

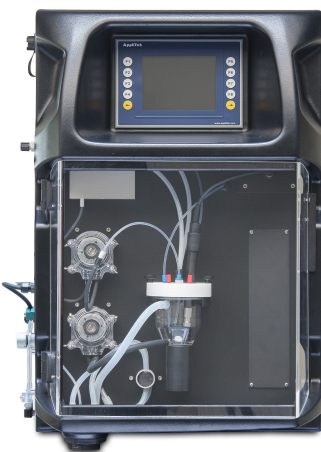
Determination of Critical Chemical Parameters in Industrial Steam Boilers Using the SulPhos® On-line Water Analyzer

Treatment and management of boiler water is for many companies a relatively small area of operation. Yet at the same time it is of such critical importance that overall operations may cease if boilers are not operated adequately. Therefore a properly managed boiler chemistry program should be part of clear maintenance and supervision procedures in order to control and enhance the operational performance of the boiler, regardless of size and output. **SulPhos®** provides operators of small to mid scale steam boilers an objective and measurable basis to control and adjust boiler chemistry. Levels of active components of sodium sulphite / metabisulphite and sodium phosphate are monitored in real-time, resulting in reduced risk of failures and a significant reduction in chemicals and costs related to energy and water.

Aim: monitor and control critical boiler chemistry

Water naturally contains various levels of contaminants, minerals and dissolved gases which cause major operational problems and damage to boilers if they are not removed or controlled on a continuous basis. Boiler operators are familiar with various water demineralization techniques such as reverse osmosis, water softening and ion-exchange. All these technologies involve some kind of a mechanical pretreatment resulting in a constant supply of high purity feed water to the boiler. Being of equal importance as the external mechanical treatment, chemical treatment of the actual boiler water is a *conditio sine qua non* for reliable boiler operation. Inadequate control of oxygen levels, for example, is a major source of failure due to uncontrolled corrosion. Calcium and magnesium hardness, leading to the well-known phenomenon of scaling, is another culprit of boiler failure and results either from improper demineralization or concentration effects.

Conventional boiler chemistry programs often have a trial-and-error approach where chemicals are dosed without knowing the exact effects of dosing. As a result, under or overdosing is all but too common in conventional maintenance programs. In the case of dissolved oxygen, mistakes can be made in the mechanical removal of oxygen (by deaeration) or the chemical scavenging. Another common practice is that grab samples are taken (either by external companies offering support services) to measure levels of scavengers and active chemical components. Due to the lack of data in between these discrete points it will be unlikely for an operator to know what is happening exactly with the chemistry of the boiler water.



The SulPhos® approach: from reactive to proactive

The **SulPhos®** On-line Water Analyzer serves as an analytical tool in a proactive, properly managed boiler chemistry program allowing companies to focus on their core activities, while protecting at the same time their production assets. Developed on the mainframe of AppliTek's state of the art **TitriLyzer®** Series, the **SulPhos®** provides boiler operators the following advantages:

- **Continuous, automatic, on-line monitoring** of the critical parameters SO_3 , PO_4 as well as conductivity in order to control boiler chemistry and chemical feed;
- **Objective, measurable basis** for process settings or adjustments resulting in improved protection against scaling and corrosion, the major causes of failure and down-time;
- **Peace of mind** by an efficiently managed steam boiler allowing to cut back on operational costs (water, energy, chemicals) without cutting back on overall performance;
- Last but not least, the analyzer data can be communicated to a **secure web portal** where customers or external service providers can visualize the results in function of time.

Typical target industries

The **SulPhos®** On-line Water Analyzer can be implemented in small to mid scale steam boilers with typical operational pressures below 70 bar (1000 psi): agro and food processing industry, pulp & paper industry, smaller chemical plants or heat recovery steam generators in various manufacturing plants.