



# SPECTROLAB

Spectrolab Science

cat71121

## **Model S1000**

**Sulfur in oil, petrol, diesel / All liquids**

**The new S1000 series XRF**

**For ultra low levels of Sulfur in fuels ..... LOD 0.2ppm**

## **MWDXRF**



ASTM D7039 ISO 20881 SH/T0842  
and other standards

## The need for lower detection methods of sulphur in hydrocarbon fuels

In order to reduce the harmful emissions of pollutants such as sulphur and its derivatives in the environment, stricter quality standards for hydrocarbon fuels are now in place. The limit of sulphur content in gasoline has been reduced from 150 ppm to 50 ppm and further restrictions will shortly apply to the level of 10 ppm or lower. Standard XRF technology does not work well at this level due to interferences within the measurement and low overall sensitivity. For this reason there is a need to revise testing methods and instrumentation. These changes can be found in the V and IV vehicle fuel standards, which have been introduced in ASTM 07039 "Standard Test Method for Sulfur in Gasoline, Diesel Fuel, Jet Fuel, Kerosene, Biodiesel, Biodiesel Blends and Gasoline-Ethanol Blends. There are several options that can provide enhanced sensitivity. The preferred analytical method is Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry MWDXRF

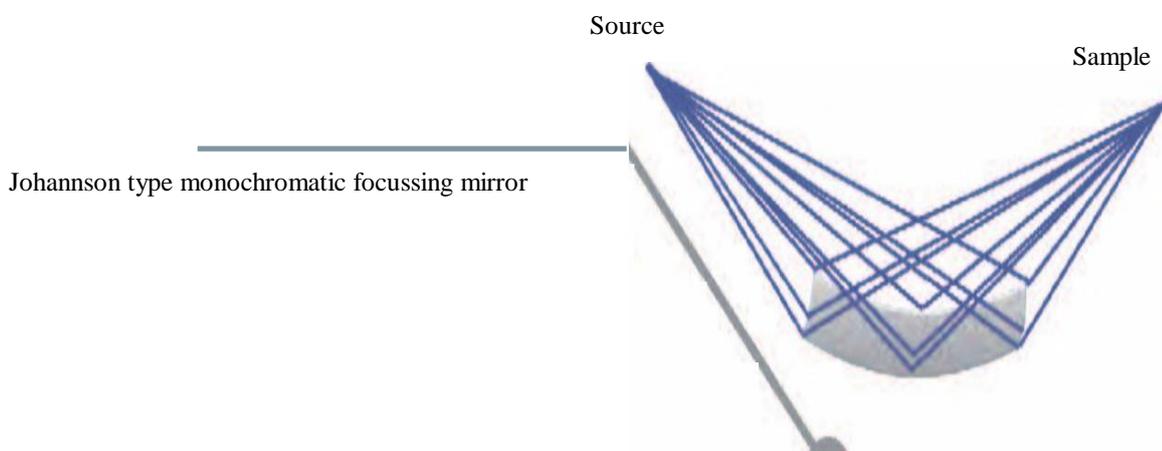
Based on the method of monochromatic wavelength dispersive X-ray fluorescence spectrometry (MWDXRF) the new S1000 series X-ray fluorescence spectrometer is the perfect instrument for determining ultra-low sulfur content, offering the advantages of high sensitivity detection, excellent discrimination and fast analytical times .

The S1000 X-ray fluorescence spectrometer can be used for the production and quality control required in oil refining and petrochemical oil storage or transportation. Also oil and fuel quality supervision in government departments, military and many other similar applications.

The S1000 is a compact desk top analyser able to measure the concentration of Sulfur in fuels such as gasoline, diesel, petrol, aviation fuels , kerosene, biodiesel and biodiesel blends as well as gasoline-ethanol blends, etc at the sub ppm level and at high speed

## How does the new technology work.....

Conventional XRF systems currently used for sulphur analysis are based on a simple X-ray source collimated by a pin hole aperture. Polychromatic X-rays illuminate the sample and any fluorescence is detected using a conventional silicon detector. The resulting signal is then energy discriminated and processed. The problem being that the pin hole collimators and filters used, significantly reduce the number of photons at the sample and discrimination is incomplete. This new technology described as MWDXRF overcomes these design limitations in a number of ways avoiding the need for pin hole collimators and filters. In addition interferences are also eliminated. With MWDXRF incident X-rays are generated by a microfocus X-ray source and **focussed** onto the sample using a Johannson monochromatic focussing mirror. Secondary X-rays are diffracted by the sample are then focussed by a second Johannson monochromatic mirror onto a detector. This arrangement provides for extremely low backgrounds with the advantage of simple or no matrix corrections. The result being an analyser capable of extremely high sensitivity, LOD's of 0.2ppm and superb S:N ratios



## Features

Compact desk top lab instrument

On line monitoring option. Can be used as an on line analyser

Offers high reliability and requires no routine service

An advantage of this type of spectrometer is that it is inherently simple in concept. There are no moving parts to go wrong.

All optics are carefully adjusted at the factory for optimum performance and locked into position.

Installation is simply a matter of switching the instrument on and checking performance relative to normal standards as supplied

All electronics are state of the art employing a unique digital shaping MCA and a digital pulse height analyser with features that include fast baseline restoration and optimum peak detection

Convenient automatic drift correction can be checked using simple solid samples with high, medium and low concentrations

Calibration curves are pre installed according to order allowing accurate analysis in all matrixes including petrol, diesel and aviation fuels. Additional calibration curves can easily be configured as required.

## Applications

Gasoline, Diesel, Jet fuel, Kerosene, Biodiesel and blends, Gasoline Ethanol blends

## Specifications

X-ray source	Microfocus spot focus 175um
Chromium target	Be window 10um
Optics	Johannson monochromatic focussing mirrors
Type	Vacuum chamber
Hardware	High speed processor on embedded system platform Touch pad with graphical user interface
Software	Calibration, drift correction, data browse, statistics Data collection and processing, print.
Limits of detection	0.2ppm sulphur in fuel
Range	0.2ppm – 10%
Time	30 to 300 Secs
Power	115-240V 500W



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