Recommendations by the Quality Task Group (26) Water for Operating Washer-Disinfectors (Part 2)

Other Salts

The drinking water may contain yet other salts depending on its source. The total salt content can be determined by analysing the drinking water. Often this content is 500 mg/litre water. When the water evaporates, e.g. when the instruments dry in the washer-disinfector or in the air, the salts and any other non-volatile compounds will remain on the instruments. Depending on their substrate and quantity, they are manifest more or less clearly as striae, streaks or curls and give the impression that the instruments are not clean.

For this reason, too, it is recommended that demineralised water be used for at least the last rinse water.

In addition to the ion exchanger system described above, ➜ **SALTS** can also be removed by a reverse osmosis system. In this system the low-salt water must be kept in stock and when planning such a water-treatment system provision must be made for adequate stocks. This system, too, must be maintained, in accordance with the manufacturer's instructions.

➜ **DEMINERALISED WATER** is produced by exchange of cations and anions or by reverse osmosis.

Silicic Acid and Silicon Oxide

Silicic acid (silicon oxide = SiO_2) may also be present in drinking water. In practice it has been noted that the SiO_2 content increases just before the capacity of the exchanger system is exhausted, and this cannot be impeded by the exchange resins. This phenomenon is known as "silicic acid slippage".

A higher ➜ **SILICIC ACID** content in the last hot rinse water can result in glasslike deposits inside the machine and on the instruments. These are mainly a bluish iridescent discoloration, and occasionally give rise to rainbow colours through the layers of different thickness. While these bluish glasslike deposits do not pose a hygiene risk, they are often classified as blemishes or defective cleaning.

➜ **SILICIC ACID** can cause multicoloured, glasslike deposits.

Since silicon oxide does not dissociate, i.e. forms no salt, nor is it endowed with conductivity. Hence a conductometer will not be able to signal the presence of a high silicon oxide content. Conductivity increases only when the capacity for salt exchange has been exhausted. Once this conductivity value is reached, regeneration must be effected or the system will automatically switch to the second system.

To prevent silicic acid "slippage", switching over the system at an earlier stage, and regenerating, has proved useful. To this effect, the water consumption must be regulated via a water meter until the time of premature switchover. The system must be constantly monitored.

This problem does not occur when demineralised water is produced by a reverse osmosis system. But this system, too, must be maintained in accordance with the manufacturer's instructions.

Metal Compounds

This group consists of hydroxides, oxides and salts of metals such as iron, copper, manganese, zinc, etc.

The most common problems stem from iron oxide = rust.

Iron can be present as a component of drinking water up to 0.2 mg/l. The iron (II) compounds, which are water soluble, undergo oxidation when they come into contact with oxygen, thus forming iron (III) hydroxide and then iron (III) oxide = rust.

But the iron compounds or rust can also originate from old and damaged water pipes and can be sporadically carried into the machine as particles.

Rust can also occur as extraneous rust if steel instruments, e.g. scalpels, are inadvertently placed in the washer-disinfector and processed together with rustproof instruments; they can thus give rise to secondary rust, i.e. the rust can be transferred

to other stainless steel instruments. ➜**RUST** can destroy stainless steel instruments and must therefore be removed immediately after it has occurred. This can be done for example by placing the instruments in a solution of an appropriate instrument detergent (basic detergent).If the rust has come from the pipes, the only solution is to provide for a new pipe connection to the washer-disinfector.

Often new stainless steel instruments do not have an adequate "passive layer" and can also show slight rust deposits if they have not been put through the prescribed instrument circuit. The manufacturers therefore recommend that new instruments be put through the entire reprocessing cycle once or repeatedly so that they can acquire a thicker passive layer.

In principle, provision must be made for adequate capacity when planning water-treatment systems. The systems must be technically maintained. Attention must be paid to timely intervention in the systems to ensure that enough softened or demineralised water is available.

For more information:

AKI Brochure "Proper Maintenance of Instruments". www.a-k-i.org

➜ **THE OCCURENCE OF RUST** is dangerous. It can lead to destruction of stainless steel instruments.

Fig. 1: Colourful tarnish – opalescent silicate coatings*

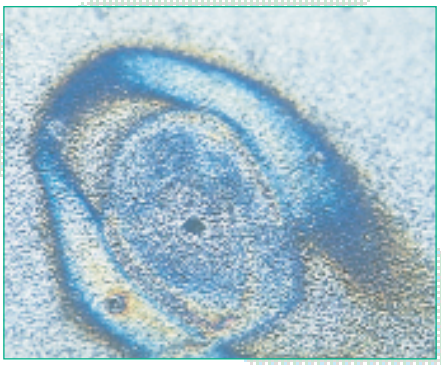

Fig. 2: Pitting corrosion on a chisel* (magnified section; see also Part 1 of this Recommendation, issue 6/2002 of *Central Service*)

* *Figures reprinted with permission from the AKI brochure "Proper Maintenance of Instruments", 7th edition 1999)*