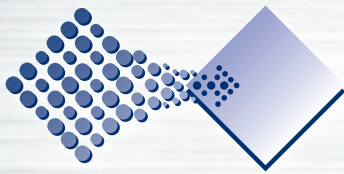


# In-situ Asphaltene Transmitter



## Model 53T Series Transmitter

CST 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 Problem

As the world 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 reducing the capability to produce and transport crude oil efficiently and economically. Additionally, relatively small changes in asphaltene content can have dramatic affects on pipeline deposition. Therefore, in an effort to increase productivity while reducing maintenance costs, CST now offers a photometric monitor to evaluate the asphaltene content in crude oil.

### Benefits of On-Line Monitoring

The CS&T 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 and Probe

Custom Sensors & Technology 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).



Model 53T UV Transmitter & ATR Probe



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

### Applications for the UV Transmitter

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

# Typical 53T Product 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 numerical format	3-1/2 digits

## Electrical

Power requirement	24V DC (9-32VDC).
Power consumption	10 Watts, max
Analog outputs	4-20mA isolated
Analog loop resistance	500 Ohms, nominally @ 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, CST can provide sample handling systems for samples that need to be extracted from the process line. Please consult factory for your packaging and sample handling needs.

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Custom Sensors & Technology is a full service provider. We also supply photometric transmitters, fiber optic probes & flow cells, O<sub>2</sub> transmitters, sample handling systems, and services including: application engineering, commissioning & start-ups, product validation, factory acceptance testing, process stream GAP Analysis, and in-house repair.