

**Haiwang**<sup>®</sup>  
海王



**Better Separation**



**WEIHAI HAIWANG HYDROCYCLONE CO.,LTD.**

**WEIHAI HAIWANG HYDROCYCLONE CO.,LTD.**

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## THE COMPANY INTRODUCTION

Established in 1989, Weihai Haiwang Hydrocyclone Co., Ltd. is the largest and leading supplier of cyclone separation equipment and technical service in the Asia-Pacific region, and also one of the world-renowned cyclone manufacturers. Haiwang's leading products such as cyclone, classifying screen and separator etc. are widely used in mining, coal mining, electric power and environmental protection industry etc. Haiwang products take the leading market share in the field of separation industry and have been exported to more than 50 countries & regions including Australia and Russia etc. We have 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 and India etc., thus to provide local service for clients all over the world conveniently.

Haiwang is the "National Torch Plan Key High-Tech Enterprise", "New High-tech Enterprise of Shandong Province", "Single-Item Champion Enterprise in the Manufacturing Field of Shandong Province", "International Self-Owned Brand Enterprise of Shandong Province" and has established "Shandong Engineering Technology Research Center" and "Shandong Academician Workstation" etc. seven innovation platforms. We have the professional R&D team of more than 100 persons, to provide the professional services in design, consultation and technical support for clients. Besides, Haiwang also has more than 60 patents of independent intellectual property rights, including 8 patents for invention, 1 patent of "National Technology Invention Award", 5 patents of "National Key New Products", with the honor of drawing up 3 industrial standards as the technical forerunner and leader in the industry.

Haiwang has its own manufacturing bases, which cover an area of more than 150,000 square meters, the industry-leading manufacturing capacity and the standard production line equipped with the robot, laser cutting machine, automatic painting line etc. advanced machining equipment, competent of meeting the European, the American and the other international fabrication standards. The annual capacity is over 20,000 sets of different sizes of cyclones, more than 5,000 sets of vibrating screens and separators etc. In addition, Haiwang has the spare part warehouse with an area of more than 20,000 square meters, which can guarantee the timely and fast supply of various spare parts to clients. Haiwang has passed the EU CE certification, Quality Management System ISO9001, Environmental Management Systems ISO14001, Occupational Health & Safety Management System OHSAS18001 and GOST Russian authentication, which is a national safety production standardized enterprise.

## PRODUCTS & SERVICES

Excellence, Reliability, Value

- Hydrocyclones
- Heavy Medium Cyclones
- Multi-layer Vibrating Screens
- Fluidizing Bed Separators
- Spiral Separators
- Auto-control System of Cyclones
- Tailings Stacking Process & Equipments
- Separation Process & Engineering ; EPC service
- Coarse Coal Slime Separation Process & Equipments

# HYDROCYCLONE SPECIFICATION

## SPECIFICATIONS AND PARAMETERS

Specification	Diameter (mm)	Inlet pressure (MPa)	Capacity (M <sup>3</sup> /h)	Cut size (μm)
FX840	840	0.04-0.15	500-900	74-350
FX710	710	0.04-0.15	400-550	74-250
FX660	660	0.04-0.15	260-500	74-220
FX610	610	0.04-0.15	200-300	74-200
FX500	500	0.04-0.2	140-300	74-200
FX400	400	0.06-0.2	100-220	74-150
FX350	350	0.06-0.2	70-160	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

## PATENTED PRODUCTS



### Volute Feeding Pre-classifying Hydrocyclone

Volute feeding chamber design  
 Overflow fineness increased over 5%  
 Fine particles in underflow decreased by 3-5%  
 Recovery increased by 1-3%  
 Classification efficiency increased over 10%  
 Lower feeding resistance and power consumption



### Multi-cone Hydrocyclone

Multi-cone design  
 Capacity increased by 20-30%  
 Power consumption decreased over 15%  
 Realize finer classification with bigger diameter Cyclone



### Spiral Feeding Hydrocyclone

Spiral feeding chamber design  
 Decrease inlet turbulence & resistance  
 Decrease abrasion and power consumption  
 Decrease coarse particles in overflow  
 Classification efficiency increased over 10%  
 Capacity increased over 10%



### Flat Bottom Hydrocyclone

For ferrous ore grinding system with classification fineness of -200 mesh≤65%  
 Less fine particle in underflow and increase efficiency over 10%  
 Lower mill circulation load and capacity increased over 15%  
 Power consumption saved over 12%



