Thermo Scientific AnStat-430

Online Sampling and Elemental Analysis Station

The Thermo Scientific™ AnStat-430 Online Analysis and Sampling Station provides continuous online elemental analysis while ensuring accurate, representative full flow sampling for metallurgical balancing. Options for additional process functionality, including distribution and pebble screening, make the AnStat-430 system a versatile and compact solution.

Features

- Isotope free with advanced long life, low power, X-ray tube technology.
- Air cooled X-ray tube and detector that does not require liquid nitrogen or chiller
- Higher counts for improved accuracy and performance
- Continuous minute by minute analysis
- High availability
- Low maintenance and operating costs
- Low head, full flow gravity fed design

Thermo Scientific AnStat-430 sampling and analysis station

Introduction

The Thermo Scientific AnStat-430 sampling and analysis station is the latest version of our market-leading single stream dedicated online slurry analyzer and sampling station. AnStat-430 system takes advantage of the Thermo Scientific™ MEP-400 In-Stream Analysis (ISA) Multi Element Probe with its modern ED-XRF technology Silicon Drift Detector (SDD) and X-ray tube. This eliminates the need for isotopes and cryogenic cooling requirements, significantly improving safety. Coupled with our integrated in stream sampling technology for exceptional sampling accuracy and analysis availability, this makes the AnStat-430 system the ultimate in slurry sampling and analysis.

The Thermo Scientific™ AnStat-430 online slurry analyzer and sampling station is configured and sized exactly to your process requirements for optimal performance. It features an integrated analyzer and a full-flow representative sampling system, incorporating multiple stages to progressively sub-sample the slurry stream before delivering metallurgical accounting quality composite samples through a final-stage metallurgical sampler. With minimal head loss due to its gravity fed in stream design, the AnStat-430 system enables dramatically simplified plant design and allows for elimination of pumps, resulting in lower installation and operating costs.

The AnStat-430 sampling and analysis station provides real-time, minute-by-minute elemental assays for the slurry stream. It does not suffer from sample transport and stream cycle time delays nor cross contamination associated with multiplexed analyzer systems. Instead, the dedicated and continuous in-stream analysis of the process streams allows operators or expert systems to control the process and quickly respond to process upsets and changing conditions.

With exceptional availability, sampling and analysis accuracy, the AnStat-430 system is a high integrity solution enabling reliable, rapid, and effective responses to changing plant conditions and process upsets, while also providing validation samples.

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AnStat-430 benefits

The AnStat-430 sampling and analysis station provides a 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 you greater control of your process. When combined with experienced operators or an expert control system, the analyses from the AnStat-430 system opens many possibilities, such as:

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

AnStat-430 application example

The AnStat-430 system features a very low head loss whilst sampling the full flow of a process stream. When used on the most critical streams of your plant it ensures the fastest update time with maximum availability. As such the AnStat-430 system is especially suited where its high accuracy and fast updates can help to minimize losses due to circuit upsets. As shown below, the design allows for very low head loss which can lead to significant concentrator construction cost savings while eliminating the need for dedicated sample pumps.

AnStat-430 Analysis - MEP-400 Multi Element Probe

The Thermo Scientific™ MEP-400 Multi Element Probe is a product of over 50 years of experience with immersion probe based in stream elemental analysis. It is our safest multi-element probe ever, incorporating a fail-safe retractable shutter and a controllable X-ray tube with automatic interlock and visual beacon to minimize risk of radiation exposure for operators. This allows for the radiation to be switched off when not in use or for maintenance. The new MEP-400 probe attains higher count rates than previous MEP generations, with a 10 times improvement in MEP-300 copper lower limit of detection, it enables exceptional analyzer accuracy. Similar improvements are also realized for other base metals.

Thermo Scientific MEP-400 system multi-element probe

AnStat-430 sampling

The Thermo Scientific™ SamStat-30 is a sampling station technology developed for easy and efficient installation into a modern processing plant. The flange-to-flange scope of supply delivers significant savings in engineering design and construction costs for new plants. MEP-400 brings advanced analytical technology to the SamStat-30, making it into AnStat-430 Analysis and Sampling Station. The design has been iterated for over 30 years to provide highly reliable dedicated sample presentation and online analysis

The SamStat provides ideal slurry presentation to the MEP-400 probe and has demonstrated superior availability and reliability. The AnStat-430 system requires no pumps or sample transport lines, minimizing both capital and operating costs. Special attention is paid to optimizing flow velocity for de-aeration and wear while maintaining critical transport velocity for coarser particles.

Multi-stage sampling is both continuous and proportional, fully reflecting process variability. The AnStat-430 online sampling and elemental analysis station has been successfully installed in mineral processing plants around the world, handling flows from 4 to 36,000 m^3/hour where it delivers high availability and accuracy for both on-line assays and metallurgical balance samples.

