

Measure for Chlorine in Crude at Sub-ppm Levels



Analyze Total Chlorine with Unparalleled Precision and Ease of Use

Clora® measures total chlorine in hydrocarbons such as aromatics, distillates, heavy fuels, crude oils, and water.

This state-of-the-art technology complies with ASTM D7536 and D4929C and delivers unparalleled accuracy and precision for petroleum and petrochemical applications where simple, quick, and reliable analysis is critical.*

APPLICATIONS

- Total chlorine analysis in petroleum products, biofuels, aromatics and other chemicals, and water
- For refineries, petrochemical and additive plants, pipeline terminals, and test laboratories

FEATURES AND BENEFITS

- **LOD:** 0.13 mg/kg (ppm) at 300s, 0.09 mg/kg (ppm) at 600s for hydrocarbons, 0.3 mg/kg (ppm) at 300s, 0.21 mg/kg (ppm) at 600s for aqueous samples**
- **Dynamic range:** 0.13 mg/kg (ppm) to 4 wt%
- Manual sulfur correction to correct for high sulfur samples
- Easy to use:
 - Intuitive 10-inch touch screen
 - Just plug in and measure
 - **Measurement time:** 10-999 s
- Low and high range calibrations available:
 - **Low range:** 0.13 mg/kg (ppm) – 3000 mg/kg (ppm)
 - **High range:** 0.3 wt% - 4 wt%
- **Low maintenance:** no gasses, heating elements, columns, or quartz tubing
- Traditional XRF sample cups or XOS Accucells – decided at time of order
- Small footprint
- LIMS integration for data management and transfer
- Preset favorites capability to save data entry time and minimize mistakes on common samples
- Bar code reader autofills sample name to reduce data entry time
- Storage capacity for more than 50,000 measurement results
- Supports up to 30 calibration curves
- USB connectivity in front and back for connecting to printer, keyboard, mouse, memory stick
- Supports USB as well as network printers
- Large, easy-to-remove side panels for easy serviceability
- Advanced error reporting and diagnostics



THE R SERIES



ASTM D7536 & D4929C

*All qualification herein are subject to user guide specifications. If you have further questions, reach out to our team of experts at info@xos.com.

**Longer cycle time increases counts and lower LOD, but sample conditions over time must be considered. For further inquiries, please contact us at info@xos.com.

Analyze Total Chlorine with Unmatched Analytical Performance

Easier to use than ever, Clora® 2XP analyzes total chlorine in liquid hydrocarbons such as aromatics, distillates, heavy fuels, and crude oils, as well as aqueous solutions, while automatically correcting for sulfur interference.

The enhanced precision and performance technology makes it the ideal choice for testing related to catalyst poisoning in reformers or for sites with fluid catalytic crackers and hydrocrackers monitoring very low chlorine levels. This state-of-the-art technology complies with ASTM D7536 and D4929C.*

APPLICATIONS

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

FEATURES AND BENEFITS

- **LOD:** 0.1 mg/kg (ppm) at 300s, 0.07 ppm at 600s in hydrocarbons**
- **Dynamic range:** 0.1 mg/kg (ppm) – 2 wt%
- Automatic sulfur correction saves time and improves accuracy and precision on high sulfur samples
- Easy to use:
 - Intuitive 10-inch touch screen
 - Just plug in and measure
 - **Measurement time:** 10-999 s
- Low and high range available:
 - **Low range:** 0.1 mg/kg (ppm) – 3000 mg/kg (ppm)
 - **High range:** 0.3 wt% – 2 wt%
- **Low maintenance:** no gasses, heating elements, columns, or quartz tubing
- Traditional 43 mm XRF sample cups
- Small footprint
- LIMS integration for data management and transfer
- Custom sample presets to save data entry time and minimize mistakes on common samples
- Bar code reader autofills sample name to reduce data entry time
- Storage capacity for more than 50,000 measurement results
- Supports up to 30 calibration curves
- USB connectivity in front and back for connecting to printer, keyboard, mouse, and memory stick
- Supports USB and network printers
- Large, easy-to-remove side panels for easy serviceability
- Advanced error reporting and diagnostics



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TWO Critical Measurements, ONE 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, and crudes
- For use in refinery labs, pipeline terminals, additive plants and inspection laboratories

FEATURES AND BENEFITS

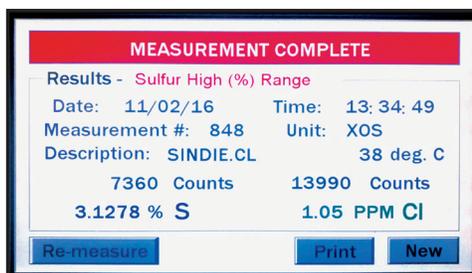
- Sulfur
 - LOD: 0.4 mg/kg (ppm) at 300 s, 0.28 mg/kg (ppm) at 600 s**
 - Dynamic range: 0.4 mg/kg (ppm) to 5 wt%
- Chlorine
 - LOD: 0.3 mg/kg (ppm) at 300 s, 0.21 mg/kg (ppm) at 600 s
 - Dynamic range: 0.3 mg/kg (ppm) to 3000 ppm
- Extremely low maintenance: no gasses, heating elements, columns, or quartz tubing
- Automatic sulfur correction
- Easy to use
 - Intuitive touch screen
 - Just plug-in and measure
 - Measurement time: 30-900 s



ASTM D2622, D7039, D7536, D4929,
ISO 20884 | SH/T 0842

OPTIONS

- LIMS data output compatible software



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.

