



水 · 生命 · 爱

BE WATER
FOR FUTURE

LOREN INDUSTRY CO., LIMITED

LOREN INDUSTRY CO., LIMITED

Wuxi , Qingdao Dongguan CHINA • 2019

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中国空分工程有限公司
China National Air Separation Engineering Co., Ltd.



中国兵器工业集团 中兵节能环保集团有限公司
CHINA NORTH ENERGY CONSERVATION AND ENVIRONMENT PROTECTION CO.,LTD.

Belongs to Qingdao New Pacific Energy Conservation and Environmental Protection Group, Loren Industry Co., Limited focuses its core business on energy conservation and environmental protection projects, energy conservation and environmental protection equipment, energy conservation and environmental protection technology services, and development and utilization of new energy. The company also a large-scale group company, engaged in many industries and fields such as real estate, engineering machinery, new materials, municipal engineering, fire engineering, and garment processing and foreign trade. The registered capital of the company is 120 million yuan, its engineering projects throughout the world. Since its establishment in 2000, the company has been adhering to the philosophy of “relying on technology and taking service as a carrier to achieve win-win cooperation with customers”, emphasizing R&D and utilization of environmental cutting-edge technologies in the world, and has established good partnerships successively with some academic research institutions such as the National Urban Pollution Control Center, the School of Environmental Engineering of Tsinghua University, Seoul National University in South Korea, etc.

History

TIME LINE

The company was involved in the environmental protection industry, and established Qingdao Clyde Environmental Protection Co., Ltd., the first batch of environmental protection companies in China, researching and developing domestic environmental protection business.

1996

The founder of the group moved from the military industry to the real estate industry, whose projects cover Qingdao, Inner Mongolia, Harbin, Heilongjiang, Guiyang and other places.

2000

2008

The company had partnered with China Ordnance Industry Group to establish Beijing North Energy Conservation and Environmental Protection Co., Ltd. of Shandong Branch.

Qingdao New Pacific Energy Conservation and Environmental Protection Group was established to integrate environmental protection industry resources, expand international environmental protection business, and expand the scale of the group.

At the same time , Loren Industries Co., Limited was established for overseas business trial test

2013

2014

Signed strategic cooperation agreement with The BEWG and CNASEC, Jointly completed more than 1000 domestic and foreign large and small municipal water projects.

2016

The Group entered the Sino-German Ecological Park and joined forces with German environmental protection companies to jointly develop new environmental technologies.

2019

The Group focuses on environmentally friendly cutting-edge technology, accumulating industry competitiveness, and striving to become a benchmark for environmental protection industry.

BUSINESS SCOPE

(业务范围)

- Zero Release
- Municipal Wastewater
- Black and Odorous Water
- Industrial Effluents
- Chemical Wastewater
- Pharmaceutical Waste Water
- Sea Water Desalination
- Hypersaline
- Organic Waste Water
- Printing and Dying Waste Water
- Starch Waste Water
- Aquaculture Waste Water
- Petrochemical Waste Water
- Reverse Osmosis Concentrated Water Reuse
- Coke plant wastewater



ORGANIZATIONAL STRUCTURE

The group has 296 employees, including 1 international registered environmental engineer, 2 registered structural engineers, 1 certified public accountant, 6 professor-level senior engineers and 60 staffs with senior professional title, forming an organic combination of junior, middle and senior technical strengths. The human resources pattern dominated by advanced technical forces has laid a solid talent base and technical strength for the group. The company has several entities covering environmental protection design institutes, environmental protection engineering companies, environmental protection equipment manufacturing plants, sewage operation companies, monitoring stations, and laboratories. It also sets the supplementary service departments, including the general office, the after-sales service department, the financial management department and other departments, to realize the quick start of the project, promote steadily, and complete the project construction and the later operation management with excellent quality and quantity and with low cost.



Group advantages

- Advanced environmental protection technology and strong scientific research ability
- Complete system, efficient management
- National defense industry background
- Twenty years of experience in environmental protection field



STRATEGIC PARTNERS

市政水务

Urban Water Services



水环境综合治理

 Water Environment
Comprehensive Treatment


村镇水务

Rural Water Services



工业水务

Industrial Water Services



海水淡化

Seawater Desalination



海外业务

Overseas Business



科技服务

Scientific and Technical Services



金融服务

Financial Services



环卫及固废

 Environmental Sanitation and
Solid Waste Treatment


清洁能源

Clean Energy



Beijing Enterprises Water Group Limited (BEWG) is a comprehensive and leading professional water services and environmental protection services provider covering industrial investment, design, construction, operation, technical service and capital operation in full industrial chain. Its scope of business covers many fields such as water services in cities and towns, water services in river basins, industrial water services, rural water services, seawater desalination services, environmental sanitation, solid waste treatment, scientific and technical services, financial services and clean energy.

