

## INNOVATIVE CLAY FINES MEASUREMENT

The K40 Analyzer provides a measurement of potassium concentration in oil sands, ash, potash or other substances. This concentration can then be correlated with the amount of clay or fines.

Processes and treatments sensitive to clay fines can be better managed with the K40 Analyzer's online measurement.

The K40 Analyzer is optimized to detect the naturally present gamma radiation emitted by the decay of the potassium 40 (<sup>40</sup>K) isotope. The analyzer can also be configured to also detect other elements (e.g. uranium and thorium).

### *This instrument can be used to:*

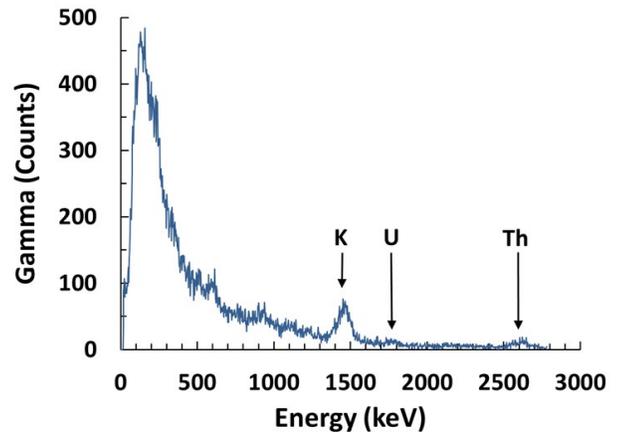
- Obtain an indirect measure of clay content in ores, slurries or ash by correlating the detected counts per minute of <sup>40</sup>K with clay fines present in the material.
- Provide measurements on pipelines, apron feeders, conveyor belts, storage tanks or vessels.
- Generate trending data that can be fed backwards to optimize the mining and blending of oil sands, or fed forward for caustic dosage in the plant.
- Prevent process upsets in Primary Separation Vessels.
- Assist with extraction chemistry and mining strategy.

### *Benefits*

- Improved efficiency and yield in bitumen extraction processes.
- Closed loop control in control scenarios that may have been open-loop before.
- High reliability since there are no moving parts and no intrusion into the pipeline or vessel.
- Measurement can be used to aid in mining to ensure consistent ore quality entering the process.

### *Site Installation*

- The analyzer is made up of two components: the transmitter cabinet and the detector with external shielding.
- The transmitter cabinet is installed in a protected environment, and connects with the detector unit as well as providing the external outputs and communications.
- The detector is shielded to prevent background radiation, already present in the plant, from falsifying the analyzer's readings.
- The detector and shielding can be installed on pipeline, apron feeder or conveyor belt.



*K40 Analyzer Sampled Spectra*



*Transport Line installation  
(shown with additional site specific shielding walls)*



*Apron Feeder installation*

## PRODUCT SPECIFICATIONS

### Detector Unit with External Shielding

- Detector Unit: 1292 mm x 254 mm x 254 mm (51"x 10"x 10") LWH, 45 kg (100 lbs.)
- External Shielding: 1422 mm x 610 mm x 381 mm (56"x 24"x 15") LWH, 1184 kg (2605 lbs.)
- 120 VAC / 15 A / 60 Hz / 1ph. power mains for fan and heater (sourced from the Transmitter cabinet)
- Operating Temp: -50 °C to +40 °C

### Transmitter Cabinet

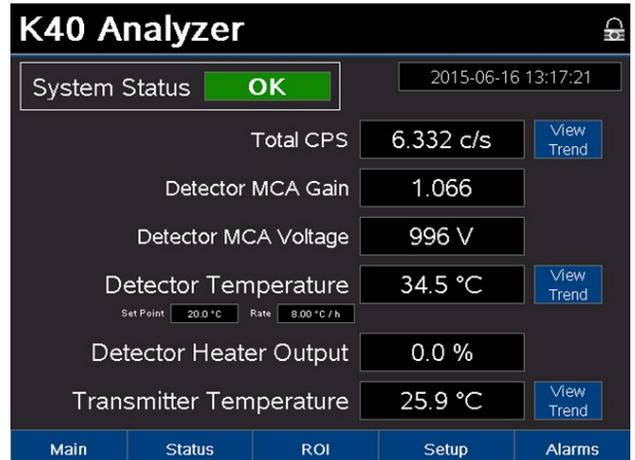
- 762 mm x 610 mm x 305 mm (30"x 24"x 12") HWD 55 kg (121 lbs.) NEMA4 rated CSA enclosure
- Industrial Embedded PC for high level control and data communication
- Programmable PLC for logic control and DCS analog/digital outputs
- Operating Temp: +5 °C to +25 °C
- Humidity: 20 - 80% RH, no condensation
- Must be sheltered from wind and sun
- 120 VAC / 15 A / 60 Hz / 1ph. power mains
- K40 Counts per sec 4-20 mA analog output
- Detector Temperature 4-20 mA analog output
- RS-485 Modbus communications output
- Alarm dry contact output (1, wired NO or NC)
- Front door mounted operator HMI Display Unit with touch screen

### Documentation

- User manual with sections describe installation, maintenance and routine operation
- Operator training program



Detector unit partially installed into the external shielding



HMI Display Screen (Main Screen shown)

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