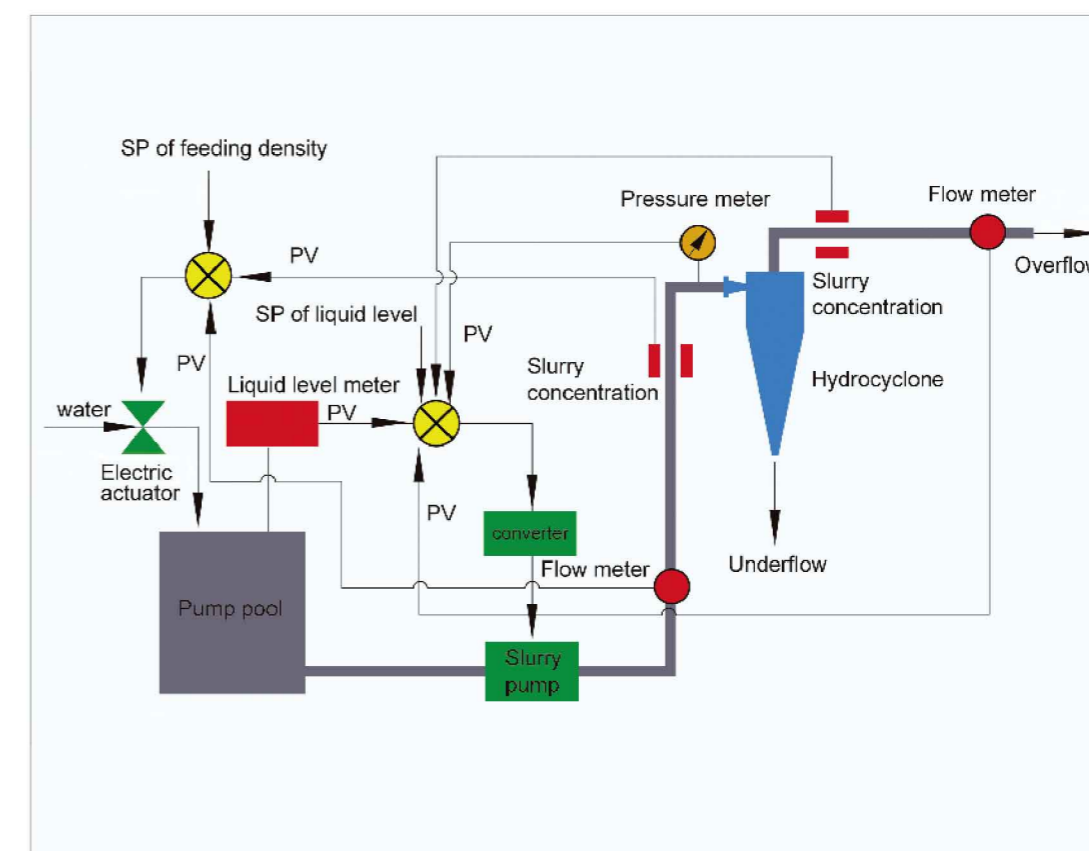
### Adjustable Apex

The adjustable apex can be applied to the grinding classification, tailing stacking and tailing dam processes, etc. It is convenient to control the performance of cyclone by online adjusting the dimension of apex electrically or manually and inspect the dimension of apex through the visual window. The adjustable apex is suitable for processing ore with unstable quality, thus can reduce the labor needed for changing apex frequently and improve the working efficiency.



## AUTO-CONTROL SYSTEM OF CYCLONES

Auto-control system for pump sump level, feeding density and pressure of cyclones, etc.



## TAILINGS STACKING PROCESS AND EQUIPMENTS

Hydrocyclone & dewatering screen used for coarse particle tailings stacking.  
 Thickener & filter press used for fine particle tailings stacking.  
 Most of tailings stacked by hydrocyclone & dewatering screen to decrease the load of filter press, save equipment investment and operation cost.  
 Circulating water reused.



# COMPLETE CLASSIFYING EQUIPMENTS SOLUTIONS

Multi-layer vibrating screen combined with cyclones used for iron,lead zinc,tin,tungsten etc.ferrous and non-ferrous ores classifications,will dramatically avoid over-grinding,increase recovery and mill capacity by 10%. Haiwang provides minerals classification EPC and cyclone-pump-screen complete equipments and service.

