XOS®

better analysis counts

17 35.45

Clora

Chlorine On-Line Analyzer

On-Line Chlorine Analysis in Crude, Water and Process Streams

Chlorine monitoring in crude oil, process streams, water and effluent streams presents valuable insights in e.g. desalting and refining operations for corrosion management, environmental and process control purposes. The CLORA On-Line Analyzer presents a breakthrough process analytical solution for quantification of total chlorine from 0.2 ppm up to 3000 ppm. CLORA analyzers are not sensitive to sample temperature variation and do not require consumable gasses or liquids. Comprehensive data communications and diagnostics capabilities enable a maximum in uptime. The CLORA On-Line Analyzer is based on the same MWD XRF analytical platform as the CLORA Bench-Top Analyzer.

Application Areas:

- Upstream desalting, refining, power generation and effluent management.
- Total chlorine analysis in:
  - raw and desalted crudes
  - water and effluent streams
  - refinery process streams
  - finished product

Features and Benefits:

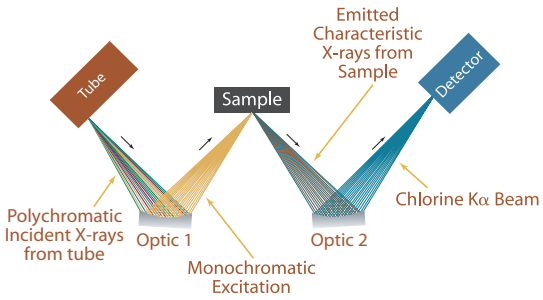
- LOD: 0.2 ppm in hydrocarbon matrices (at 300s)
  0.3 ppm in aqueous streams (at 300 s)
- Dynamic range: 0.2 ppm – 3000 ppm wt.
- No consumable liquids or gasses required.
- No combustion or sample conversion: ensures safe and low maintenance operation.
- Calibration is linear up to 3000 ppm and one calibration curve runs all hydrocarbon matrices.
- Direct measurement in ppm wt.
- Continuous and real time analysis.

Options:

- Multi-stream analysis capability
- Auto-validation capability.

MWD XRF

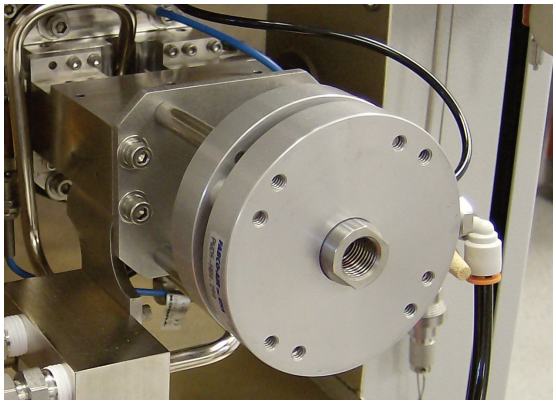
Monochromatic Wavelength Dispersive X-Ray Fluorescence (MWD XRF) utilizes state-of-the-art focusing and monochromating optics to increase excitation intensity and dramatically improve signal-to-background over traditional WD XRF instruments. This enables significantly improved detection limits and precision. A monochromatic and focused primary beam excites the sample and secondary characteristic fluorescence x-rays are emitted from the sample. A second monochromating optic selects the chlorine characteristic x-rays and directs these x-rays to the detector. MWD XRF is a direct measurement technique and does not require consumable gasses or sample conversion.



Precision

The MWD XRF analytical platform enables unrivalled precision and accuracy. Long term stability studies indicate highly stable and precise results.

	Crude 1	Crude 2	Water
Average Value	14 ppm	3 ppm	10 ppm
Run Time	5 min	5 min	5 min
STD DEV	0.4 ppm	0.25 ppm	0.6 ppm



Viscosity and Sample Conditioning

The CLORA On-Line Analyzer can accept most all crude oil streams with a maximum viscosity limitation of 160 cSt at 70°F (1.6 cm^3/s at 21°C). More viscous materials can be analyzed by increasing sample temperature up to 300°F. A 100 micron self-cleaning by-pass flow style filter assembly or an in-line filter assembly is recommended. The analyzer is insensitive to water content in the crude oil. Aquaeous matrices can be tested for chlorine concentration in the same fashion as hydrocarbon matrices.

High Viscosity Dynamic Window Module

The High Viscosity Dynamic Window Module (HV-DWM) ensures stable and accurate test results independent of sample matrix. The HV-DWM automatically and at preprogrammed intervals positions a new and robust window material in the measurement area. As a result, the measurement is stable and drift caused by contamination build up is eliminated. The HV-DWM uses an x-ray transparent polyimide film allowing stream pressures up to 80 psi (550kPa). While the sample stream continuously flows through the HV-DWM, the sample analysis takes place continuously as well ensuring rapid and highly representative chlorine monitoring of the sample stream.

Product Specifications

Analytical Platform	Monochromatic WD XRF
Dynamic Range	0.2 - 3000 ppm wt.
Calibration	3 - 5 point cal curve (depending on range)
Data Communication	Analog outputs: 2x 4 - 20 mA, multiple discrete alarm outputs
Digital Communication	Modbus RS-232, Modbus RS-485 (Half or Full Duplex), Modbus TCP
Remote Diagnostics	Optional via TCP/IP or UDP
Local HMI	Touch screen display
Ambient Temperature	0 - 40°C, (32 - 104°F)
Power	110 - 240 VAC, 50 - 60Hz, 750W max.
Instrument Air - Purge and Valve	40 - 100 psig, (275-690 kPa) 4 scfm max; -40°F (-40°C) dewpoint, oil free, N^2 optional
Dimensions	62" (h) x 34" (w) x 18" (d), 158 cm (h) x 86 cm (w) x 46 cm (d)
Certifications	ATEX Zone 1 Ex d ia [ia] px IIC T4; CE, NEC Class I Div 2 Groups B,C,D T4A
Flowrate	Continuous flow through measurement cell at 3-5GPH (11.4 - 18.9 lph)
Sample Pressure	30 - 80 psi (210 - 550 kPa)
Sample Temperature	Min: > Cloudpoint, Max: 300°F (150°C)
Sample Viscosity	Max 160 cSt at 70°F, (1.6 cm^2 at 21°C) more viscous material may require sample heating
Sample Filtration	No water removal required, particle filtration to 100 micron

XOS®

better analysis counts

15 Tech Valley Drive • East Greenbush, New York 12061, USA • 518.880.1500 • Fax: 518.880.1510
e-mail: info@xos.com • website: www.xos.com