating technology, sensor technology has advanced rapidly and a number of affordable corrosion monitoring systems are now available.

These systems can be split into 2 categories: direct and indirect measurement. The indirect systems measure water quality parameters such as pH and conductivity, whereas the direct monitors measure corrosion directly, using a single sensor, and are therefore much more cost effective.

The patented Risycor uses an electronic version of the proven coupon method. The advantage of this direct method is that only one type of sensor is required.

A major advantage of monitoring systems is that they don't just measure, but also record corrosion levels during the lifetime of the plant. Most of these systems also have the ability to send an alarm when corrosion rates exceed safe levels, or even have remote viewing functions.

These alarms give operators and FM companies plenty of time to check, locate and remedy the causes of the increased corrosion levels before they do any costly damage to the system. This goes even for systems with thin wall carbon steel pipework for which corrosion monitoring is a must *….for routine maintenance and correcting simpler problems a smart system could definitely have its advantages'.*

For more detailed information about preventing corrosion by continuous monitoring, contact Gordon Pringle of HASL and ask for the CIBSE approved CPD. ■