



HOT
Process For Environment

Sensor-based Element Analyzer
基于传感器的智能元素分析设备

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X-ray Coal Ash & Moisture Analyzer X射线煤炭智能灰分水分仪

HOT X-ray Real-time Ash & Moisture Content Analyzer uses X-ray penetration technology to quickly scan the coal sample on the belt and uses an AI algorithm to calculate the ash content & moisture content of coal in real-time, so as to achieve the purpose of online real-time monitoring of ash & moisture.

HOT研发的X射线智能灰分水分仪使用X射线穿透技术快速扫描皮带上的煤样，并使用人工智能算法实时计算煤的灰分和含水量，从而实现煤矿灰分和水分在线监测。



Real-time Detection
实时测定



AI Algorithm
AI算法



Rapid Scanning
快速扫描



Real-Time Data Output

实时数据输出

- Be able to output data stably in real time;
- Diversified output mode on-demand (hourly/per shift/daily output).
- 系统可以稳定地实时输出数据;
- 可按需设定输出模式, 如小时输出、每班输出、每日输出等。



Quality Stability

质量可靠

Detection error of less than $\pm 0.5\%$ after standard testing.

经过8小时的连续标准测试后, 设备仍能保持小于 $\pm 0.5\%$ 的检测误差。



System Linkage

系统联动

X-Ray Coal Ash & Moisture Analyzer can directly link with the automatic density control system or other compatible systems in the coal preparation plant to provide data support for automatic control in the coal processing circuit.

如果选煤厂有自动密度控制系统, X射线智能灰水分仪测量的数据可以直接与系统连接, 为自动控制提供数据支持。不仅如此, 本设备还可以与其他系统结合使用。



Easy Maintenance

维护简单

X-ray Ash & Moisture Analyzer is an integrated equipment with a simple and durable structure, and its system spare parts replacement is very convenient.

X射线灰分和水分分析仪是一种结构简单耐用的集成设备, 其系统备件更换非常方便。

Technical Parameter/技术参数	
Measuring Accuracy of Ash Content 灰分测量精度	
Ash Content $\leq 15\%$ 灰分 $\leq 15\%$	$\leq 0.5\%$, 1σ
Ash Content $15\% \sim 30\%$ 灰分为 $15\% \sim 30\%$	$\leq 1.0\%$, 1σ
Ash Content $\geq 30\%$ 灰分 $\geq 30\%$	$\leq 1.5\%$, 1σ
Measuring Accuracy of Moisture Content 水分测量精度	
$5\% \sim 10\%$	$\leq 0.5\%$, 1σ
$10\% \sim 20\%$	$\leq 1.5\%$, 1σ
More Than 20%	$\leq 2.0\%$, 1σ
Reference Accuracy of Calorific Value 热值参考精度 (The Specific Accuracy Is Given According to the Site Conditions) (具体精度根据现场条件确定)	
Clean Coal 精煤	$\leq 100\text{kcal/Kg}$, 1σ
Low Ash Raw Coal 低灰分原煤	$\leq 150\text{kcal/Kg}$, 1σ
High Ash Raw Coal 高灰分原煤	$\leq 200\text{kcal/Kg}$, 1σ

