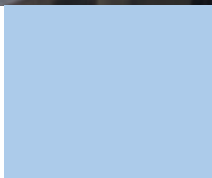
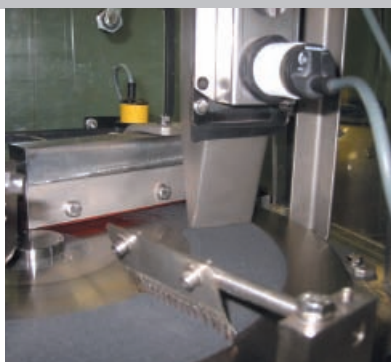


The DSA-200 provides online, accurate elemental analysis of dry streams in Mineral Sands applications. The continuous analysis allows plant operators to follow and respond to process trends in real time. This enables improvements in recovery, product quality and profitability.

DSA-200

Continuous, Online Dry Stream Elemental Analyzer for Mineral Sands Applications



Features

The DSA-200 measures and reports:

- Up to 20 elements (Al and higher) simultaneously, with an update time of one minute
- Modern detector and electronics design with digital signal processing, giving superior accuracies and improved remote diagnostics
- Accurate calibration and check sampling is achieved as the sample taken corresponds exactly to the analysis period
- Direct interface to any plant process control system (e.g., Modbus or OPC) from the central computer

Benefits

- Rapid detection of process disturbances
- Fewer off specification production due to contaminants, such as zircon in rutile
- Optimal set-up of separator parameters
- Reduced analytical costs for process control

The DSA-200 is a robust analyzer intended for installation close to the primary flow in the process environment. First introduced in 1991, the 200 series is the latest release in a successful line. Elements from Al and higher in the periodic table can be measured using the X-Ray Fluorescence (XRF) technique. Thermo Fisher Scientific can design and provide materials handling systems for sampling and return. Correct sampling and analysis facilitates manual or automatic process adjustments.

The DSA-200 incorporates full digital signal processing. It can process much higher count rates thus significantly improving

measurement accuracies. Critical detector performance and spectrum configuration can now be made from the central computer. This allows Thermo Fisher to provide remote diagnostics, superior accuracy, availability and faster investment pay-back.

Wet Plants

Thermo Fisher Scientific also offers a range of in-stream analyzer products for continuous elemental analysis of slurry streams. These are single element or multi-element probes.

DSA-200

Analyzer Performance

Sample Characters	Feed flow in range 10 to 100 kilograms per hour (22-220 lb/h); free-flowing, fine powder (<1% moisture and p80 <150 micron); sample temperature <+90°C (<+210°F)
Analysis Update Time	Typically 1 minute
Detection System	Energy dispersive: Si(Li) or H.P. Ge, solid state detector with electronic reset; LN ₂ -cooled; Typical resolution 140-160 eV (@ Mn K α)
Measurement Capabilities	All elements with atomic number >12 (aluminium and higher in periodic table)
Ambient Temperature	0°C to +50°C (+32°F to +122°F).

Accuracy

Stream	Element	Assay Range %	Typical Error % (at 1 sigma) ¹
Zircon	TiO ₂	0.06 - 0.20	0.008
	Fe ₂ O ₃	0.07 - 0.30	0.003
	ZrO ₂	64.5 - 66.5	0.1
Rutile	TiO ₂	94 - 96	0.2
	Fe ₂ O ₃	0.5 - 1.1	0.03
	ZrO ₂	0.5 - 1.1	0.03
Ilmenite	TiO ₂	48 - 52	0.2
	Fe ₂ O ₃	45 - 50	0.3
	SiO ₂	1 - 4	0.1
	CaO	0.04 - 0.30	0.004
	Cr ₂ O ₃	0.1 - 0.4	0.01

¹Use as guide only. Dependent on particle size, mineralogy and matrix variations.

Utilities Required

Electrical Power	Factory selectable 380/415/440/460 Volts AC ±10%, 3-phase, 48-62 Hz ±2 Hz (3 wire plus earth)			
Temperature Control Option	115/230 Volts AC ±10%, 3-phase, 48-62 Hz ±2 Hz (3 wire plus earth)			
Power Consumption	Maximum 400 W			
Air	Instrument-quality air: Clean and dry to 0.1 microns with dew point <+2°C (<+36°F). Pressure nominally 600 kPa (87psi), ranging from 450 kPa to 800 kPa. Secondary air filter built in. Consumption: Intermittent, <5 litres per day at working pressure.			
Radioisotope Sources	X-ray Source	Typical GBq	Activity (millicuries)	RWL (Recommended Working Life in years) ²
	Cm-244	1.1-7	30-190	10
	Pu-238	1.1-7	30-190	10
	Am-241	0.11-0.8	3-20	15
	Cd-109	0.4-0.8	10-20	5
	Fe-55	1.1-3	30-80	5
	² Can be used for longer times if tested in accordance with local radiation safety rules.			
Communications Links	Internal: TCP. Options available. External: OPC (TCP/IP or serial); Modbus (TCP/IP) or Modbus serial (EIA RS-232, RS-422, RS-485); 4-20 mA current loops			
Off-Site Modem	One data-quality phone line or VPN internet link			
Standards	Radiation shielding designed to IAEA safety standards. Electrical cabinet: IP66. Quality assurance: ISO 9001			

²Can be used for longer times if tested in accordance with local radiation safety rules.

Dimensions and Weights

	Length	Width	Height	Weight
	1010 mm (40 in)	600 mm (24 in)	1846 mm (73 in)	300 mm (661 lb)
Primary Sampler (Optional)	Primary samplers can be specified and supplied by Thermo Fisher Scientific. In some circumstances existing sampling system may be used.			

DSA-200 Technical Diagram

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Australia
+61 (0) 8 8150 5300
+61 (0) 8 8234 5882 fax

Chile
+56 (2) 335-3388
+56 (2) 335-1590 fax

Europe
+49 (0) 6104-923680
+49 (0) 6104-923682 fax

USA
+1 (800) 488-4399
+1 (858) 452-9250 fax

Canada
+1 (604) 669 6395

China
+86 (0) 21 6865 4588
+86 (0) 21 6445 7830 fax

India
+91 (20) 6601 1245
+91 (20) 2612 5739 fax

www.thermo.com/minerals
sales.pid.adelaide@thermofisher.com