JOHN FINLAY ENG.
& TECH.GROUP OF COMPANIES

LET THERE BE
NO
WASTED
ORES
IN THE WORLD

HPY FINLAY

Minerals, which take millions of years to form, are often mined within seconds. This highlights the importance of using these precious resources wisely and maximizing their value. At John Finlay, we believe in the importance of ensuring full utilization and maximizing the value of what the earth provides. We are committed to revolutionizing the beneficiation process through innovation and technology, making it more efficient and sustainable.

HPY Finlay Technology (Hefei) Co., Ltd. is an international company established in Hefei, China through the strong alliance between John Finlay Engineering Technology (Beijing) Co., Ltd. of Australia and Ganzhou HPY Technology Co., Ltd.

John Finlay has been into Coal Beneficiation since 1978 and has experience building 150+ Coal washeries and 80+ Coal washery operation plants across the globe.

For three consecutive years, HPY has been recognized as a "Seed Unicorn Enterprise" in Jiangxi Province and is a key company to be listed in the Ganzhou Special Economic Zone.

The headquarters in Ganzhou covers an area of 40,000 square meters, including Asia's largest mineral processing laboratory covering 26,000 square meters and a 1,000 square meter engineering research centre. The company also has branches in various cities throughout China.

With a diverse portfolio of over 30 different types of ores, HPY has demonstrated the effectiveness and versatility of its ore sorting technology. HPY's goal is to support the global mining industry in maximizing economic and environmental benefits while revolutionizing mineral processing through innovative technology. As of 2024, HPY Technology Co., Ltd. had successfully sold more than 500+ intelligent ore sorting machines.

Laboratory

Ganzhou R&D Center

R&D Team & Production Team
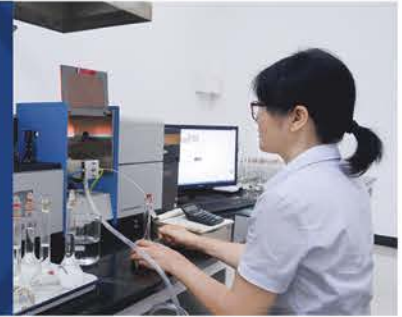
DRY BENEFICIATION

HPY Finlay has a domestic market share of nearly 80% in China, working with over 100+ mining customers & 400+ machines in use.

For dry-washing equipment, We have worked with customers both within and outside the borders of China. Since 2015 we've worked with over 100+ different customers. We've also extended past the borders, working in Tajikistan and Russia.

Copper, Gold, Molybdenum

Over 70
machines in use

Lead-Zinc

Over 80
machines in use

Tungsten

Over 90
machines in use
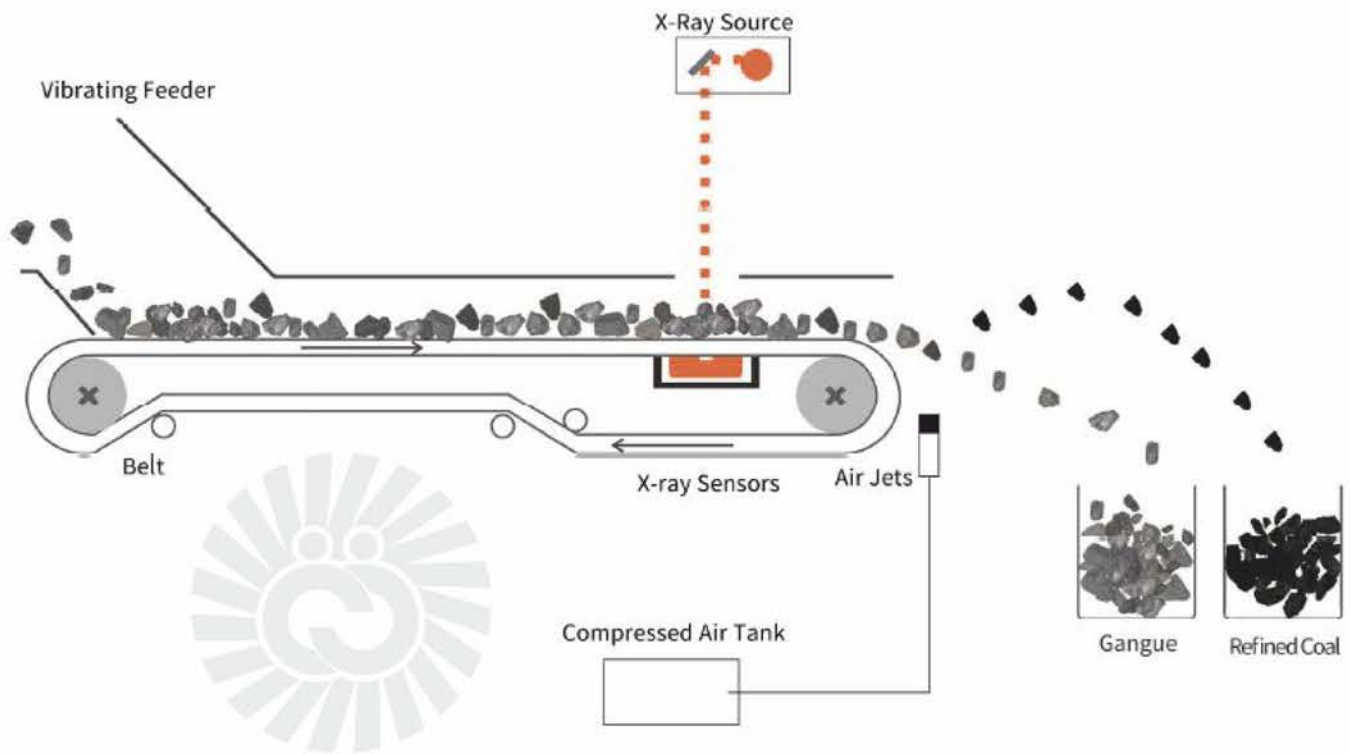
Tin & Antimony

Over 40
machines in use

Phosphate/Coal

Over 80
machines in use

Dry beneficiation is a process that allows companies to use sensor-based technology to pre-concentrate or sort waste rock early in the comminution process. This allows companies to separate commercially valuable minerals or metals from other rocks.

Our machines analyze each rock particle to identify specific characteristics that enable them to distinguish usable ore from waste rock. Subsequently, the machines utilize air jets to sort them accordingly.

AI DEEP LEARNING ALGORITHM : POWER OF AI & ML

The ore data can be identified with high-speed accuracy. In +6-300mm raw coal, the gangue is identified in real-time, and the identification accuracy rate is up to 99.5% or more.