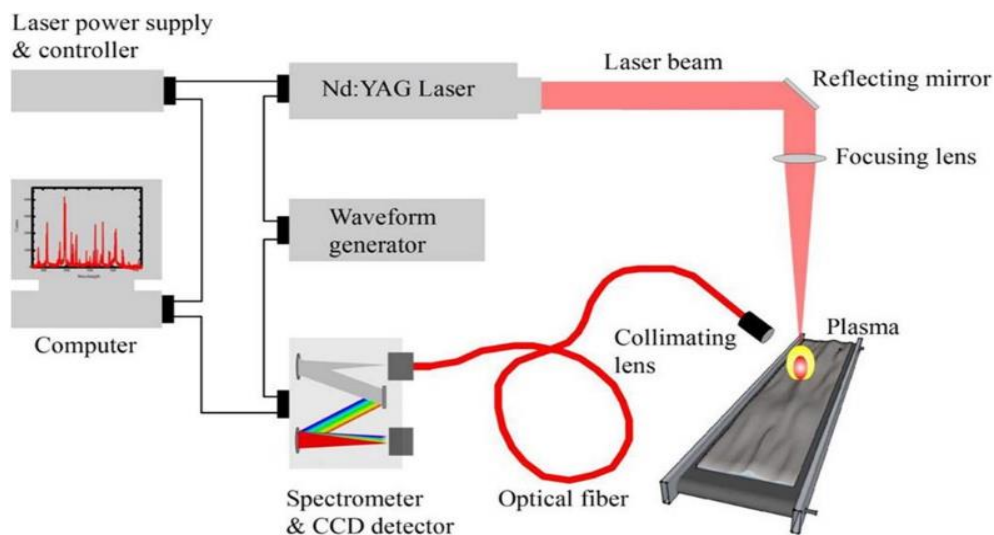
Comparing with lab testing, the X-ray ash analyzer detection result can accurately reflect trend of ash content with less error.

与实验室测试相比, X射线智能灰水分仪的检测结果能够准确反映灰分的变化趋势, 误差较小。



Laser Induced Plasma Spectroscopy (LIPS) Online Elemental Analyzer 激光诱导等离子光谱学 (LIPS) 在线元素分析仪

Principle of LIPS laser elemental analyzer 技术原理



Laser-induced plasma spectroscopy(LIPS) is an elemental analysis technology developed based on the basic principle that the wavelength of atomic spectrum and ion spectrum has a one-to-one correspondence relationship with specific elements, and the spectral signal intensity has a certain quantitative relationship with the content of corresponding elements. 激光诱导等离子体光谱 (LIPS)，是基于原子光谱和离子光谱的波长与特定元素具有一一对应关系，光谱信号强度与相应元素的含量具有一定定量关系的基本原理而开发的元素分析技术。

Compared with other traditional elemental analysis technologies, laser elemental analysis technology is a qualitative and quantitative analysis of almost **All Elements**.

与其他传统元素分析技术相比，激光元素分析技术是对几乎所有元素的定性和定量分析。



The laser is focused on the sample surface through a lens. When the energy of the laser pulse is greater than the breakdown threshold energy of the sample, the plasma will be generated locally on the sample surface, which is the laser-induced plasma. As the plasma expands to the outside environment, it gradually cools and emits a spectrum to characterize the composition of the sample. Photodetectors and spectrometers are used to collect the emission spectrum of plasma. By analyzing the plasma spectrum and combining with the quantitative analysis model, the category and content information of the analyzed samples can be obtained.

激光通过透镜聚焦在样品表面。当激光脉冲的能量大于样品的击穿阈值能量时，将在样品表面局部产生等离子体，即激光诱导等离子体。随着等离子体膨胀到外部环境，它逐渐冷却并发射光谱来表征样品的组成。光电探测器和光谱仪用于收集等离子体的发射光谱。通过分析血浆光谱并结合定量分析模型，可以获得分析样品的类别和含量信息。

◆ Applications 应用场景

Metallurgical
Engineering
冶金工程

Gem
Identification
宝石鉴定

Archaeological
Analysis
考古分析

Biomedical
Science
生物科技

Food
Industry
食品工业

More...
其他更多



Real-time Measurement 实时测量

Online measurement can quickly obtain the ash content, which is convenient for the coal preparation plant to realize intelligent control.
在线测量可快速获取灰分，方便选煤厂实现智能控制。

Full Composition Analyzing 全成分分析

It can measure the all elements and sulfur, moisture, volatile matter, calorific value and other industrial analysis indicators in coal.
它可以测量煤中的所有元素和硫、水分、挥发分、热值等工业分析指标。

High-accuracy 高精度

Accurate measurement of ash content, high measurement accuracy and not affected by external factors such as process, ash composition and content.
准确测量灰分含量。测量精度高，不受工艺、灰分成分和含量等外部因素的影响。

