

HAIWANG PRODUCTS AND SERVICE BROCHURE



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Weihai Haiwang Technology Co., Ltd
Weihai Haiwang Hydrocyclone Co., Ltd

COMPANY PROFILE



Weihai Haiwang Technology Co., Ltd. is the worldwide leading separation technology R & D and equipment manufacturing base. By adhering to the concept of “Better Separation”, Haiwang is committed to providing advanced technology, high efficient equipment and superior service for users in mining, coal, sand aggregate, electric power environmental protection, petroleum, chemical and the other industries to assist users for the sustainable development. The products are far ahead in the domestic marketing share, and have been exported to more than 60 countries, including Australia, Russia, Peru and India, etc. Haiwang has established the international branch companies including Neptune Mineral Co., Ltd in Russia and Helicon Mining Services Pty Ltd in Australia, and also the agencies in America, Peru, Chile, South Africa, India and Mongolia, etc. over 10 countries, thus to provide local service for clients all over the world conveniently.

150000 m²

Production Base Area

50000 sets

Annual Production Capacity of Equipment

20000 m²

Spare Part and Accessory Warehouse Area

EurAsian Conformity

Rostechnadzor Permit

ISO9001 Quality Management System Certification

ISO14001 Environment Management System Certification

OHSAS18001 Occupational Health and Safety Management System Certification

European CE Certificate

CONTENTS

03-04	07-08	11-12	15-16	19-20	23	25-26	29-30	33-38
R&D Strength	Machining and Storage	Dense Medium Cyclone	Multi-layer Vibrating Screen	Spiral Separator	Fine Sand Recovery Workstation	Helicon Wearing Resistant Rubber	Intelligent Control Expert System	Site cases
Product Service	Patented Structure	Slurry Pump	Vibrating Screen	FBS Fluidized Bed Separator	Integrated Machine for Washing and Fine Sand Recovery	Wearing Resistant Material	After-sales Service	
05-06	09-10	13-14	17-18	21-22	24	27-28	31-32	



5000 m²

R&D STRENGTH



1

National Technical Invention Award



3

Draft Industrial Standards



200

Independent Intellectual Property



>5000 m²

R&D Base Area



>30

Experimental Platforms



150

Professional Technical Team



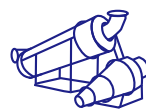
We
provide professional separation equipment for you



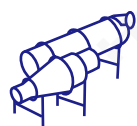
Hydrocyclone



Integrated Machine
for Sand Washing and
Fine Sand Recovery



Dense Medium
Cyclone



Coal Slime Dense
Medium Separator



Vibrating Screen



Multi-Layer Vibrating
Fine Screen



Spiral Separator



FBS Fluidized
Bed Separator



Cyclone Station
for Power Plant



De-sanding Cyclone



Cyclone Filter for
Impurity Removal
from Finished Oil



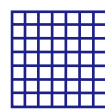
Wearing
Resistant Pipeline



Valve



Pump



Screen Panel Accessory

We
provide professional separation
technical solution for you



Grinding and Classification
System Optimization



Sand Washing and
Fine Sand Recovery



Cyclone to
improve efficiency



Engineering Mud
Purification



Coarse Slime Ultrafine
Separation/Classification



Solid Waste
Recycling



Tailing Recovery



Water Treatment



Automatic Control





Dynamic parts warehousing

Annual production capacity of cyclones >40,000 sets
Annual production capacity of multi-layer screens, vibrating screens, spiral separators, FBS and pumps, etc. >10,000 sets
Dynamic inventory parts warehouse with area of 20,000 square meters



Advanced Machining Equipment

- Gantry Machining Center
- Horizontal Machining Center
- Plasma Cutting Machine
- Laser Cutting Machine
- Welding Robot
- Spray Painting Robot.....





Cyclone with Volute Pre-classifying Feeding Chamber

Adopting feed particles clockwise rotation and radial arrangement technology;
Stable feeding flow field, reducing short-circuit flow effectively;
Low inlet resistance, with low energy consumption ;
Less fine particles misplaced in underflow, with higher classifying efficiency.



Flat Bottom Cyclone

Adopting flat bottom fluidized bed high-efficiency classifying technology;
Less fine particles misplaced in underflow, with 10% higher classifying efficiency than conventional cyclone;
Lower circulation load, with higher grinding and classifying capacity, and lower unit energy consumption;
Alleviating the anti-enrichment problem in iron ore classification;
Suitable for the primary grinding and classifying of ferrous metal ore.



Multi-cone Cyclone

Adopting multi-cone non-linear centrifugal classification technology;
Multi-cone design, with high centrifugal force, and fine cut size;
Lower cyclone pressure drop, enabling higher cyclone capacity;
Low inlet resistance, with low energy consumption ;
Suitable for fine classification, desliming, thickening and other operations.



Cyclone with Spiral Feeding Chamber

With spiral feeding chamber design;
Stable feed flow field, with less turbulence at feed inlet;
Lower inlet resistance, with less wear and energy consumption;
Less short-circuit flow, with higher classifying efficiency;
Higher capacity per cyclone set.