It is a company listed on the Main Board of The Stock Exchange of Hong Kong Limited (one of Red Chips, Stock Code: HK 00371), and has been selected in Hong Kong's Hang Seng Index of Chinese Stocks, in Hang Seng Main China 100 Index, in Hang Seng Composite Medium Index, and in Morgan Stanley Capital International Index. Meanwhile, it is one of the first batch of experimental companies of Shanghai-Hong Kong Stock Connect. BEWG has consecutively ranked No.1 for seven years among "Top 10 Influential Enterprises of Chinese Water Industry".

At the Global Water Summit in 2014, BEWG was named one of the Top Four Global Water Service Companies. In 2016, its Changi NEWater Plant II in Singapore won the ward of the "Water Deal of the Year", and the company was selected into the list of the Fortune China 500 companies. BEWG has also earned honors including "Listed Companies with Most Valuable Brand" and "Top Listed Companies with Social Responsibility".



中国空分工程有限公司

China National Air Separation Engineering Co., Ltd.

China National Air Separation Engineering Co., Ltd. (CNASEC) is located in the international metropolis – Hangzhou, which is one of the eight ancient capital cities in China and enjoying a high reputation of the paradise on earth. China National Air Separation Plant Corporation as its former was affiliated to Ministry of Machinery. It was established in 1981 under approval of National Machinery Industry Council. In 2006, it was restructured into limited liability company under condition of state holding combining with diversified investment entities.

After painstaking efforts and development for more than three decades, CNASEC has successfully reshaped into an engineering company who taking technology as its core competitiveness and engaged in engineering design, consultation as well as general contracting.

CNASEC owns the licenses & certificates covering engineering design license for petrochemical & pharmaceuticals industry (Chemical engineering, petroleum & chemical products storage), engineering design license for water and air pollution prevention and control, pressure vessel design license, pressure pipe design license, general contracting license on mechatronics engineering. Moreover, CNASEC owns business rights for contracting on overseas mechatronics engineering & international bidding engineering in domestic as well as import & export business. CNASEC has ISO 9001, ISO14001 and OHSAS 18001 certified in terms of quality, environmental, and occupational health & safety management. Company has gained more than 40 items for invention patents, utility model patents as well as software copyrights, and be awarded of High-tech enterprise by authorities of Zhejiang Province.

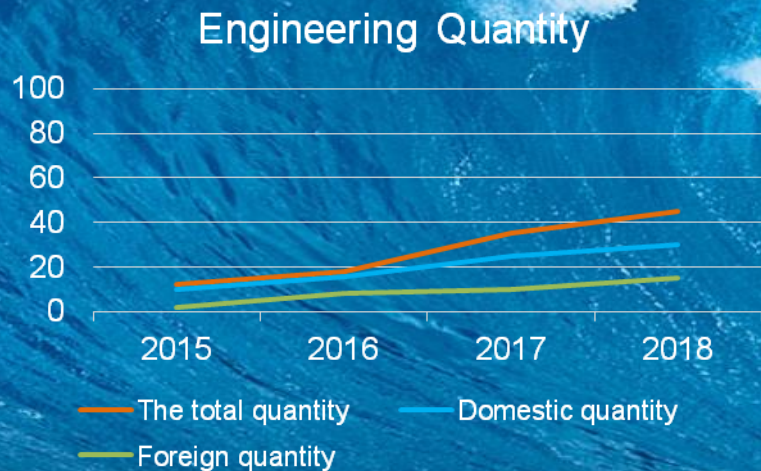




GROUP PERFORMANCE

Group Performance

Focus on environmental protection for 20 years !



Group Performance

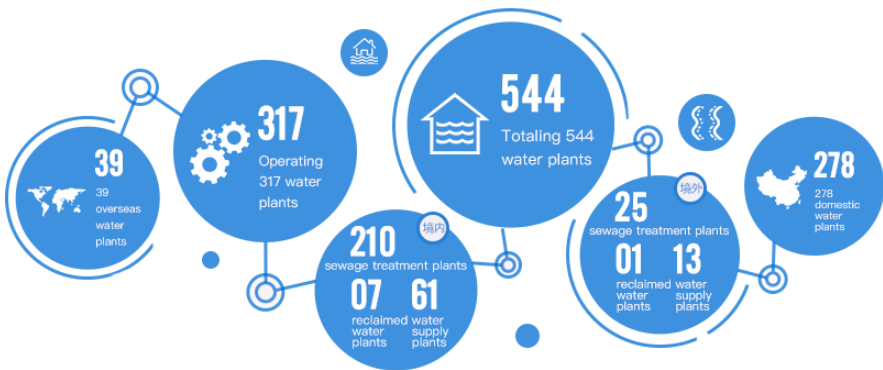


Focus on environmental protection for 20 years !

