

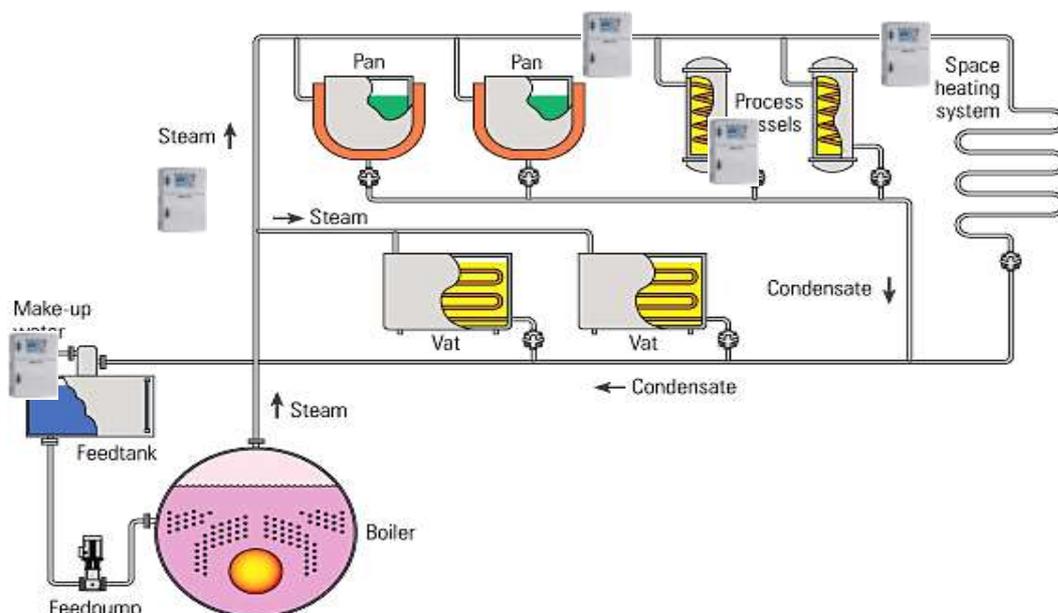
## BioTector TOC analyser meets tough demands of Oil in Water (OIW) and Hydrocarbons (HC) applications in Oil & Gas and Refinery industries

As known for many years, Crude oil refinement is a very energy intensive process. Steam and hot water are of big concern for processing. Its contamination leads to corrosion in e.g. pipes, boilers and heat exchangers. Reliable monitoring of these could lead to enormous cost savings. Therefore, Oil in Water (OIW) analyser are required and in this case a TOC analyser is an excellent choice.

The BioTector TOC analyser measures TOC and VOC. Though, but as "Oil" is part of the total TOC or VOC measurement we cannot discriminate between dissolved oil or hydrocarbon and the free floating (droplets) of oils or hydrocarbons in the water. Our BioTector TOC will measure both the dissolved and free (oils) hydrocarbons, and thus OIW is defined as a subset of TOC. Even though this, TOC can be found as a very suitable replacement for oil & grease in water.



Reliable, dependable and trustworthy TOC measurements are very important, because the production of steam and hot water is vital for the operation of many types of installations and facilities in crude oil refinement. High pressure steam is used for generating electrical power, for driving turbines, utility pumps and for process heating. Medium pressure steam is typically used for heat transfer to refinery products via heat exchangers and the low pressure steam is used for a variety of purposes e.g. pipe tracing, process heat exchange and deaerators. Although, the temperature of the steam continues to decrease and it becomes hot condensate, it still contains a lot of energy and remains very valuable. Significant cost savings can be attained through the reuse of the so-called "Return



Condensate” or “Steam Condensate”. However, the purity of this Return Condensate is of vital importance and should be monitored by an on-line TOC analyser that measures any oil type in a range from 10 ppb to over 100 ppm together with organics that do not belong to oil groups.



At Oil & Gas and Refinery industries, the alarm thresholds are typically found to be about forty times cleaner than drinking water (~100 to 1,000 ppb range). Therefore, the analytical field performance and reliability of the TOC analyser must be excellent and correspond to the tough demands of the industry regarding accuracy/precision, stability and Up-Time. The well proven and patented Two Stage Advanced Oxidation (TSAO) technology of the BioTector On-Line TOC analyzer are found to be a perfect choice for this application. This TSAO technology is MCert. Certified with an Up-Time of 99.86%, was awarded with a Product Leadership Award by Frost & Sullivan, and has shown excellent Field Performance in International Field tests and shown best Instrument Performance in Lab. conformity analysis.

This TSAO BioTector technology provides complete oxidation of large (representative) volume samples (several ml's) and has an unsurpassed Self-Cleaning Technology to overcome drift or accumulation of pollutions. There's also no need for delicate sampling systems, incl. filtrations; while the internal 3.2 mm internal diameter, creates ability of handling particulates up to 2 mm. No sample or matrix interference, like Salts (up to 30%), Calcium (up to ~12-15%), pH-swings (~1-12), Sulfur compounds, etc., have impact on the final measurement. The well-designed BioTector On-Line TOC analyzers are built to survive and made to measure, and thus constructed out of reliable and robust chemical inert materials, allowing durability to withstand all sort of harsh environments and sample matrices! This way real and true quantitative and qualitative TOC measurements and thus OIW analysis can be achieved 24/7.

Hence, using the BioTector TSAO technology analysers, the operators can rely on the results and do no longer have to divert expensive Condensates to drain and thus tremendous cost savings can be achieved; which will lead to an overall increased plant performance.