

AA-DUET

Product Overview

AA-DUET can be used to measure coal ash on the entire conveyor belt quickly and accurately. The instrument has the strength of good stability, high measurement accuracy, and convenient installation and maintenance. It does not require cumbersome processes such as sampling, sample preparation, and laboratory tests, nor does it need an additional investment such as building tower etc for its installation. It can be installed on the belt rack directly without any modification to the belt rack.

Product Application

Application case: a power plant in India

Site condition: Reference is here drawn for one of our installations at a Power Plant in India where two types of coal from different sources are used, one domestic with high ash content in the range of 35%~40% and the other one imported with low ash content in the range of 6%~12%, coal from two different sources are objectively blended to achieve a targeted % age ash $\leq 34\%$, thereby ensuring to meet MOEF&CC regulation



Technical Parameters

Operating Temperature	-20°C ~ +50°C	
Operating Humidity	Relative humidity $\leq 95\%$ ((+25°C))	
Power	Single-phase AC220V $\pm 10\%$, $\leq 500W$	
Ground Resistance	$\leq 4\Omega$	
Communications	RS 232/485, optical fiber	
Data Output	4-20mA	
Detection Accuracy	Cleaned coal (5%-15%)	$\leq 0.5\%$, 1σ
	Ash content Low ash raw coal (15%-30%)	$\leq 1.0\%$, 1σ
	High ash raw coal (30%-50%)	$\leq 2.0\%$, 1σ
Long-term Stability	Continuous measurement of standard blocks for 24 hours, any "ten minutes ash content" deviation between measured value and average value is less than 0.5%	
Radiation Safety	The safety of the sealing source meets the requirements of IAEA. The dose equivalent rate at 1 m of the instrument's surface $\leq 2.5\mu$ SV/h. Normal use of the instrument will not cause any injury to the operator.	
Protection Level	IP65	

Product Features

- **Fast Response:** Conduct real-time online detection of coal passing through the belt, give the instantaneous value and average value of coal ash content in any time period as required.
 - **Representativeness:** Analyze the coal passing through the belt, overcome the shortcomings of traditional analysis method which had the poor representativeness due to analysis of only a small amount of coal.
 - **Reliability:** Conduct non-contact measurement based on the principle that rays can penetrate through substances. Best measurement scheme is designed according to the site conditions, and all key components are self-designed to ensure the long-term stable and reliable operation of the instrument.
 - **Advancement:** Using the latest FPGA design technology and ARM core single chip microcomputer this combines the nuclear electronic technology and computer technology to realize the high-speed processing of nuclear pulse signal and improve the dynamic response of the instrument.
- Application effect:** After installation of ash analyzer, the Plant could better control & stabilize the coal ash content for boiler feed, which in fact has significantly improved. Further this has also improved boiler performance through enhanced level of automation management.



DF-MMA Microwave Moisture Analyzer

Product Overview

DF-MMA microwave moisture analyzer is a new type of non-contact material moisture online detection equipment. It adopts the principle of microwave transmission and performs real-time online scanning of all materials, with high measurement accuracy, good representativeness, strong anti-interference, and good adaptability to working conditions. The product is a fully automatic online detection system based on an embedded system operating platform. While realizing accurate and real-time monitoring of moisture, it can also be used as a link in industrial process automation control to provide reliable real-time moisture data continuously, and the measurement results can be directly involved in the process of automation control.

Product Application

The microwave moisture analyzer is suitable for online moisture measurement in coal mines, coal washing plants, coal preparation plants, coking plants and coal-burning power plants.

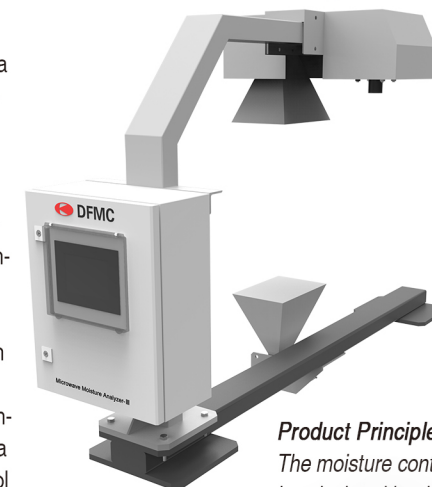
Application case

Site situation: Installed on the coal conveyor of a coking plant. The analyzer is operating under the conditions of 2.4 m/s transfer speed of the belt, strong vibration, frequently changed material type, uneven material type and severely heavy caking in winter.