Ultra-fine Classification Cyclone

With ultra-small cone angle and multi-cone design;
Excellent resistance to wear and corrosion;
Smooth inner surface, with higher classification accuracy;
Cut size of 1-5 μ m.



Specifications

Model No.	Diameter (mm)	Inlet pressure (MPa)	Capacity (m ³ /h)	Cut size (μ m)
FX840	840	0.04-0.15	500-1000	74-350
FX710	710	0.04-0.15	400-650	74-250
FX660	660	0.04-0.15	260-600	74-220
FX610	610	0.04-0.15	200-350	74-200
FX500	500	0.04-0.2	140-350	74-200
FX400	400	0.06-0.2	100-270	74-150
FX350	350	0.06-0.2	70-210	50-150
FX300	300	0.06-0.2	45-100	50-150
FX250	250	0.06-0.3	40-100	40-100
FX200	200	0.06-0.3	25-60	40-100
FX150	150	0.08-0.3	14-40	20-74
FX125	125	0.1-0.3	8-25	25-50
FX100	100	0.1-0.3	6-25	20-50
FX75	75	0.1-0.4	5-10	10-40
FX50	50	0.1-0.4	2-5	5-40
FX25	25	0.1-0.6	0.3-1	5-20
FX10	10	0.1-0.6	0.05-0.1	1-5



Two-product Dense Medium Cyclone

$E_p: \leq 0.05\text{g/cm}^3$



Three-product Dense Medium Cyclone with Non-pressured Feeding

$E_{p1} \leq 0.03\text{g/cm}^3$ $E_{p2} \leq 0.05\text{g/cm}^3$



Three-product Dense Medium Cyclone with Pressured Feeding

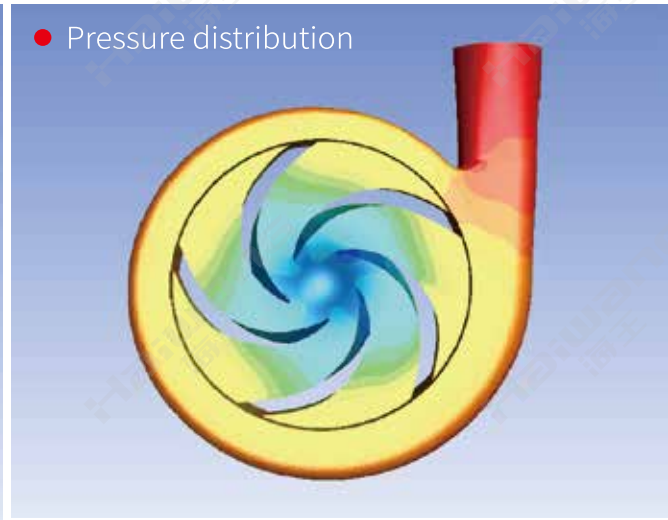
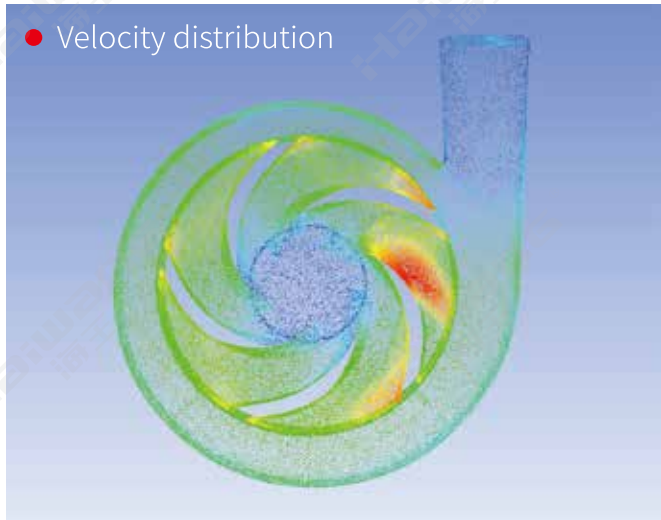
$E_{p1} \leq 0.03\text{g/cm}^3$ $E_{p2} \leq 0.05\text{g/cm}^3$

PROVIDING CUSTOMERS WITH BEST PRODUCTS AND SERVICE
IS OUR RELENTLESS PURSUIT!





Haiwang HWCP Series Slurry Pump



Independent research and development design

Single stage, single suction, cantilever, double shell structure
Optional auxiliary impeller with packing seal or mechanical seal

Quality Assurance

With Chinese second-class comprehensive performance test platform for water pumps
Pump performance detected automatically by computer



Alloy material

High chromium wear-resistant cast iron material (Cr28)
Hardness HRC60
Suitable for strong abrasive conditions
Alkali resistance

Polyurethane material

Casting molding
Wet parts with good sealing and low noise
Excellent wear-resistant and strong cavitation resistance
Excellent acid and alkali resistance, salt resistance, oil resistance

Rubber material

Casting molding
Wet parts with good sealing and low noise
Excellent wear-resistant and strong cavitation resistance
With excellent corrosion resistance and a wide range of operating conditions

Model No.	Maximum power allowed kW	Clean water performance		Interval passing maximum particle size mm
		Flow rate m³/h	Peak efficiency%	
50HWCP-R	22	12-50	41.4	13
80HWCP-R	45	46-185	68.2	24
100HWCP-R	90	66-250	71.0	35
150HWCP-R	75	115-450	78.0	48
200HWCP-R	200	218-850	82.7	62
250HWCP-R	450	300-1480	76.0	72
...	...	...	...	...