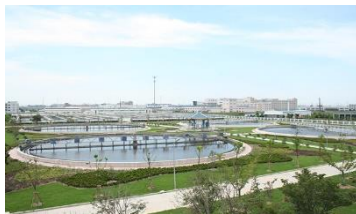
NO.	Company Name	Project	Water Volume
1	山西**药业集团	Chinese medicine extraction wastewater treatment project	≥1500m³/d
2	通化**药业有限公司	Chinese medicine extraction wastewater treatment project	≥1000m³/d
3	**集团药业	Fermentation pharmaceutical wastewater treatment project	≥24000m³/d
4	吉林**药业有限公司	Chinese medicine extraction wastewater treatment project	≥1000m³/d
5	宁夏**药业有限公司	Fermentation pharmaceutical wastewater treatment project	≥3900m³/d
6	宁夏**生物科技有限公司	Fermentation pharmaceutical wastewater treatment project	≥8500m³/d
7	宁夏**投资集团	Potato starch wastewater	≥3000m³/d
8	烟台***果汁股份有限公司	Juice gum sewage	≥1000m³/d
.....			
201	印尼***集团	Corn starch wastewater treatment project	≥7000m³/d
202	**市政污水处理厂	The overall design of municipal sewage treatment	≥100000m³/d
203	**区污水处理厂	The overall design of municipal sewage treatment	≥50000m³/d

NO.	Company Name	Project	Water Volume
			Pretreatment+ RO+The secondary RO+The mineralization
1	马来西亚***旅游公司	Desalination	50m³/D (twin-stage) 7 sets; 200m³/D (twin-stage) 6 sets Pretreatment+ RO
2	马来西亚***公司	Desalination	30m³/D 80m³/D1 50m³/D 50 sets
:	:	:	:
			Sand filters+ Ultra filtration+RO
100	新加坡***有限公司	Desalination	(energy recovery fix) 3×900m³/D

Municipal Water Performance



BEWG actively extends the urban water service market and provides the integrated solutions to the investment, construction and operation management for the water source, water transmission, water supply, sewage, reclaimed water and pipeline operation projects by means of PPP mode, BOT mode, TOT mode, entrusted operation, equity acquisition and joint venture cooperation. the domestic water treatment planning scale of BEWG was approximately 30 million tons/day; the total number of water treatment plants exceeded 500, covering 27 provinces, cities and municipalities in China.



Municipal Water Performance



中国空分工程有限公司
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- Indonesia sewage treatment plant 40000 t/d
- Zhejiang Province Shaoxing sewage treatment plant (phase I) 300000 t/d
- Zhejiang Province Zhoushan Dinghai sewage treatment plant 40000 t/d
- Lanxi municipal sewage treatment plant 40000 t/d
- Chengdu no.2 sewage treatment plant, sichuan province 300000 t/d
- The second sewage treatment plant of Anji, Zhejiang province 20000 t/d
- Fujian Province Changtai county sewage treatment plant 20000 t/d
- Shanxi Province Fushan county sewage treatment plant 10000 t/d
- Hebei Province Wuji county urban sewage treatment plant reconstruction and expansion project 60000 t/d
- Shenzhe county chengnan sewage treatment plant 10000 t/d
- Fujian Province Longyan second sewage treatment plant 20000 t/d
- Qingdao Jiaonan sewage treatment plant, phase 1, 2 and 3 150000 t/d
- Jilin gongzhuling industrial zone sewage treatment plant phase I 15000 t/d



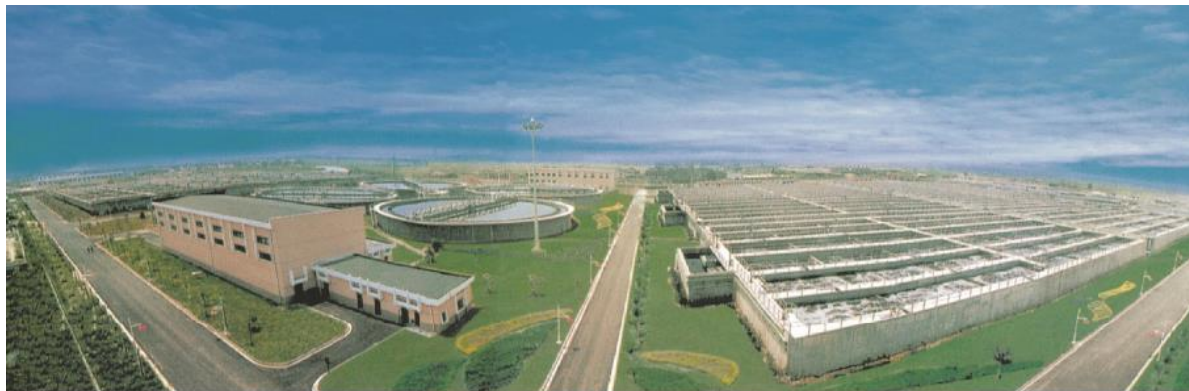
Municipal Water Performance



中国空分工程有限公司
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- Zhejiang Province Shaoxing sewage treatment plant (phase I) 300000 t/d



▲ 绍兴污水处理厂一期300,000吨每天处理工程主要工艺设备供货及安装总承包
Major process equipments supplying and installation project of 300,000T/D Waste Water treatment engineering for Shaoxing Sewage Treatment factory (Phase I)

