

# WATERWIDE

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## Special points of interest:

- Policy at WATERWIDE has always been to deliver the best possible service at an affordable cost.
- WATERWIDE takes pride in looking after our smallest clients with the same degree of interest and integrity as we do our largest customers.
- WATERWIDE'S site reports are produced from a laptop computer and portable printer thus ensuring professional presentation.

## THE RISK ASSOCIATED WITH SPRAY IN COOLING TOWERS

The monitoring and control of Cooling Water Systems which incorporate an evaporative cooling tower fall under the HSC's ACOP guidance document HSC—L8.

This document covers the management and control measures required to be put in place in order to demonstrate control of Legionella bacteria.

Legionella bacteria are the micro-organisms responsible for Legionnaires disease, a pneumonia like illness which is carried in water and transmitted by air.

Effective means of preventing this aerosol leaving the confines of the cooling tower are therefore essential if the risks associated with the carrying of bacteria in the aerosol are to be minimised.

A typical cooling tower system has some form of drawing air over a cascading flow of water. Design therefore, has to allow unimpeded cool air in to the tower and warm, water vapour saturated air out of the tower, WITHOUT allowing the release of physical water droplets into the environment.



In order for susceptible people to contract the disease, the bacteria must be inhaled into the lungs, which when carried in water is most often achieved by means of atomised water droplets.

Many types of cooling water systems have the capability to produce atomised water and indeed many achieve cooling by way of atomising water as a feature of the tower design.

High efficiency drift eliminators are now commonly used in the head and/or sides of the tower. These are generally 'S' profiled moulded plastic strips which force the expelled air to turn abruptly causing the heavier water droplets to hit the 'S' bend and fall back into the system.

As a means of Risk Reduction, the HSE place great emphasis on ensuring drift eliminators are both in good repair and correctly fitted.

## INEXPENSIVE WATER SOFTENER MONITORING

Water softeners are used both in domestic and industrial situations. The use of a water softener is to remove calcium and magnesium scale forming ions and exchange them for non scaling sodium ions. Hence water softeners are sometimes referred to as base exchange units.

Soft water can be easily tested for with the use of a simple colour change tablet. A small sample of water is taken and one tablet introduced. If the water turns green, then the water is soft. If the water turns red, then the water is hard.

As a consequence of this red/ green result, the tablets used in the test are sometimes referred to as Yes / No tablets or Stop / Go tablets for obvious reasons.



WATERWIDE can supply a complete test for evaluating hardness, which will also allow a moderate degree of definition on how hard (or soft) a water is. Similarly, we can provide replacement test

tablets for most type of Yes/No—Stop/Go kits.

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*Working Water Harder!*

WATERWIDE is a National water treatment company supplying products and services to industrial and municipal water users.

Working throughout the UK, we design our own water treatment programs within the confines of current legislation. HSC—L8 is the guidance used from the HSE for programs where water is used for open evaporative or spray cooling and is also used to provide programs for hot and cold down water services.

On the steam raising side of the business, land boilers are maintained in strict accordance with the parameters laid down in BS2486 and again, programs are tailored and bespoke to the clients needs.

Effluent treatment is also catered for where we supply a free consultancy service, together with products and services to ensure our clients maintain a satisfactory effluent discharge compliance.

Our monitoring and reporting systems are well established and provide graphical information on critical parameters concerning the plant.

In all, we aim to provide a superior technical service at a reasonable cost.

**If you have any questions or comments regarding water related topics, please telephone, fax or e-mail us.**

## BIOFILM

A biofilm is a complex mass of organic and inorganic material resulting from the infestation, colonisation and development of bacteria in a system. In its early stages, the biofilm is predominantly organic, being a produce of adherent sessile bacteria. The bacteria produce a polysaccharide coating which acts as a protective sheath around the bacterial cells wall. In numbers, this sheath manifests itself as a slimy material which can cause operational problems such as physical blockages of pipework and reduced heat transfer.

The slimy nature of the deposit lends itself to attracting other types of material such as inorganics like sand, water salts and other particulates. Thus within a relatively short period of time, the once 'pure' polysaccharide material, becomes a homogenous mix of accumulated debris which serves to both protect the further developing bacterial cells and also provide a source of nutrient.

As time passes, so the inner most areas of the biofilm can become devoid of oxygen resulting in anaerobic conditions being set up in the biofilm.

This has the result of killing off some of the bacteria which were involved in the initial formation of the biofilm, and also allowing new anaerobic tolerant bacteria to take over and develop.

One particularly troublesome type of anaerobic bacteria are termed Sulphate Reducing Bacteria (SRB's) which, as the name suggests, utilise the reduction of the Sulphate molecule as a means of metabolism. This causes significant problems in localised areas through pin hole corrosion, a direct result of the action of active sulphide being produced as a bye product of metabolism. This sulphide then reacts with water to produce a very corrosive liquor based on Hydrogen sulphide gas and/or Iron to produce Iron Sulphide.



**Pin Hole Corrosion as a result of anaerobic bacterial activity**