Oil in Water Monitor Method Comparison

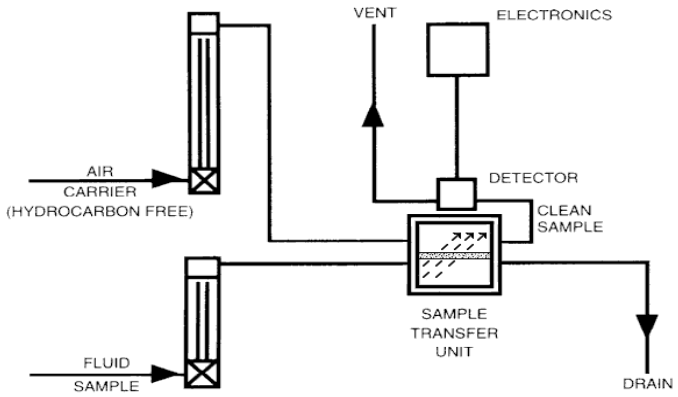
U.V. Fluorescence vs. the Model 204 with Sample Transfer Stripper™

Potential problems exist with UV Fluorescence technology when quantifying oil or hydrocarbon (VOC) in water compared to the Model 204 with Sample Transfer Stripper (exclusive Membrane Technology). It is important to understand the principles behind the two methods.

In the case of the UV Fluorescence method, hydrocarbons and volatile organic compounds (VOCs), after being excited by UV light, give off unique wave lengths of frequencies with an appearance of a glow. Each unique frequency is received by a photocell for computing. Unfortunately, undesirable compounds other than oil molecules and hydrocarbons (VOC) are fluoresced. Contamination in water, called turbidity, includes liquids and solids (clay, wood, dirt, plankton, algae, bacteria, etc.) which are difficult to filter completely and effectively. Clay particles can even pass through a one micron filter. VOCs containing aromatic and carbonyl compounds are also good absorbents of UV light. Inorganic materials and gases will absorb giving erroneous results as well. Straight chain VOCs and aliphatic compounds typically will not respond with the UV Fluorescence methods, causing undervalued readings.

Optional filters are used in an attempt to correct the problem of interference but produce little results. Filtering also results in 'scrubbing' of critical oil components that need to be quantified. A large surface sensing area of the sample is used in attempt to increase accuracy, but this does not correct the problems associated with turbidity. Oil hydrocarbons may still hide behind solids and evade measurement. This results in inaccurate readings. In addition, selective light filtering techniques, which use specific wavelengths, are used in attempt to increase accuracy and sensitivity. This technique is also highly sensitive to anything in addition to VOCs and oil molecules, such the aforementioned contamination. As a result, output readings including zero may be unstable. Calibrations may be affected as well. This filtering technique often blocks out important oil molecules critical for accurate and representative measurements.

The Model 204 utilizes the Sample Transfer Stripper (exclusive membrane technology). This technology allows the permeation of VOCs from oil or water thru the membrane into the carrier air. This provides the solid state sensor with an ultra-pure and clean sample for analysis.



Simplified flow diagram of the Model 204 utilizing the Sample Transfer Stripper (exclusive membrane technology)

Filtering of solids is only needed to prevent plugging of the flow system. Any contamination, solid crystalline materials or turbidity, will not interfere with proper readings even in the ultra low 1 PPB Wt. levels. The Model 204 measures total oil hydrocarbons including aromatic and aliphatic compounds.

A technical paper presented at the ISA Symposium in Houston provides a case study for this method measuring below the 5 ppb level and is available upon request. The permit allowed less than 5 ppb VOCs in the water.

In summary, the use of the Sample Transfer Stripper & solid state sensor technologies offered in the Model 204 is recommended considering the many interferences, inaccuracies & maintenance requirements of the UV Fluorescence and turbidity method. Analytical Systems has been awarded '**Preferred Vendor**' from Shell Global & Saudi Aramco for the model 204 and the environmental government regulator (TCEQ) has awarded letters recognizing the Model 204 as "**Best Available Control Technology**". Patents and Patents pending based on letters available upon request.

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