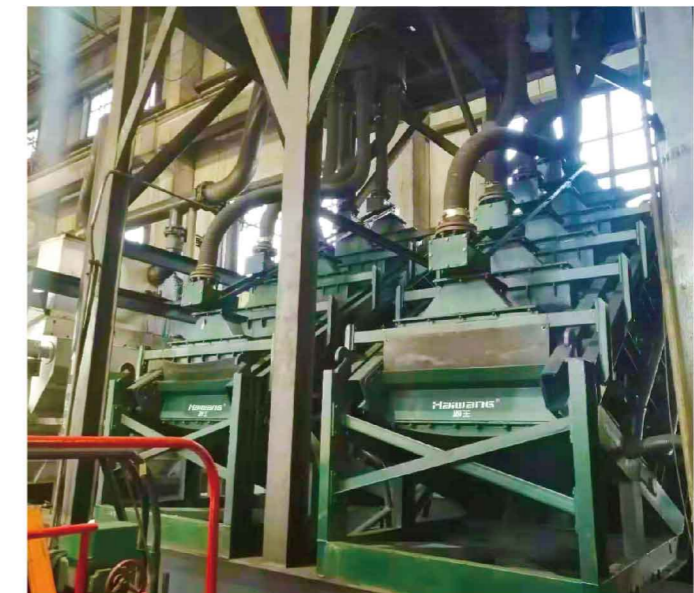


Spec.	3DZS-1007	5DZS-1007
Layer	3	5
Frequency (rpm)	1500	1500
Cut Size (mm)	0.074-1.0	0.074-1.0
Capacity (t/h)	30-90	50-150
Motor Power (kW)	2×1.8	2×1.8
Screen Area (m <sup>2</sup> )	4.2	7.4

## MULTI-LAYER VIBRATING SCREEN

Feed density: 25-50%  
 Feed paths: 3 or 5  
 Screen Material: Flexible polyurethane  
 Mesh Size (mm): 0.10-1.00

Large unit capacity of 8-9 t/m<sup>2</sup> · h with 0.10mm mesh size  
 Low power consumption of 0.075kWh/t with 0.10mm mesh size  
 Screening efficiency above 80%  
 Screen mesh life above 6 months



# HEAVY MEDIUM CYCLONES

## Two products HM cyclone with pressured feeding

Maximum size of 1600mm with capacity over 1000t/h  
 Maximum feeding size of 120mm  
 Ep≤0.05  
 Separation efficiency≥95%  
 High-alumina ceramic lining



## Three products HM cyclone with non-pressured feeding

Maximum size of 1500/1100 with capacity of 500-600t/h  
 Second stage with adjustable vortex finder  
 Maximum feeding size 100mm  
 Ep1≤0.03 , Ep2≤0.05  
 Separation efficiency 93-98%  
 High-alumina ceramic lining



Spec.	Diameter (mm)	Feeding Size (mm)	Pressure (MPa)	Capacity (t/h)	Volume Capacity (m³/h)
FZJ 600	600	≤30	0.06-0.12	40-80	250-350
FZJ 660	660	≤30	0.06-0.14	60-100	300-400
FZJ 710	710	≤40	0.08-0.14	80-140	400-600
FZJ 800	800	≤40	0.08-0.14	120-180	600-800
FZJ 850	850	≤50	0.08-0.14	160-240	700-900
FZJ 900	900	≤50	0.10-0.16	220-320	800-1100
FZJ 1000	1000	≤60	0.10-0.16	260-360	1000-1200
FZJ 1100	1100	≤60	0.10-0.16	320-420	1100-1300
FZJ 1150	1150	≤60	0.10-0.16	360-460	1200-1400
FZJ 1200	1200	≤80	0.12-0.18	400-500	1300-1600
FZJ 1300	1300	≤80	0.12-0.18	450-550	1500-1800
FZJ 1400	1400	≤90	0.12-0.18	500-600	1600-2000
FZJ 1450	1450	≤90	0.12-0.18	550-650	1900-2200
FZJ 1500	1500	≤100	0.12-0.18	650-750	2000-2400
FZJ 1600	1600	≤120	0.14-0.20	800-1000	2200-2600

Spec.	Diameter (mm) 1 <sup>st</sup> stage	Diameter (mm) 2 <sup>nd</sup> stage	Feeding Size (mm)	Pressure (MPa)	Capacity (t/h)	Medium Circulation (m³/h)
WTMC600/400	600	400	≤30	0.06-0.10	40-60	250-350
WTMC710/500	710	500	≤35	0.08-0.12	60-100	350-450
WTMC850/600	850	600	≤45	0.10-0.14	100-160	500-650
WTMC900/650	900	650	≤50	0.12-0.16	120-180	600-800
WTMC1000/710	1000	710	≤55	0.15-0.18	160-220	800-1000
WTMC1100/780	1100	780	≤60	0.18-0.22	200-280	900-1200
WTMC1200/850	1200	850	≤70	0.20-0.28	260-350	1200-1400
WTMC1300/920	1300	920	≤80	0.24-0.30	320-400	1400-1800
WTMC1400/1000	1400	1000	≤90	0.28-0.36	400-500	1800-2200
WTMC1500/1100	1500	1100	≤100	0.32-0.40	500-600	2200-2600

