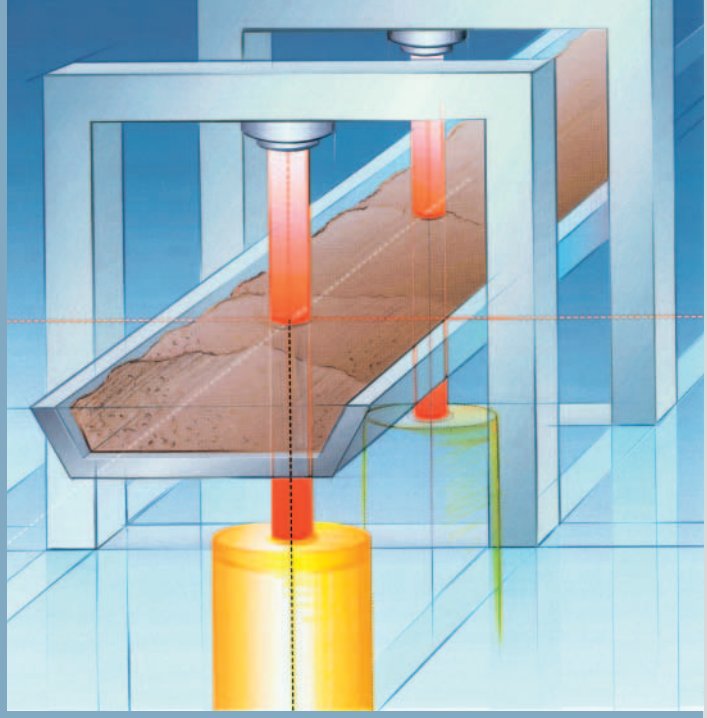

AshAlyzer LB 421

Online Analysis Of Ash Content In Coal

PROCESS CONTROL

BERTHOLD TECHNOLOGIES

AshAlyzer LB 421 – The Winning Solution

Determining ash content is a critical measurement – especially these days where energy and commodity costs are so important. Berthold Technologies has the solution – and it´s cost effective as well. With non-contacting and non-intrusive technology, Berthold Technologies can make this measurement reliably and consistently as well as reduce maintenance and operating costs.

Accurate and cost-effective

- Determination of ash content during train loading or delivery to power stations
- Monitoring the control of blending methods
- Early recognition of trends in the ash content permits optimal process control
- Optimized process control in coal preparation
- Ideal utilization of resources in coal production and processing leads to significant reduction of costs

Online and Non-contact

The AshAlyzer is specifically designed to work in harsh environments such as coal mining and processing. It allows the precise determination of the ash content and the calorific value of coal, right on the conveyor belt. Continuous, reliable and precise. Neither heat nor dust affect the measurement.

As an option the AshAlyzer can be provided with a microwave moisture measurement which uses micro-waves to compensate for moisture changes that may affect the ash measurement accuracy.

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AshAlyzer system highlights

Accurate results in real time
The continuous real time monitoring of the coal quality permits the optimized control of processes.

Transmission measurement
Representative and accurate results, taking into account the whole coal cross-section on the belt; compensates for loading and bulk density variations.

Precise and reliable
High accuracy regardless of ash content range. High long-term stability due to automated drift and decay compensation. Unrivalled in price and performance.

Simple handling and operation

The installation of the AshAlyzer on existing conveyor belts is simple, with minimal space requirements. The dedicated evaluation system provides the user with all necessary information and controls at a glance.

Field-tested System

We have many years of experience in the coal industry, in particular with ash analysis. The AshAlyzer is in operation worldwide and has proven its maturity and user friendliness.

Non-contact Ash Content Measurement

Radiation emitted by a gamma source is attenuated when it passes through the coal on the conveyor belt. State-of-the-art scintillation detectors, mounted opposite of the radiation sources, record the transmitted radiation intensities. As the ash components in the coal have a higher absorption level than the combustible elements, this absorption is a direct measure of the ash content in the coal on the conveyor belt.

- Similar to X-raying bone fractures, different materials show different attenuation
- Transmitted beam passes through the coal, not just a surface measurement
- Reliable and maintenance-free, as no mechanical contact with coal

The radiation from the individual radiation sources is individually measured in separate detectors. Only such an arrangement permits an accurate measurement unperturbed by interference between the different sources.