- Zhejiang Province Zhoushan Dinghai sewage treatment plant 40000 t/d

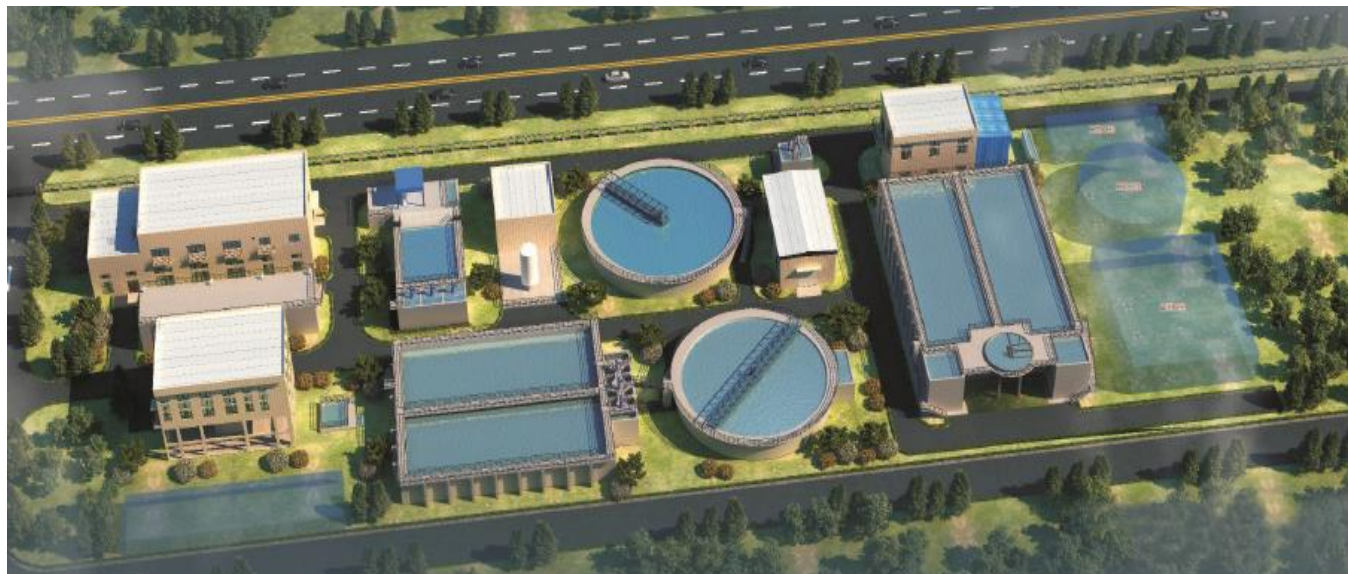


▲ 舟山定海40,000吨每天污水处理厂（一、二期）工艺设备
Process Equipment Supplying and Installation Project of
Treatment Plant (Phase I, II) of Zhoushan Dinghai WWT

Medical/Paper/Chemical Wastewater Treatment Project



中国空分工程有限公司
China National Air Separation Engineering Co., Ltd.



▲ 浙江华丰纸业科技有限公司年产65,000吨卷烟产品配套用纸生产线项目污水处理及中水回用工程
Waste Water Treatment and Water Recovery Project for Zhejiang
Huafeng Paper Science & Technology Co., Ltd

Medical/Paper/Chemical Wastewater Treatment Project



中国空分工程有限公司
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Changxing County Jiapu Sewage Treatment co. LTD 20000t/d Printing and Dyeing Wastewater Treatment Project



▲ 长兴县永清污水处理有限公司20,000吨每天印染污水集中处理工程
20,000T/D Dyeing Waste Water Treatment Project of Changxingjiapu
Waste Water Treatment Co., Ltd

Gynecology and Obstetrics Hospital of Zhejiang University Medical College 850 t/d Hospital Sewage Treatment Works



▼ 浙江大学医学院妇产科医院850吨每天医院污水处理工程
850T/D Hospital Waste Water Treatment Project

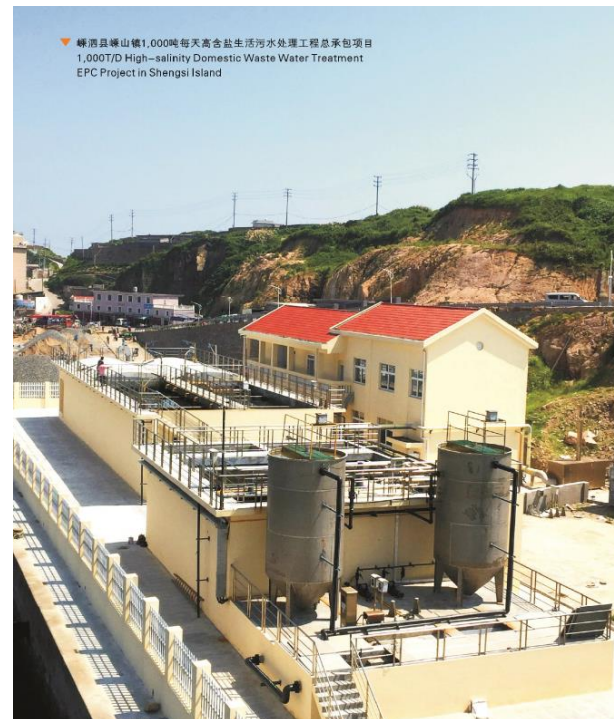
Other Wastewater Treatment Project



中国空分工程有限公司
China National Air Separation Engineering Co., Ltd.



