better analysis counts

Monitor Chlorine in Crude at Sub-ppm Levels

Benchtop and Online Analysis Solutions

Chlorine Analysis in Hydrocarbons, Aqueous Solutions, and Catalyst

Clora® delivers unprecedented accuracy and precision for petroleum and petrochemical applications where ease-of-use, reliability and measurement speed are critical.

Applications
- Total chlorine analysis from aqueous solutions and aromatic products to heavy fuels, crudes and catalyst
- For refineries, petrochemical and additive plants, pipeline terminals, and test laboratories

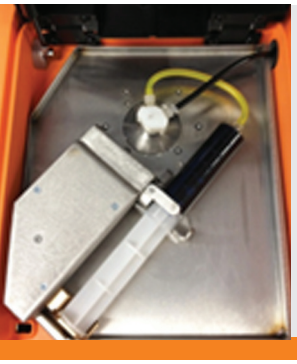
Features
- Complies with ASTM D7536
- LOD: 0.13 ppm wt. for hydrocarbons
- LOD: 0.3 ppm wt. for aqueous samples
- Dynamic range:
  - Standard: 0.13 ppm wt. up to 3000 ppm wt.
  - XR Package: 0.13 ppm wt. up to 4% wt.
- Dimensions: 37 cm (w) x 50 cm (d) x 34 cm (h)
- Programmable measurement time: 30-900 s
- Replaceable air-cooled X-ray tube
- Robust polyamide window for easy cleaning

Benefits
- Easy to use with intuitive touchscreen interface
- Plug-in and measure
- Low maintenance: No conversion gases, columns, heating elements, or quartz tubing

Options
- LIMS data output software capability
- Extended Range: 0.06 ppm up to 4%
- Catalyst Testing Capability
- Accu-flow and Auto-sampler

17 35.45 Clora Chlorine Analyzer

ASTM D7536



Get Accu-flow to Eliminate Particle Settling
The optional Accu-flow design allows the sample to flow continuously during the measurement. This continuous flow eliminates the settling of chlorine, producing accurate and precise total chlorine results.

ACCU-FLOW

Twice the Precision. Twice the Performance. Improved Sub-ppm Analysis.

Clora 2XP delivers twice the precision as Clora, which is ideal for applications requiring low-level detection, and testing related to catalyst poisoning in reformers or sites with fluid catalytic crackers and hydrocrackers monitoring very low levels of chlorine. Additionally, its automatic sulfur correction is perfect for high sulfur applications.

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Clora 2XP
Chlorine Analyzer

Applications
- Total chlorine analysis from aqueous solutions and aromatic products to heavy fuels, crudes and catalyst
- For refineries, petrochemical and additive plants, pipeline terminals, and test laboratories

Features
- Complies with ASTM D7536
- Automatic sulfur correction for chlorine
- LOD: 0.07 ppm wt. in hydrocarbons
- LOD: 0.2 ppm wt. in aqueous samples
- Dynamic range:
  - Standard: 0.07 ppm wt. up to 3000 ppm wt.
- Dimensions: 37 cm (w) x 50 cm (d) x 34 cm (h)
- Programmable measurement time: 30-900 s
- Replaceable air-cooled X-ray tube
- Robust polyamide window for easy cleaning

Benefits
- Faster analysis and more accurate results with automatic sulfur correction
- Twice the precision
- Lowest LOD available in an XRF instrument without the hassle of combustion techniques

Options
- LIMS data output software capability

ASTM D7536

Automatic Sulfur Correction

Many heavy samples, like crude oil, VGO or coker residual, may have percent-level sulfur present while chlorine may be as low as a few parts per million. High sulfur levels will typically depress the chlorine measurement result during XRF analysis. Clora 2XP is able to measure the chlorine and sulfur concentrations simultaneously, and the sulfur counts information is then used to automatically correct the chlorine measurement.

TWO critical measurements, ONE push of a button, ZERO hassle

Sindie +Cl is a two-in-one instrument enabling trace analysis of both sulfur and chlorine with one push of a button. It is the ideal solution to certify sulfur levels in finished products, assess chlorine for corrosion mitigation, and optimize process parameters.

Applications

- Total sulfur analysis from ultra low sulfur fuels to crudes
- Total chlorine analysis from aqueous solutions and aromatic products to heavy fuels, crudes, and catalyst
- For use in refinery labs, pipeline terminals, additive plants and inspection laboratories

Sindie +Cl
Sulfur and Chlorine Analyzer

Features

- Complies with ASTM D2622, D7039, D7536, SH / T 0842
- Automatic sulfur correction for chlorine
- Sulfur
  - LOD: 0.4 ppm at 300 s.
  - Dynamic Range: 0.4 ppm to 5%
- Chlorine
  - LOD: 0.3 ppm at 300 s.
  - Dynamic Range: 0.3 ppm to 3000 ppm
- Programmable measurement time: 30-900 s
- Dimensions: 37 cm (w) x 50 cm (d) x 34 cm (h)

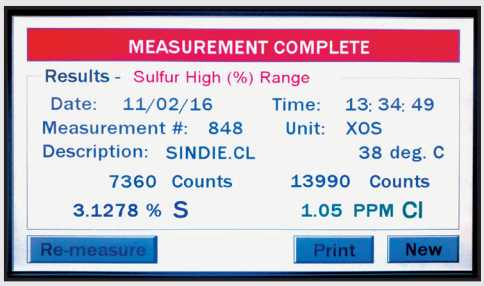
Benefits

- Simultaneous measurement of sulfur and chlorine
- Compliance flexibility
- Sulfur in ultra low sulfur diesel and gasoline with industry-leading reproducibility
- Rapid monitoring of chlorine in crude oil and process streams for corrosion prevention

Options

- LIMS data output software capability

ASTM D2622, D7039, D7536, SH / T 0842



Two Critical Measurements

Sindie +Cl performs trace analysis of both sulfur and chlorine with one push of a button. You can measure both elements in one sample, or measure each separately by simply inserting a new sample.

