

Elemental Analysis

MSA-330 Multi Stream Slurry XRF Analyzer

The Thermo Scientific™ MSA-330 Multi-Stream Analyzer provides accurate, fast, cost-effective elemental analysis of up to 12 slurry streams. The information provided by the MSA allows plant operators to follow process trends in real time, enabling automatic or manual changes to optimize your process.

Features

- Advanced energy dispersive X-ray detector
- Peltier cooled detector does not require liquid nitrogen
- High availability
- Accurate and reliable
- 3 to 12 analysis streams
- Streams remain separate through the complete system
- Composite sampling included
- Low slurry head loss of less than 0.8m across the MSA

The MSA-330 Multi-Stream Analyzer provides simultaneous analysis of up to 20 elements and percent solids.

The MSA-330 Multi-Stream Analyzer comes with a Thermo Scientific™ MEP-300 Multi Element Probe that does not require Liquid Nitrogen cooling. The MEP-300 has a Silicon Drift detector (SDD) with vastly improved sensitivity to common elements and lower background. This results in higher accuracy, shorter counting times and lower detection limits.

The MSA-330 Multi-Stream Analyzer offers the most flexible multi stream elemental analysis solution for process control and monitoring for mineral beneficiation circuits, and can be combined with the Thermo Scientific™ AnStat-330 Online Sampling and Elemental Analysis Station to optimise the elemental analysis solution within any existing or new plant.



6 Stream MSA-330 Multi-Stream Analyzer with Vacuum Filter Option

MSA-330 Multi-Stream Analyzer Sampling and Sample Presentation

The MSA-330 Multi-Stream Analyzer provides online analysis for between 3 and 12 streams of slurry. Each of the streams to be analyzed by the MSA-330 is provided with a dedicated analysis tank. The analysis tanks consist of a de-aeration zone, followed by an analysis zone and a cross-stream sampler. The standard 300-mm wide analysis tank can accept flows up to approximately 12 m³/hr. Larger width tanks are available, which means flows up to 30 m³/hr. can be analyzed, eliminating the need for primary samplers in some cases and providing enhanced sampler accuracy.

Sample return is simplified by the fact that the MSA-330 Multi-Stream Analyzer maintains separated sample streams from sample point to the analyzer and through sample discharge. The slurry head loss is less than 0.8m across the MSA-330. With proper plant design & layout considerations, numerous sample streams can be transported from the samplers to the MSA without sample transfer or return pumps.

The sample or full flow process streams operate continuously ensuring the most representative sampling and allowing the MSA-330 to take readings on any stream at any time without needing to wait for sample to be prepared.

Unlike a simple process stream sampler, the combination of the Thermo Scientific™ Samstat-30C Slurry Sampling Station with the MSA-330 provides full metallurgical accounting quality sampling, as the full stream is sampled down to the point where it goes into the MSA-330 and then sampled to the bucket or optional vacuum filter.

The metallurgical sampler can be used for both shift and calibration sampling for each stream, automatically taking calibration samples for each stream.

MSA-330 Multi-Stream Analyzer Benefits

The MSA-330 Multi-Stream Analyzer provides a valuable window into your mineral separation processes. The system provides stable, accurate and reliable assays of core and nuisance elements in your slurry streams from Calcium (Ca) to Uranium (U). The quality of the information allows greater control of your process.

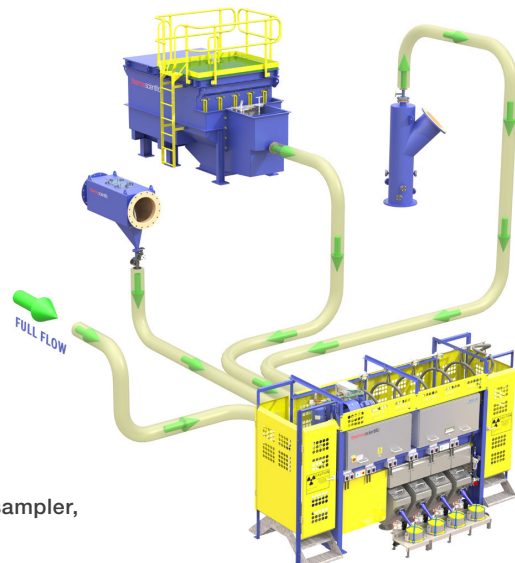
Experienced metallurgists, operators or an expert control system can leverage the analyses from the MSA-330 to:

- Provide enhanced process control
- Improve efficiency
- Reduce energy consumption
- Improve metal recovery
- Optimize reagent consumption
- Minimize the amount of off-spec material in product

For a large base metal concentrator with AnStat-330 dedicated analyzers in the critical Feed, Concentrate and Tails streams, the MSA-330 Multi-Stream Analyzer can be used to provide online analysis to the intermediate streams within the cleaner circuit.

For example, a 4 stream MSA-330 can be used within the cleaner circuit to provide quick assay updates for each of the cleaner feed, 2nd cleaner feed, cleaner conc and cleaner tails streams. With careful layout, the 4 streams are gravity fed to the MSA-330 and gravity returned requiring no sample transport pumps.

A simplified sampling system that eliminates pumps reduces design, piping and pump capital costs as well as reducing ongoing pumping, maintenance and other operational costs.



Feed options for MSA-330.
From left: Full flow process stream, gravity sampler, SamStat-30C and pressure sampler

MSA-330 Multi-Stream Analyzer Analysis - MEP-300 Multi Element Probe

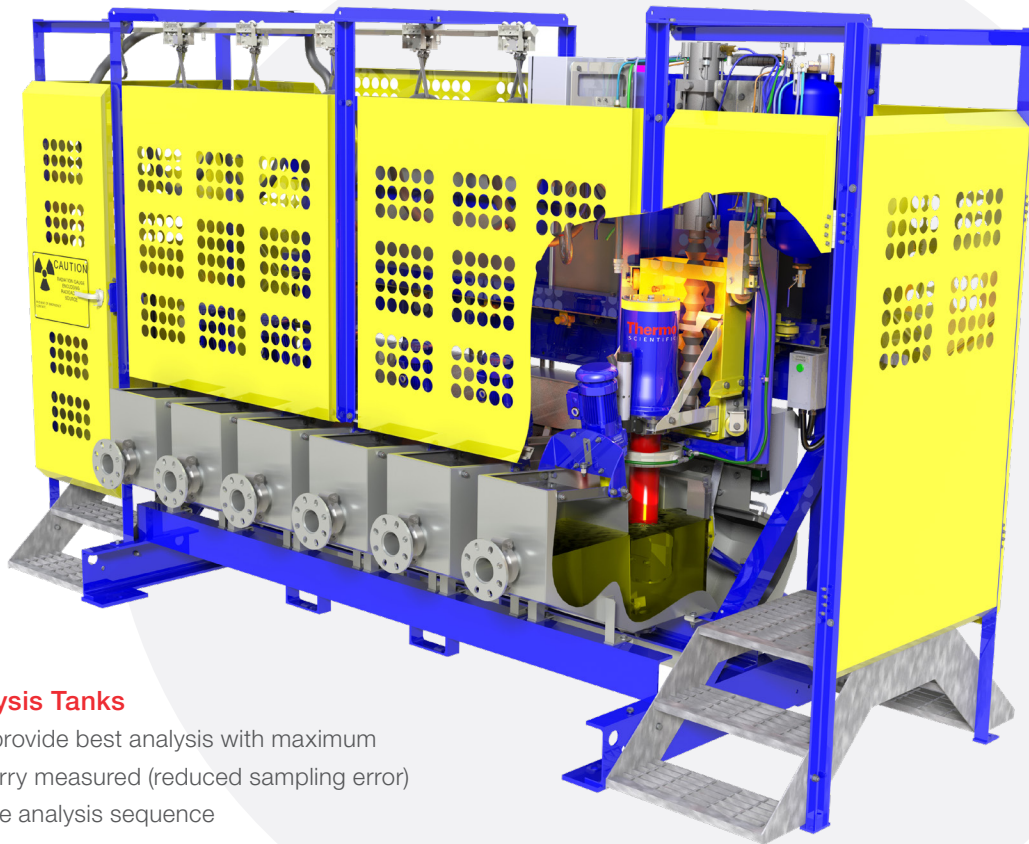
The MEP-300 Multi Element Probe is the product of 45 years of experience with probe based in-stream element analysis. It is the safest MEP ever with a retractable detector and source combining with a visual beacon to ensure no risk of radiation exposure for operators. The new detector attains higher count rates than previous generations with a better than 400% increase in copper sensitivity (CuKa). The MEP-300 has a very low background with high signal-to-noise ratio, resulting in exceptional instrument precision and perfectly matched to the industry leading sampling precision through the SamStat-C continuous sampling system.