Application effect: Measurement accuracy achieved at site is 0.5%, where input material moisture varies in the range 5% to 15%.

Technical Parameters

Model	DF-MMA	
Accuracy	5%~10%	$\leq 0.5\%$, 1σ
	10%~20%	$\leq 1.5\%$, 1σ
	20% Above	$\leq 2.0\%$, 1σ
Data Output	Moisture content (percentage)	
Reaction Time	$\geq 1s$ (user adjustable)	
Analog Output	4~20mA, $\pm 0.2\%$	
Operating Temperature	-20 ~ +50°C	
Protection Level	IP 65	
Power	220V AC $\pm 10\%$, 50/60Hz	
Power Consumption	50W	
Monitor	5.7 inches 640x480 graphic lattice, 65K colors TFT touch LCD (integrated on the host)	



Product Principle
The moisture content is calculated by detecting the power attenuation and phase shift of microwave.

Product Parameters

- **Non-contact measurement:** Contactless & no wear parts, hence low maintenance
- **Material overall moisture content measurement:** material penetration, representative
- **Strong anti-interference capability:** Not affected by dust, water vapor and vibration in the environment
- **Not affected** by material color, temperature and particle size
- **Fast real-time measurement results:** Sampling rate reaches the microsecond level
- **Wide range of application:** Almost all (non-conductive) substances can be measured
- **High safety:** Low emission energy, no radioactive nuclear source



AMA-D

Product Overview

AMA-D independently developed and manufactured by DFMC includes two measuring units, ash detection and moisture detection, which are directly installed on the coal conveyor belt to conduct real-time online measurement of coal ash content, moisture content and also determination of calorific value.

Product Overview

- Ash content adopts the dual energy γ -ray transmission technology
- Moisture content is measured via microwave transmission technology
- Calorific value is calculated through the measured ash / moisture content value



Technical Parameters

Ash content measurement accuracy

Cleaned coal	(ash content 5%~15%)	$\leq 0.5\%$, 1σ
Low ash raw coal	(ash content 15%~30%)	$\leq 1.0\%$, 1σ
High ash raw coal	(ash content 30%~50%)	$\leq 2.0\%$, 1σ

Moisture content measurement accuracy

Cleaned coal	5%~10%	$\leq 0.5\%$, 1σ
Low ash raw coal	10%~20%	$\leq 1.5\%$, 1σ
High ash raw coal	20% Above	$\leq 2.0\%$, 1σ

Calorific value reference accuracy (specific accuracy is given according to the site conditions)

Cleaned coal	(ash content 5%~15%)	$\leq 100\text{kcal/Kg}$, 1σ
Low ash raw coal	(ash content 15%~30%)	$\leq 150\text{kcal/Kg}$, 1σ
High ash raw coal	(ash content 30%~50%)	$\leq 200\text{kcal/Kg}$, 1σ

Product Features

- **Fast Response:** Conducts real-time online detection of coal passing through the belt, give the instantaneous value and average value of coal ash content in any pre-selected time period as required.
- **Representativeness:** Make analysis of the coal passing through the belt, overcome the shortcomings of traditional analysis method which is in poor representativeness due to the analysis of only a small amount of coal.
- **Reliability:** conduct non-contact measurement based on the principle that rays can penetrate through substances. Best measurement scheme is designed according to the site conditions, and all key components are self-designed to ensure the long-term stable and reliable operation of the instrument.

Product Application

AMA-D is suitable for online ash & moisture measurement in coal mines, coal washing plants, coal preparation plants, coking plants, coal-burning power plants and coal wharf to conduct online measurement. At the same time, it can also be used in automatic adjustment and control of production process in coal preparation and blending process

AA-XRAY

Product Overview

AA-XRAY can be installed directly on the belt of sampling machine to detect the coal ash online.

Product Overview

The instrument combines X-ray fluorescence technology with X-ray absorption. The coal sample is irradiated with X-rays, the ray intensity of different energy after interception with material is measured, and the ash value of coal is calculated through data analysis and processing.

Product Parameters

- The X-ray tube is used instead of the radiation source, and there is no radiation when the power is off.
- The measurement is not affected by the change of particle size and density.
- Real-time online nondestructive detection of ash in coal.
- Non-contact measurement is adapted.

Product Application

AA-XRAY is suitable for online measurement in coal mines, coal washing plants, coal preparation plants, coking plants, coal-burning power plants and coal wharf, etc.