Hoist and probe

- Non-isotope XRF immersion probe for elemental analysis
- Pneumatic hoist raises and lowers probe for maintenance
- New innovative Quick-Change window design
- Local control panel includes safety lockouts
- High visibility beacon provides easy to recognize operational status from a distance

Controller

- Stainless steel, IP65 rated
- Contains stirrer motor VFD and programmable sample timer
- Industrial computer and I/O platform

Full flow, staged sampling

- Full process flow continuously sampled
- Each tank contains a baffle and weir to ensure mixing and correct presentation of sample to fixed cutters in line with fundamental principles of sampling theory
- Effective de-aeration of slurry while maintaining critical transport velocities
- Single or multiple inlets
- Optional expanded de-aeration zone for high froth streams
- Pneumatic dump valve option allows remote and automatic operation
- Pebble screen option captures coarse oversized particles from cyclone roping events

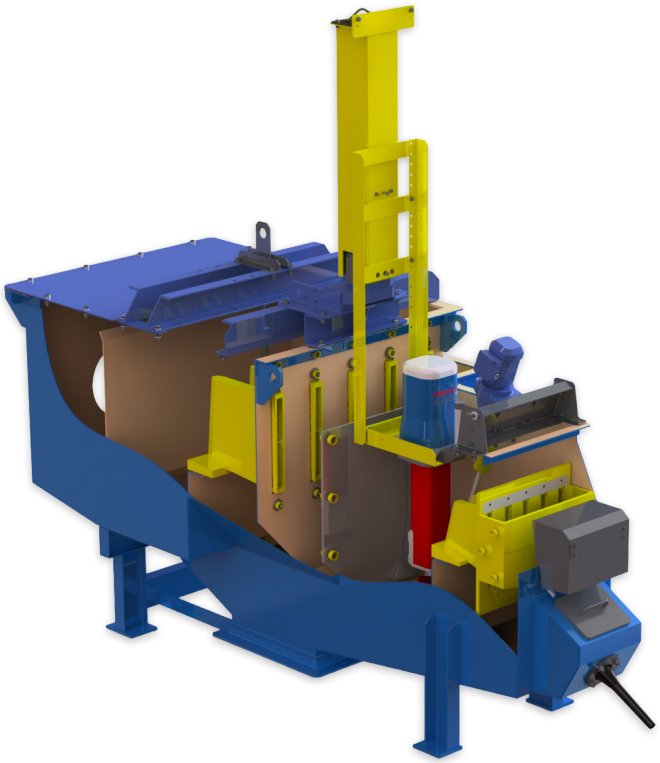
Analysis stage

- Variable speed impeller ensures optimal slurry presentation for XRF analysis over a wide range of flow conditions
- Improved impeller design and shaft sealing for increased service life
- Probe sees a relatively large volume of slurry, ensuring accurate and representative analysis

Cross-cut sampler

- A final-stage, cross-cut sampler is located at the outlet of the analysis tank for calibration and metallurgical accounting sample acquisition
- Environmentally hardened to minimize maintenance and maximize availability
- Tooth pulley belt with electric motor drive for constant speed to comply with best design practices for crosscut sampling
- Programmable sample intervals

Thermo Scientific AnStat-430 controller



Thermo Scientific AnStat-430 showing the MEP-400 probe

Thermo Scientific AnStat-430 online sampling and elemental analysis station

General specifications	
Analysis update time	Continuous measurement, typically with 1 minute assay updates
Excitation	X-ray tube
Detection system	Silicon drift detector, Peltier cooled. Typical resolution 132 eV @FeKα.

Accuracy

Assay range (% element by weight)	Expected relative error (Guide only)	Assay range (% element by weight)	Expected relative error (Guide only)
0.05 to 0.2	4%-6%	1 to 10	2%-4%
0.2 to 1.0	3%-5%	10 to 80	1%-2%

Sampling – primary samplers	
Design/methodology	Sampler design is proportional with minimum fraction of 4% sampled at each stage.
Sample flow rate	Configured to suit any flowrate from 4 m^3/hr to 36,000 m^3/hr, with 1 to 3 stages of static cutters.
Sampling – final stage	A small linear cross-cut sampler is installed to collect the final sample, typically 10 liters for calibration or shift composite samples.

Utilities required	
Power (in-plant)	Three phase 380-600 Volts AC +/- 10%, 50/60 Hz (48 – 62 Hz), 2.5 kVA
Air	Instrument Air, ISO 8573.1 Class 3, 4, 3, Dewpoint <3 °C. Pressure 550 kPa minimum, 1000 kPa maximum, nominal 600 kPa (87psi). Consumption: maximum flow rate 420 SLPM
Water (F Models)	Clean plant water, ranging from 11.7 - 23.4L/min @ 300kPa (Max)
Communications	Ethernet TCP/IP: 100 MBps or greater. Optional Fibre Optic converter available.

Environmental	
Temperature – controller, ambient	-10°C to 55°C (measured at enclosure surface temperature, temperature to not exceed 55°C) Sunshade recommended to protect equipment & personnel. Required for outdoor installations above 35°C.
Temperature - process fluid	0°C to 45°C
Temperature – MEP-400 Probe, ambient	0°C to 55°C
Humidity	0 to 95% RH - non condensing
Vibration	<0.5G at installation tank supports
Dimensions and weights	Request installation drawing for specific equipment dimensions & weights

Compliance and standards	
Electrical enclosure	IP65
Probe	ARPANSA RPS13, IP66
Quality assurance	Adelaide manufacturing facility ISO-9001:2015 certified
Safety assurance	Adelaide manufacturing facility ISO45001:2018 certified
Environmental assurance	Adelaide manufacturing facility ISO14001:2015 certified

Learn more at **thermofisher.com/ANSTAT-430**

For current certifications, visit thermofisher.com/certifications