

CLOSED SYSTEM WATER TREATMENT

Protection of water quality in closed heating or cooling systems requires more than dosing with inhibitor chemicals

INSTALLATION AND MAINTENANCE SURVEY

Before starting a water treatment programme, a survey of the installation will identify design characteristics that will determine treatment, analytical parameters and the maintenance schedule. The survey will also point to shortcomings in the installation that may indicate areas of remediation before a treatment programme can be fully effective. Materials of construction, deadlegs, areas of stagnant flow and operating characteristics (for example, summer shut down) are important elements to consider before implementation of chemical treatment and analysis.

CORROSION CONTROL

A corrosion inhibitor programme is designed to protect all the metals in the system. Caution needs to be taken that certain metals, for example aluminium used in some boilers, are compatible with the chemical treatment recommended. Once dosed, regular monitoring of inhibitor levels is required to maintain protection. Low chemical levels can, in some instances, promote pitting corrosion. Chemicals can be dosed through a dosing pot (see picture below), by injection or through the feed water make up unit.



REDUCING BIOFOULING AND BIOFILMS

The growth of micro-organisms in pipework and on heat exchange surfaces can lead to the formation of biofilms which set up patterns of corrosion with a closed system. pH, temperature, stagnation and system materials are factors contributing to the proliferation of, for instance, sulphate and nitrite reducing bacteria, also known as SRB and NRB. Where

these are detected or biofouling is suspected, the use of biocides may be necessary as part of the treatment programme.

PREVENTING SEDIMENTATION

The formation and deposit of debris at points of low flow or in pockets within the system can promote corrosion, erosion or, in extreme cases, clogging and reduction in flow. This can be addressed by maintaining system velocities and, where necessary, removal of loose material from the system with filters. Filtration may be with strainers, dirt separators, magnetic filtration or hydro-cyclones.

MONITORING THE WATER TREATMENT PROGRAMME

Regular sampling and analysis of circulating water will identify system changes and any need to adjust treatment or make changes to system operation. Checking chemical parameters will confirm that the treatment is achieving the required results or alert the responsible person to problems that may be developing in the system. Remedial action can be taken accordingly, or more in-depth investigations carried out. Microbiological monitoring is required where bacterial growth is a possibility.

FURTHER INFORMATION

Water Treatment for Closed Heating & Cooling Systems - BSRIA BG 50/2013

Pre-Commission Cleaning of Pipework Systems - BSRIA BG 29/2012