



16
S
32.065

14
Si
28.086

40
Zr
91.22

28
Ni
58.69



Rigaku

Leading With Innovation

Mini-Z series

Benchtop wavelength dispersive X-ray fluorescence spectrometers

S analyzer • Si analyzer • Zr analyzer • Ni analyzer



Mini-Z S analyzer



16
S
32.065

6-position automatic sample changer

Mini-Z Si analyzer



14
Si
28.086

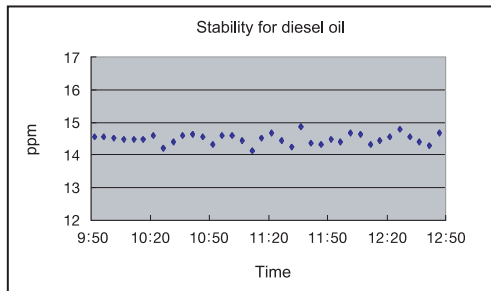
6-position automatic sample changer

The Mini-Z S analyzer was specifically designed for rapid batch testing of low and ultra-low sulfur fuel samples. It meets the EPA regulation ($S < 10$ ppm) required for fuel oil arising from environmental concerns, and also meets ISO 20884 and JIS K2541-7 analysis specifications. The Mini-Z S analyzer can determine concentrations as low as 0.3 ppm, far outperforming EDXRF instruments.

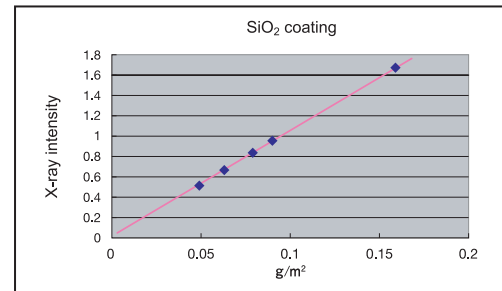
- Total sulfur analysis using non-combustion method
- Optics optimized for analysis of sulfur in fuel oil
- Measures both peak and background
- LLD: 0.3 ppm (counting time 300 s)
- Analysis range: 0.5 ppm to 500 ppm (following ISO 20884 and JIS K2541-7)
- Repeatability: standard deviation 0.17 ppm for 10 ppm sulfur in diesel oil

The Mini-Z Si analyzer allows high-precision analysis of Si coatings used for surface treatments (e.g. coating on polyester (PET), polypropylene (PP) and paper). This analyzer is ideal for coating technology R&D and quality assurance on production lines where coatings are applied.

- Repeatability: standard deviation 0.0002 g/m^2 for 0.046 g/m^2 Si on polyester (PET) (counting time 100 s)
- LLD: 0.00015 g/m^2 (counting time 100 s)
- Analysis range: Si coating 0.0005 to 2 g/m^2
- WD optics produce high sensitivity and low background



Single sample, 300 s measurement, for 3 hours
Average 14.5 ppm, standard deviation 0.16 ppm



Sulfur concentration in diesel oil

	4 ppm	9 ppm	16 ppm
1	4.31	9.14	15.89
2	4.40	9.27	16.10
3	4.08	9.05	16.10
4	4.27	9.00	16.23
5	4.45	8.92	16.17
6	4.09	8.67	15.89
7	4.43	9.14	15.88
8	4.04	9.03	16.43
9	4.11	9.17	16.33
10	4.13	9.09	16.26
Average	4.23	9.05	16.13
S.D.	0.16	0.17	0.19

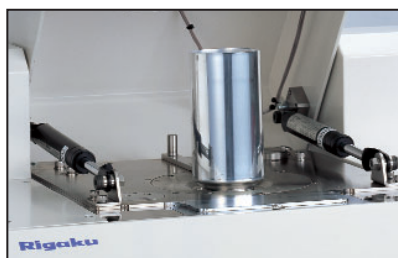
10 consecutive measurements
This table illustrates good repeatability at low concentrations

Sample: polyester (counting time 100 s)

	0.046 g/m^2
1	0.0460
2	0.0463
3	0.0460
4	0.0463
5	0.0462
6	0.0458
7	0.0461
8	0.0456
9	0.0459
10	0.0460
Average	0.0460
S.D.	0.0002

10 consecutive measurements

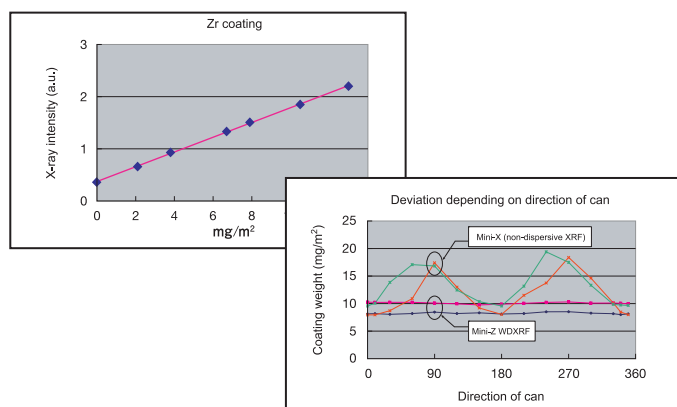
Mini-Z Zr analyzer



40
Zr
91.22

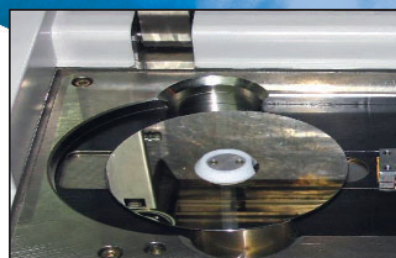
The Mini-Z Zr analyzer can determine the thickness of the Zr coatings used on aluminum cans to reduce corrosion and improve the label printing quality. This WDXRF analyzer has excellent reproducibility and is unaffected by the angular orientation of aluminum can samples, making it vastly superior to EDXRF analysis.

