Sulfur Analyzer for Petroleum Fuels

SINDIE®-7039

Bench-Top Analyzer

ASTM-D 7039

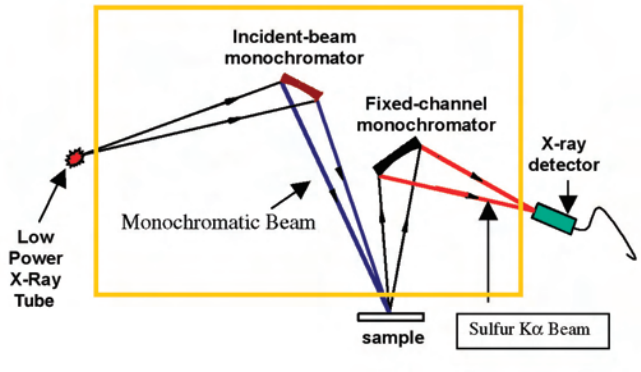
The SINDIE-7039 Bench-Top analyzer is a compact, easy to use sulfur analyzer, designed for petroleum fuels from ultra low sulfur diesel and gasoline to heavy fuel oil.

SINDIE-7039 delivers unprecedented accuracy and precision, and provides the ultimate solution for the petroleum industry where reliability and speed are critical.

Breakthrough Monochromatic WD XRF technology offers a limit of detection of 0.4 ppm wt. with a dynamic range up to 5000 ppm wt. This direct measurement technique does not require sample conversion, consumable gases or high temperature operation.

The SINDIE-7039 design is ideal for laboratory and industrial use and requires minimal maintenance.

FIGURE 1
Analytic Engine Configuration



- **Monochromatic excitation = Extremely low background**
- **No moving parts in analyzer engine**
- **No consumables or sample conversion required**
- **Simplified matrix correction**

APPLICATION AREAS:

- Total sulfur analysis from ULS fuels up to 5000 ppm
- From gasoline to heavy fuel oil
- For pipeline terminals, refineries and test laboratories

FEATURES AND BENEFITS:

- LOD: 0.4 ppm wt.
  Dynamic range: 0.4 – 5000 ppm wt.
- Repeatability:

S Concentration	*Std. Dev.*
1 ppm	0.1 ppm
10 ppm	0.4 ppm
100 ppm	1.0 ppm
500 ppm	1.7 ppm

- Fits on any bench, in any lab:
  14.5”w x 19.5”d x 13.5”h
- Plug-and-go design: standard wall power is only utility required
- User-friendly with touch screen interface
- Flip-lid design for easy sample cup introduction
- Measurement time: 30s-300s. programmable
- One calibration for diesel and gasoline matrixes over full dynamic range
- Extremely low maintenance:
  No conversion gases
  No columns
  No heating elements
  No quartz tubing
- Field replaceable air-cooled excitation tube
- No sample conversion or combustible gases required
- Polyamide x-ray window, no exposed Be windows

Typical SINDIE-7039 Bench-Top Specifications

FIGURE 2
Linearity 0–500 ppm
R^2=0.9999

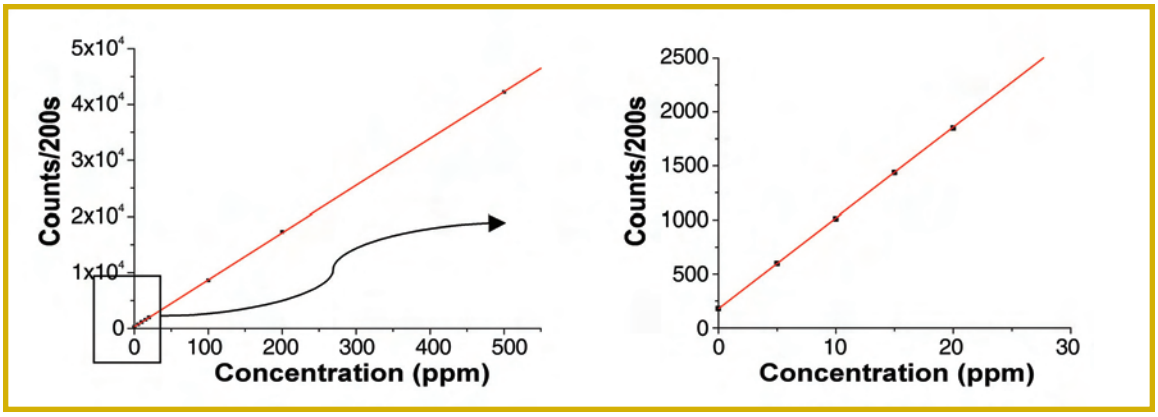


Table 1. Repeatability. Successive sulfur measurements of diesel specimen at various sulfur concentrations, on same analyzer. Measurement time: 300 seconds.

Measurement	2 ppm	10 ppm	20 ppm	500 ppm
1	1.98	9.20	19.47	498.51
2	1.96	9.75	19.95	502.14
3	2.23	9.66	19.58	500.83
4	2.11	9.75	19.64	498.52
5	2.15	9.85	20.00	498.64
6	1.87	10.07	20.52	—
7	1.97	9.74	20.56	—
8	1.99	10.11	20.45	—
9	2.11	9.85	19.75	—
10	2.23	10.58	19.72	—
Mean	2.06	9.86	19.96	499.73
SD	0.12	0.35	0.40	1.66
RSD	5.97%	3.60%	2.04%	0.33%

Table 2. Reproducibility Values at 95% Confidence Level. An interlaboratory study among six labs, using six different analyzers, analyzed 10 diesel fuels and 9 gasolines (some containing oxygenates). Samples were analyzed in duplicate and back-to-back. None of the labs used matrix correction calculations. For more information, contact your XOS representative.

Sulfur Concentration (ppm)	Gasoline Precision (ppm)	Diesel Precision (ppm)
1	0.69	0.59
2	0.97	0.84
5	1.54	1.32
10	2.17	1.86
20	3.08	2.63
50	4.86	4.14
100	6.88	5.84
200	9.73	8.23
500	15.38	12.97

Test Method	In accordance with ASTM Standard Test Method D-7039
Dimensions	14.5”w x 19.58”d x 13.5”h
Power	100-120 VAC, 47-63 Hz at 6.0 Amps 200-240 VAC, 47-63 Hz at 6.0 Amps
Other Utilities	None
Sample Introduction	Maximum sample cup volume: 15cc.
I/O Ports	Ethernet 10/100 base T RS 232
Optional Computer Interface	Pentium, 100MHz, 32 MB RAM Windows 98 or newer operating system
Ambient Temperature Requirements	5–40°C (40–104°F)
Dynamic Range	0.4 ppm–5000 ppm (wt.)
Measurement Time	30-300 seconds

Travel at the Speed of SINDIE®

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