High sorting precision: the amount of gangue in coal is up to <1% and the amount of coal in gangue is up to <1%.
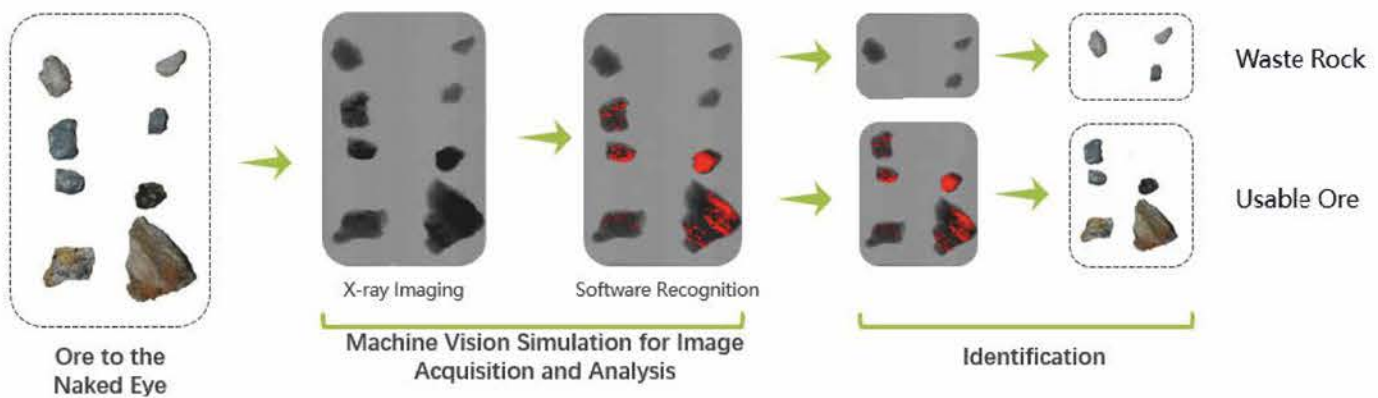

Coal to the naked eye

Coal under imaging system

Image after using Wenshu algorithm

Left : Gangue; Right : Coal

ULTRA-LOW RADIATION PRODUCT

Brick House

HPY Finlay Dry Coal Separation Machines

Fruits & Vegetables/ Air

0.25 mSv per year

0.5 mSv per year

0.75 mSv per year

3.7 mSv per year

6.9 mSv EACH TIME

CT Scan

Highland Areas

*The scientific unit of measurement for whole body radiation dose, called "effective dose," is the millisievert (mSv).

辐射安全许可证
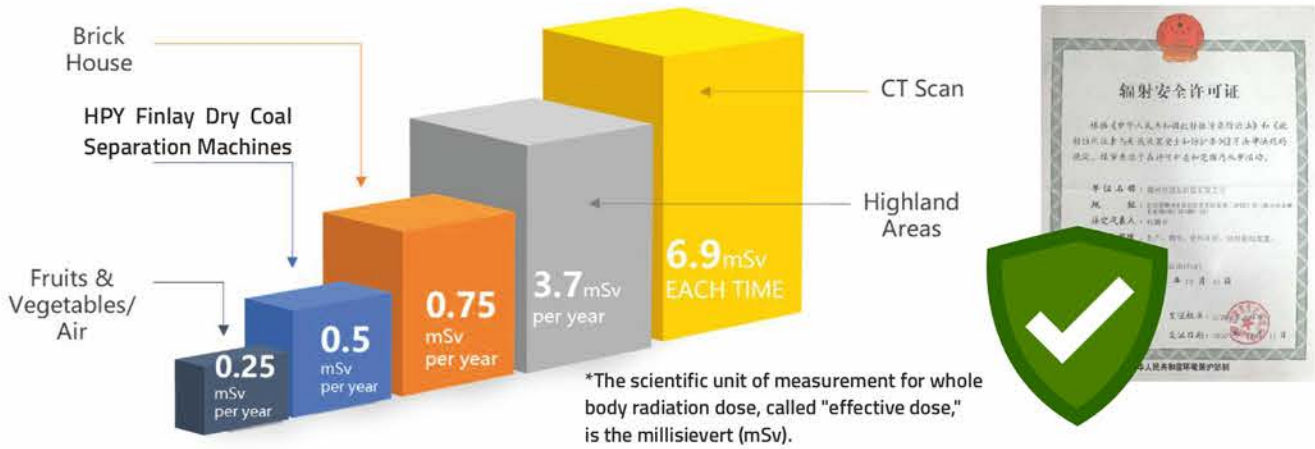
HOW DOES DRY BENEFICIATION WORK?

Dry beneficiation works with surfacing sensors and x-ray sensors combined with the power of artificial intelligence and machine learning algorithms. This works in a way where you can set the density of ore as well as GCV (Gross Calorific Value) combined to obtain the results.

Ore to the Naked Eye

X-ray Imaging

Software Recognition

Machine Vision Simulation for Image Acquisition and Analysis

Identification

Waste Rock

Usable Ore

Density Of Coal

-1.3	-1.4	-1.5	-1.6	-1.7	-1.8	+2.0

Gross calorific value

7500	7000	6500	5500	4000	2500	500

HPY FINLAY
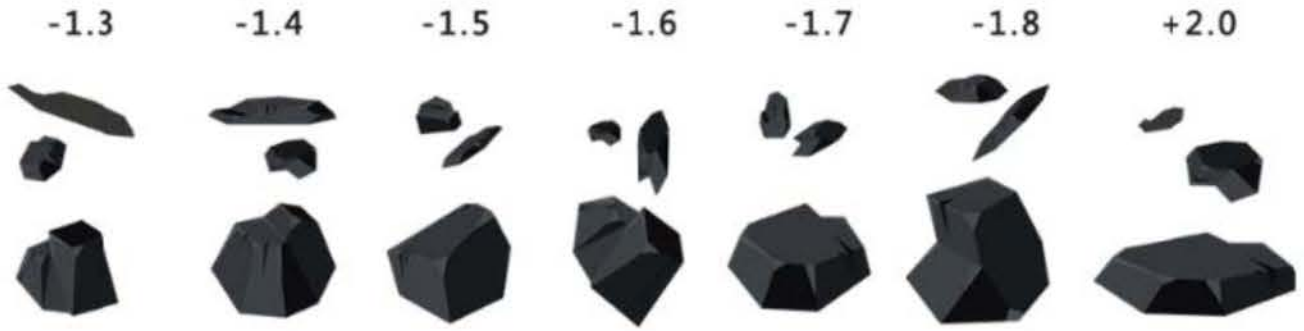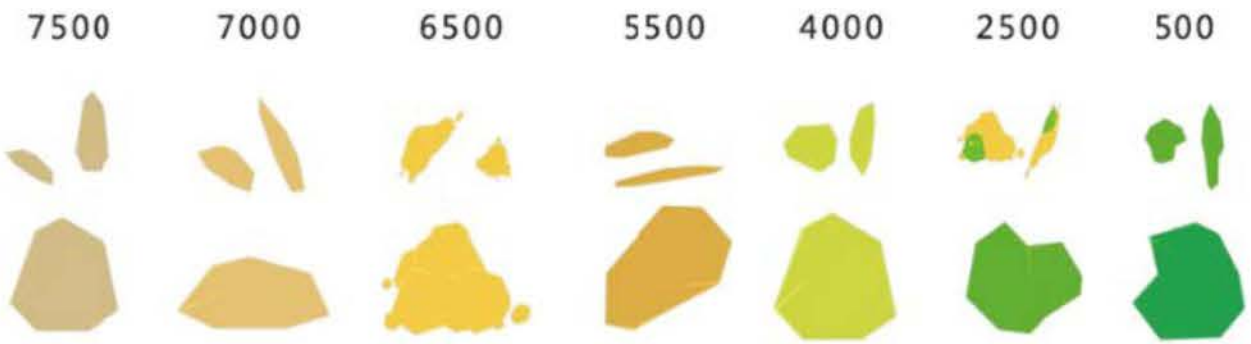
CORE TECHNOLOGY - MACHINE VISION (Detection Technology For Ore Sorting)