▲ 浙江豪美钒业有限公司3,000吨每天石煤提钒废水处理及900吨每天回用工程
3,000T/D Extracting Vanadium from Stone Coal Waste Water Treatment and 900T/D Water Recovery Project for Zhejiang Haomei Vanadium Industry Co., LTD



▼ 嵊泗县嵊山镇1,000吨每天高含盐生活污水处理工程总承包项目
1,000T/D High-salinity Domestic Waste Water Treatment
EPC Project in Shengsi Island

Other Wastewater Treatment Project



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Yongkang City Municipal Landfill 480t/d Landfill Leachate Treatment Project



永康市垃圾填埋场480吨每天渗滤液处理工程（一期）
480T/D Landfill Leachate Treatment Project in Yongkang City

150t/d Landfill Leachate Treatment Project in Huangdian town, Lanxi City



兰溪市黄店镇150吨每天垃圾渗滤液处理工程
150T/D Landfill Leachate Treatment Project in Lanxi City

Flue Gas Desulfurization and Denitration Project



中国空分工程有限公司
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VOC Emission Control and Ozone Denitration



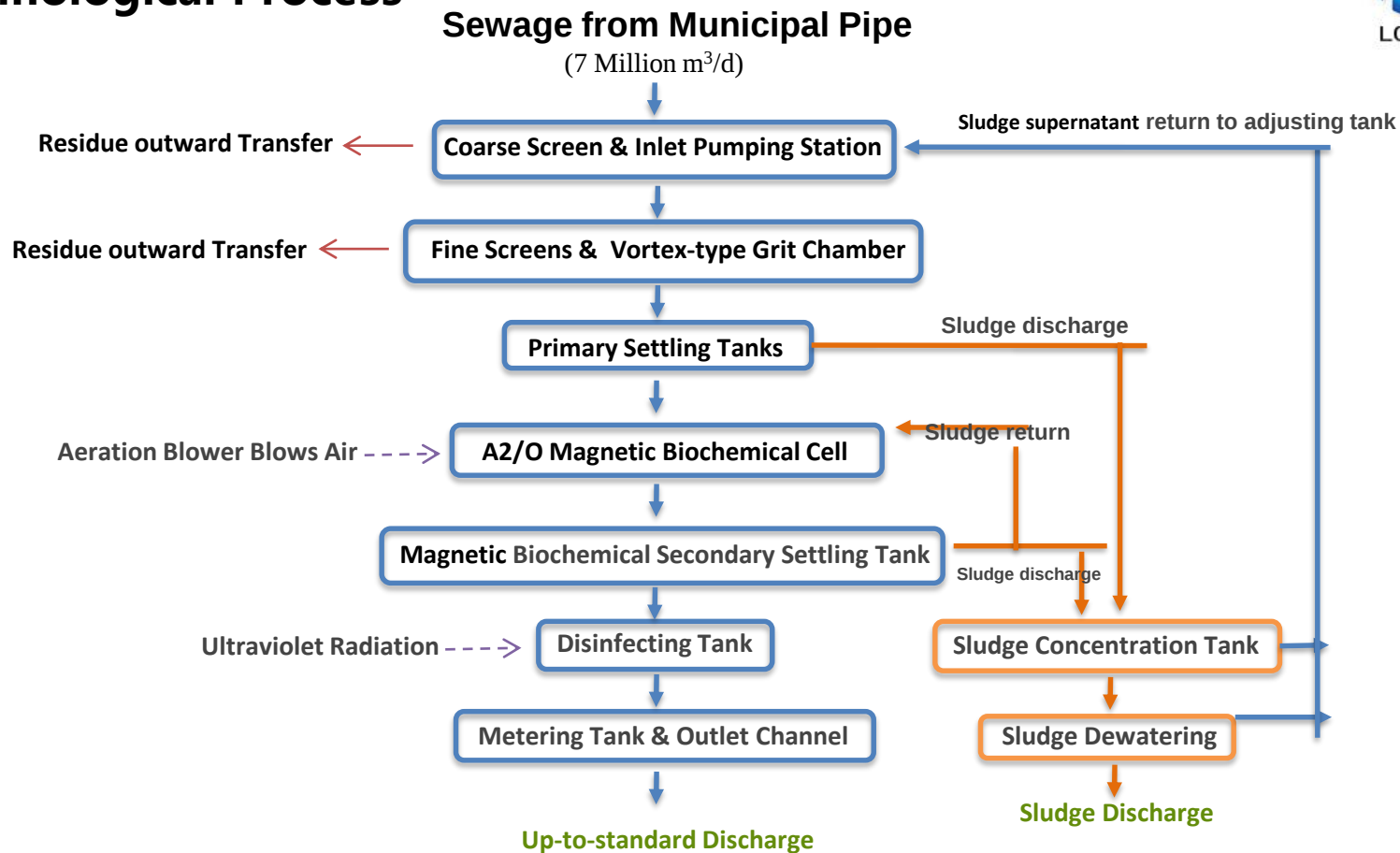
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DESIGN SCHEME

