Sulfur / Chlorine-in-Oil

MESA-7220V2

X-RAY FLUORESCENCE
The advanced innovative field measurement of Sulfur and Chlorine

- Measure a wide range of different fuel types
- Choose between a single or 8-tray carousel analyzer
- Vacuum based system, no purge gases required
- ASTM 7220 with PLOQ of 3 ppm sulfur
- Auto Ranging now available
- ASTM 4929 Compliant

Technology

The MESA-7220V2 measures both sulfur and chlorine in petroleum based products using the Monochromatic EDXRF method. A monochromatic X-ray source is used in order to obtain an ultra-low noise background which affords the best detection limits for both sulfur and chlorine.

The detector window size was increased to collect more fluorescent X-rays and thus achieve lower level ppm values. This provides excellent, repeatable performance at both low and high concentrations of both elements.

By adjusting the angle of the graphite crystal, the excitation beam can more thoroughly excite sulfur in the sample, increasing sensitivity.

Key Features

- Dynamic Analysis Range:
  - Sulfur: 0.7 ppm - 10.0Wt%
  - Chlorine: 0.6 ppm - 10.0Wt%
- Auto Ranging for extended curves.
- No purge gases required.
- Maximum 60 calibration curves and 300 data points per curve.
- Calibration curves can be edited after they have been saved.
- Measurement times from 30 - 999 s.
- Measurement repeats from 1 - 99 times.
- Oxygen correction feature eliminates interference which can affect Sulfur readings.
- Various sample types* [Solids, Liquids, Powders, Pastes, Pellets, and Films] can be measured.
- Can program up to 20 Admin & User accounts.
- User replaceable X-ray window.
- Micrometer adjustment of graphite crystal angle for better sensitivity.
- Stand-alone PC to allow software updates electronically.
- Built-in interlocks to protect operators from X-rays.
- Silicon Drift Detector/X-ray Beryllium Window.

Diffractive Optics + Ag Lα X-rays

Using Diffractive Optics & Ag Lα X-rays lowers the background in the S & Cl region. Also by using a Ag anode (Ag Lα) with the diffractive optics, it produces a mono-chromatic beam with very low background with 0 ppm Sulfur compared to direct measurement.

Vacuum Environment in the Optics

- Inert conditions permit increased sensitivity of lighter elements.
- All optics for MESA-7220V2 is under vacuum from an internal Vacuum pump so that no purge gases are needed.

*Performance is based on petroleum samples.
**Operation feature**

8 Positions Turntable

Multiple (8) position turntable is available for high throughput measurements.

**Maintenance feature**

User replaceable X-ray Window

The purpose of the window is to transmit X-rays and to maintain the vacuum inside the optical path.

**Software feature**

Flexible Calibration Curves

Auto Ranging of Extended Calibration Curves

Continuous curve function allows combining multiple calibration curves with different concentration ranges to create a composite calibration curve, which can cover a wide concentration range. It means once users only need to create one calibration curve covering the entire range.

**Application**

Solid Solution with High Reliability and Precision for the Oil Industry

- **ASTM D4294 / ISO 8754**
  - S in Petroleum and Petroleum Products by EDXRF

- **ISO 13032/20847**
  - Determination of low concentration of sulfur in automotive fuels — Energy-dispersive X-ray fluorescence spectrometric method

**Standard Methods Compliance**

- **ASTM D7220** Standard Test Method for Sulfur in Automotive, Heating, and Jet Fuels by Monochromatic Energy Dispersive X-ray Fluorescence Spectrometry
- **ASTM D4294** Standard Test Method for Sulfur in Petroleum and Petroleum Products by Energy Dispersive X-ray Fluorescence Spectrometry
- **ASTM D4929** Determination of Organic Chloride Content in Crude Oil (Cl + S)
- **ISO 8754** Determination of sulfur content — Energy-dispersive X-ray fluorescence spectrometry
- **ISO 20847** Determination of sulfur content of automotive fuels — Energy-dispersive X-ray fluorescence spectrometry
- **ISO 13032** Determination of low concentration of sulfur in automotive fuels — Energy-dispersive X-ray fluorescence spectrometric method
Specifications

<table>
<thead>
<tr>
<th>Instrument Dimensions</th>
<th>Inch</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>11.69</td>
<td>297</td>
</tr>
<tr>
<td>Depth</td>
<td>16.54</td>
<td>420</td>
</tr>
<tr>
<td>Height (Closed)</td>
<td>16.54</td>
<td>420</td>
</tr>
<tr>
<td>Height (Open)</td>
<td>29.49</td>
<td>749</td>
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</table>

Instrument Mass
32 kg / 70.55 lb (PC, display monitor, and printer are not included)

<table>
<thead>
<tr>
<th>Principle</th>
<th>X-ray Fluorescence analysis (Monochromatic EDXRF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
<td>Petroleum products</td>
</tr>
<tr>
<td>Elements to Measure</td>
<td>Sulfur (S) and Chlorine (Cl)</td>
</tr>
<tr>
<td>Measurement Range</td>
<td>0.00 – 100,000 ppm</td>
</tr>
<tr>
<td>Detection Limit</td>
<td>S: 0.7 ppm</td>
</tr>
<tr>
<td></td>
<td>Cl: 0.6 ppm</td>
</tr>
<tr>
<td>Sample Volume</td>
<td>7 – 10 mL for each sample cell</td>
</tr>
<tr>
<td>Sample Chamber</td>
<td>Atmospheric Conditions</td>
</tr>
<tr>
<td>X-ray Tube</td>
<td>Ag Target</td>
</tr>
<tr>
<td>Detector</td>
<td>Silicone Drift Detector (SDD)</td>
</tr>
<tr>
<td>Vacuum Level in the optics</td>
<td>≤ 4 kPa, Diaphragm Pump</td>
</tr>
<tr>
<td>Conformity Standards</td>
<td>ASTM D7220 / D4294 / D4929</td>
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<tr>
<td></td>
<td>ISO 8754 / 13032 / 20847</td>
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</tbody>
</table>

PC
<table>
<thead>
<tr>
<th>CPU</th>
<th>Intel® Core™ i5-8500™ or faster</th>
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</thead>
<tbody>
<tr>
<td>OS</td>
<td>Microsoft Windows 10 Pro, 64 bit, ²</td>
</tr>
<tr>
<td>Memory</td>
<td>4GB or more</td>
</tr>
<tr>
<td>Storage</td>
<td>1TB or more</td>
</tr>
<tr>
<td>Display Unit</td>
<td>Full HD (1920 x 1080)</td>
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</table>

Printer
<table>
<thead>
<tr>
<th>Model</th>
<th>CT-S4000 made by CITIZEN WATCH CO., LTD.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper / Paper width</td>
<td>Line thermal printer (External) / 112 mm / 4.4 inch</td>
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</table>

X-ray Fluorescence Sulfur-in-Oil Analyzer SLFA series line up

XFR Sulfur-in-oil analyzer equipped with a turntable, which allows sequential measuring up to 8 samples.

<table>
<thead>
<tr>
<th>Range</th>
<th>0 - 9.9999%</th>
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<tbody>
<tr>
<td>Detection limit</td>
<td>5 ppm or less</td>
</tr>
<tr>
<td>Accuracy</td>
<td>less than 5 ppm (1% sulfur sample) less than 1.6 ppm (0% sulfur sample)</td>
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</tbody>
</table>

SLFA-60 SLFA-6000

Bulletins: HRE-3951B

Please read the operation manual before using this product to assure safe and proper handling of the product.

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