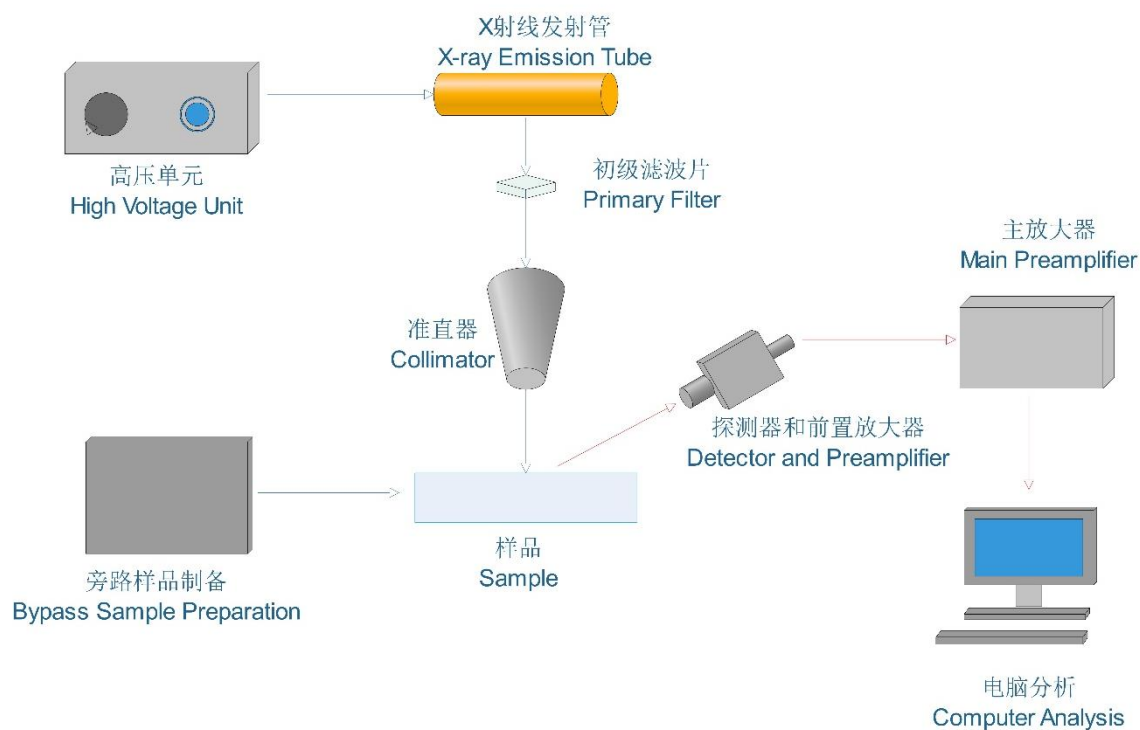
Safe Operation 操作安全

No radiation source and no need to obtain approval from the environmental protection department.
无放射源，无需取得环保安全部门批准。

XRF Pulp Grade Analyzer XRF 矿浆品位仪

The XRF Slurry Grade Analyzer is a highly integrated intelligent instrument with X-ray fluorescence technology for quick online elemental analysis. It can achieve rapid and accurate elemental analysis without sampling for multiple streams in mineral processing operations. The XRF Pulp Grade Analyzer has a high degree of intelligent integration, which is easy to operate and maintain. The instrument is also compatible with centralized control systems, intelligent control systems, etc. It is essential equipment for intelligence froth.

XRF矿浆品位仪是一种利用X射线荧光技术实现在线矿物品位监测和分析的大型一体化仪器。它无需采样即可快速准确地检测元素，适用于不同类型的矿石。该仪器具有高度的智能集成化，易于操作和维护，并能与集中控制系统、智能控制系统等联动，成为智能浮选必不可少的设备。



◆ Working Principle 工作原理

It is mainly composed of automatic sampling, exciter, detector measuring circuit and computer, among which the detector plays a dual role of chromatic dispersion and photoelectric conversion.