ZKJ-D Series Multi-layer Vibrating Screen

ZKJ1007-D Series Multi-layer Vibrating Screen

Model	Motor power (kw)	Screen area (m2)	Aperture size (mm)	Dry ore capacity (t/h)	Screen mesh material
ZKJ1007-D1	1.8×2	1.4	0.074~1	4-9	Flexible wearing-resistant polyurethane
ZKJ1007-D2	1.8×2	2.9	0.074~1	8-18	
ZKJ1007-D3	1.8×2	4.4	0.074~1	12-27	
ZKJ1007-D4	1.8×2	5.8	0.074~1	16-36	
ZKJ1007-D5	1.8×2	7.3	0.074~1	20-45	

ZKJ1007-D/3 Series Multi-layer Vibrating Screen

Model	Motor power (kw)	Screen area (m2)	Aperture size (mm)	Dry ore capacity (t/h)	Screen mesh material
ZKJ1007-D1/3	1.8×2	2.19	0.074~1	5-10	Flexible wearing-resistant polyurethane
ZKJ1007-D2/3	1.8×2	4.39	0.074~1	10-20	
ZKJ1007-D3/3	1.8×2	6.58	0.074~1	15-30	
ZKJ1007-D4/3	1.8×2	8.78	0.074~1	20-40	
ZKJ1007-D5/3	1.8×2	10.97	0.074~1	25-50	

ZKJ1408-D Series Multi-layer Vibrating Screen

Model	Motor power (kw)	Screen area (m2)	Aperture size (mm)	Dry ore capacity (t/h)	Screen mesh material
ZKJ1408-D1	2.8×2	2.24	0.074~1	5-11	Flexible wearing-resistant polyurethane
ZKJ1408-D2	2.8×2	4.48	0.074~1	10-22	
ZKJ1408-D3	2.8×2	6.72	0.074~1	15-33	
ZKJ1408-D4	2.8×2	8.96	0.074~1	20-44	
ZKJ1408-D5	2.8×2	11.20	0.074~1	25-55	

The actual processing capacity of the ZKJ series multi-layer high-frequency vibrating fine screen is related to the property of the incoming material and the aperture of the screen mesh, and the processing capacity is also different for different types of slurry and screen mesh specifications.



ZKJ-D

Multi-layer high frequency fine screen mesh

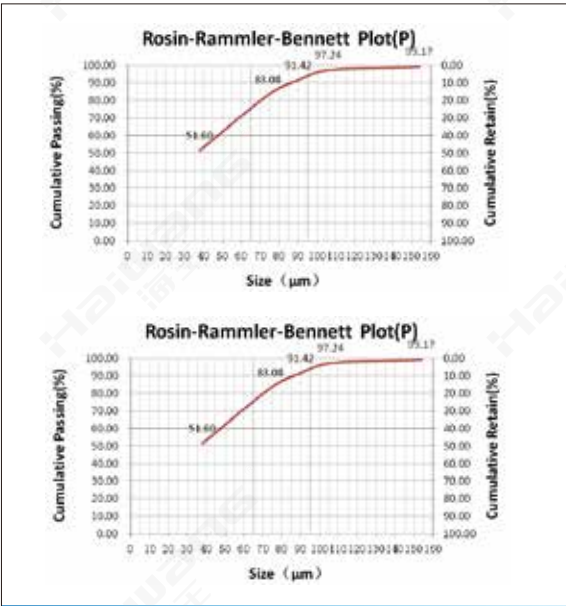
Flexible polyurethane material integral molding process



Motion and material status during the actual classifying process of multi-layer screen



High efficiency, high aperture ratio, anti-blocking, wearing-resistant, long service life.



Cumulative Curves for Materials

Mesh specification	Slot width (mm)	Slot length (mm)	Aperture ratio (%)
1045×700 1245×840 1445×840	0.074	2.65	18.73
	0.10	2.65	23.41
	0.12	2.65	24.45
	0.15	2.65	25.42
	0.20	2.65	35.67
	0.25	2.65	36.60
	0.30	2.65	38.50
	0.35	2.65	41.32
	0.40	2.65	42.5
	0.50	2.65	44.5

Haiwang Vibrating Screen

With various series such as ZKJ, ZKX, ZKK and ZKB, Haiwang vibrating screens can meet various working conditions such as mineral screening, mineral dewatering and slurry impurity removal etc.