Online Chlorine Analysis in Hydrocarbon or Water

Chlorine contributes significantly to the corrosion of plant equipment and must be treated accordingly. With ever-changing crude quality and blends, chlorine levels can shift quickly, making real-time analytical results invaluable. Clora Online® presents a breakthrough analytical solution for quantification of total chlorine from 0.2 ppm up to 3000 ppm. By monitoring desalted crude, a plant can optimize performance and immediately see impacts of crude changes (including organic chloride). Additionally, monitoring overhead water can provide the needed feedback for chemical feed.

Applications
- Total chlorine analysis in:
  - raw and desalted crudes
  - water and effluent streams
  - refinery process streams
  - finished product

Features
- Uses ASTM D7536 technology
- LOD: 0.2 ppm in hydrocarbon matrices @ 300 s
- LOD: 0.5 ppm in aqueous streams @ 300 s
- Dynamic range: 0.2 ppm – 3000 ppm wt.
- Calibration is linear up to 3000 ppm and one calibration curve runs all hydrocarbon matrices

Benefits
- Continuous, real-time analysis
- Easy to use with intuitive touch screen interface
- Direct measurement in ppm wt.
- Low Maintenance: No consumable liquids, gases, combustion, or sample conversion
- Not sensitive to sample temperature changes

Options
- Multi-stream Analysis Capability
- Auto-validation Capability

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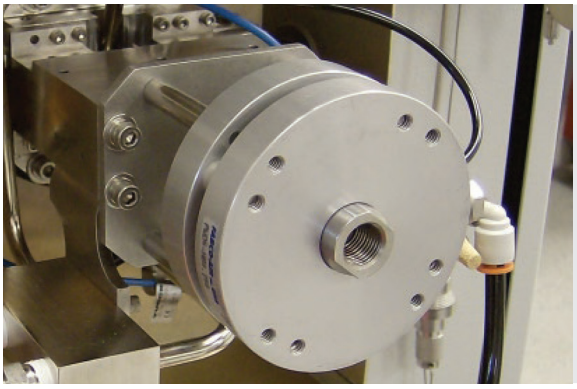
Clora ONLINE
Chlorine Analyzer



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

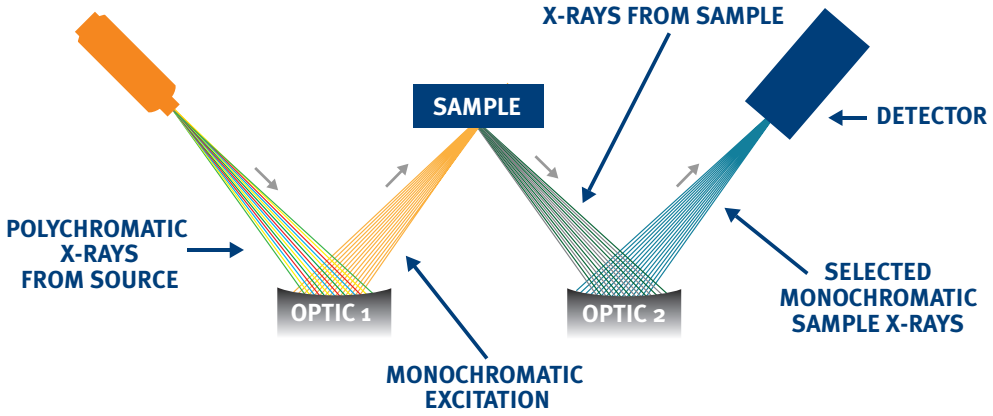
	Crude 1	Crude 2	Water
Average Value	14 ppm	3 ppm	10 ppm
STD DEV	0.4 ppm	0.25 ppm	0.6 ppm

Benchtop and Online Chlorine Analysis

Monitoring chlorine for corrosion mitigation is critical during refining processes. Chlorine can poison expensive catalysts and lead to corrosion in overhead or reactor effluent systems. Clora® analyzers offer breakthrough analytical solutions for the determination of chlorine in liquid hydrocarbon samples such as aromatics, distillates and heavy fuels, and aqueous solutions.

Advanced Analysis with MWDXRF

Monochromatic Wavelength Dispersive X-Ray Fluorescence (MWDXRF) utilizes state-of-the-art focusing and monochromating optics to increase excitation intensity and dramatically improve signal-to-background ratio compared to traditional WDXRF instruments. This enables significantly improved detection limits, precision, and a reduced sensitivity to matrix effects. 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. MWDXRF is a direct measurement technique and does not require consumable gases or sample conversion delivering robust and low-maintenance analyzers with dramatically lower detection limits and faster response times.



Eliminate Particle Settling with Accu-flow

Accu-flow technology helps to minimize the effects of particulate settling, which is common when testing for chlorides in crude oil using XRF in the laboratory. Over a typical measurement cycle, the heavier particles can settle to the bottom of the sample cup and cause higher than normal results. Accu-flow pushes the sample through the system keeping the sample uniform, delivering a result that better reflects crude streams as they exist in the refinery. Accu-flow is available with Clora® benchtop analyzers.

ACCU-FLOW

XOS®
better analysis counts

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