



HOT
Process For Environment

引领矿业革新

Transforming The Way Mining Industry Works

浩特（成都）智能科技有限公司
HOT (Chengdu) Industries Co., Ltd



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关于浩特 About HOT



浩特(成都)智能科技有限公司（简称“HOT”），致力于为矿业提供“全流程”智能化产品及技术服务。



HOT前身是北京浩沃特工业技术有限公司，是国家级高新技术企业，中关村金种子工程入选企业，具备从工程设备研发、制造、选厂设计、工程承包、及选厂运营的“一站式”服务能力。

HOT (Chengdu) Industries Co., Ltd. (hereinafter referred to as “HOT”), is committed to providing **“Whole process” intelligent products** and technical services for mining industry.

Formerly known as Beijing HOT Industrial Technology Co., Ltd., which was a national high-tech enterprise, the company has the ability to provide "one-stop" services from exploration, mine development, mining and mineral processing operations.



技术创新/ Innovations

在夯实矿业专业服务能力的基础上，公司已将人工智能、工业物联网等新技术应用到矿业生产实践。如：XRT射线矿石预抛尾分选技术(干选)，X射线灰分水分仪，智能密控系统，智能浮选系统，人工智能磨机功率优化等选矿智能装备及智能工艺控制系统。帮助矿山企业实现节能减排，降本增效，助力矿山企业实现可持续的高质量发展。

On the basis of providing professional services for the mining industry, the company has applied new-edge technologies such as AI and IoT to mining production. For example, the XRT pre-concentration ore sorting, X-ray coal ash analyzer, AI comminution efficiency optimization system, etc.

HOT aims to assist mining enterprises in achieving energy conservation and emission reduction, and contributes to their sustainable and high-quality development.



GLENCORE



知名客户 / Clients

HOT的选矿以及智能化技术已获得国内外知名矿业公司的认可，客户包括：中国神华、中国广晟、山东能源、紫金矿业、淡水河谷、拉法基、英美黄金、英美资源、嘉能可超达、蒙古能源、韩国矿产资源等矿业公司。

Reputable Clients: AngloGold Ashanti, Vale, China Shenhua, Xstrata (Now, Glencore), Mongolian Mining Corporation, KORES, Shandong Energy Group (Yan Coal), etc.

国际化/ Global Presence

HOT在印度尼西亚设立了合资公司，并在刚果(金)、澳大利亚、赞比亚、俄罗斯、土耳其、墨西哥、蒙古等主要矿业国家与当地知名服务商建立了代表处或合作关系。

HOT serves all around the major mining countries, e.g. D.R. Congo, Zambia, Cote d'Ivoire, Mexico, Australia, Indonesia, Mongolia, and China.

证书 Certificates

公司致力于光电技术、核磁共振、激光诱导、工业物联网、人工智能算法在矿业领域应用的研究。目前已获得专利及软件著作权近50项，在申请专利逾200项。

HOT is committed to researching and developing Magnetic Resonance, Laser-Induced Breakdown Spectroscopy, Photoelectric Technology, the Industrial Internet of Things, and Artificial Intelligence algorithms in mining. Nearly 50 patents and software copyrights have been obtained, and more than 200 patents are being applied for.



振动筛预测性维护系统

Vibrating Screen PHM System

借助安装在设备上的各种传感器硬件，该系统可以对振动筛故障高发部位实时监测，准确感知振动、温度、应力信号。采集的信号通过中继器传输至本地或云端，经服务器端AI机器学习算法和模型，对设备运行数据进行分析，综合评估设备的健康状况，对于设备故障前期产生的异常信号能够捕捉分析，并及时预警、报警。

Real-time monitoring of high-incidence parts of vibrating screen, accurate perception of vibration, temperature and stress signals. The signal is transmitted to the local or the cloud through the repeater. Through the server-side AI machine learning algorithm and model, the equipment operation data is analyzed.

It can capture and analyze abnormal signals generated in the early stage of equipment failure, and give early warning and alarm in time.



延长设备使用寿命
Extend equipment life



故障预测性预警
Predictive maintenance



实时监测/支持移动设备查看
Real-time monitoring/ Mobile Phone

⚠️ 大梁断折/Beam

安装无线裂纹监测传感器 (AS001)，感知裂纹的产生，检测主梁的工况；

Install a wireless crack monitoring sensor (AS001) to sense the occurrence of cracks and detect the working conditions of the main beam.