ZKJ

Linear screen with double excitation motor

Model	Screen area (m²)	Installed power (kW)
ZKJ1224	3.6	2.4x2
ZKJ1530	5.5	3.0x2
ZKJ1837	7.3	5.8x2
ZKJ2136	9.0	7x2
ZKJ2445	11.2	11x2
ZKJ2448	13.4	11x2



ZKX

Linear screen with side-mounted symmetrical exciter

Model	Screen area (m²)	Installed power (kW)
ZKX1536	6.0	5.5x2
ZKX1837	7.3	7.5x2
ZKX1845	8.1	7.5x2
ZKX2136	9.0	7.5x2
ZKX2445	11.2	11x2
ZKX3061	18.6	22x2



ZKK

Single-layer horizontal linear screen with box-type exciter

Model	Screen area (m²)	Installed power (kW)
ZKK2136	7.81	22
ZKK2448	11.90	22
ZKK3061	18.60	30/45
ZKK3661	22.32	30/45
ZKK3673	26.79	37/45
ZKK4373	31.25	55/75

Note: 2ZKK Double-layer can be customized



ZKB

Single layer banana screen with box exciter

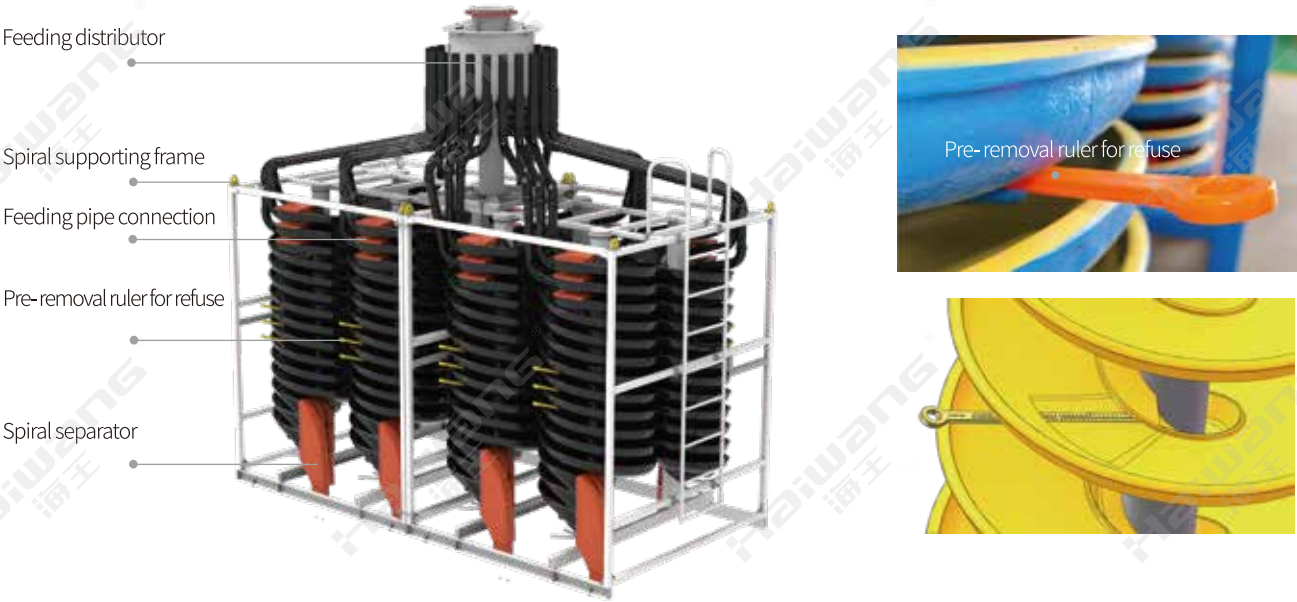
Model	Screen area (m²)	Installed power (kW)
ZKB2461	14.88	22
ZKB3061	18.60	30/45
ZKB3661	22.32	30/45
ZKB3673	26.79	30/45
ZKB4361	26.05	55
ZKB4373	31.25	55

Note: 2ZKB Double-layer can be customized



Spiral Separator

Various structures and materials can be chosen in line with ores with kinds of properties and separation densities. High-precision integrated Injection molding, multi-section composite parabola design, spiral drainage groove, “S type” anti-turbulent flow feeding well and concentrate back flushing and the other various kinds of new techniques are in option, which can be applied for iron ore, titanic iron ore, tungsten, tin, gold, garnet, zircon, barite and coal slime separation.