### Coal slime HM separator/Coal slime HM cyclone

Ep≤0.08  
 Separation efficiency >90%  
 Adjustable vortex finder  
 High-alumina ceramic lining



Coal slime HM separator



Coal slime HM cyclone

#### Key parameters of coal slime HM separator

Spec.	Diameter (mm)	Feeding Size (mm)	Pressure (MPa)	Capacity (t/h)	Volume Capacity (m <sup>3</sup> /h)
TSMC350	350	0-1.2	0.06-0.15	10-30	100-200
TSMC500	500	0-1.5	0.08-0.15	30-50	200-300
TSMC600	600	0-2.0	0.08-0.15	40-80	300-400
TSMC710	710	0-2.0	0.10-0.15	60-100	400-600

#### Key parameters of coal slime HM cyclone

Spec.	Diameter (mm)	Feeding Size (mm)	Pressure (MPa)	Capacity (t/h)	Volume Capacity (m <sup>3</sup> /h)
SMC150	150	0-0.5	0.12-0.18	4-10	20-35
SMC200	200	0-0.5	0.18-0.22	10-15	35-55
SMC250	250	0-1.0	0.22-0.24	15-20	55-80
SMC300	300	0-1.0	0.24-0.28	20-30	80-120
SMC350	350	0-1.0	0.26-0.30	30-40	120-160
SMC400	400	0-1.5	0.28-0.32	40-55	160-220

### Three products HM cyclone with pressured feeding

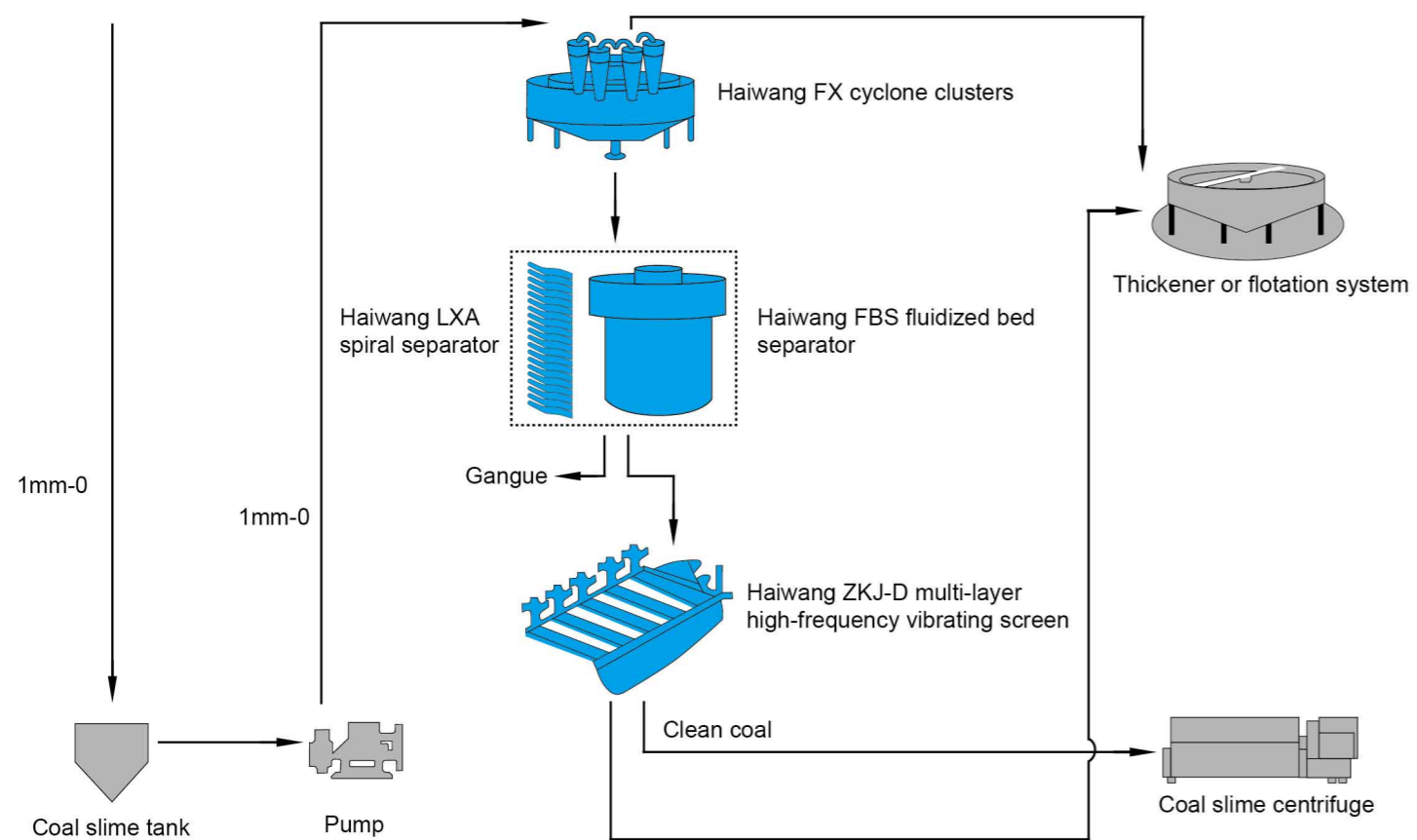
Maximum size of 1400/1000 with capacity 450-550t/h  
 Patented double cone design  
 Maximum feeding size 100mm  
 Ep 1≤0.03, Ep2≤0.05  
 Separation efficiency 93-98%  
 High-alumina ceramic lining