EXTERNAL CHARACTERISTICS

VIS HD IMAGING

0.1mm Ore Detection Accuracy	Ultra-Bright Light Source	Dual-Sided Imaging

INTERNAL INFORMATION

X-RAY IMAGING

Single/ Dual Energy X-ray Sensors	High-Speed Processing	99.5% Accuracy

ORE INFORMATION ASSISTANCE

Infrared Reflection Imaging ⟶ High Powered Infrared Light Source Industrial Infrared Camera

X-ray Fluorescence ⟶ X-ray Identification of Elemental Characteristics

Laser Induced Penetration ⟶ High-Precision Plasma Identification Technology

Input

Concentrated Ore

Waste Rock

Feature Extraction and Classification

We have developed and pioneered an AI algorithm specifically for ore sorting, called the Wenshu Algorithm. This algorithm applies deep learning theory to the mining industry, allowing for the development of an adaptive ore-sorting model that can track and optimize itself in real-time based on changes in ore grade.

In complex ore sorting environments, the ore sorting model can adapt its structure to accommodate different characteristics such as ore size, texture, lustre, and thickness in order to achieve accurate identification.
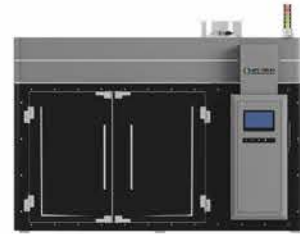
MACHINE VISION
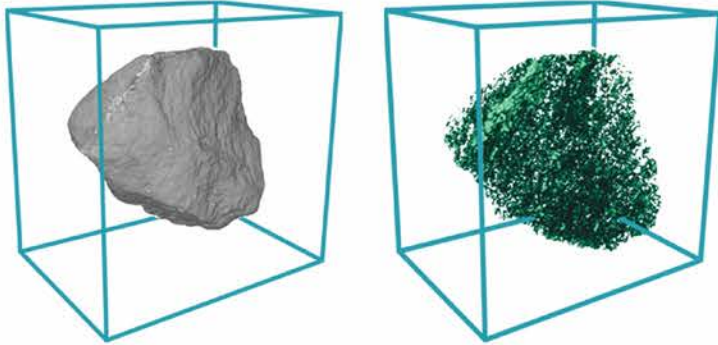
- Single/Dual-Energy X-ray
- VIS HD Imaging
- Large Processing Capacity, Fast Processing Speed
- Accurate

OUR EQUIPMENT

Circle Series

Insight Series

Classic Xrt Series

Cloud Platform

Golden Coal Series

Error Detection

Technical Support

Real-Time Monitoring

Cloud Transfer

CIRCLE SERIES

01

Large processing capacity and wide processing particle size range

FAST: A highly efficient industrial control system can respond in one millisecond, processing up to **10,000 ORES PER SECOND.**

PRECISE: Using a high-precision 360° multi-layered air jet system, the ore and waste rock can be sorted accurately by spraying the ore with compressed air.

COMPATIBLE: Upon entering the machine, the ore enters free fall, removing the limitations on the particle size range. The Circle Series can identify and sort ores as small as 5mm.

02

High recognition accuracy

UNIQUE FEEDING: The vibrating feeding structure has the advantages of uniform material distribution, a wide feeding transfer surface, and large feeding volume.

IMAGING: A customized aerial imaging system improves imaging quality by 30% compared to traditional ore sorting machines. The sorting accuracy can reach up to 99%.

ANALYSING: The use of machine learning & active learning optimizes sorting and allows the machine to improve its recognition ability and accuracy over time.

The World's First Ring-shaped XRT Ore Sorting Machine

Metallic Minerals ▪ Nonmetallic Minerals ▪ Coal

03

Precise air jet system

INTELLIGENT: Synthesizes jet streams based on the size of ore.

FAST & STABLE: The reaction time of the air jets is less than 1.5 milliseconds.

ACCURATE: The diameter of a single nozzle is only 2mm, which can accurately spray the centre of an ore as small as 5mm.

04

Small size and easy operation & maintenance

SMALL SIZE: 75% smaller than traditional ore sorting machines, which reduces infrastructure investment and expansion costs that may have been used to add larger ore sorting machines into the mineral processing plant.
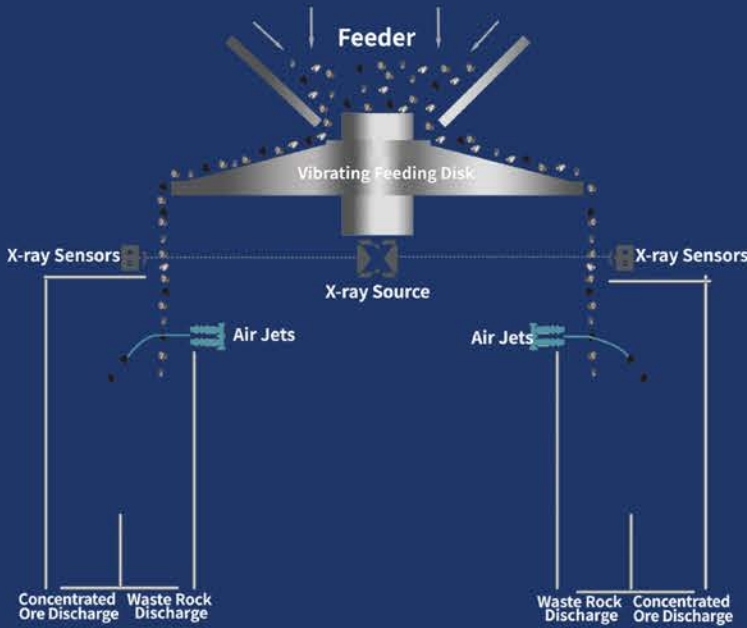
EASY OPERATION: It is equipped with HPY Cloud which uses big data management, allowing for remote control and easy maintenance.