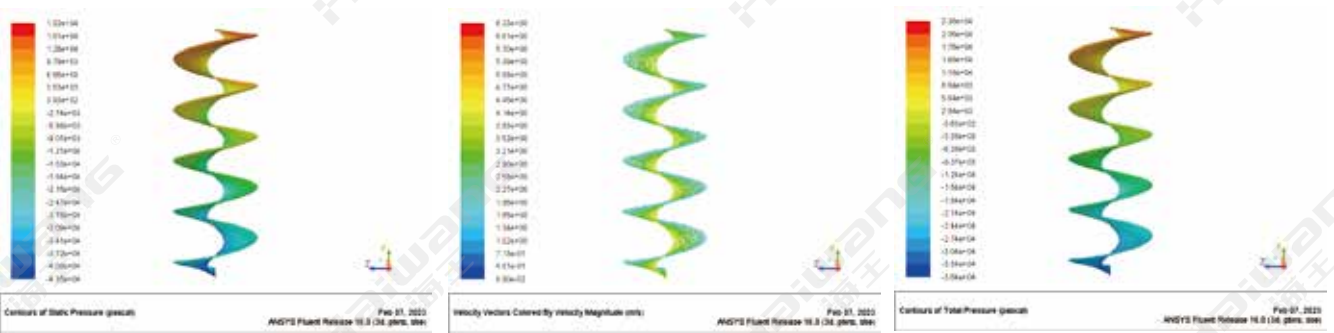


Specifications

Specifications	LXB1500	LXB1200	LXB1000	LXB700	LXA1000
Spiral diameter (mm)	1500	1200	1000	700	1000
Pitch to diameter ratio (pitch/diameter)	0.45、0.6、0.75	0.45、0.6、0.75	0.45、0.6、0.75	0.45、0.6、0.75	0.6
Separation particle size (mm)	2-0.03	2-0.03	2-0.03	0.5-0.02	0.15~2
Feeding concentration (%)	25-55	25-55	25-55	25-55	20~40
Qty. of installed start (t/h)	2-4	1-3	0.8-2	0.6-1	2~3
Number of installed heads	1-4	1-4	1-3	1-3	1~3
Material	Nylon + Fiberglass	Nylon + Fiberglass	Nylon + Fiberglass	Nylon + Fiberglass	FRP, polyurea

Product design

Relying on a large database, adopting advanced research and development measures, and software simulation of the flow field, realize the digitalization and informatization of the research and development and design of spiral chute products to continuously improve the products for the industry leading.



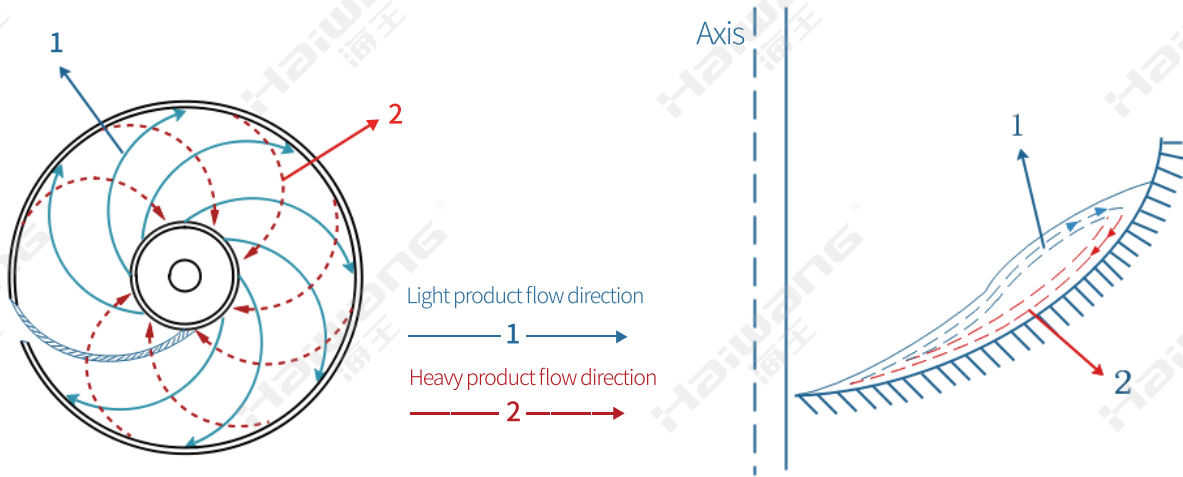
Simulation diagram of static pressure flow field in spiral chute

Simulation diagram of velocity flow field in spiral chute

Simulation diagram of total pressure flow field in spiral chute

Separation principle

The ore particles in the slurry are loosely layered under the action of gravity, friction, inertial centrifugal force and water flow pressure. The dense ore particles enter into the bottom layer and move to the inner edge, and the ore particles with less dense enter into the upper layer and move to the outer edge. On the surface of the spiral groove, a concentrate zone, a middle zone and a tailing zone are formed, and finally the concentrate and tailings are separated by a cutter. The rationality of structural parameters such as the cross-sectional shape and pitch of the spiral chute determines the result of the separation parameter.



(a) Schematic diagram of material sorting on the spiral surface

(b) Axial schematic diagram of the sorting process

Fluidized Bed Separator



FBS fluidized bed separator is a new type separation equipment with self-generated medium, large capacity and low operation cost joint developed by Weihai Haiwang Hydrocyclone Co., Ltd. and the Institute of Process Engineering of the Chinese Academy of Sciences, which is developed by combining fluidization technology and turbulent flow field gravity interference sedimentation separation technology firstly, so as to realize the high-efficiency separating or purification of coarse coal slime, ore sand, pyrite and the other fine-grained materials. It has reached the domestic leading technical level by identification of Scientific and technological achievements of Shandong Province and has been listed in the Shandong Province's major energy-saving technology industrialization project and the National Torch Program project have authorized 2 national utility model patents and won 1 Shandong Provincial Science and Technology Progress Award.