Spec.	Diameter (mm) 1 <sup>st</sup> stage	Diameter (mm) 2 <sup>nd</sup> stage	Feeding Size (mm)	Pressure (MPa)	Capacity (t/h)	Volume Capacity (m <sup>3</sup> /h)
YTMC710/500	710	500	≤35	0.09-0.14	70-120	400-550
YTMC850/600	850	600	≤45	0.13-0.16	120-180	650-750
YTMC900/650	900	650	≤50	0.15-0.18	140-200	750-950
YTMC1000/710	1000	710	≤55	0.18-0.22	180-240	900-1100
YTMC1100/780	1100	780	≤60	0.20-0.24	220-300	1100-1400
YTMC1200/850	1200	850	≤70	0.22-0.28	300-400	1400-1700
YTMC1300/920	1300	920	≤80	0.26-0.32	350-450	1600-1900
YTMC1400/1000	1400	1000	≤90	0.30-0.40	450-550	1900-2300



# COARSE COAL SLIME SEPARATION PROCESS & EQUIPMENTS



## Coal slime classifying cyclone

Maximum size of 1250mm with capacity 1300m<sup>3</sup>/h  
 Cut size 0.20-0.40mm  
 High-alumina ceramic lining



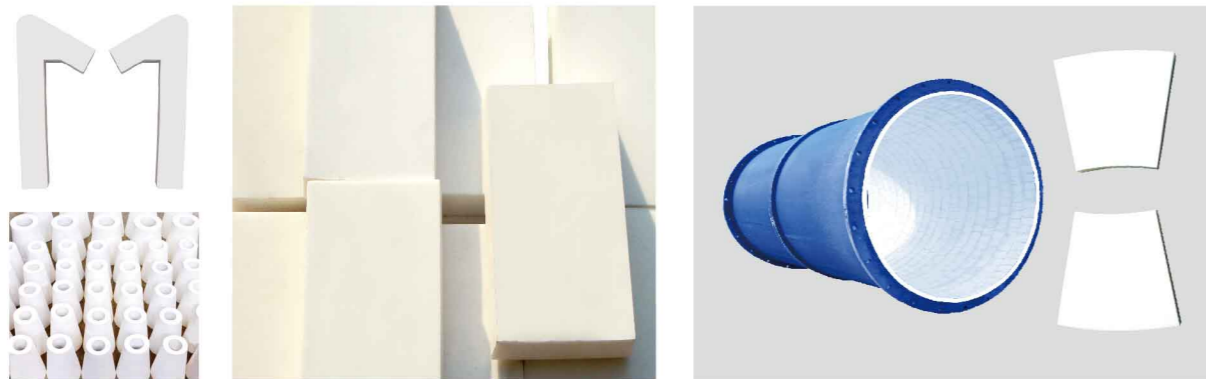
Spec.	Diameter (mm)	Pressure (MPa)	Capacity (m <sup>3</sup> /h)	Cut Size (mm)
FX150	150	0.10-0.15	20-35	0.04-0.10
FX250	250	0.10-0.15	60-85	0.04-0.12
FX350	350	0.10-0.15	70-120	0.06-0.16
FX380	380	0.10-0.15	130-180	0.06-0.16
FX450	450	0.10-0.15	150-220	0.10-0.20
FX500	500	0.10-0.15	180-270	0.10-0.20
FX610	610	0.10-0.15	280-380	0.10-0.20
FX660	660	0.10-0.15	340-460	0.15-0.25
FX710	710	0.10-0.15	40-560	0.15-0.25
FX850	850	0.10-0.15	560-850	0.20-0.30
FX1000	1000	0.10-0.15	800-1050	0.20-0.40
FX1250	1250	0.10-0.15	1000-1300	0.20-0.40



