

APPLICATION NOTE

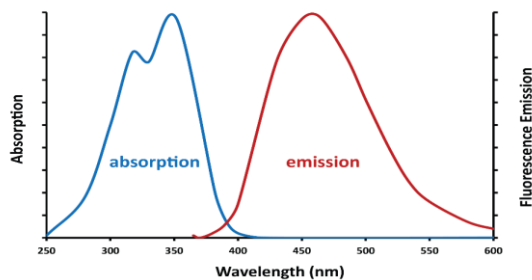
2.05 PETROCHEMICAL

OIL IN WATER

- Simultaneous measurement of fluorescence and turbidity
- Large measurement range
- Detection limit 1µg/l
- Real time continuous measurement

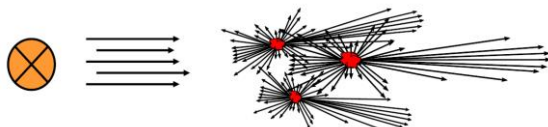
The [Kemtrak FL007 oil in water analyzer](#) detects oil in water using both fluorescence and turbidity. These two measurement principles complete each other in this application.

Fluorescence: a phenomenon whereby a portion of the light absorbed by hydrocarbons is re-emitted at a higher wavelength. It requires a UV-light source.



The aromatic compounds in the oil are responsible for fluorescence. Hence the ratio of aromatics to total oil must be constant to give consistent results.

Turbidity/Light Scatter: oil in water scatters light and can indicate ppm levels. The scattering is independent on the oil type or aromatic content so oil without aromatics or low on aromatic content could be detected. Other suspended solids in the oil will also interfere with the light scattering.



APPLICATION

Applications for industrial oil in water monitoring are plentiful.

In the oil and gas industry it is important to monitor separation efficiencies to optimize production rates, preventative maintenance, chemical use, flow, and ensure environmental compliance. Water separated from the oil (produced water) must be cleaned from oil before disposal or re-injection.

Another application for oil and gas end-users of fuels and oils is the environmental monitoring and the detection of oil contamination in stormwater run-off to monitor trace oil in effluents.

It is also important to detect oil in water contamination through pinhole leaks or other breaches into the cooling water of heat exchangers.

De-salination and water purification plants need to monitor the presence of oils in raw water sources to protect filtration media in Reverse Osmosis (RO).

These are just a few of the many applications for oil in water monitoring. Anywhere oil is being separated from water or where an oil can leak into water, one should consider monitoring needs for efficiency or compliance.

Trace Oil in Water Discharges

Trace oil in water typically refers to ppm and mg/l concentrations. When water is released back into the environment or to a treatment facility, permitted discharge concentration levels are usually regulated by an environmental authority. Regulations vary by country and region, but water discharge concentration limits for land-based applications tend to be about 15 mg/l.

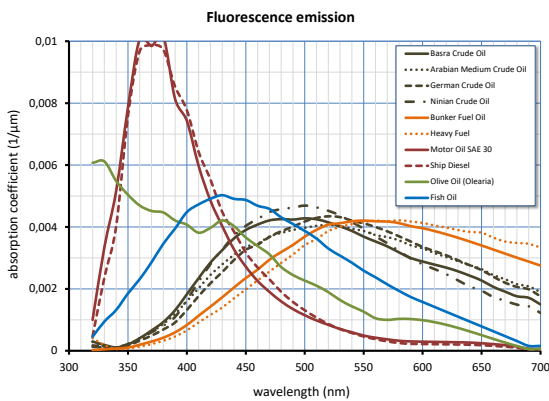
Oil/Water Interface

In process operations such as oil production and recycling facilities, oil is intentionally separated from water by mechanical or chemical means. Alarms and monitors are used to track the oil/water interface levels and rag (emulsion) layers which provides valuable data to the operators for process control decisions.

INSTALLATION

The [Kemtrak FL007 oil in water analyzer](#) is a fiber optic probe-based system for the detection of oil in water. The immersion probe has the same dimensions as industry standard $\varnothing 12$ mm PG 13.5 pH sensors allowing a range of standard fittings and retractable probe holders to be used. The probe is available in different lengths. We recommend a flow velocity of 1.5 m/s or higher to prevent sediments and deposits to form. A bypass installation is suitable to secure a higher stable flow.

Oils have different fluorescence emission spectra, which makes the calibration of the analyzer site-specific. Also, it should be done using actual process water or with samples of oil that are actually going to be measured by the analyzer.



The [Kemtrak FL007 oil in water analyzer](#) offers a state-of-the-art simultaneous measurement of fluorescence and turbidity to assure reliable continuous monitoring of oil and hydrocarbon contamination in water. Fiber optic connections rather than electrical connections allow for a high reliability of measurement and safe and easy installation in EX-areas.



Kemtrak $\varnothing 12$ mm PG 13.5 backscatter probe with sapphire window