⚠️ 激振器故障/Exciter

安装无线激振器传感器 (AD006)，监测激振器4轴承温度、润滑油温度、激振器振动幅度，判断激振器轴承是否出现故障，双激振器驱动检测振动的均衡性；

Install the wireless exciter sensor (AD006), monitor the temperature of the four bearings of the exciter, the lubricating oil temperature, and the vibration amplitude of the exciter, determine whether the exciter bearing is faulty, and the double exciter drives to detect the balance of vibration.

⚠️ 电机故障/Motor

安装无线振动温度传感器 (AD008)，用于监测电机的温度和振动强度；

Install a wireless vibration temperature sensor (AD008) to monitor the temperature and vibration intensity of the motor.

⚠️ 筛体入料不均/Material Feeding

在入料端及出料端各安装2个无线振动温度传感器 (AD008) 监测筛体振动的角度和幅度，判断是否存在入料不均问题。

Two wireless vibration temperature sensors (AD008) are installed at the feeding end and the discharging end respectively to monitor the angle and amplitude of vibration of the screen body, and determine whether there is a problem of uneven feeding.



X射线智能矿石分选

XRT Sensor-based Intelligent Ore Sorter

SorterX 是结合X射线传输技术（XRT）、图像识别以及AI算法的高效智能矿石预富集设备（干选）。

SorterX is an efficient intelligent ore pre-concentration equipment that combines X-ray transmission(XRT), image recognition and AI algorithm technology.



SorterX 矿石分选机广泛用于分选金属/非金属矿石、工业矿石、能源（煤炭分选）等，包括锂、煤、铜、铅锌磷矿、钨、镍、银、金、锑、锰、高岭土等。

SorterX is widely used in the separation of metal/nonmetallic ores, industrial ores, energy (coal preparation) minerals, such as Lithium, Coal, Copper, Lead-zinc Phosphorite, Tungsten, Nickel, Silver, Gold, Antimony, Manganese, Kaolin, etc.



技术规格Model	TXS10-102.5	TXS12-102.5	TXS14-102.5	TXS16-102.5	TXS18-102.5	TXS20-102.5	TXS24-102.5	TXS28-102.5	TXS30-102.5
有效分选宽度 Belt Width (mm)	800	1000	1200	1400	1600	1800	2200	2600	2800
处理能力 Yield(t/h)	48	60	72	84	96	108	132	156	180
分选粒级 Separation Size (mm)	100 ~ 25	100 ~ 25	100 ~ 25	100 ~ 25	100 ~ 25	100 ~ 25	100 ~ 25	100 ~ 25	100 ~ 25
配套厂型 Supporting Factory Type(Mt/a)	<0.9	0.9 ~ 1.1	1.1 ~ 1.3	1.3 ~ 1.5	1.5 ~ 1.7	1.7 ~ 1.9	1.9 ~ 2.4	2.4 ~ 2.8	2.8 ~ 3.2
注：1、分选精度优于跳汰机；2、100-25mm产率按30%计算。 Remarks: 1. The separation accuracy is better than Movable Sieve Jig; 2. 100-25mm yield is calculated at 30%.									

XRT智能光电矿石分选机是高效环保的智能矿石分选设备。经矿山实际测算，抛废率可高达 88%，针对原矿抛废率可达 30~60%，金属回收率最高可达 99%。金属有效分选粒级范围+8-100mm，煤矿有效分选粒级范围+10-300mm，单机处理量最高可达 40~380t/h，是目前国内唯一在有色金属、黑色金属、非金属和煤矿均有实际应用的智能矿石分选机。

XRT sorter is a highly efficient and environmentally friendly intelligent ore sorting equipment, it has been practically applied in the field of coal gangue pre-discarding, non-ferrous metal and ferrous metal pre-concentration. According to the actual calculation, the waste disposal rate can reach as high as 88%, the waste disposal rate for the raw ores can reach up to 30 - 60%, and the metal recovery rate can reach up to 99%. Capacity of single unit of XRT sorter is 40 - 380tph.



精确控制
Precise Control



快速识别
Rapid Recognition



AI 算法
AI Algorithm



X 射线（无源）
X-ray(passive)

X射线煤炭智能灰分水分仪

X-ray Coal Ash & Moisture Analyzer

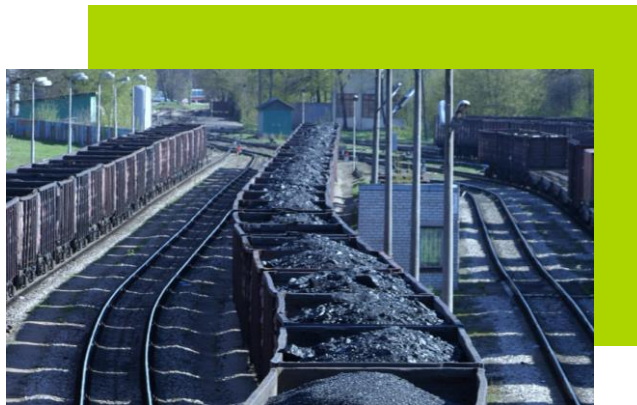


HOT研发的X射线智能灰分水分仪使用X射线穿透技术快速扫描皮带上的煤样，并使用人工智能算法实时计算煤的灰分和含水量，从而实现煤矿灰分和水分在线监测。

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.