The exciter generates high-energy X-rays through high voltage, which eject core electrons from atoms and make atoms into unstable excited states. When valence electrons fill these holes, energy is released in the form of X-ray fluorescence. The wavelength or energy of the fluorescence is unique to the element and can be detected using a detector and computer analysis system to identify the element and its content.

XRF矿浆品位仪主要由自动采样旁路，激发器、探测器和测量电路以及计算机组成，其中探测器起色散和光电转换双重作用。

激发器通过高电压产生高能X射线，从原子中弹出内层电子，使原子进入不稳定的激发状态。当外层电子填补这些空穴时，能量以X射线荧光的形式释放。每种元素的荧光波长或能量是独特的，因此可以使用探测器和计算机分析系统检测并确定元素和其含量。



Performance Features
性能特点



High degree of automation and intelligence
自动化、智能化程度高

It adopts pneumatic electronic control technology and realizes computer automatic control of sampling, measurement and analysis, daily sampling and data processing.
计算机自动控制取样，实现测量分析、日取样以及数据处理等作业。



Stable and reliable data analysis
数据分析稳定、可靠

With the function of "linearization correction", it greatly improves the analysis accuracy.
具备“线性化校正”功能，极大提升分析精度。



Representative and fresh samples, fast and accurate analysis
样品具有代表性、新鲜性，分析快速、准确

The fluid section sampling and gap sampling are adopted, and the slurry sample box adopts jet technology.
采用流体断面取样和间隙取样等方式，矿浆样品盒采用射流技术。



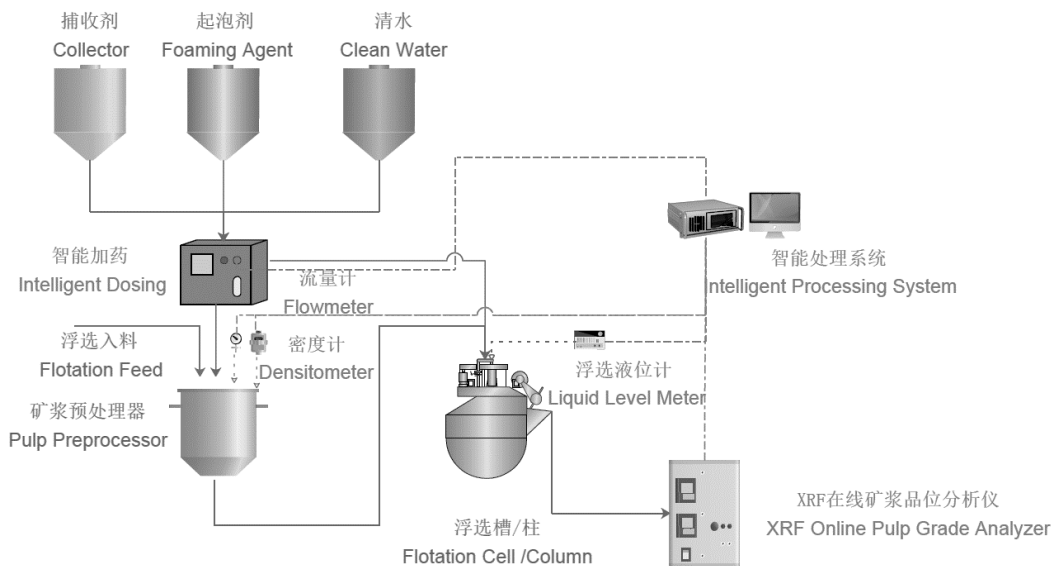
No radiation 安全无辐射

The fully closed optical channel structure design is adopted.
采用全封闭光通道结构设计。



Convenient operation and maintenance
操作维护便捷

The analyzer adopts a modular design, with high function integration, small size, and easy operation and maintenance.
模块化设计，功能集成度高，体积小，便于操作维护。





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