

TELEDYNE ANALYTICAL INSTRUMENTS

Fluorescence Measurement of Soluble & Insoluble Hydrocarbons in Water

Most streams contain a complex mixture of many components which makes the measurement of hydrocarbons in water challenging. This challenge can be met by using Teledyne's Photo-X Fluorometer. The Photo-X Fluorometer detects the aromatic fraction of; dissolved, dispersed, and emulsified hydrocarbons in water. The Fluorometer is unaffected by bubbles or suspended solids because of its front surface probe design (patent pending). Offering this unique immunity to real process conditions and having the ability to provide insitu measurements sets Teledyne apart from the competition.



Ex-proof
fiber optic
based
UV
Photo-X
fluores-
cence
transmitter

Benefits

- Continuously monitors the dissolved, aromatic hydrocarbon in the water stream
- Unaffected by bubbles, reabsorption, or turbidity in sample
- Fiber optic; source, reference, and fluorescence
- 4-20 mA range output
- Photometric transmitter can be remotely mounted
- Analyzer electronics separated from fluidics section
- With insertion probe, there is no inner-filter effect

Industries with Fluorescent Applications

Chemical
Pharmaceutical
Aviation

Petrochemical
Environmental
Food / Beverage

Typical Hydrocarbon Applications

- BTEX
- Aromatic chemicals
- Oils; Crude, Lube, PAH
- Jet fuels / Diesel / Gasolines
- Heat exchangers
- Produced water
- Process water
- Ground water
- Potable water
- Cooling water

Fiber Optic Extractive Fluorescence Flow Cell

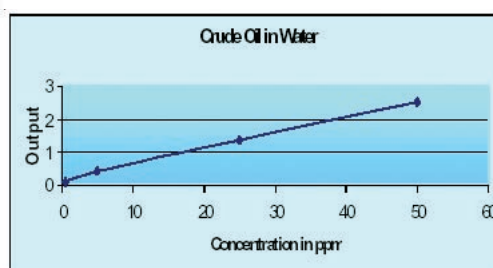
Free falling stream based flow cells have two major drawbacks when measuring fluorescence signal from a liquid sample; 1) the cell can be pressurized without backups in the cell thus allowing a pump to freely push the sample around the optical cell, and 2) typical 90° fluorescence measurements suffer from either an inner-filter effect or quenching, both based on sample stream composition.




Probe shown in
automatic retractable
device

Fiber Optic InSitu Probes

Teledyne provides the means to automatically or manually insert the fluorescence probe into a flowing process stream and remove the probe for cleaning without going through the expensive ball valve. The probe is either steam or solvent cleaned in the neck of the flange when needed. The probe is isolated from the process, steam or solvent is introduced, and the probe is re-inserted into the process stream.



Typical response curve from the analyzer



Fluorescence Measurement of Soluble & Insoluble Hydrocarbons in Water

PRODUCT SPECIFICATIONS

Photo-X Fluorometer

System

Ambient temperature:	-20 to +40° C
Measured parameter:	Fluorescence
Electromagnetic compatibility:	per IEC 801 standards
Repeatability / accuracy:	± 20 counts
Sensitivity:	10 counts (smallest detectable change)

User Display & Control

Type of display:	Back-lit liquid crystal display
Display numerical format:	Up to 5 digits plus 3 digits after the decimal
Fluorescence range:	1 ppb up to 1000 ppm, user scalable, minimum 0-100 counts precision 0.05% (of any unit)
Display update interval:	1 second
Transmitter mounting:	Typically in NEMA 4 enclosure, sections can be remotely mounted

Optical

Light source:	UV pulsed Xenon lamp
Filters:	Interference, bandpass, blocking, or edge
Detectors:	Silicon photodiodes, or PMT
Wavelength range:	Excitation / Emission dependent
Fiber optic connectors:	SMA-905

Electrical

Power supply:	24 VDC
Power consumption:	10 Watts
Analog outputs:	4-20mA (isolated); min/max: 0 / 20 mA
Analog loop resistance:	400 Ohms, maximum

Mechanical

Analyzer weight:	3 lbs. (depending on packaging)
Enclosure:	Polycarbonate or 316SS -- NEMA 4X (IP66) 8" H x 3-7/8" W x 1.5" D

Options

High concentration:	>1000 ppm, when used with In line mixers or Centrifugal, high shear pump
Packaging:	X, Y or Z (Zone 1, 2) purge available

Probe

Materials:	316SS or Hastelloy C
Temperature rating:	315.5° C (600° F)
Pressure rating:	5,000 psig
Expected probe life:	25 years (non-corroding streams)

Probe Options

- 6, 12, or 24" length
- Automatic retractor for cleaning

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Warranty

Instrument is warranted for 1 year against defects in material or workmanship. NOTE: Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.