State-of-the-art Technology ①

The new ash content measuring system AshAlyzer represents state-of-the-art technology:

- The basic arrangement consists of 2 radiation sources and detectors. DUET (Dual energy transmission)
- Provides ash content, calorific value and bulk flow
- Americium emits low energy photons, picking up changes in coal composition
- The cesium source emits high energy photons and allows accurate and precise measurements at all times even with varying belt loading
- Berthold has many years of experience with this technology, which is well proven and established
- The detectors are distinguished by an extremely high long-term stability. Patented technology for stabilization
- Thousands of detectors in operation worldwide

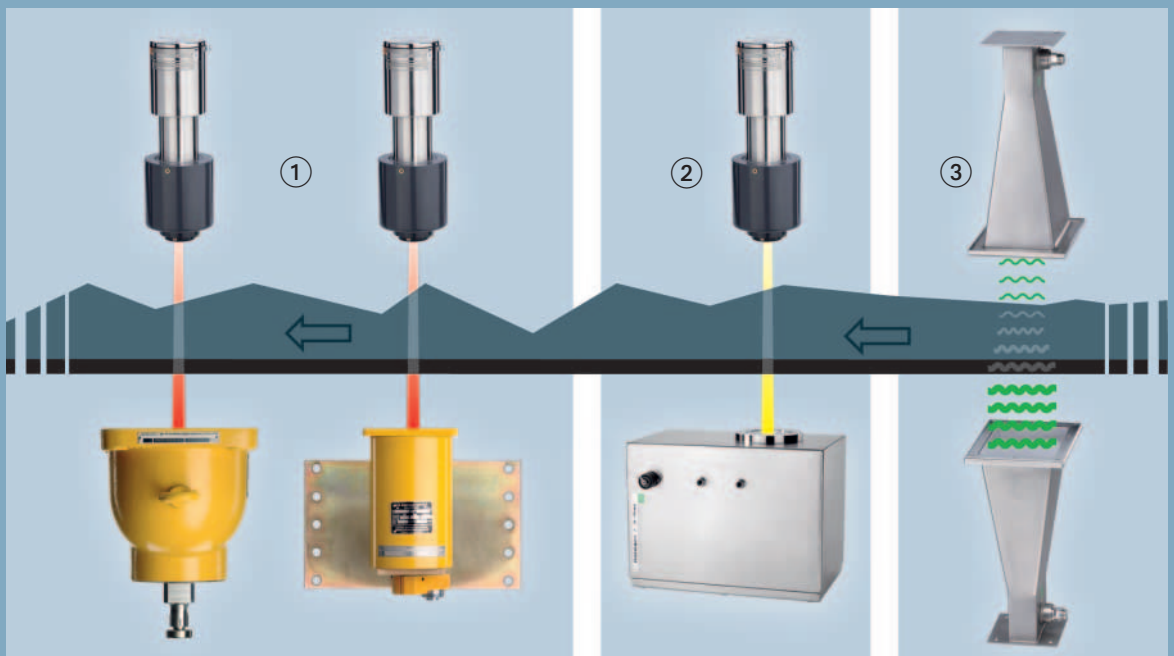
Varying ash composition ②

- In conditions where the ash composition is expected to vary, e.g. due to iron and calcium content fluctuations
- Including a 3rd transmission measurement improves accuracy and repeatability
- A high stability, low-energy X-ray beam is provided for the 3rd transmission measurement

Microwave moisture measurement ③

Direct and accurate determination of moisture content by microwave transmission

- Reliable and well established technology
- Moisture input for accurate calculation of calorific value and ash
- In conditions where water concentration is high or expected to vary considerably, it is a must for precise results



Cs Transmission & Am Transmission

- Cesium high-energy photons
- Attenuation reveals variations in bulk density and loading
- Americium low-energy photons
- Attenuation picks up changes in coal composition
- Based on the 2 signals the evaluation unit continuously determines the ash content online
- Collimated, narrow beams

X-ray Transmission measurement

- State-of-the-art X-ray generator
- Collimated beam of X-ray transmitted through the coal
- Even more sensitive to variations in ash compositions
- Signal is used by the evaluation unit to compensate for these variations

Microwave moisture measurement

- Low-intensity micro-wave transmits through the material
- Water molecules in the coal attenuate the transmitted signal
- Sender and receiver on opposite sides

Monitoring & Control

- 12“ TFT touch screen, flat panel industrial computer
- Large display, easy-to-use, intuitive interface
- Remote control/display and service functionality
- Robust dust and moisture protection IP65
- Large and clear graphical and numerical displays
- Standard industrial 4 to 20 mA outputs makes it easy to integrate in existing process control systems
- Displays the time dependent trend of the ash, the calorific value and moisture etc.