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Online Chlorine Analysis in Liquid Hydrocarbon Process Streams

Chlorine contributes significantly to the corrosion of plant equipment and must be treated accordingly. With ever-changing crude quality and potential for process upsets, chlorine levels can shift quickly, making real-time analytical results invaluable. Powered by MWDXRF®, Clora® Online uses ASTM D7536 technology and delivers real-time, continuous analysis of total chlorine from 0.2 ppmw up to 3000 ppmw. By monitoring desalted crude, a plant can optimize performance and immediately see impacts of crude changes (including organic chloride).

This process analyzer is ATEX and NEC certified for hazardous area locations.*

APPLICATIONS

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

FEATURES AND BENEFITS

- Uses ASTM D7536 technology
- ATEX Zone 1 and NEC Cl | Div 2 Certified
- **LOD:** 0.2 ppmw in hydrocarbon matrices @ 300 s**
- **LOD:** 0.6 ppmw in aqueous streams @ 300 s
- **Dynamic range:** 0.2 ppmw – 3000 ppmw
- Calibration is linear up to 3000 ppmw and one calibration curve runs all hydrocarbon matrices
- Robust industrial design: wall mounted or standalone
- Continuous, real-time analysis
- Rapid response to upsets
- Easy to use with intuitive touch screen interface
- Direct measurement in ppm wt
- **Low maintenance:** no consumable liquids, gasses, combustion, or sample conversion
- Not sensitive to sample temperature changes

OPTIONS

- Multi-stream analysis capability
- Auto-validation capability



ASTM D7536



ATEX and NEC
Certified

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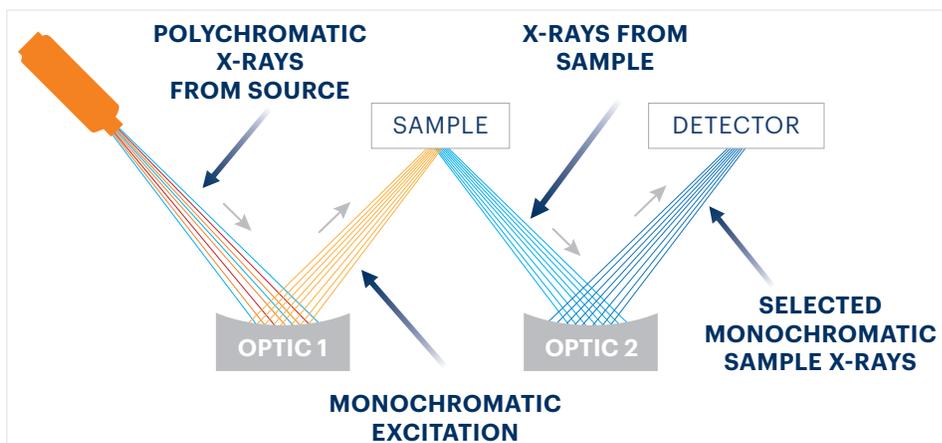
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Benchtop and Online Chlorine Analysis

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, heavy fuels, and aqueous solutions

Advanced Analysis with MWDXRF

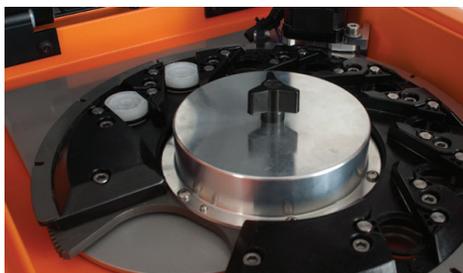
Monochromatic Wavelength Dispersive X-ray Fluorescence (MWDXRF) utilizes state-of-the-art focusing and monochromating optics to increase excitation intensity and dramatically improve signal-to-background ratio compared to traditional WDXRF instruments. This enables significantly improved detection limits, 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 gasses or sample conversion delivering robust and low-maintenance analyzers with dramatically lower detection limits and faster response times.



Eliminate Particle Settling with Accu-flow

Available on M-Series Clora

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.



Autosampler

Available on M-Series Clora

- 8 sample cell capacity
- Increases productivity
- Utilizes XOS Accucell sample cups