# ABRASION - RESISTANT MATERIALS

## HW-AC Hard Wearing Alumina Ceramic

Content of Alumina  $\leq 95\%$  ;  
High hardness, high temperature, corrosion, abrasion resistance



Moh's Hardness	Apparent Porosity (%)	Bending Strength (MPa)	Density(g.cm <sup>3</sup> )	Abration(%)	Al <sub>2</sub> O <sub>3</sub> (%)
9	$\leq 0.1$	$\geq 290$	$\geq 3.65$	$\leq 0.04$	$\geq 95$

## Low Temperature Pre-polymerization and High Temperature Extraction Stepwise Synthesized Hard Wearing Polyurethane

With nearly 30 years' researching experience and combining the features of mining, chemical engineering and other industries, Haiwang researches and develops the worldwide advanced process on stepwise synthesized polyurethane by cooperating with domestic and oversea researching institutes. The process is of low temperature pre-polymerization and high temperature extraction, which can realize the individualized design on product formula. The linear arrangement and reasonable hybrid crosslinking of the main chain in the polyurethane elastomer are adjustable and controllable; and the performance including strength, elongation, elasticity and abrasive resistance and other performance indexes can all meet the international advanced level. This type of polyurethane can be used to manufacture cyclone, screen panel, screen mesh, rubber covered roller, flexible couplings and buffer spring, etc., which are widely applied in mining, chemical engineering and environmental protection industries in domestic and overseas.



Acid And Alkali Resistance	High Temperature Resistance(°C)	Permanent Deformation (%)	Elongation (%)	Elasticity (%)	Shore Hardness	Tensile Strength (MPa)	Tear Strength (KN/m)
pH1-7 pH7-13	$\leq 100$	$\leq 10$	400-1500	25-65	10-98	20-50	30-130



## Nano-modified Material

With the international advanced IPN technology, the interpenetrating structure between polyurethane rigid group and rubber flexible macromolecular chain can break the limitation that no coexist between the traditional polyurethane and rubber material, thus to achieve a new type of elastomer with high strength, high elasticity and high flexibility. Active nano protective film can be formed after adding the modified nano functional packing to improve the scrub resistance of material surface and increase the lifespan. The strict forming technology and smooth liner with standard dimensions can reduce the friction energy consumption inside cyclone and improve the classifying efficiency.

Acid And Alkali Resistance	Shore Hardness	Tensile Strength (MPa)	Elongation (%)	Tear Strength (N/mm)	Elasticity (%)	S.G.	DIN Abrasion (Wet Type) (cm <sup>3</sup> )
Nano Modified Hard Wearing Rubber	65	30	720	55	78	1.2	0.014
Traditional Rubber	60	23	570	90	65	1.15	0.072
Traditional Polyurethane	85	40	470	110	55	1.17	0.075

## ABRASION - RESISTANT MATERIALS

### Helicon Wet Mixed Hard Wearing Rubber

With nearly 30 years' researching experience and combining the features of mining industry, Haiwang researches and develops the worldwide advanced wet mixed hard wearing rubber by cooperating with domestic and oversea researching institutes. The process mixes the nano additives and rubber micelle rapidly and uniformly, which can improve the dispersibility of additives maximally and guarantee the performance of rubber to meet international advanced level, including the integrity, uniformity of long rubber molecular chain, abrasion, elongation at break and elasticity, etc. The rubber has been widely used in large and extreme-large concentration plants in domestic and overseas.



	Shore Hardness	Tensile Strength (MPa)	Elongation (%)	Tear Strength (N/mm)	Elasticity (%)	S.G.	DIN Abrasion (Wet Type) (cm <sup>3</sup> )
Wet mixed hard wearing rubber	36	27.5	810	43	82	0.97	0.016
Traditional processed rubber	60	23	570	90	65	1.15	0.072



According to the working condition at sites, different hard wearing material or combination of different hard wearing material can be adopted to improve the using lifespan of equipment.