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SORTING MECHANISM

Feeder

Vibrating Feeding Disk

X-ray Sensors

X-ray Source

X-ray Sensors

Air Jets

Air Jets

Concentrated Ore Discharge | Waste Rock Discharge
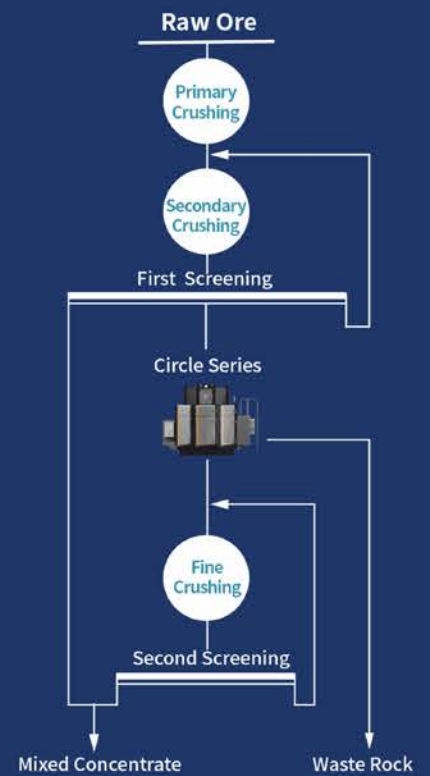
Waste Rock Discharge | Concentrated Ore Discharge

- Unique Feeding System
- Aerial Imaging Technology
- Intelligent Controls
- High-Density Air Jet Arrangement

Model		Weight (t)	Power* (kW)	Size (mm)	Capacity (t/h)	Machine Size (mm)
Coal	FHG 1700-T	18	20	6-25	25-40	5100*3273'4070
				25-50	80-120	
				30-80	90-130	
	FHG 3400-T	32	40	6-25	50-80	9720*3458'5394
				25-50	160-240	
				30-80	180-260	
	FHG 5000-T	40	60	6-25	75-120	8000*6200'5394
				25-50	240-300	
				30-80	270-360	
Metallic Ores	FHG 1700-T	18	20	5-20	25-40	5100*3273'4070
				10-80	80-140	
	FHG 3400-T	32	40	5-20	50-80	9720'3458'5394
				10-80	160-240	
	FHG 5000-T	40	60	5-20	75-120	8000*6200*5394
				10-80	240-320	
Non Metallic Ores	FHG 1700-T	18	20	5-20	25-40	5100*3273*4070
				10-80	80-120	
	FHG 3400-T	32	40	5-20	50-80	9720*3458*5394
				10-80	160-240	
	FHG 5000-T	40	60	5-20	75-120	8000*6200*5394
				10-80	240-320	

*does not include air compressor or fan

Raw Ore

Primary Crushing

Secondary Crushing

First Screening

Circle Series

Fine Crushing

Second Screening

Mixed Concentrate

Waste Rock

GOLDEN COAL SERIES

THE GOLDEN COAL SERIES is a specialized machine designed for dry coal sorting and the comprehensive treatment of gangue. It utilizes high-speed air jets, an advanced AI algorithm, and the option of using VIS HD imaging or single/dual-energy X-ray detection to accurately and efficiently sort coal from gangue. The design greatly reduces the size of the machine and is 20% smaller than other dry coal sorters with the same processing capacity. The standard model can process up to 360t/h. If customers have custom requirements, a higher processing capacity can be achieved by expanding the size of the machine.

All key components of the machine are designed to be explosion-proof, making it suitable for both surface and underground working environments. The Golden Coal Series does not consume water or use chemical mediums, and its energy consumption is much lower than traditional coal washing and other coal sorting processes. It can achieve clean, efficient and environment friendly dry coal sorting, and is accurate enough to replace hand sorting, jigging, shaking, and heavy medium processes. The Golden Coal Series can save on land, personnel, and capital costs for coal preparation plants.

3.5
milion USD per year in economic benefits

2.1
million USD per year in reduced infrastructure investment

75%
lower CO_2 emissions

65%
less wastewater

HPY FINLAY
约翰菲雷好能友科技(合肥)有限公司

Cost-effective Dry Coal Sorting Machine
Bituminous▪Lignite ▪ Anthracite ▪ Multi-type Coal Mines
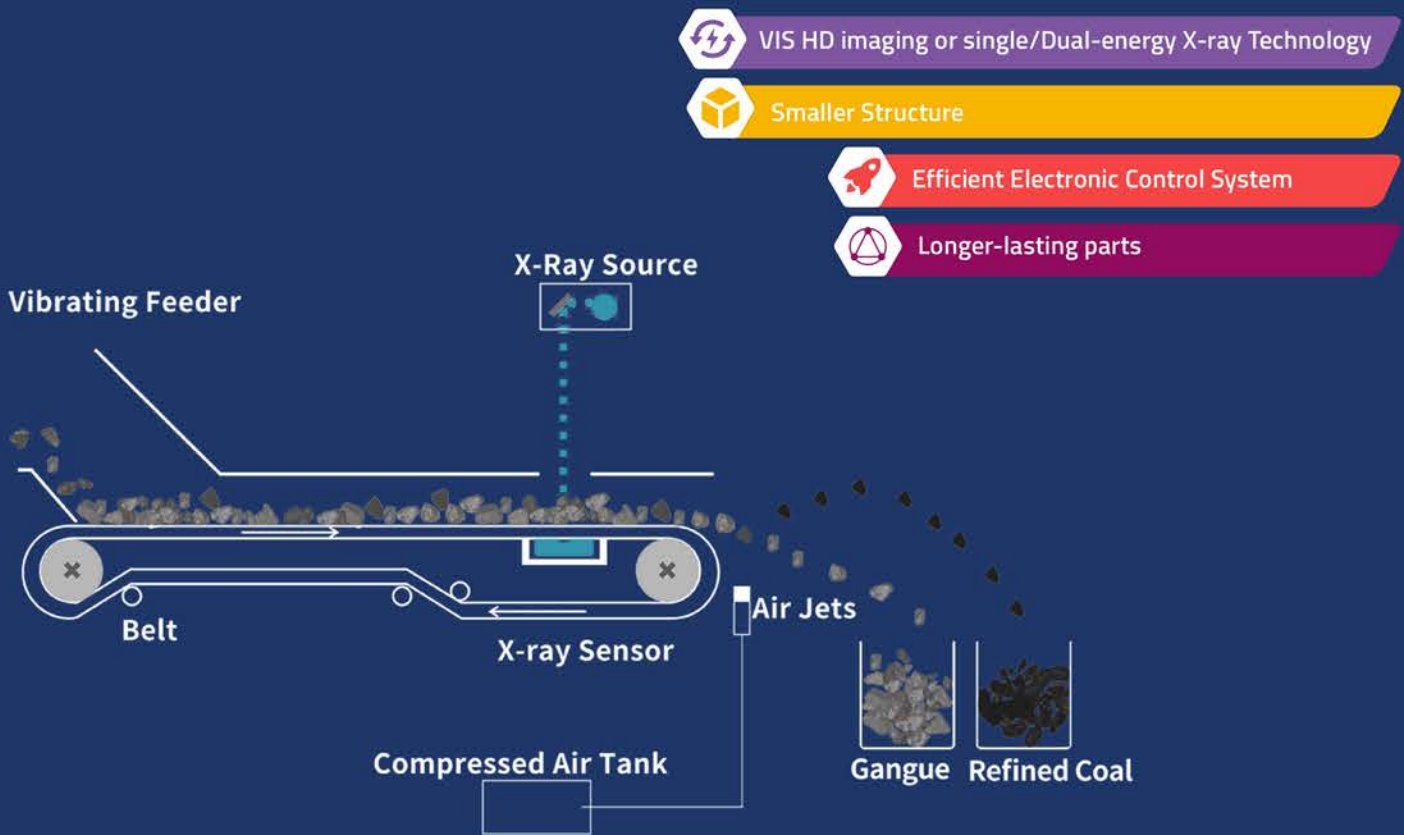
SORTING MECHANISM

- VIS HD imaging or single/Dual-energy X-ray Technology
- Smaller Structure
- Efficient Electronic Control System
- Longer-lasting parts