- Sample shape: aluminum can ϕ 66 mm (height < 170 mm)
- Repeatability: standard deviation 0.1 mg/m² for 8 mg/m² coated weight (counting time 100 s)
- LLD: 0.12 mg/m² (counting time 100 s)
- Analysis range: coated weight 0.4 mg/m² to 30 mg/m²
- WD optics remove directional dependence due to the shape of the sample



Measurement is simplified because directional effects due to the shape of the sample are negligible

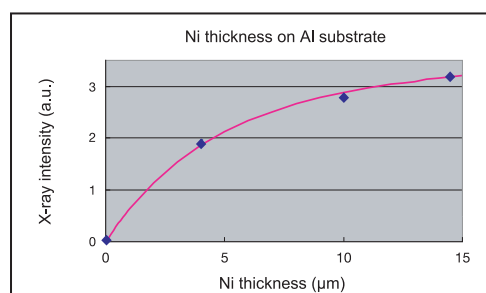
Mini-Z Ni analyzer



28
Ni
58.69

The Mini-Z Ni analyzer performs high-precision measurements for coating and plating thickness. Its compact WD optics allow results that surpass anything possible with an energy dispersive unit.

- Repeatability: 0.03 μ m for Ni 14.4 μ m on an Al substrate (ϕ 8 mm) (counting time 30 s)
- Analysis range: 0 to 15 μ m



Sample: Al substrate

Reproducibility with sample re-loading

	80 mg/m ²
1	8.22
2	8.26
3	8.11
4	8.03
5	8.11
6	8.07
7	8.06
8	7.94
9	8.13
10	8.02
Average	8.09
S.D.	0.095

Sample: Al substrate (counting time 30 s)

	Thickness (μ m)
1	14.40
2	14.37
3	14.34
4	14.35
5	14.31
6	14.37
7	14.41
8	14.41
9	14.38
10	14.36
Average	14.37
S.D.	0.03

The Mini-Z series of compact benchtop wavelength dispersive XRF instruments are designed for analyzing specific individual elements. The optics are optimized for the particular element, allowing for high precision and ease of analysis.

*Exceptional repeatability • Excellent LLDs • Wide analysis range • Easy-to-operate touch panel
No cooling water, plug-n-play • Light weight and compact body*

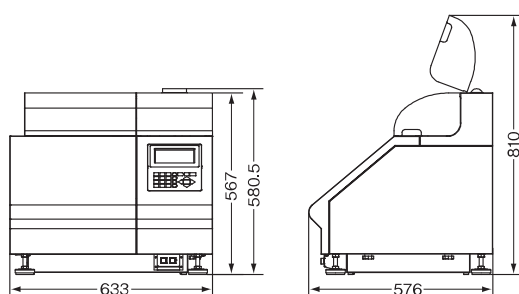
Mini-Z series benchtop WDXRF spectrometers

Specifications and installation requirements

	S analyzer	Si analyzer	Zr analyzer	Ni analyzer
X-ray tube	Compact air-cooled Cr target X-ray tube	Compact air-cooled Pd target X-ray tube	Compact air-cooled Pd target X-ray tube	Compact air-cooled Pd target X-ray tube
Analyzing crystal	RX9	RX4	RX9	LiF(200)
Detector	S-PC	S-PC	S-PC	S-PC
Analysis area	φ 30 mm	φ 30 mm	φ 30 mm	φ 8 mm
Sample chamber	6-position sample turret Sample amount: 4 mL or more (requires Rigaku liquid cells) Path: He	6-sample turret Path: He	Path: He	Path: Dry air, r axis mapping (optional)
Power supply	100/220 V 2/1 A single-phase (50/60 Hz) (plug with ground)			
Ground	Ground resistance 30 Ω or less			
Ambient condition	Room temperature: 15-28°C (daily variation: less than ±2°C), Humidity: less than 75% RH			
Gas	He (flow rate: 100 mL/min)			Dry air (flow rate: 50 mL/min)

S and Si analyzers

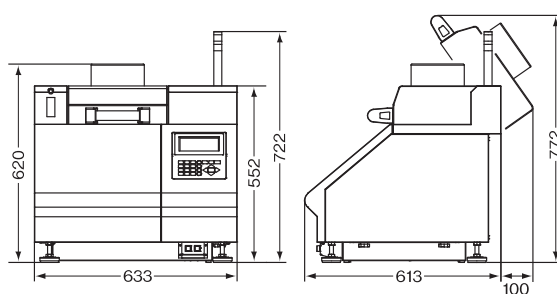
Unit: mm



Weight: 65 kg

Zr analyzer

Unit: mm



Weight: 70 kg



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