

TELEDYNE **ANALYTICAL INSTRUMENTS**

In-Situ Asphaltene Transmitter

Teledyne offers an insitu probe, Attenuated Total Reflectance (ATR), for applications in which the concentration and/or extinction coefficients are too high for use of standard spectroscopic work. The advantage of this probe is that it works insitu under extreme process conditions. One application of this probe (and associated electronics) is to determine the amount of asphaltenes in crude oil.

Defining the Problems

As the world's supply of crude oil diminishes, use of heavier crude oils is increasing. Consequently, problems associated with deposition of heavy crude fractions like asphaltenes, waxes, etc., in production pipes, vessels and reactors has increased proportionally. Depositions on surfaces reduces flow which in turn reduces the capability to produce and transport crude oil efficiently and economically.

Additionally, relatively small changes in asphaltene content can have dramatic effects on pipeline deposition. Therefore, in an effort to increase productivity while reducing maintenance costs, Teledyne now offers a photometric monitor to evaluate the asphaltene content in crude oil.

Benefits of On-Line Monitoring

Teledyne's asphaltene monitoring system allows the user to monitor the asphaltene concentration in real time. Consequently, the user can utilize this information to optimize production, pipeline flow, or process treatment conditions.

Additional benefits of the Asphaltene monitoring system are;

- Elimination of lengthy laboratory methods to determine the Asphaltene in crude oil
- Insitu measurements of heavy HC in real time mode
- Validation of chemical additive effectiveness
- Elimination of costly shut downs because of Asphaltene precipitation in pipelines
- Provides numeric results rather than subjective evaluation of visual samples

The Photo-X Transmitter & Probe

Teledyne utilizes a low cost transmitter that generates a signal from our detector board and uses it to monitor the amount of heavy aromatic HC in the crude oil stream. This reading is based on the amount of optical attenuation from the monitoring package (UV Transmitter and ATR probe).

Applications for the UV Transmitter

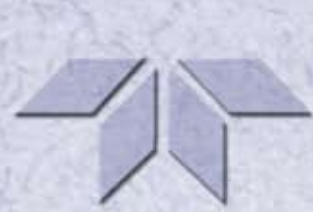
- Off Shore Platform
- Blending stations
- Pipelines
- API Gravity monitoring
- Refineries
- Crude blending
- Weight % asphaltent
- HC Survey Tool



Photo-X UV transmitter & ATR probe



ATR crystal with guard for insitu measurement of asphaltenes in crude.



In-Situ Asphaltene Transmitter

SPECIFICATIONS

Transmitter

Measured parameter:	Asphaltene in crude oil
Resolution:	±0.020AU
Temperature range:	-10°C to +55°C (operating conditions will depend on packaging options)
Response time:	< 1 min. to 90% of FS
Detector response:	210-650nm
Temperature stability:	0.001 mA / °C
Repeatability:	1% or less of Full Scale range
Measurement drift:	<±2% of Full Scale/month

User Display & Control

Type of display:	LED display
Display:	3-1/2 digits

Electrical

Power requirement:	24 VDC (9-32 VDC)
Power consumption:	10 Watts, max
Analog outputs:	4-20 mA isolated
Analog loop resistance:	500 Ohms, maximum @ 24V
Alarms:	Optional (this can be offered through our systems integration group)

Mechanical

Transmitter weight:	3 lbs
Enclosure construction:	Extruded Aluminum Optional Nema enclosures or purged enclosures are offered through our systems integration group
Transmitter size:	8" x 3-7/8" x 1.5" (HWD")

Lamp

Type:	Xenon Flash Lamp
Wavelength range:	200-650nm
Lamp life:	Typically 1 year, typically
Size:	2" x 4 x 1-1/2" (HWD")

Packaging

Transmitters may be mounted in any required enclosure to meet customer area classification needs. Additionally, Teledyne can provide sample handling systems for samples that need to be extracted from the process line. Please consult the factory for your packaging and sample handling needs.

 **TELEDYNE**
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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.