Vibrating Feeder

X-Ray Source

Belt

X-ray Sensor

Air Jets

Compressed Air Tank

Gangue **Refined Coal**

	Model	Weight (t)	Power*** (kW)	Size (mm)	Capacity (t/h)	Machine Size (mm)
HD Camera Imaging Series	FHG-1200-C	23.8	14	25-100 / 50-300	40-80 / 80-120	12470*2324*3548
	FHG-1400-C	24.8	16	25-100 / 50-300	55-90 / 120-160	12470*2538*3548
	FHG-1600-C	25.8	18	25-100 / 50-300	75-120 / 140-180	12470*2724*3548
	FHG-1800-C	26.8	20	25-100 / 50-300	90-140 / 180-220	12570*2925*3548
	FHG-2400-C	46	28	25-100 / 50-300	80-160 / 200-260	12570*3345*3730
	FHG-2800-C	49	36	25-100 / 50-300	110-180 / 240-320	12570*4720*3730
	FHG-3200-C	52	42	25-100 / 50-300	150-240 / 280-360	12570*5270*3730
	FHG-3600-C	56	48	25-100 / 50-300	180-280 / 360-450	12570*5690*3730
X-Ray Series	FHG-1200-X	23.8	14	25-100 / 50-300	40-80 / 80-120	12470*2324*3548
	FHG-1400-X	24.8	16	25-100 / 50-300	55-90 / 120-160	12470*2538*3548
	FHG-1600-X	25.8	18	25-100 / 50-300	75-120 / 140-180	12470*2724*3548
	FHG-1800-X	26.8	20	25-100 / 50-300	90-140 / 180-220	12570*2925*3548
	FHG-2400-X	46	28	25-100 / 50-300	80-160 / 200-260	12570*3345*3730
	FHG-2800-X	49	36	25-100 / 50-300	110-180 / 240-320	12570*4720*3730
	FHG-3200-X	52	42	25-100 / 50-300	150-240 / 280-360	12570*5270*3730
	FHG-3600-X	56	48	25-100 / 50-300	180-280 / 360-450	12570*5690*3730

*VIS HD Imaging ** Single or dual energy *** does not include air compressor or fan
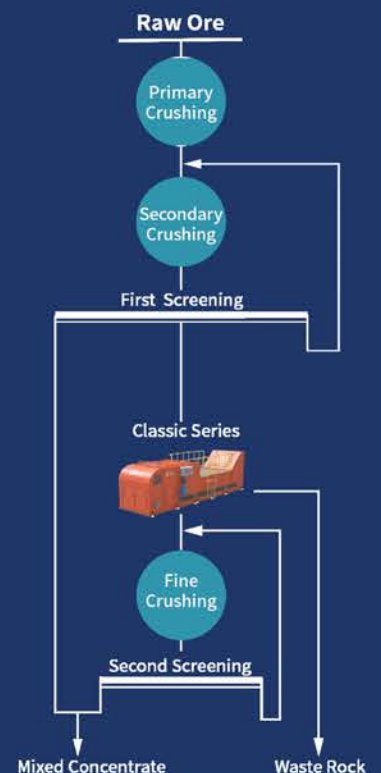
Raw Coal

Crushing

Screening

Lump Coal

Golden Coal Series

Refined Coal   Gangue
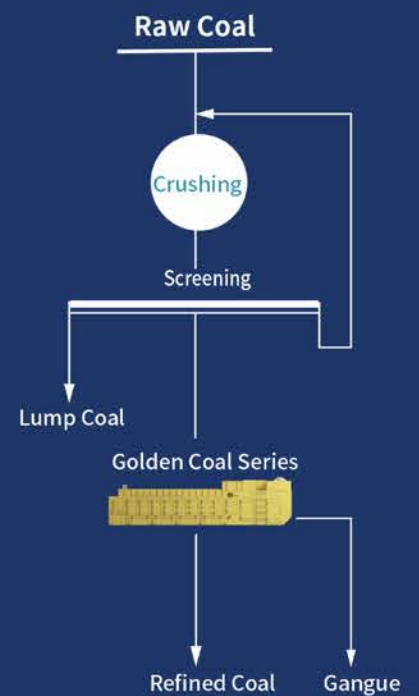
INSIGHT SERIES

☀ HPY FINLAY

INSIGHT SERIES SENSOR-BASED DRY COAL SORTING MACHINE

☀ HPY FINLAY

THE INSIGHT SERIES features a cutting-edge modular designthat represents a significant improvement over the previousgeneration of sorting machines that use belt conveyors. Theinnovative vibration feeder+short belt+free-fall structure havegreatly simplied its design, while reducing machine size, makingmaintenance easier and occupying less space.Moreover, the machine has flexible assembly, allowing fordifferent feeding widths (1600mm, 3200mm) and a processingcapacity ranging from 40-120 tons per hour (+10mm-60mm).catering to various coal processing plants' needs. Each modulecan be controlled and monitored by its software, reducingoperation costs.

Model		Weight (t)	Power* (kW)	Size (mm)	Capacity (t/h)	Machine Size (mm)
Coal	FHG-SC1600	9	30.5	20-60	30-60	8387*2705*3035
	FHG-SC2400	16	45	20-60	50-90	8082*3930*2847
	FHG-SC3200	18	60	20-60	80-120	8770*5235*2992
Metallic Ores	FHG-SC1600	9	30.5	20-60	30-60	8387*2705*3035
	FHG-SC2400	18	45	20-60	50-90	8082*3930*2847
	FHG-SC3200	20	60	20-60	80-120	8770*5235*2992
Non Metallic Ores	FHG-SC1600	9	30.s	20-60	30-60	8387*2705*3035
	FHG-SC2400	18	45	20-60	50-90	8082*3930*2847
	FHG-SC3200	20	60	20-60	80-120	8770*5235*2992

Raw Ore

Primary Crushing

Secondary Crushing

First Screening

Classic Series

Fine Crushing

Second Screening

Mixed Concentrate   Waste Rock

CASE STUDY

ZHICUN LITHIUM GROUP CO., LTD.

Zhicun lithium group co., ltd. operates in Yichun city, Jiangxi province, known as the "Lithium Capital Of Asia." it achieves extensive mass production of battery-grade lithium products through mineral processing and lithium salt production bases. the company integrates mining, mineral processing, and lithium slag utilization, establishing a complete lithium-ion industry chain.

✴ HPY FINLAY
CLEAN ENERGY

Particle Size	:	+10-60mm
Processing Capacity	:	40-60t/h
Raw Ore Grade	:	Li2O 1.27%
Waste Rock Grade	:	Li2O 0.60%
Concentrate Grade	:	Li2O 2.63%
Rejection Rate	:	67.00%
Recovery Rate	:	68.35%
Enrichment Ratio	:	2.07

HPY CLOUD PLATFORM

1234567890

Data Capture

Fault Warning

Indicator Statistics

Real-time Operating Conditions

Real-time Monitoring

Cloud Storage

Easy-to-use System

Message Notification

24 HOURS

specialized and dedicated customer services

CASE STUDY

JIYUAN COAL MINE DRY COAL SORTING PROJECT

The Jiyuan Coal Mine Dry Coal Sorting Plant, located in Tongzi County, Zunyi City, Guizhou Province, has a designed capacity of 1.8 million tons per year. Utilizing advanced X-ray identification technology, this plant economically and environmentally processes raw coal from Jiyuan, Guancang, and surrounding coal mines.