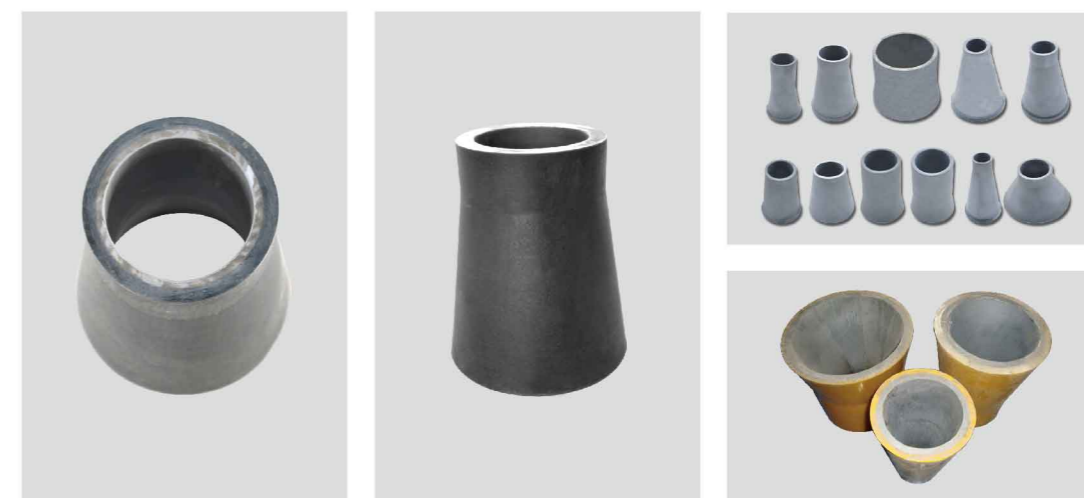
### KM Composite



Applicable temperature: -25~150 °C. Alkali, salt and oil resistant. Can be used under conditions of any concentration of hydrochloric acid, concentration of sulfuric acid less than 20% and nitric acid less than 5%.

### HW-NM Hard Wearing NM Composite

High temperature vacuum self propagating crystallization; High intensity & hardness, high temperature, abrasion and corrosion resistance.



Temperature (°C)	Porosity (%)	Bending Strength (MPa)	Modulus of elasticity (GPa)	Moh's Hardness	Acid and alkali resistance
≤1380	<0.1	250	330	9	Excellent

Australia Roy Hill Iron Ore Pty Ltd.  
Australia Citic Pacific Mining SINO Iron Project  
Australia Karara Mining Ltd  
Australia Rocklands Copper Mine  
Australia Jiujiang Mining( Australia) Ltd.  
Australia Precision Screen Pty Ltd.  
Australia Rizal Resources Corporation

Ecuador Mirador Copper Mine ( ECUACORRIENTE S.A.)  
SHOUGANG HIERRO PERÚ S.A.A.(10,000,000t/year)  
MINERA SHOUXIN PERÚ S.A.  
Minera Chinalco Perú - Proyecto Toromocho  
Bolivia Uyuni 350KTPA Potash Plant  
Bolivia Huanuni Tin Mine  
Brazil GERDAU ACOMINAS Iron Mine  
Bolivia Huanuni Tin Mine  
ANDIMETAL S.A.C.  
Colombian Coke Company  
Mexico laboratory project  
Honduras Iron Mine

Saudi Ma'aden Jalamid Phosphate Plant  
Iran Sangan Iron Mines  
Iran Golfa Iron Mine  
Iran Sanabad an Iron ore Co.  
Iran Jalal Abad Iron Mine  
Iran Kaolin Mining Project  
Iran Chimia Phosphate Mine  
Iran Paya Foolad Iron Mine  
Iran Gohar Zamin Iron Mine  
Iran Gohar Ravesh Sirjan Co.  
Iran Choghart Concentrate Plant  
Iran TangZagh Iron ore Concentrate Plant  
Iran Bandar Abbas 2.5MT Pelletizing Plant  
Iran Ismaloon Iron Ore Concentrate Plant  
Iran Kaveh Shargh 2.5MTPA Iron Concentrate Plant  
Iran Mobarakeh Sangan 5MTPA Concentrate Plant  
Iran Gole Gohar Iron Mine Line 5, 6, 7  
Iran Iron Ore Concentrate Plant in REZVAN Mine  
Zarand Iranian Steel Company (ZISCO Phase II) Project  
Sirjan Iranian Steel Company (SISCO Phase II) Project