Specifications

Specifications	FBS1800	FBS2100	FBS2400	FBS3000	FBS3600	FBS3900
Tank diameter(mm)	1800	2100	2400	3000	3600	3900
Capacity (t/h)	20~40	30~50	40~60	60~100	100~140	140~180
Uprising water volume (m3/h)	20~30	30~50	45~70	70~100	120~150	140~180
Uprising water pressure (KPa)	70~100	70~100	70~100	70~100	70~100	70~100

Technical Advantages

01

Authorized 3 national patents

- ZL200920305033.1
(A pulse turbulent field fluidized mineral separator)
- ZL201220421393.x
(A new type of underflow discharge valve for coal slime separator)
- ZL201520556769.1
(A feeding well of coal slime separator)



03

High precision density sensor

The protection level of the sensor is IP68, and the safety factor is high; the bed density can be accurate to 0.001g/cm3, realizing high-precision density control.



02

Intelligent pneumatic actuator



The intelligent pneumatic actuator is selected for automatic setting, optimal PID control, valve position signal feedback, HART communication and other powerful functions. Small air consumption, anti-vibration, anti-water, anti-oil, anti-corrosion, suitable for low voltage (8.5v), protection class IP66, high safety factor, low probability of failure, easy maintenance.

04

SIEMENS PLC programmable controller



The command operation speed reaches 0.22us, making signal collection, analysis and execution more convenient and faster to ensure high-precision separating of the system.

FS Series High-efficient Fine Sand Recovery Workstation

FS series high-efficient fine sand recovery workstation is mainly used in the process of fine sand recovery from waste water of aggregate production line, pre-dewatering of slurry disposal, and sand recovery from mine tailing, etc. It can recover sand over 75μm in the feeding material, with the comprehensive recovery rate over 98%. The processing capacity of each single set ranges from 100 m3/h to 700 m3/h with different specifications for selection, and fine sand over 45μm can be recovered according to the requirements of users.

Model No.	Capacity (m³/h)	Amount of fine sand recovered (t/h)	Particle size recovered (μm)	Reference power (Kw)
FS150	100-150	10-20	> 75	28
FS250	200-250	20-30		43
FS300	250-300	25-40		56
FS400	300-400	30-50		66
FS500	400-500	40-50		97
FS600	500-600	50-60		112
FS700	600-700	60-70		132



XFS Series Integrated Machine for Sand Washing and Fine Sand Recovery

Haiwang XFS series integrated machine for sand washing and fine sand recovery integrates the three processes of sand washing, fine sand recovery and product dewatering, which mainly includes 6 parts: sand washing wheel bucket, sand washing tank, cyclone (cluster), cyclone feeding pump, screen undersize pump sump and linear vibrating dewatering screen. It is characterized by compact structure, small footprint, high sand washing efficiency, simultaneous discharge of coarse and fine sand, and uniform material mixing, etc.

Model No.	Capacity (t/h)	Washing water flow rate (m³/h)	Particle size recovered (mm)	Reference power (Kw)
XFS100	50-100	100-150	> 0.074	49.9
XFS150	100-150	150-250		65.5
XFS200	150-200	200-300		74.5
XFS250	200-250	250-400		123
XFS300	250-300	300-450		142
XFS400	350-400	400-600		180.5
XFS500	400-500	500-750		237



HELICON WEARING RESISTANT RUBBER

Replaceable Liner Design

Adopting high-quality rubber raw materials and nano additives, and being processed by low-temperature mixed emulsion technology and integrated vulcanization molding, the liner can better resist the impact and cutting of sharp ore particles.

With Shore hardness of 36, tensile strength of 27.5MPa, tensile elongation of 810%, tear strength of 43N/mm, resilience of 82%, and DIN abrasion of 0.016cm³



	Shore hardness	Tensile strength (MPa)	Tearing elongation (%)	Tear strength (N/mm)	Resilience (%)	S.G.	DIN abrasion (wet type) (cm³)
Helicon Wearing Resistant Rubber	36	27.5	810	43	82	0.97	0.016
Traditional rubber	60	23	570	90	65	1.15	0.072

Wearing Resistant Materials

HW-AC High Alumina Ceramic

Adopting imported raw materials from Germany, with wet grinding and spray drying granulation process. Density $\geq 3.65\text{g/cm}^3$, porosity $\leq 0.1\%$, Rockwell hardness $\geq 80\text{HRA}$, Mohs hardness of 9, compressive strength $\geq 2000\text{MPa}$, flexural strength $\geq 290\text{MPa}$, abrasion resistance $\leq 0.009\text{g}$, abrasion $\leq 0.04\%$, and fracture toughness $\geq 4.8\text{MPa}\cdot\text{m}^{1/2}$.