PROJECT OVERVIEW

- Processing Capacity: 1.80Mt/a
- Processing Particle Size: Deshelling from 10-300mm raw coal
- Machine Used: ① One Golden Coal FHG-1600-X dry coal sorting machine, single machine's processing capacity 140-180t/h
② One Circle Series FHG-1700-T dry coal sorting machine, single machine's processing capacity 80-100t/h System Processing Result: Coal in the reject ≤2%, Reject removal rate >90%

XINJIANG ZHONGLUN DRY COAL SORTING PROJECT

The Xinjiang Zhonglun Coal Sorting Project, located in Gaochang District of Turpan City, Xinjiang, has an annual production capacity of 5 million tons of raw coal. This project leverages advanced dry coal sorting technology to address the region's unique climatic challenges, including perennial water shortages and drought conditions.

PROJECT OVERVIEW

- Processing Capacity: 5.0Mt/a
- Processing Particle Size: Pre-reject gangue from 10-300mm raw coal
- Machine Used:
  ① One Golden Coal FHG-1800-X dry coal sorting machine, single machine's processing capacity >180t/h
  ② One Circle Series FHG-3400-T dry coal sorting machine, single machine's processing capacity 150-200t/h
- System Processing Result: Coal in the Reject <2%, Reject removal rate >90%

SOLUTION

To efficiently process raw coal while conserving precious water resources, the Xinjiang Zhonglun project employs state-of-the-art intelligent dry coal sorting technology. This approach not only enhances the efficiency and accuracy of coal selection but also significantly reduces environmental pollution by minimizing water usage.

JOHN FINLAY ENG.
&TECH.GROUP OF COMPANIES

DATONG COAL MINE GROUP MADAOTOU COAL INDUSTRY CO., LTD.

PROJECT OVERVIEW

The Datong Coal Mine Group sought to enhance its coal sorting efficiency and reduce environmental impact. To achieve this, they integrated Hefei John Finlay's advanced dry sorting technology into their operations.

- Location: Datong City, Shanxi Province, China
- Annual Production Capacity: 24 million tonnes
- Coal Reserve: 89.2 billion tonnes

EQUIPMENT AND PERFORMANCE

- Production Capacity: 24.00 Mt/a
- Processing Particle Size: 200mm-800mm (The first large-particle sorting machine in China)
- Machines Used: Two FHG-2400-X Golden Series dry coal sorting machines
- Single Machine's Processing Capacity: >285 t/h
- Sorting Efficiency:
- Coal in Rejects: <1%
- Reject Discharge Rate: >95%

RAW COAL PRODUCTION SYSTEM RENOVATION FOR HEBI COAL & ELECTRICITY CO., LTD.

PROJECT OVERVIEW

- Location: Hebi Coal & Electricity Co., Ltd., Hebi City, Henan Province.
- Initial System: Screening and hand sorting, followed by crushing and mixing
- Issue: High Reject content causing blockages and affecting production efficiency
- Coal Reserve: 89.2 billion tonnes

EQUIPMENT AND PERFORMANCE

- Processing Capacity: 1.20 Mt/a
- Processing Particle Size: Pre-reject Reject from 50-300mm raw coal
- Machine Used: 1 FHG-1400-X Golden Coal Series dry coal sorting machine
- Single Machine's Processing Capacity: 115-160 t/h
- System Processing Result:
- Coal in Reject: <1%
- Reject Discharge Rate: >95%

XINYAN COAL MINE UNDERGROUND AI DRY SORTING SYSTEM SOLUTION

PROJECT OVERVIEW

- Location: Xinyan Coal Mine, Zhongyang County, Shanxi Province
- Production Capacity: 2.40 Mt/a
- Challenges: High reject content, increased transportation burden, and inefficient coal preparation

SOLUTION: FOUR-IN-ONE APPROACH

Xinyan Coal Mine adopted a comprehensive "mining, selection, transportation, and filling" approach, incorporating a sensor-based dry coal sorting system to pre-discharge Reject underground.

- Reject Pre-Discharge:
- The new system pre-sorts Reject from raw coal before it reaches the surface, reducing the volume of waste transported.
- Reject Backfilling:
- Rejected Reject is used to fill mine voids, reducing surface disposal and environmental impact.

EQUIPMENT AND PERFORMANCE

- Processing Particle Size: Pre-reject Reject from +50-300mm raw coal
- Machine Used: 1 FHG-1800-X Golden Coal Series dry coal sorting machine
- Single Machine's Processing Capacity: >180 t/h
- Sorting Result:
- Coal in Reject: <1%
- Reject Discharge Rate: >95%

CASE STUDY

GUIZHOU PANJIANG CLEAN COAL CO., LTD. - TUCHENG MINE

PROJECT OVERVIEW

- Location: Tucheng Mine, Liupanshui city, Guizhou Province.
- Production Capacity: Process raw coal 0.60 Mt/a
- Objective: Enhance coal quality and increase economic benefits through advanced dry sorting technology

SOLUTION

Circle Series Sensor-Based Dry Coal Sorting Machine
- Processing Particle Size: 10-50mm
- Main Equipment: 1 FHG-1500-T Circle Series sensor-based dry coal sorting machine
- Single Machine's Processing Capacity: >100 t/h

SORTING RESULTS

- Coal in Reject: <2%
- Reject Discharge Rate: >90%

LAOGONGYINGZI COAL MINE OF PINGZHUANG COAL INDUSTRY IN INNER MONGOLIA

PROJECT OVERVIEW

- Location: Laogongyingzi Coal Mine, Chifeng City, Inner Mongolia.
- Challenges: High dust and noise, safety hazards, intensive labor, and low sorting efficiency

SOLUTION : ADVANCED DRY COAL SORTING SYSTEM

- Processing Particle Size: Pre-reject Reject from +70-400mm raw coal
- Machine Used: 1 FHG-1600-X Golden Coal Series dry coal sorting machine
- Single Machine's Processing Capacity: >180 t/h

SORTING RESULTS

- Coal in Reject: <1%
- Reject Discharge Rate: >95%

GUINENG GROUP HEBIAN COAL INDUSTRY

PROJECT OVERVIEW

- Location: Duge Town, Shuicheng District, Liupanshui City, Guizhou Province
- Production Capacity: 0.9 Mt/a
- Challenges: High Reject content, low-quality raw coal, high transportation and washing costs

SOLUTION: DRY COAL SORTING SYSTEM

To improve efficiency and reduce costs, Hebian Coal Mine installed a dry coal sorting system at the wellhead, aimed at pre-discharge of Reject from the raw coal. This approach offers several benefits:
- Reject Pre-Discharge:
- Pre-sorting Reject at the wellhead reduces the volume of waste transported and processed.
- Cost Reduction:
- Minimizes transportation and subsequent washing costs by reducing the Reject content before it reaches the preparation plant.

