



## Detection of Oil Contamination Using UV Handheld Fluorometer

### Background:

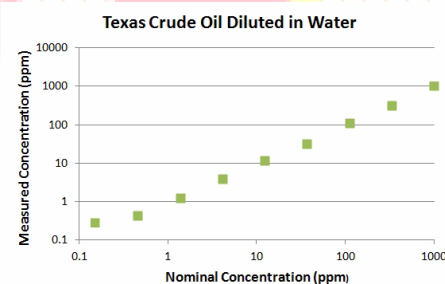
PAHs (Polycyclic Aromatic Hydrocarbons) are one of the most widespread organic pollutants. In addition to their presence in fossil fuels, they are also formed by incomplete combustion of carbon-containing fuels such as wood, coal, diesel, fat, tobacco, and incense. Due to their physical properties, PAHs are widely used in many industrial applications, such as lubricating oil, hydraulic oil, and electro-hydraulic control fluid. Their applications also could produce man-made contamination in the water systems due to leakage of the oils.

### Fluorescence Detection:

The aromatic fraction of PAHs can be excited with UV or near-UV light to emit fluorescent light. The fluorescence intensity is linear with the concentration of the oil. This technology is ideal for monitoring leaking lube oil in the cooling systems or power plants, or leaking crude oil in ocean/lake environment. Our handheld fluorometer is designed for crude oil detection and monitoring. Due to the low interference from other substances, we can prove that this technology has the potential of detecting submg/ L (< 1-ppm) level of oil contamination in water samples from the environment. And due to its high portability, it can be used anywhere in the field to conduct environmental inspection for potential oil contaminations.

### Fluorometer Features:

- Uses standard 1-cm plastic cuvette for easy sample collection.
- Rapid (5 seconds reading) and highly sensitive (<1ppm)
- Wide measurement range (0 - 10,000ppm, by proper calibration).
- Simple touch screen operation. No repeated calibrations needed.
- Powered by 4xAA batteries or 5VDC Power Adaptor.
- Portable for field operation, and stores up to 80 data/channel for computer analysis.
- Dimension (L x W x H): 185mm x 90mm x 35mm



### Kit includes:

Handheld Fluorometer, with USB Cable, Power Supply, and Software/Manual CD.  
Texas crude oil standard, 1% diluted in acetone, 2 mL  
1-cm Plastic Cuvette with Cap: 50 pcs  
Disposable 500- $\mu$ L Transfer Pipette: 50 pcs

### Simple Operating Procedure:

1. Add 1-mL of water sample into a cuvette as "Sample". Filter the water to reduce turbidity first if needed.
2. Add 1-mL of distilled water into another cuvette as "Blank".
3. Prepare a standard solution according to your own program and measuring range. For example, 10  $\mu$  L of Texas oil standard was poured into 0.99 mL of distilled water for dilution. Then put it into a cuvette as "Standard".
4. Fluorometer calibration: Switch on the fluorometer. Place the "Blank" cuvette into the sample holder and close the cover. From the Main screen, press [Calibrate]  $\rightarrow$  [Confirm]  $\rightarrow$  [Assay 1] (or another assay number you like)  $\rightarrow$  [Blank]. Fluorometer starts measuring. Press left or right arrow on [ <- Std -> ] until the window shows the prepared "Standard" value. Place the "Standard" tube into the sample holder and close the cover. Press [Measure]. The fluorometer shows "Calibration Finished". The fluorometer is now calibrated. Press [Return].
5. Sample measurement: Place the "Sample" cuvette into the sample holder and close the cover. From the Main screen, press [Measure]  $\rightarrow$  [Assay 1] (or the assay you selected earlier in calibration)  $\rightarrow$  [Measure]. The concentration will be displayed in the window. Record the data, or press [Save] to save the data for later retrieval. Press [Return] and then [Measure] for the next sample.