MEP-300 Multi-Element Probe

Cross Cut Sampler

- A final-stage, cross-cut sampler is located at the outlet of each analysis tank for calibration and composite sampling
- Environmentally hardened to minimize maintenance and maximize availability
- Optional vacuum filters



Individual Analysis Tanks

- Designed to provide best analysis with maximum amount of slurry measured (reduced sampling error)
- Programmable analysis sequence

Traverser and Probe

- Traverser with pneumatic hoist moves probe to correct tank as required
- Safety lockout point at control box
- Full set of safety interlocks on doors
- Raise on loss of air pressure

Thermo Scientific MSA-330 Multi-Stream Analyzer (MSA-330)

Analysis Performance				
Number of Streams	3-12			
Analysis Time Per Stream	Typically, 1 minute			
Sample Flow Rate	Nominally 10m³/hr for standard tank, from 1m³ /hr to 30³ m/hr			
Detection System	Silicon drift detector, peltier cooled. Typical resolution 145 eV			
Accuracy	All elements with atomic number above 20 (i.e., above Ca in the periodic table)			
	Assay Range (% element by weight)		Relative Error¹	
	0.05 to 0.2		4%-6%	
	0.2 to 1.0		3%-5%	
	1 to 10		2%-4%	
	10 to 80		1%-2%	
	¹ Guide only; dependent on particle size, mineralogy and matrix variations			
Utilities Required				
Electrical Power	Factory selectable 360-600 Volts AC ± 10%, 3-phase, 48-62 Hz ± 2 Hz (3 wire plus earth) Maximum power consumption: 3-stream, 1.8kW; 6-stream, 2.9kW; 9-stream, 3.8kW – with standard 250W stirrer motors			
Air	Air supply must be at minimum instrument air quality to ISO8573-1 Class 3,4,3 at all times (Max 3 °C Pressure dew point). Pressure nominally 700 kPa (87 psi) minimum 550 kPa, maximum 1000 kPa. Minimum of 420 slpm @ 700 kPa at air inlet of controller frame Air consumption will vary with ambient and slurry temperatures. Consumption @ 700kPa: 380 SLPM @ 45°C Slurry and Ambient Temp 150 SLPM @ 30°C Slurry and Ambient Temp 15 SLPM @ 20°C Slurry and Ambient Temp			
Water	Clean plant water. 300 – 800 kPa Individual tank sprayers: 3.8 L/min per tank @350 kPa. Probe spray ring - 0.15 L/min @350 kPa			
Radioisotope Sources	X-Ray Source	Typical GBq	Activity	Recommended Working Life (RWL)
	Pu-238	1.1-3.7	30-100 mCi	15 years
	Am-241	0.4-1.1	10-30 mCi	15 years
	Cd-109	0.8-1.5	20-40 mCi	15 years
Communications	Ethernet TCP/IP: 100 MBps. Remote login to WinISA computer recommended. Reserve Static IP addresses: One for WinISA server and one for each analyzer			
Environmental				
Operating Temperature (Ambient)	-10°C to 55°C (measured at enclosure surface temperature, temperature to not exceed 55°C)			
Operating Temperature (Process Fluid)	0°C to 45°C, Check with factory for higher temperature options			
Humidity	0 to 95% RH - non-condensing			
Vibration	< 0.5G at installation tank supports			

 Learn more at thermofisher.com/minerals

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