EQUIPMENT AND PERFORMANCE

- Processing Particle Size: 50-300mm
- Machine Used: 1 FHG-1600-X Golden Coal Series dry coal sorting machine
- Single Machine's Processing Capacity: >180 t/h
- Sorting Result:
- Coal in Reject: <1%
- Reject Discharge Rate: >95%

REJECT RECOVERY: WEALTH FROM THE WASTE

Guizhou Panjiang Clean Coal Co., Ltd. - Shanjiaoshu Mine

PROJECT OVERVIEW
- Location: Shanjiaoshu Mine, Liupanshui City, Guizhou Province.
- Production Capacity: 2.0 Mt/a
- Objective: Comprehensive utilization of Rejects to improve economic benefits and reduce environmental impact

SOLUTION: Circle Series Sensor-based Dry Coal Sorting Machines

- Processing Particle Size: 10-50mm
- Machines Used: Two FHG-1500-T Circle Series sensor-based dry coal sorting machines
- Single Machine's Processing Capacity: >100 t/h

SORTING RESULTS
- Coal in Reject: <2%
- Reject Discharge Rate: >90%

Coal comes from the main inclined shaft

50-300mm Separation Of coal and gangue		50mm screening

50-300mm Kaolinite separation	50-300mm clean coal	25mm screening

50-300mm Kaolinite	50-300mm gangue	-25 slack coal

Process Flow Diagram of the Maomaoshan Modification Plan

CASE STUDY

MAOMAO MOUNTAIN COAL MINE, SHAN XI PROVINCE - AI-DRY COAL SORTING AND KAOLIN EXTRACTION

PROJECT OVERVIEW
- Location: Maomao Mountain Coal Mine, Zuoyun County, Datong City, Shanxi Province.
- Current Coal Output: 5.00 Mt/a
- Planned Expansion: 10.00 Mt/a

SOLUTION: Advanced Dry Coal Sorting And Kaolinite Extraction System
- Production Capacity: Two production lines, each processing 5 million tons of raw coal per year
- Processing Particle Size: Deep pre-discharge of gangue from 25mm-300mm
raw coal and extraction of kaolin from 25mm-300mm sorted gangues

EQUIPMENT AND PERFORMANCE

1. Dry Coal Sorting:
  - Machines Used:
  - Two Golden Coal FHG-2800-X dry coal sorting machines
  - Processing Capacity: Each machine >280 t/h
  - Function: Sorts 50mm-300mm raw coal, producing three products
2. Kaolin Extraction (50mm-300mm Rejects):
  - Machines Used:
  - Two Golden Coal FHG-1600-C dry coal sorting machines
  - Processing Capacity: Each machine >160 t/h
  - Function: Extracts kaolin from sorted gangues

3. Deep Gangue Pre-Rejection (25mm-50mm Raw Coal):
  - Machines Used:
  - Two Circle Series FHG-3400-T dry coal sorting machines
  - Processing Capacity: Each machine >200 t/h
  - Function: Deeply pre-rejects gangue from raw coal
4. Kaolin Extraction (25mm-50mm Gangues):
  - Machines Used:
  - Two Insight Series FHG-SC2400 sensor-based dry coal sorting machines
  - Processing Capacity: Each machine >90 t/h
  - Function: Extracts kaolin from sorted gangues

25-50mm Separation of coal and gangue
→ **25-50mm clean coal**
→ **25-50mm gangue** → **25-50mm Kaolinite separation** → **25-50mm Kaolinite** / **25-50mm gangue**

LEAD-ZINC

TIBET SUMMIT RESOURCES CO., LTD. TAJIK-CHINA MINING CO., LTD.

Particle Size	+10-90mm	Raw Ore Grade	Pb+Zn <4-6%
Rejection Rate	>30%	Waste Rock Grade	Pb+Zn <0.6%
Recovery Rate	>95%	Enrichment Ratio	>1.4
*According to the testing done by Tajik-China Mining the waste rock grade is 0.4%.			

ALUMINIUM CORPORATION OF CHINA LIMITED QINGHAI HONGXIN MINING INDUSTRY CO., LTD.

Particle Size	+10-40mm	Raw Ore Grade	Pb 1.50% Zn 3.15%
Rejection Rate	21.49%	Waste Rock Grade	Pb 1.50% Zn 3.15%
Concentrate Grade	Pb 1.89% Zn 3.99%		
*Annual economic benefits of 6.4 million USD			

ZHONGDI MINAN INDUSTRIAL CO., LTD. LANPING LEAD-ZINC MINE

Particle Size	+5-60mm	Raw Ore Grade	Pb+Zn 6-9%
Rejection Rate	55%	Waste Rock Grade	Pb+Zn 2%
Recovery Rate	70%	Concentrate Grade	Pb+Zn 15%
*Annual economic benefits of 10.8 million USD			

GUANGXI NANDAN NANFANG METAL COMPANY LIMITED KANGMA MINERAL PROCESSING PLANT

Particle Size	+12-80mm	Raw Ore Grade	Pb 1.01% Zn 8.81%
Rejection Rate	23%	Waste Rock Grade	Pb 0.04% Zn 0.32%
Recovery Rate	99%	Concentrate Grade	Pb 1.26% Zn 11.05%

CASE STUDY

TUNGSTEN

CHINA TUNGSTEN AND HIGHTECH MATERIALS CO., LTD.

Particle Size	+15-60mm	Raw Ore Grade	Wo_3 0.28%
Rejection Rate	58.44%	Waste Rock Grade	Wo_3 0.04%
Recovery Rate	89.70%	Concentrate Grade	Wo_3 0.89%

HUNAN NONFERROUS METALS XINTIANLING WOLFRAM MINE CO., LTD.

Particle Size	+15-35mm	Raw Ore Grade	Wo_3 0.15-0.40%
Rejection Rate	25%	Waste Rock Grade	Wo_3 0.04%
Recovery Rate	>94%	Processing Capacity	80-90t/h

CHONGYI ZHANG YUAN TUNGSTEN CO., LTD.

Particle Size	+15-60mm	Raw Ore Grade	Wo_3 + Sn 0.350%
Rejection Rate	≥85%	Waste Rock Grade	Wo_3 + Sn 0.038%
Recovery Rate	90.86%	Concentrate Grade	Wo_3 + Sn 2.120%

JIANGXI TUNGSTEN HOLDING GROUP COMPANY LIMITED XIALONG TUNGSTEN MINING CO., LTD.

Particle Size	+15-90mm	Raw Ore Grade	Wo_3 0.25%
Rejection Rate	90%	Waste Rock Grade	Wo_3 0.03%
Recovery Rate	90%	Concentrate Grade	Wo_3 2.25%

MOLYBDENUM

BEIJING HUAXIA JIANLONG MINING SCIENCE & TECHNOLOGY CO., LTD. - ABAG BANNER JINDI MINING CO., LTD.

Particle Size	+15-31.5mm	Raw Ore Grade	Mo 0.042%
Rejection Rate	40.7%	Waste Rock Grade	Mo 0.019%
Recovery Rate	85.0%	Concentrate Grade	Mo 0.072%

GUANGDONG HENGXING ECONOMIC DEVELOPMENT CO., LTD. BAISHIZHANG MOLYBDENUM MINE

Particle Size	+15-40mm	Raw Ore Grade	Mo 0.175%
Rejection Rate	≥85%	Waste Rock Grade	Mo 0.015%
Recovery Rate	93.37%	Concentrate Grade	Mo 0.731%

PHOSPHATE

YUNTIANHUA GROUP CO., LTD. YUNNAN PHOSPHATE HAIKOU CO., LTD

Particle Size	+15-70mm	Raw Ore Grade	P_2O_5 15.01%
Rejection Rate	58.44%	Waste Rock Grade	P_2O_5 10.00%
Recovery Rate	61.37%		
*Increase of 5 million tons of phosphate resources, creating a value of 3 million USD.			

