



# 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
- Maintenance screen to monitor the life of X-ray tube
- 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

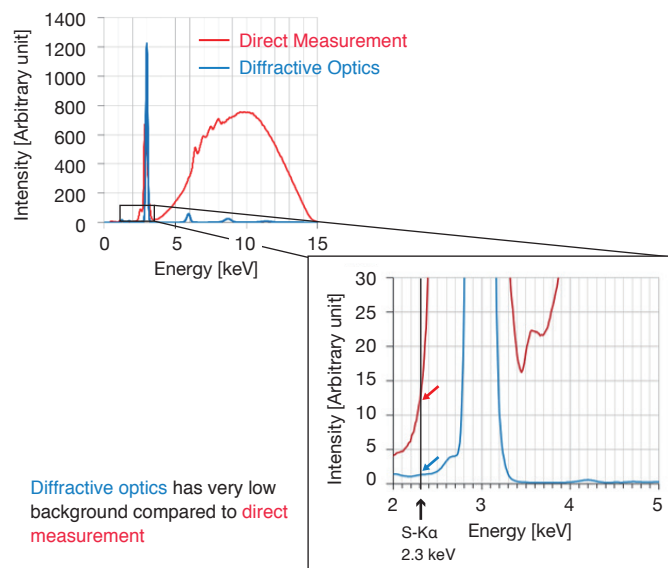
- Dynamic Analysis Range:
  - Sulfur: 0.7 ppm - 10.0Wt%
  - Chlorine: 0.6 ppm - 10.0Wt%
- Auto Ranging for extended curves.
- No purge gases required.
- Maximum 60 calibration curves and 300 data points per curve.
- Calibration curves can be edited after they have been saved.
- Measurement times from 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.

\*Performance is based on petroleum samples.

## Diffraction Optics + Ag La X-rays

Using Diffraction Optics & Ag La X-rays lowers the background in the S & Cl region.

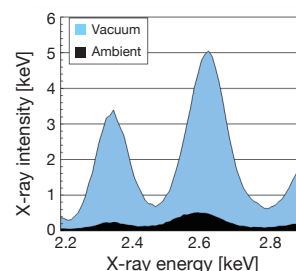
Also by using a Ag anode (Ag La) with the diffraction optics, it produces a mono-chromatic beam with very low background with 0 ppm Sulfur compared to direct measurement.



Diffraction optics has very low background 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.



Comparative graph with/without vacuum system

## Operation feature

### 8 Positions Turntable

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



Standard Mode (Single)

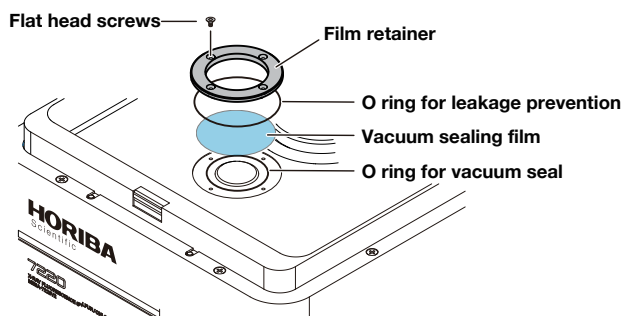


8 Positions (Turntable)

## 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.



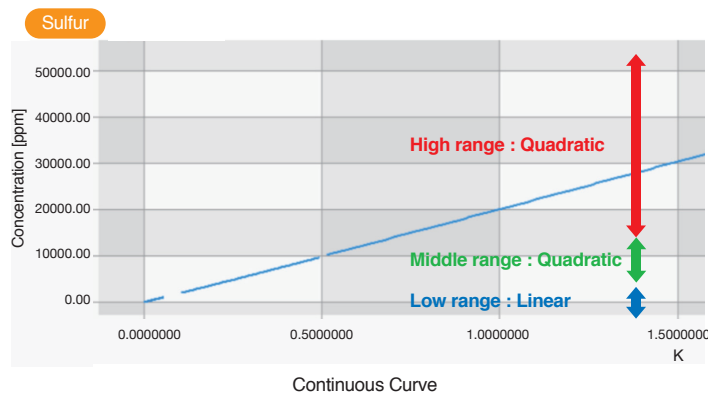
When the window is broken or stained, users can replace the vacuum sealing film easily.