According to the company's years of engineering design and construction and operation experience, the design of A2/O combination process has the characteristics of less land occupation, high degree of automation, low maintenance and operation costs, less use of chemicals, good effect of nitrogen and phosphorus removal, stable effluent standards, etc., fully meet the requirements of Aleppo sewage treatment plant. Meanwhile, biological waste gas treatment system and sludge deep treatment and utilization system are designed to ensure the zero pollution of the plant.

Technological Process



Advanced sewage treatment technology and supporting equipment :

1. LA Series Efficient Maintenance-free Aerator

1) Extremely high oxygen efficiency , provides excellent mixing performance , the jet-flow creates a tremendous shear force to move the surrounding fluid , takes relatively less energy to mix and maintain the mixture

2) The aeration capacity per unit of energy consumption increases with the depth

3) For the project which need to improve oxygen demand and residence time , just increase the height of the original pool can realize the oxygenation efficiency increase

4) The upper and lower pipes are connected by flanges, can choose different aerator for aeration, realize more accurate aeration, also to achieve LA aerator rapid installation.

5) All equipment in the pool are static equipment, no power unit , the circulating pump is placed outside the pool , convenient for repair and maintenance

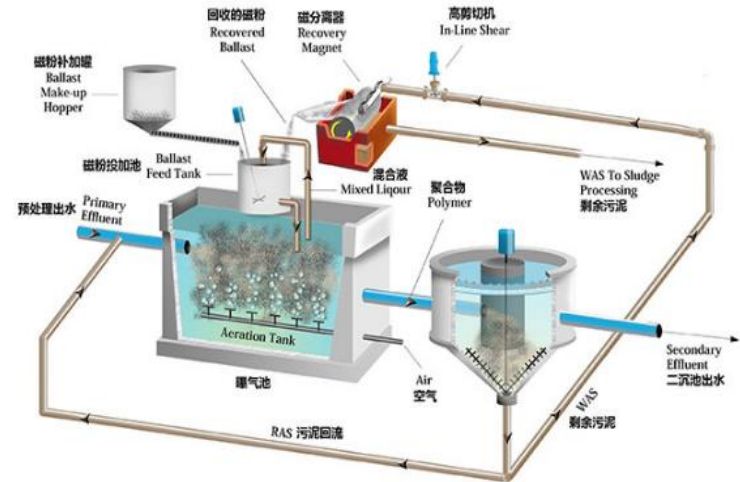
6) In the A2\O process, LA aerator has high oxygen - filling capacity, excellent mixing function, can be applied to various forms of A2\O process pool.

Technical Superiority



2. Application of magnetic biochemical precipitation technology in biochemical process, Instead of a traditional secondary sedimentation tank

- 1) Increase the mixed liquor suspended solids (MLSS) of the aerobic tank mixture, up to above 10g/L
- 2) Increase the settling rate of activated sludge, up to above 10m/h
- 3) The surface loading of the sedimentation tank can be achieved to $4\text{m}^3/\text{m}^2\text{h}$, the traditional aerobic process surface loading is just $0.55\text{-}0.8\text{ m}^3/\text{m}^2\text{h}$
- 4) The occupied area is 1/3 or even lower than that of conventional biochemical precipitation treatment process
- 5) Effectively control activated sludge expansion
- 6) High shock resistance
- 7) Save the cost of future expansion



Magnetic Biochemical Precipitation



At present, this technology has been widely used in the new sewage treatment plant and sewage plant expansion project in China, and it can successfully replace the secondary sedimentation tank to obtain better sewage treatment effect, with small land area and low investment and operation cost.



The background of the slide features a scenic view of a city skyline with several tall, modern buildings. In the foreground, there is a calm body of water reflecting the city and the sky. The sky is a vibrant blue with scattered white clouds. On the right side, there are green trees and foliage. A semi-transparent rectangular box is centered over the image, containing the text 'CORE TECHNOLOGY'.