YICHANG BAILIYUAN LOGISTICS CO., LTD.

Particle Size	+15-50mm	Raw Ore Grade	P_2O_5 16.96%
Rejection Rate	50.50%	Waste Rock Grade	P_2O_5 7.99%
Recovery Rate	77.01%	Enrichment Ratio	1.54

CASE STUDY

ANTIMONY

HUNAN GOLD CORPORATION LIMITED ZHAZIXI ANTIMONY MINE

Particle Size	+15-70mm	Raw Ore Grade	Sb 2.01%
Rejection Rate	60.00%	Waste Rock Grade	Sb 0.08%
Recovery Rate	97.62%	Enrichment Ratio	Sb 0.08%

*Added 5 million tons of ore resources, valued at over 291 million USD.

YUNNAN MULI ANTIMONY INDUSTRY CO., LTD.

Particle Size	+20-40mm	Raw Ore Grade	Sb 1.86%
Rejection Rate	93.94%	Waste Rock Grade	Sb 0.19%
Recovery Rate	90.38%	Enrichment Ratio	Sb 27.74%

GOLD/COPPER

CHINA NATIONAL GOLD GROUP CO., LTD INNER MONGOLIA JINTAO CO., LTD-GOLD MINE

Particle Size	+10-60mm	Raw Ore Grade	Au 0.82g/t
Rejection Rate	34%	Waste Rock Grade	Au 0.10g/t
Enrichment Ratio	2.80%	Enrichment Ratio	Au 2.30g/t

CHINA NONFERROUS HONG TOUSHAN FUSHUN MINING GROUP CO., LTD.

Particle Size	+10-60mm	Raw Ore Grade	Au 0.82g/t
Processing capacity	2000t/d	Waste Rock Grade	Au 0.10g/t
Enrichment Ratio	Au 8.50 Cu 12.65	Enrichment Ratio	Au 1.301g/t Cu 1.460%

APPLICABLE MINERAL TYPES

XRT sorting has its distinct advantages and avoids errors of manual ore sorting, colour sorting, and XRF ore sorting, it allows for the rapid detection of both the internal and external features of the ore, providing optimal principles for technology in the field of ore sorting

Anthracite

Bituminous

Lignite

Lead-Zinc

Gangue

Antimony

Tungsten

Copper

Phosphate

Molybdenum

Lithium

Gold

1	1.0078
H	
Hydrogen	

3	6.9410	14	9.0122
Li		**Be**	
Lithium		Beryllium	

11	22.990	12	24.305
Na		**Mg**	
Sodium		Magnesium	

19 39.098	20 40.078	21 44.956	22 47.867	23 50.942	24 51.996	25 54.938	26 55.845	27 58.933	28 58.693	29 63.546	30 65.380
K	**Ca**	**Sc**	**Ti**	**V**	**Cr**	**Mn**	**Fe**	**Co**	**Ni**	**Cu**	**Zn**
Potassium	Calcium	Scandium	Titanium	Vanadium	Chromium	Manganese	Iron	Cobalt	Nickel	Copper	Zinc
37 85.468	38 87.620	39 88.906	40 91.224	41 92.906	42 95.950	43 98	44 101.07	45 102.91	46 106.42	47 107.87	48 112.41
Rb	**Sr**	**Y**	**Zr**	**Nb**	**Mo**	**Tc**	**Ru**	**Rh**	**Pd**	**Ag**	**Cd**
Rubidium	Strontium	Yttrium	Zirconium	Niobium	Molybdenum	Technetium	Ruthenium	Rhodium	Palladium	Silver	Cadmium
55 132.91	56 137.33	57 138.91	72 178.49	73 180.95	74 183.84	75 186.21	76 190.23	77 192.22	78 195.08	79 196.97	80 200.59
Cs	**Ba**	**La**	**Hf**	**Ta**	**W**	**Re**	**Os**	**Ir**	**Pt**	**Au**	**Hg**
Caesium	Barium	Hydrogen	Hafnium	Tantalum	Tungsten	Rhenium	Osmium	Iridium	Platinum	Gold	Mercury
87 223	88 226	89 227	104 261	105 262	106	107 264	108 269	109 278	110 281	111 282	112 285
Fr	**Ra**	**Ac**	**Rf**	**Db**	**Sg**	**Bh**	**Hs**	**Mt**	**Ds**	**Rg**	**Cn**
Francium	Radium	Actinium	Rutherfordium	Dubnium	Seaborgium	Bohrium	Hassium	Meitnerium	Darmstadtium	Roentgenium	Copernicium

HIGH PRECISION IMAGING RECOGNITION SYSTEM
FPGA is a world-leading logic Control for sub millisecond Response control.

AIR JET SYSTEM
Precise sorting and efficient separation with the airjet system.

MECHANICAL CONSTRUCTION
Cost-effective mechanical construction for efficient dry washing equipment.

MECHANICAL CONTROLS
Easy operation with mechanical controls in dry washing cloud platforms.

ENVIRONMENTAL BENEFITS

- Significantly reduce the energy consumption of grinding and flotation processes, and reduce the consumption of wearable materials and chemicals.

- Reduce pressure and extend service life on the tailings pond.

- Improve mining extraction rate, comprehensive resource utilization rate, and mineral processing recovery rate.

- Reduces reliance on harmful chemicals typically employed in conventional sorting processes.

- Reduced water consumption

					2 4.0026 **He** Helium
5 10.811 **B** Boron	6 12.011 **C** Carbon	7 14.007 **N** Nitrogen	8 15.999 **O** Oxygen	9 18.998 **F** Fluorine	10 20.180 **Ne** Neon
13 26.982 **Al** Aluminium	14 28.086 **Si** Silicon	15 30.974 **P** Phosphorus	16 32.065 **S** Sulfur	17 35.453 **Cl** Chlorine	18 39.948 **Ar** Argon
31 69.723 **Ga** Gallium	32 72.640 **Ge** Germanium	33 74.922 **As** Arsenic	34 78.960 **Se** Selenium	35 79.904 **Br** Bromine	36 83.798 **Kr** Krypton
49 114.82 **In** Indium	50 118.71 **Sn** Tin	51 121.76 **Sb** Antimony	52 127.60 **Te** Tellurium	53 126.90 **I** Iodine	54 131.29 **Xe** Xenon
81 204.38 **Tl** Thallium	82 207.20 **Pb** Lead	83 208.98 **Bi** Bismuth	84 209 **Po** Polonium	85 210 **At** Astatine	86 222 **Rn** Radon
113 286 **Nh** Nihonium	114 289 **Fl** Flerovium	115 289 **Mc** Moscovium	116 293 **Lv** Livermorium	117 294 **Ts** Tennessine	118 294 **Og** Oganesson

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