Alkalinity or hardness? Why not measure both? Is that possible?

Cooling cycles can be affected by a variety of influences. Variable raw water quality, the specific cooling water conditioning, plus the subsequent use of the cooling water each present their own challenges. In all of these instances, however, too high a degree of hardness can lead to deposits in the heat exchangers, which then results in reduced cooling performance. If the buffer capacity is too low, this also has a negative impact. It causes the carbonate equilibrium to worsen, leading to the formation of carbonic acid, which has a corrosive effect on the metal pipes.

Challenges in the cooling cycle

Time

The process for monitoring the cooling water quality may vary depending on the design of the cooling cycle, the area of application and the size of the company, but in general it is carried out via manual sampling. Manual sampling and analysis can be rather time consuming, especially when dealing with varying quality and composition of the cooling water, meaning there is less time for other important tasks.

Safety

Optimally adjusting the levels of alkalinity and hardness prevents the cooling water from increasing in salinity. However, continuous conductivity measurement to show the level of salinity is often not sufficient to reliably analyse the buffer capacity of the cooling water.

- If the degree of hardness is too high, it can lead to deposits in the heat exchangers, reducing the cycle's cooling performance as a result.
- If the buffer capacity is too low, it worsens the carbonate equilibrium. This leads to the formation of corrosive carbonic acid, which has a damaging effect on metal pipes.
- Deposits and corrosion can cause essential system parts to fail, and repairing these parts may require a considerable amount of effort.

Optimisation

Directly measuring alkalinity and hardness has two decisive advantages:

- Real-time measurement results allow cooling water cycles to function under optimal conditions, thus preventing damage to system parts.
- Measuring both parameters in a single measuring system reduces the amount of installation, training and maintenance that is required.

EZ4000 and EZ5000 Analysers for Alkalinity and Hardness

EZ4000 Single-parameter Titrators
EZ4003 Free Alkalinity
EZ4004 Total Alkalinity
EZ4041 Total Hardness
EZ4043 Total Hardness (low measuring range)
EZ4044 Calcium Hardness

EZ4000 Single-parameter Titrator

EZ5000 Multi-parameter Titrators
EZ5001 Total Alkalinity & Free Alkalinity
EZ5002 Total Hardness & Calcium Hardness
EZ5003 Total Hardness & Free Alkalinity
EZ5004 Total Hardness & Total Alkalinity
EZ5005 Total Hardness & Total Alkalinity & frei Alkalinity
EZ5006 Total Hardness & Calcium Hardness & Total Alkalinity & Free Alkalinity

EZ5000 Multi-parameter Titrator

Options include:

- Multiple stream analysis (1-8 streams) reducing cost per sampling point
- Analogue and/or digital outputs for communication

Detailed information on the analysers – such as methods, measuring ranges etc. – can be found on the respective data sheet and on our website.

Other options for cooling water monitoring in the laboratory or in the field

AT1000 Laboratory titrator

SL1000 Portable Parallel Analyser

DRxxxx Photometer

You want to measure these or other parameters? Our application experts will support you in finding the best solution for your specific situation. Just contact us via phone, e-mail or the website.

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