Technical Parameter/技术参数	
Measuring Accuracy of Ash Content 灰分测量精度	
Ash Content ≤15% 灰分≤15%	≤0.5%, 1σ
Ash Content 15%~30% 灰分为15%~30%	≤1.0%, 1σ
Ash Content ≥30% 灰分≥30%	≤1.5%, 1σ
Measuring Accuracy of Moisture Content 水分测量精度	
5%~10%	≤0.5%, 1σ
10%~20%	≤1.5%, 1σ
More Than 20%	≤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	≤100kcal/Kg, 1σ
Low Ash Raw Coal 低灰分原煤	≤150kcal/Kg, 1σ
High Ash Raw Coal 高灰分原煤	≤200kcal/Kg, 1σ



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射线智能灰分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。

高清高速矿石专用色选机

HD High Capacity Ore Color Sorter



色选机是根据物料光学特性的差异，利用光电探测技术将颗粒物料中的异色颗粒自动分拣出来的设备。从矿山中采下来含有某种有价值的矿物质的矿石原料，经过色选后，纯度高、色泽均匀，大大提高了矿石的经济价值。

The color sorter is an equipment that uses photoelectric detection technology to automatically sort out the heterochromatic particles in the granular material according to the difference in the optical properties of the material.



应用矿种: 金矿、铜矿、钨矿、萤石、重晶石、石英石、钾长石、碳酸钙、工业盐等。

Application: Gold, Copper, Tungsten, Fluorite, Baryte, Quartz, Potassium Feldspar, Calcium Carbonate, Industrial Salt, and etc.



一键智能/AI Embedded

结合机器视觉和人工智能算法，高清识别，智能高效。

Combined with machine vision and artificial intelligence algorithms for ore sorting. HD video recognition and high capacity.



除尘环保/Dust Cleaning

配备悬浮式清灰装置，高粉尘环境下依然表现出高选净率。

Suspended dust cleaning device, which can also show high sorting rate in high dust environment.



选别范围/Sorting Range

立式双层复选，选别范围广。可处理从26目-120目不等的细小矿石颗粒。

Vertical double layer selection with a wide selection range. It can handle small ore particles ranging from 26 to 120 mesh.

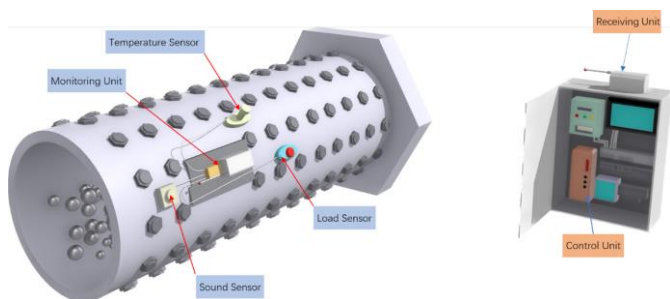


磨矿功率优化系统

Comminution Efficiency Optimization System

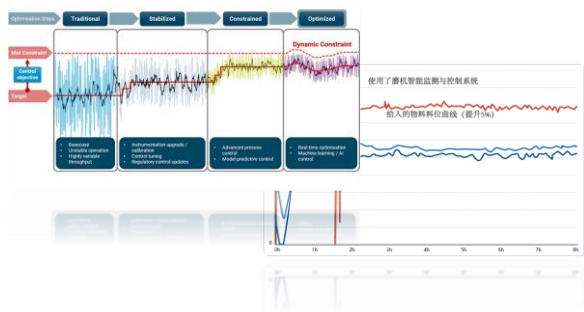
球磨机监测系统包括在球磨机上安装的包括对温度、振动、声音、负载等多个参数在内监测的单元。

球磨机控制系统能将数据库中的参数建立各类特征模型，如实时料位模型，磨机负荷模型等。通过对此类模型的分析与校验，确定磨机运行的最佳值，从而通过控制模块完成对球磨机的控制。



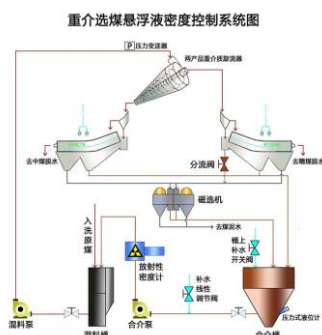
The monitoring system is installed on the ball mill with a monitoring unit including temperature, vibration, sound, load and other parameters.