Committed to technological leadership

Berthold Technologies was established in 1949 and is located in Bad Wildbad, in the Black Forest in Germany. Since then, Berthold has been developing superior non-contacting measurement systems, including ground-breaking achievements such as the radiometric level switch and the continuous level gauge for difficult operating and environmental conditions.

Applications in Mining:
radiometric belt scales, density and level measurements, microwave moisture on-belt

The bottom line of Berthold Technologies' success and growth has been, and still is, research and development, which has always focused on our customers' needs. Berthold Technologies' process control division offers one of the most comprehensive product lines for non-contact monitoring of process parameters. Berthold Technologies sets the standards worldwide through technological leadership and provides customized measurement solutions – from project planning right up to the start of operation:

- After-sales service and support that is unmatched by any competitive supplier
- Our team of worldwide representatives has the expertise, experience and serious concern for the needs of the coal mining and processing industry
- Each potential application is assessed by our experts, in close consultation with the client, to ensure the optimal deployment of monitors and their associated systems and services

Technical Data AshAlyzer LB 421

Evaluation unit LB 421	
Assembly	Wall-mounted housing with IP65 (NEMA 4X) protection Industrial Computer with 12 inch TFT touch panel Weight: approx. 48 kg
Power	wide range 100-240 VAC, 47-63 Hz, max. 150 VA (AC)
Operating temperature	0 °C…+45 °C (32 °F…113 °F)
Inputs	
Analog input	0/4…20 mA, input resistance 250 Ω – Moisture content (option) – Conveyor speed (option)
Digital input	0 V / 5 V signals – Product selection (4-bit) – Belt stop – Batch measurement start/stop – Sample measurement start/stop – Error X-ray (option)
Counter	for tachometer / conveyor speed
Outputs	
Analog output	0/4…20 mA, load max. 350 Ω – Ash content – Calorific value – Mass flow (option) – Moisture content (option) – Iron content (option)
Digital output	0 V / 5 V open collector or relay contact SPDT (max. 250 VAC, 5 A) – General error – Sample measurement running

Transmission measurements	
Detectors	Scintillation counter with NaI(Tl)crystal Long-term stability ± 0.1 % Stainless steel housing with IP65 (NEMA 4X) protection Operating temperature: –40 °C… +50 °C (–40 °F…122 °F) – LB 5441-02 (Cs) 40x35 NaI(Tl) crystal – LB 5481 (Am/X-ray) 44x5 NaI(Tl) crystal
Cesium radiation source	Nuclide ^{137}Cs, typical activity 370 to 1110 MBq (10 to 30 mCi) In lead-filled cast iron-housing with lockable radiation exit channel – LB 7440 D weight approx. 31 kg – LB 7442 D weight approx. 81 kg
Americium radiation source	Nuclide ^{241}Am, typical activity 3700 to 11100 MBq (100 to 300 mCi) In robust brass shielding with lockable radiation exit channel Weight: approx. 14 kg
Iron compensation (Option)	
X-ray generator	45 kV X-ray generator unit Stainless steel housing with IP 65 (NEMA 4X) protection Weight: approx. 20 kg
Power supply	selectable 115/230 VAC $^{+10\%}_{-15\%}$ 47-63 Hz 120 VA (AC)
Operating temperature	0°C…+50 °C (32°F...122 °F)
Moisture compensation (Option)	
Evaluation unit	Stainless steel housing with IP66 protection Weight: approx. 17 kg
Power	selectable 115/230 VAC $^{+10\%}_{-15\%}$ 47-63 Hz 17 VA (AC), max. 30 VA (AC)
Sensors	2 Microwave horn antennae Transmitting power max. 0.005 mW
Operating temperature	0 °C…+50 °C (32 °F…122 °F)
Output	RS485 interface to LB 421 evaluation unit

Sources and shielding see separate brochure. Subject to change without prior notice.

For worldwide distribution and service see
www.Berthold.com

Your local distributor

ISO 9001
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Quality you can trust

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