Alumina content (%)	Mohs hardness	Rockwell hardness (HRA)	Density (g/cm ³)	Abrasion (%)	Flexural strength (MPa)
≥ 95	9	≥ 80	≥ 3.65	≤ 0.04	≥ 290
Porosity (%)	Compressive strength (MPa)	Fracture toughness (MPa·m ^{1/2})	Thermal conductivity (W/m·K)	Coefficient of thermal expansion	
≤ 0.1	≥ 850	≥ 4.8	20	$7.2 \times 10^{-6} \text{m/m}\cdot\text{K} [1]$	

HW-PU Wearing Resistant Polyurethane

Acid and alkali resistance: with PH 5~13, high temperature hydrolysis resistance $\leq 100^\circ\text{C}$, Shore hardness of 10~98, abrasion of 0.014cm^3 , tear strength of 30~130KN/m, permanent deformation $\leq 10\%$, rebound rate of 25~65%, tensile strength of 20~50MPa, and elongation of 400~1500%. Processed by one-piece molding, suitable for fine-particle slurry, liquid material and other mineral classification and separation.



Acid and alkali resistance	High temperature hydrolysis resistance (°C)	Permanent deformation (%)	Elongation (%)	Resilience (%)	Shore hardness	Tensile hardness (MPa)	Tear strength (KN/m)
pH 1~13	≤ 100	≤ 10	400~1500	25~65	10~98	20~50	30~130

KM Composite Wearing Resistant Material

Operating temperature range: $-25\sim 150^\circ\text{C}$.
With excellent alkali, salt and oil resistance.
Acid resistance: hydrochloric acid of any concentration, nitric acid and other strong oxidizing acid of concentration $< 5\%$.



HW-NM Silicon Carbide Material

Adopting high-temperature vacuum self-propagation crystallization molding integrated sintering technology With Mohs hardness of 9, porosity $< 0.1\%$, flexural strength of 250MPa, elasticity modulus of 330GPa, working temperature $\leq 1380^\circ\text{C}$, hydrochloric acid of any concentration, sulfuric acid of concentration $< 75\%$, nitric acid and other strong oxygen acid of concentration of $< 5\%$.



Wearing Resistant Pipelines

Materials: rubber, polyurethane, ceramic, silicon carbide, UHMWPE, alloy.