The ball mill control system can establish various feature models based on the parameters in the database, such as real-time material level models, mill load models, etc. Based on these modules, the system can establish various characteristic models of the parameters in the database.



智能密度控制系统

Intelligent Density Control System



智能密度控制系统是一种应用于煤炭洗选工艺的智能控制技术，旨在实现煤炭产品的准确密度控制和优化生产过程。

煤炭智能密度控制系统使用传感器监测煤炭密度参数，将数据送往集中控制系统进行分析。根据分析结果，系统优化控制策略，实时调整给矿速度、浓度和重介密度参数等，以达到预期分选密度并实时进行动态调节，系统实时监测和反馈控制结果和状态，操作人员可通过界面或报警系统获得有关密度、设备状态和异常情况的信息，进行必要的调整和干预。

The intelligent density control system is an intelligent control technology applied to the coal washing process, aiming to achieve accurate density control of coal products and optimize the production process.

It uses sensors to monitor coal density parameters and sends the data to the centralized control system for analysis. Based on the analysis results, the system optimizes the control strategy and adjusts parameters such as feed rate, concentration, and dense medium density in real time to achieve the desired separation density and perform dynamic adjustments. The system continuously monitors and provides feedback on control results and status in real time, and operators can obtain information about density, equipment status, and abnormal conditions through the interface or alarm system to make necessary adjustments and interventions.



- ◆ 提高产品质量和一致性。
- ◆ 优化生产效率和产量。
- ◆ 减少能耗和成本。
- ◆ 具备成熟的自动化和智能化功能。

- ◆ Improve product quality and consistency.
- ◆ Optimize production efficiency and output.
- ◆ Reduce energy consumption and costs.
- ◆ Mature automation and intelligence function.



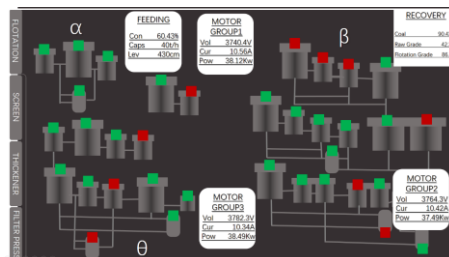


选厂智能化-生产环节

Intelligent Processing Plant- Production Link

智能浮选 Intelligent Flotation

- ◆ 基于图像视觉识别技术对其浮选效果进行分析，结合生产调控数据建立专家知识库。
- ◆ 根据在线浮选品位、入浮浓度、流量、泡沫厚度，实时调整加药量、加药比例、充气量和液位，从而实现浮选智能控制，提高产率，提高浮选质量和产量。
- ◆ The flotation effect is analyzed based on image visual recognition technology, and an expert knowledge base is established combined with production control data.
- ◆ According to online flotation grade, floating concentration, flow rate and foam thickness, the intelligent control of flotation can be realized to increase the yield and improve the quality and output of flotation.



智能压滤 Intelligent Filter Press



- ◆ 内置的压力传感器实时监测滤板压力；
- ◆ 固体颗粒监测系统实时监测滤液固体颗粒含量；
- ◆ 设备主体与主控系统相关联，通过平板等移动设备远程完成压滤机的PLC控制；
- ◆ 内置的PHM智能预测性维护系统可预测设备故障；
- ◆ The built-in pressure sensor monitors the pressure of the filter plate in real time;
- ◆ Real time monitoring of solid particle content in filtrate;
- ◆ The main body of the equipment is associated with the main control system to remotely complete the PLC control of the filter press through the mobile equipment;
- ◆ The built-in PHM system can predict equipment failure;

智能浓缩 Intelligent Concentration

- ◆ 通过煤泥水浊度仪自动在线测量煤泥水浊度,实现全自动智能加药。
- ◆ 浓缩机控制系统接入选煤厂集控系统，实现数据共享，智能加药系统与浓缩机控制系统实现联动，构成智能浓缩系统。
- ◆ The slurry water turbidity is automatically measured on-line by the slurry water turbidity meter to realize full-automatic intelligent dosing.
- ◆ The thickener control system is connected to the centralized control system of the coal preparation plant to realize data sharing. The intelligent dosing system is linked with the thickener control system to form an intelligent concentration system.

