The Industrial Water Treatment Specialists

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WATERWIDE

INSIDE THIS ISSUE:

In Brief

- WATERWIDE's 1st quarter sales this year are up on the same sales quarter of last year.
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- All of WATERWIDE's field service personnel are equipped with lap top computers and portable printers for the production of professional, readable and detailed on site Technical Service Reports
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- WATERWIDE's colour brochure outlining products and services is currently being designed.
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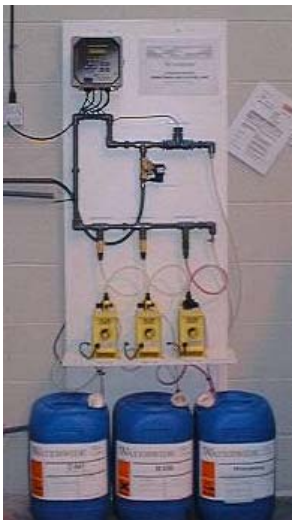
- WATERWIDE can be contacted by e-mail, at :
- enquires@waterwide.co.uk

BIOCIDE PRODUCT DIRECTIVE

European legislation is set to hit water treatment industry in a big way over the next few years which will almost certainly result in the cost of microbiocides to the end user increasing.

In a bid to unify microbiocide type products throughout Europe, such that biocides sold in the UK can be just as easily sold in another member state, a Biocide Products Directive is formally launched on 14th May 2000

First targeted will be the primary manufactures of the active ingredients or compounds. The cost of registration of actives could run into £millions, the cost of which will certainly be passed on down the line. Such is thought to be the cost impact of registration that many biocides currently used will become obsolete as raw material manufacturers fail to produce the data required to satisfy the registration criterion.



Will biocide choices become limited?
A WATERWIDE water treatment control station

In reality, this could still be a few years off as the collation of the basic raw materials to be evaluated is still, we understand, being assembled. At present, there are already 1500 materials on the list. How, when and where prioritisation will take place to assess the actives is still being discussed. It is envisaged that each member state will take on a scheduled work load of activities, carry out the assessment of compliance relative to the stated criteria and enter details of compliance on to a master list. It looks as though, having gained registration, that.....

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PRESTIGIOUS NEW CONTRACT

WATERWIDE have won a significant cooling and boiler water treatment contract with a large London Hospital.

Called in initially to determine the root cause of ammonia in the boiler steam supply, WATERWIDE undertook a six week investigation of the boiler plant culminating in the proof of intermittent ammonia at low levels coming in with the mains water supply.

Having sorted this problem out, thoughts turned to the cooling system on site which required upgrading in terms of equipment and monitoring. WATERWIDE have supplied two new state of the art microprocessor controllers and associated chemical dosing sets which will help the site fully conform to the requirements of the current HS(G)70 recommendations and the soon to be issued revision document.

PRE-TREATMENT FAILURE

The practice of base exchange softening the make up for cooling towers in hard water areas, is now common practice, especially on small/ medium sized plant. As a result, the water treatment will be geared to minimising corrosion of the pipework from the aggressive soft water supply.

Where the softener fails to supply good quality soft water for what ever reason, the high ingress of hardness salts can seriously affect the cooling water treatment program. Most programs today are designed to cope with minor hardness slippage, but prolonged feeding of hard water can lead to serious fouling of the cooling tower packing. The result is often a scaled or as in the case of the photo, a severely sludged up pack. The sludge or scale is generally predominantly calcium carbonate and it is in this environment that bacteria and other troublesome micro organisms can find an ideal location in which to develop.

A calcium carbonate / biofilm deposit on the inside of a cooling tower pack

From here, these bacteria, effectively protected by the sludge's from any biocide regime, can be leached out into the bulk water giving rise to intermittently high counts during low biocide concentration. The result through monitoring appears as high dip slide counts and evidence of poor control, which is exactly what it is.

THE TERSE HISTORY OF WATER SOFTENING

Thompson & Way, two Englishmen in 1850, first investigated ion exchange as a scientific principal. They reported that when they passed a fertiliser solution through a column of soil, calcium was replaced by ammonia.

It was not until 1905 that a German chemist, Gans, applied ion exchange to softening (replacing calcium and magnesium ions with sodium ions).

The media most commonly used for softening up to the 1930's were zeolite type materials. These were closely followed by Greensand which was more suitable for industrial use, although having lower exchange capacity.

In 1935 Sulphonated coal was developed as an ion exchanger which also had the ability of reducing the alkalinity of a water as well as the hardness.

Modern softening is now based on synthetic media of a polystyrene divinylbenzene matrix, to which functional groups are attached. This allows for very specific ion

WATERWIDE supply a range of water softening plant

BIOCIDE PRODUCT DIRECTIVE CONT

Biocide formulators (water treatment companies) may then have to register their own products (again at a cost) for inclusion.

There are currently 23 product groups identified within the proposed directory of which group 11 covers process and cooling water biocides.

The scale of the implications for unifying biocides in member states such that the same toxicological, ecological, physiological data etc is available on all raw materials and formulated products will be enormous. The likelihood is, that only the very large manufacturers will be able to cover the cost of providing this data or that only one or two actives will be put through the criterion. As a result, the number of active materials available will almost certainly significantly decrease.

The likely consequence of this is that there will be less biocide actives to choose from, and hence less choice to formulators in the market place. Those actives that are available will almost certainly end up being part of far simpler formulations than those currently available, where formulators rely heavily of manufacturing data for compliance. This in turn may lead to additional adjunct type products being sold in their own right.

TECHNICAL FORUM
IRON IN THE CONDENSATE RETURN

Returning condensate to a hot well on a steam raising boiler plant is seen as one of the most efficient ways of minimising energy losses from such a plant.