CORE TECHNOLOGY

PHYSICAL PRETREATMENT TECHNOLOGY



One

DAF/Micro Nano
Bubble Generator



Two

Sedimentation
Tank



Three

Rotary Screen



Four

Conveyor &
Compactor5



Five

Sludge
Dehydrator



Six

Mechanical
Filter



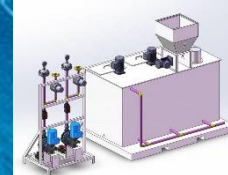
Seven

SBR
Decanter



Eight

Sludge
Scraper
Thickener



Nine

Chemical Dosing
System



Ten

Agitator and MBBR
Media

Dissolved Air Flotation Machine



LCD Series Circular High Efficiency Dissolved Air Flotation Machine

Loren LCD Shallow Depth Tank DAF Machine Advantage and Feature

- 1.Large Capacity with single unit Over 1100 M3 per Hour
- 2.Fully Use Shallow Tank Theory and Zero-Speed Convection Principle
- 3.Over 90% Suspend Solid& Algae Removal Ratio
- 4.Over 35% Concentrated Sludge Removal Ratio
- 5.Shorter HRT(Hydraulic Retention Time):5-10 minutes
- 6.Effective Tank Water Level: 600-750mm (Paper Mill More Shorter)
- 7.Very Short Mounting Room (Flexible Above facility or multiple layer mounting)
- 8.With High Surface Load
- 9.Low-cost for Mounting and maintenance, easy to clean

Applicant:

Our LCD series STP, EPT, WWTP, , Waterworks Pretreatment DAF Clarifier Is Widely Applied In Such Fields As

Algae, Varec and Other Pollutant From Waterworks , Nature Lake and River

Municipal Sewage Treatment Plant

Waterworks Upgrading Construction Project

Industrial Influent Treatment Plant like

Recycling useful material in sludge water like fiber recovery on paper, pulp industry.

Dissolved Air Flotation Machine



Applicant: India PEPL
200MLD Dyeing and Printing
Waste Water Treatment Plant

4 Sets 1050T/H Shallow
Depth DAF Clarifier with
Matching 5000LPH Auto
Polymer Dosing system and
16 M3 PAC reaction Tank

Dissolved Air Flotation Machine



LRD Series Rectangular High Efficiency Dissolved Air Flotation Machine

1. Large Capacity (Over 250TPH can be used RCC tank Structure)
2. Can Bear High Impact Load with Different Stream Influent or Sewage
3. Over 95% Suspend Solid& Algae Removal Ratio
4. Over 35% Concentrated Sludge Removal Ratio
5. Longer HRT(Hydraulic Retention Time):15-25 minutes
6. Can Used in High TSS, High TDS, and other High Concentration Waste Water Treatment
7. Dimension can be Customized Design
8. Easy Mounting , No need Operator Onsite Service Under our Manual and Instruction Guide
9. With High Surface Load
10. Material can be Coated or FRP Lined CS, SS304/316, Duplex SS2205/2507 as per water data
11. Can be OEM with ASME standard or Explosion-Proof Working Condition

Applicant:

Our LIRD series STP, EPT, WWTP, SWRO Plant, Waterworks Pretreatment DAF Clarifier Is Widely Applied In Such Fields As oil refines, petrochemical and chemical plants, natural gas processing plants, paper mills, general water treatment and similar industrial facilities Such as electroplating, food, slaughtering, brewing, tanning, printing, and dyeing, paper making.

Dissolved Air Flotation Machine



100MLD Abbas Iran Sea Water Desalination Plant DAF Pretreatment Site

Inclined Tube /Plate Clarifier or Settlers



LIPC High Efficiency Inclined Plate Settler Technical Parameter Data

Model Parameter	LIPC5	LIPC10	LIPC20	LIPC30	LIPC40	LIPC50	LIPC60	LIPC80	LIPC100
Capacity (m ³ /h)	5	10	20	30	40	50	60	80	100
Power KW	None		0.55						
Scraper Speed (m/min)	None		2.26	2.1	2.3	2.5	2.55	2.64	2.82
Plate No. (pcs)	10	15	38	46	50	56	58	60	64
Plate size (mm)	1060*1200	1350*1465	750*1600	900*1600	1050*1600	1110*1600	1150*1800	1200*2000	1300*2000
Rated Settler area (m ²)	6.36	14.83	22.8	33.12	42	49.7	60.03	72	83.2
Equipment Length (L) mm	2400	3000	3750	4050	4340	4525	4725	4975	5175
Equipment Width (W) mm	1340	1740	2220	2520	2820	3090	3190	3290	3490
Equipment Height (H) mm	3050	3200	4650	4650	4700	4900	5100	5330	5330
Inlet tube height over ground H (mm)	1300	1250	3350	3350	3350	3600	3650	3825	3825
Outlet tube height over ground H (mm)	2550	2680	3400	3450	3450	2450	3650	3825	3825
Inlet tube diameter (mm)	DN80	DN100	DN125		DN150	DN150	DN150	DN200	DN200
outlet tube diameter (mm)	DN80	DN100	DN125		DN150	DN150	DN150	DN200	DN200