Russia NLMK Group JSC Stoilensky GOK  
Russia Metalloinvest Lebedinsky GOK  
Russia UGC  
Russia Mangazeya Group  
Russia Petropavlovsk – Iron Ore LLC  
Russia SUEK JSC  
Russia UK Kuzbassrazrezugol OAO  
Russia PJSC KTK  
Russia JSC HC SDS  
Russia Mechel PAO  
Russia CC Kolmar LLC  
Russia PJSC MMC Norilsk Nickel  
Mongolia Erdenet Mining Corporation (EMC)  
Mongolia Oyu Tolgoi Ilc  
Mongolia Dragon Mining chajul changte Aobao iron ore  
Mongolia HSMG CO, LTM  
Mongolia China Railway Resources Group Xinxin Co., Ltd  
Mongolia Darkhan Metallurgical Plant (DMP)  
Mongolian Mining Corporation (MMC)  
Kyrgyzstan Kaz Minerals PLC (Bozymchak Gold Mine)  
Kyrgyzstan Dzhambayr Gold Mine  
Uzbekistan Dekhkanabad Potash Fertilizer Plant  
Tajikistan Dushanbe Power Plant  
Tajikistan Pakrut Gold Mine

Sudan Iron Project  
Algeria ore beneficiation project  
Sierra Leone Marampa Iron Mine  
Mali Sand Gold Project  
Albania Chrome Ore Project  
Eritrea Zara gold mine

Zambia Copper Project  
Zambia Ferrous manganese ore Project  
Zambia Chambishi Copper Mine Southeast Orebody Project  
Zambia Chambishi Copper Mine  
Zambia Luanshya Muliyaishi Copper Mine

Congo Shituru Copper Mine Cobalt hydroxide Production Line Project  
Congo LA COMPAGNIE MINIERE DE KAMBOVE SAS  
Congo SICOMINES Copper Mining phase 2  
Congo SICOMINES Copper Mining phase 1  
Congo Copper Cobalt Wet Type Metallurgy project  
Congo Copper Cobalt Mining Project  
Congo LA COMPAGNIE MINIERE DE KAMBOVE SAS Phase II  
Congo MK Iron Project  
Congo Dizwa copper-cobalt project  
Congo Panda Tailings Recycle Project  
Congo Lualaba Copper Mine  
Congo DR Mabende Copper Mine  
Congo DR Copper Mine - Huachin Metal Leach S.P.R.L  
Congo DR MYUNGA—KALUMBWE Copper Mine  
Congo MIKAS company Kambove Tailing Recovery Plant  
Congo CDM Copper Mining Project  
Republic of Congo SOREMI SA Co.,Ltd  
Tunisia CPG Phosphate Concentration Plant

South Africa Wurumi Iron Mine  
South Africa Greenside Colliery of Anglo Thermal Coal

Burma wa Gold ore dressing plant project  
Philippines Pasar copper mine

India Usha Martin Ltd  
India 70 Micron Pvt.Ltd  
India RASHMI Group  
India M/s Eurobond Industries Pvt Ltd  
India Euro Pratik Ispat Pvt.Ltd  
India MSP Group

Thailand CHINCHANA INDUSTRIES (THAILAND) CO., LTD.  
Thailand Fluorite Project

Malaysia PSSB Iron Mine 1  
Malaysia KAOLIN (MALAYSIA) Project  
Malaysia AK Hematite Project  
Malaysia Xinher Hematite Project

Indonesia China-Indonesia wet process project  
Indonesia Dairi Prima Mineral  
Indonesia OBI Nickel & Cobalt Project  
Indonesia VARA Sand Washing Plant  
Indonesia PT.ANUGERAH  
Indonesia Dongtai Potash Project 1

Laos Kaolin Clay Project  
Vietnam Sin Quyen Copper Mine  
Pakistan Duddar Zinc-lead Mine  
North Korea Iron Project

## REFERENCE PROJECTS-OVERSEAS



## CUSTOMER SERVICES

### Localized Service

Worldwide offices and agents provide localized sales and technical service.

### Professional Technical Service

Professional technical team provide optimum solutions and early stage laboratory tests.

### Perfect After Sales Service

Assembly,commissioning,training services by professional engineer.

### Prompt Delivery

Good production capacity and spare parts stock realize fast delivery.



Cooperation, Win-win

## PEFERENCE PROJECTS-DOMESTIC FERROUS & NON-FERROUS METALS MINE

- Anshan Iron and Steel Group Corporation
- Baotou Iron & Steel (Group) Co., Ltd.
- Shougang Mining Coporation
- Jiangxi Copper Corporation
- Aluminum Corporation of China
- China National Gold Group Corporation
- Zijin Mining Group Co., Ltd.
- China Nonferrous Metal Mining (Group) Co., Ltd.
- Shenhua Group Corporation Limited
- Qinghai Salt Lake Industry Co., Ltd.