Good quality condensate from good quality steam condenses providing high quality hot make up to the feed tank This minimises the requirement of fresh, often cold soft water supply.

Being hot, also minimises the amount of dissolved oxygen present in the feed water thus in turn, minimising the amount of oxygen scavenger required to remove traces of oxygen from the feed water. This then (in the case of sulphite type oxygen scavengers) helps to minimise the loading of the TDS of the boiler and maximise the alkalinity.

But good quality condensate can result in its own problems. The pH will typically be very low, ~ <7.0. This is due to the presence of carbon dioxide in the steam forming a dilute carbonic acid in the condensing condensate. Acidic condensate readily picks up iron from pipework and fittings resulting in a feed water to the hot well which often contains a few ppm of dissolved iron. This may not be readily noticed at the time but on entering the boiler by way of the feed water, the alkalinity of the boiler will quickly precipitate the dissolved iron as a hydrated iron oxide in the boiler shell. This can be noted from the bright red/brown cloudy colouration of the boiler water. It will quickly cover the heat transfer surfaces resulting in an adherent iron oxide scale which can seriously affect heat transfer and increase the potential for under deposit corrosion within the boiler.

To remedy this, condensate line inhibitors are often used to either elevate the pH or physically lay down a barrier on the internals of the pipework to minimise the affect of the acidic condensate. Some plants however cannot risk the use of such treatments. Hospitals, Textile industries and food factories are typical of this group. Such establishments have to look at alternative means of minimising corrosion in their condensate lines.

Two main options are available.

Stainless steel return lines in place of mild steel will help alleviate the problem of iron in the condensate.

Installation of a dealkalisation/degassing plant will remove the carbonates and bicarbonates from the make up water which in turn will prevent them from breaking down forming carbon dioxide in the first place

Either way is costly but is certainly cheaper than descaling or retubing a failed boiler, with all the down time, lost productivity and aggravation caused. *(All True)*

"Good quality condensate can result in its own problems"

MONEY DOWN THE DRAIN

NEXT ISSUE :

The Technical Forum looks at the benefits of running a clean steam raising boiler plant from an energy efficiency view point. Three areas of importance are considered.

Proper water treatment to minimise scale deposition.

Minimising boiler water blowdown.

Installing heat recovery equipment..

Each area is covered briefly with a focus on making tangible and quantifiable savings through improved control . A simple rule of thumb method of calculating pay back and future savings , through the installation of a waste heat recovery system is also covered.

PROTECTION OF COPPER

Copper is a commonly used material in the fabrication of heating and chilled water systems in buildings. Protecting copper from corrosion is an essential part of any inhibitor program. Most commonly incorporated into a chemical inhibitor formulation is an active ingredient based on 'azole' chemistry. Usually this is in the form of either Benzotriazole or Tolyltriazole. Benzotriazole reacts with the copper to form a multi molecular layered azole-copper complex. This forms a protective barrier between water and metal, but is a some what 'spongy film'. As a result, the barrier can be easily damaged by suspended solids in the water or oxidising agents such as chlorine. The Tolyltriazole-copper complex however is a more adherent and mono molecular barrier. As a result, the protective film is more resistant to damage and oxidising agents, the disadvantage being, that once broken, the film takes longer to repair.

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Working water harder!.

WATERWIDE

TEST YOUR WATER TREATMENT KNOWLEDGE

1 The total dissolved solids content of a water can be estimated from the conductivity?
TRUE/FALSE

2 Cold water holds more dissolved oxygen than hot water?
TRUE/FALSE

3 Benzotriazole is an active compound used in minimising copper corrosion?
TRUE/FALSE

4 Soft water is more aggressive (corrosive) than hard water?
TRUE/FALSE

5 Potatoes were once used in steam raising boilers as a method of sludge conditioning?
TRUE/FALSE

6 As calcium carbonate scale precipitates, the alkalinity of the water drops?
TRUE/FALSE

7 Most types of bacteria cannot become resistant to chlorine?
TRUE/FALSE

8 The bacteria responsible for Legionnaires Disease was only isolated in the mid 1970's
TRUE/FALSE

(How did you do ? …… For answers see end of text in Technical Forum Page 3)

STORED WATER TANK DESIGN

Water storage tanks used for down water services need to comply to the water supply byelaws. These byelaws give detailed guidance on the design and safety features required in order to maintain the supply in a satisfactory condition. Some basic points to consider are;

A well insulated water storage tank.

Tank Lid ~ Must be tight fitting with an air vent which prevents vermin ingress. This material must be impervious and not shatter if broken. The lid must either allow direct access to the tank by removal, or via a suitable sealed hatch.

Tank fabric ~ Must be made of non pervious material which does not support microbiological growth.

Tank internals ~ Must be free from rust, sediment and debris. Should be coated where necessary with impervious material.

Insulated ~ To minimise heat gain .

Valve arrangement ~ Must have water inlet valve that complies to a type 'A' air gap.

Warning AND overflow pipes ~ Should be installed with insect prevention devices.

Temperature ~ Water should be maintained at a temperature below 20°C at all times.

Inspection ~ The internals of the tank must be readily inspected.

Servicing ~ The float, valve or other device for controlling the in flow of water to the tank must be readily serviceable.

Head Room ~ The top of the tank should be at least 350 mm from any ceiling/overhead obstruction.

Overflow ~ The inlet valve should close before the water height is less than 25mm from the overflow pipe.

Water off take from the tank should be opposite the inlet of the tank to ensure proper flow through the tank.

Tank size should be such that the water contents are turned over at least once during a 24 hour period. Reduce the tank size if it does-