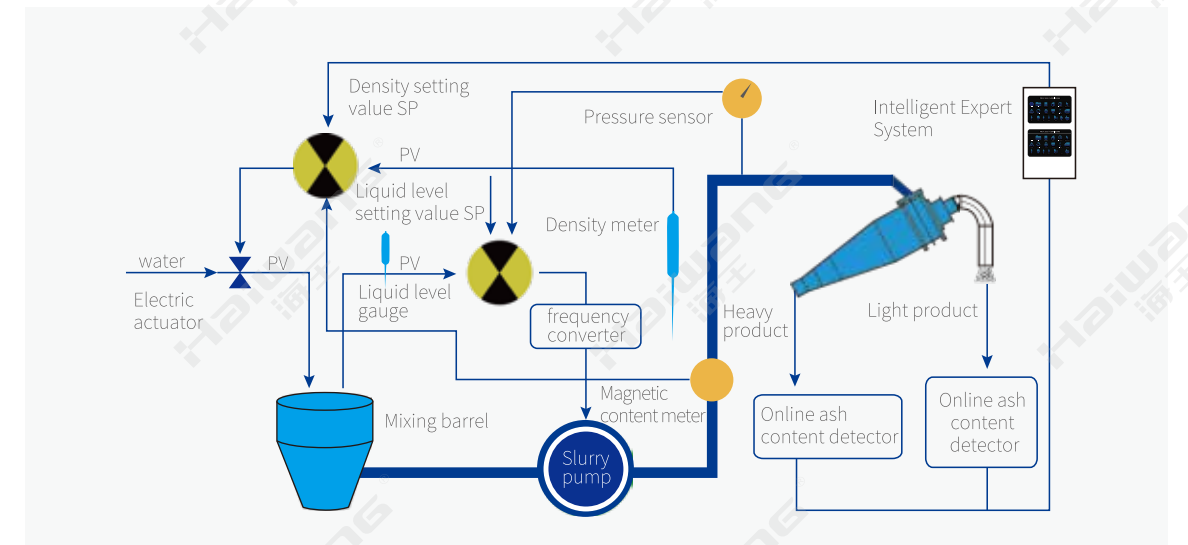
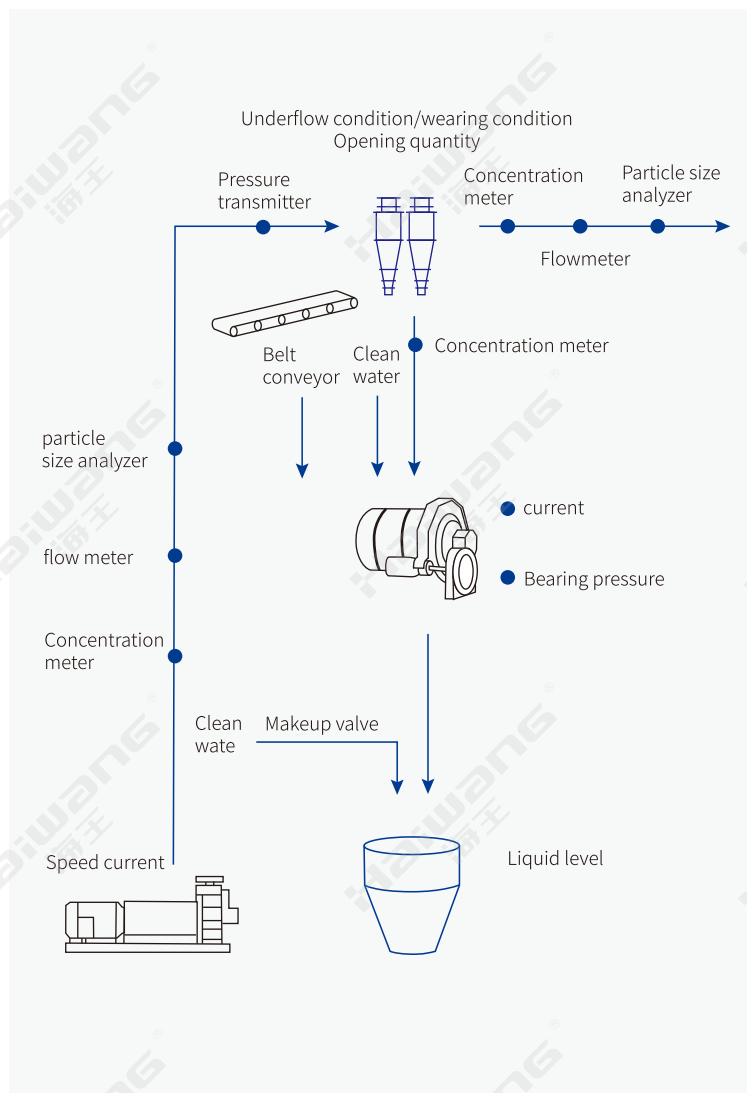
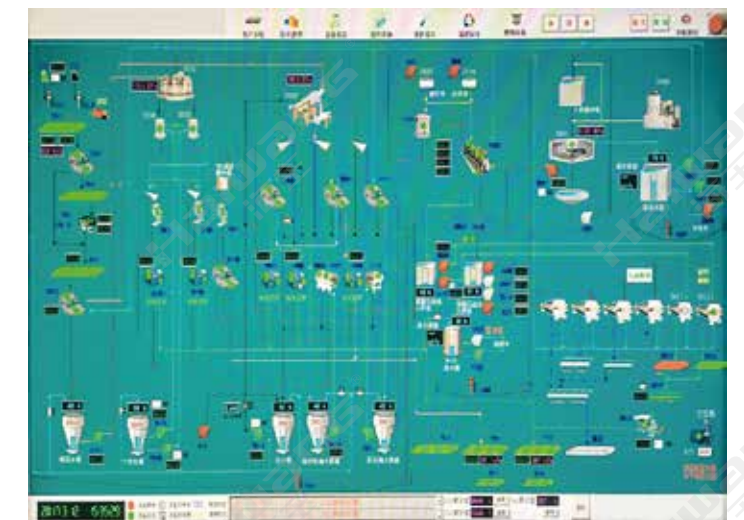




HW-IPDMCS

Intelligent Control Expert System

Intelligent control expert system can realize the intelligent inspection, intelligent analysis and intelligent control of grinding and classification system and dense medium separation system on the basis of power industrial application expert data base of Haiwang Company so as to provide forceful intelligence support for high-efficient and stable working of system.



Global after-sales service system

The Haiwang brand represents quality and reputation

10

Established agency offices in 10 countries

2

2 international branch companies

150

A professional technical team of 150 people

24

24-hour service response

35

1989-2023



Process application

- Grinding classification
- Ultrafine classification
- Dense medium separation
- Tailings dry discharge
- Sand washing and tailings stacking filling

Ferrous metal
primary grinding
classification
process



Ferrous metal
secondary & third
grinding
classification
process



Non-ferrous
metal grinding
and
classification
process



Coarse concentrate regrinding process
Ultrafine particle classification and desliming process



Tailings dry discharge/Sand washing



Tailings stacking/filling

Common dam stacking process:
Upstream method with underflow $-74\mu\text{m} \leq 75\%$,
Midstream and downstream method with underflow
 $-74\mu\text{m} \leq 25\%$, $-20\mu\text{m} \leq 10\%$

Common filling processes:
Tailings grading filling, full tailings filling, paste filling



Dense medium separation process

— Pre-concentration and separation of coal mines, fluorite mines, barite mines, spodumene, and kimberlite;
Pre-concentration of lead zinc ore, copper ore, tungsten ore, phosphate ore, and hematite