## Software feature

### Flexible Calibration Curves

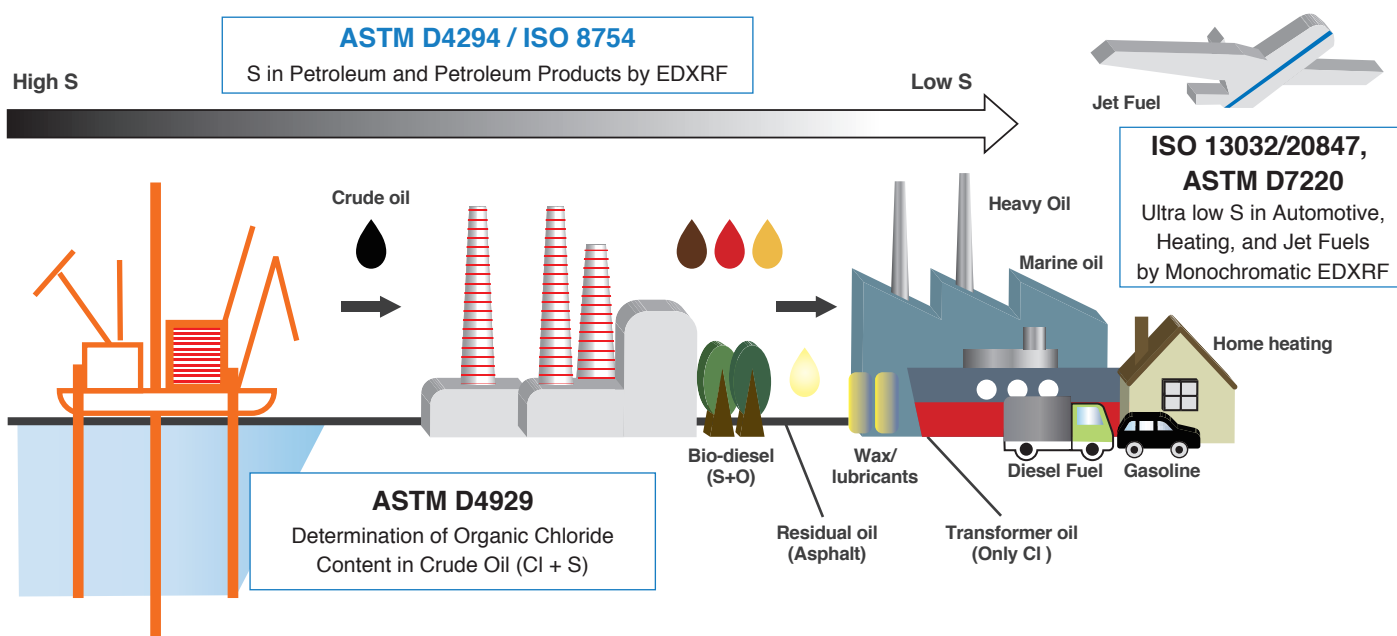
#### Auto Ranging of Extended Calibration Curves

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



## 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

### 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

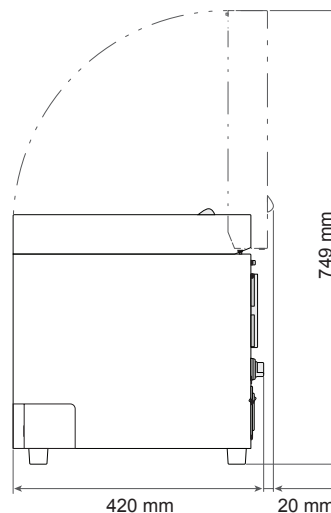
Instrument Dimensions	Inch	mm
Width	11.69	297
Depth	16.54	420
Height (Closed)	16.54	420
Height (Open)	29.49	749

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

Principle	X-ray Fluorescence analysis (Monochromatic EDXRF)
Sample	Petroleum products
Elements to Measure	Sulfur (S) and Chlorine (Cl)
Measurement Range	0.00 – 100,000 ppm
Detection Limit	S: 0.7 ppm Cl: 0.6 ppm
Sample Volume	7 – 10 mL for each sample cell
Sample Chamber	Atmospheric Conditions
X-ray Tube	Ag Target
Detector	Silicone Drift Detector (SDD) Energy resolution at Mn-Kα ≤ 175 eV
Vacuum Level in the optics	≤ 4 kPa, Diaphragm Pump
Conformity Standards	ASTM D7220 / D4294 / D4929 ISO 8754 / 13032 / 20847

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\*2 Windows is a registered trademark of Microsoft Corporation in the United States and other countries.



PC	
CPU	Intel® Core™ i5-8500*1 or faster
OS	Microsoft Windows 10 Pro, 64 bit,*2 English (US)
Memory	4GB or more
Storage	1TB or more

Display Unit	
Resolution	Full HD (1920 x 1080)

Printer	
Model	CT-S4000 made by CITIZEN WATCH CO., LTD.
Paper / Paper width	Line thermal printer (External) / 112 mm / 4.4 inch

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



SLFA-60



SLFA-6000

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

[Range] 0 - 9.9999%

[Detection limit] 5 ppm or less

[Accuracy] less than 5 ppm (1% sulfur sample)  
less than 1.6 ppm (0% sulfur sample)



Check the product video !



The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001. We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.



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