Technical Parameters

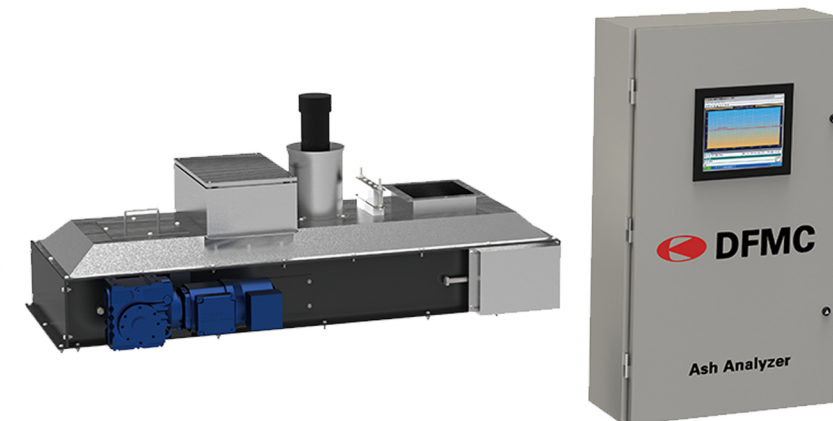
Measurement accuracy

Ash content $< 15\%$	$\leq 0.5\%$, 1σ
Ash content $15\% \sim 30\%$	$\leq 1.0\%$, 1σ
Ash content $> 30\%$	$\leq 1.5\%$, 1σ

Operating environment

Environment Temperature	$-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$
Relative humidity	$\leq 90\%$, non-condensation

Power source	three phase current 380V, 50Hz, ground wire resistance to ground $< 4\Omega$
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AMD-DUET Pro

Product Overview

AMD-DUET Pro is an online measuring instrument which can continuously detect & intercept more volume of coal bed to precisely determine the ash content in coal transported through conveyors. It can be widely used in coal mining, processing and comprehensive utilization in the fields requiring rapid and accurate measurement of coal ash content.

Product Application

The real-time online detection of the fluctuation of ash content in the coal flow can guide the coal preparation and blending production, and can participate in the automatic production control.

Application case: a coal preparation plant in China.

Site condition: AMD-DUET Pro is installed on the cleaned coal belt for ash content detection.

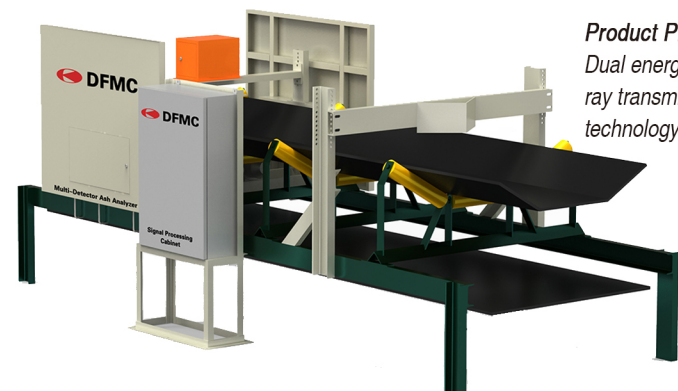
Application effect: The accuracy of ash measurement reaches around 0.4%, which is significantly better compared to one with single detector. It stabilizes the quality of clean coal, saves labor cost and improves the user's benefit.

Product Features

- The representativeness is stronger, and the measurement results are closer to the real situation of the entire coal flow.
- The measurement efficiency is higher, and accurate measurement results can be obtained in a short period of time.
- The site adaptability is stronger, which effectively reduces the influence of adverse conditions such as particle size fluctuation and belt deviation.

Product Parameters

Operating Temperature	-20°C ~ +50°C	
Power	Single-phase AC220V, 50Hz	
Ground Resistance	≤ 4Ω	
Communication Interface	Ethernet, optical fiber	
Data Output	Ash content value	
Measurement Range	Ash content value: 5%~50%	
Measurement Point	≥ 3 points	
Typical Accuracy	Ash Content	Cleaned coal (5%~15%) ≤ 0.5%, 1σ
		Low ash raw coal (15%~30%) ≤ 0.7%, 1σ
		High ash raw coal (30%~50%) ≤ 1.0%, 1σ
Radiation Safety	The safety of the sealing source meets the requirements of IAEA. The dose equivalent rate at 1 m of the instrument's surface ≤ 2.5μ SV/h. Normal use of the instrument will not cause any injury to the operator.	



Product Principle
Dual energy gamma ray transmission technology.