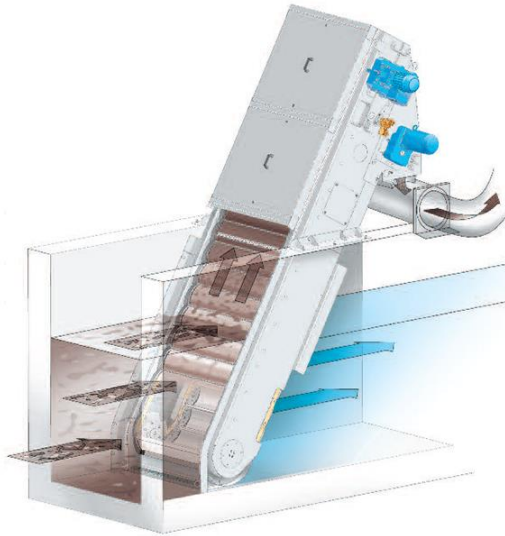
Inclined Tube /Plate Clarifier or Settlers



Grill or Screen Series



Rake Bar Screen for STP Pretreatment



Grill or Screen Series



Mesh Perforated Grille Or Screen



Reverse fishing Screen



Grill or Screen Series

Flat Plate Screen



Static Hydraulic Screen



Grill or Screen Series



Drum Screen /Filter



Drum Screen /Filter



Conveyor and Compactor



Shaft or Shaftless Conveyor



Shaft or Shaftless Compactor



Sludge Dewatering and Drying Machine



Multiple Screw Sludge Dehydrator



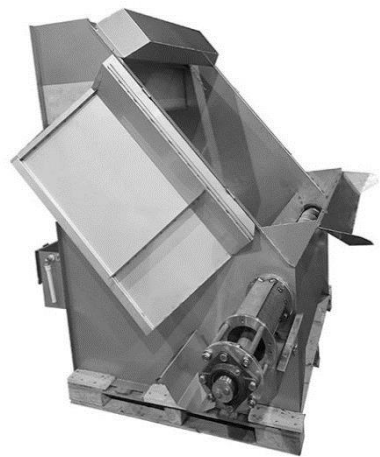
Belt Filter Press



Sludge Dewatering and Drying Machine



Manure Separator



HV Plate Frame Filter Press



Sludge Dewatering and Drying Machine



Hot Pump Waste Solid Sludge Reduction Dryer



Steam Drying Machine



Multiple Functional Filter



Rotary Fiber Disc Filter

1. Function

It is the Most Advantage Filter as Reuse for Cooling and Recycled Water as well as treatment for STP, ETP with Inlet SS <80/30 and Outlet SS below 20/10mg/l

1. Main Feature

- a. 24-hour Continuous Working With online auto backwashing simultaneously
- b. Filter Cloth can be 10 um to get better filtration efficiency
- c. Only need 1-2% of the Total Design Volume backwash water consumption
- d. Water Head Lost normally as 0.05-0.25m
- e. Lower Running Cost (about 14.8 usds per 10000 M3 Water)
- f. Fully Automatic Working with no Operator on site
- g. Small Mounting Room which is flexible for future upgrading.

Micro Fiber Rotary Filter

Rotary Fiber Disc Filter

1. Function

It is the Most Advantage Filter as Reuse for Cooling and Recycled Water as well as treatment for STP, ETP with Inlet SS <80/30 and Outlet SS below 20/10mg/l

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Multiple Functional Filter



FEF-Series Full Emerge Disc Filter



HEF-Series Half Emerge Disc Filter



Micro Fiber Rotary Filter

Model Selection

Model	Disc DN (mm)	Gross Filter Area (m ²)	Max Capacity (m ³ /D)	Total Power (KW)	Remark
LFEF/LHEF-2.0-2	2000	11.6	2000	2.25	Non-standard equipment, configuration and size will be adjusted according to actual requirements
LFEF/LHEF-2.0-4	2000	23.2	4000	2.25	
LFEF/LHEF-2.0-6	2000	34.8	6000	3.00	
LFEF/LHEF-2.0-8	2000	46.4	8000	4.50	
LFEF/LHEF-2.0-10	2000	58.0	10000	5.20	
LFEF/LHEF-2.0-12	2000	69.6	12000	5.20	
LFEF/LHEF-2.5-2	2500	17.8	3400	2.95	
LFEF/LHEF-2.5-4	2500	35.6	6800	2.95	
LFEF/LHEF-2.5-6	2500	53.4	10200	3.70	
LFEF/LHEF-2.5-8	2500	71.2	13600	6.60	
LFEF/LHEF-2.5-10	2500	89.0	17000	6.60	
LFEF/LHEF-3.0-4	3000	51.4	9800	3.70	
LFEF/LHEF-3.0-6	3000	77.0	14700	3.70	
LFEF/LHEF-3.0-8	3000	103.0	19600	6.60	
LFEF/LHEF-3.0-10	3000	128.6	24500	6.60	
LFEF/LHEF-3.0-12	3000	154	29400	6.60	

Marine or Land HFO/ LFO Oil Purifier , Bilge Oil Water Separator



Bilge Oily Water Separator



Veg/ lube oil and HFO Oil Separators



SBR Decanter (4-Rod Drive) Same as SFC Group Design

4-Rod SBR Decanter



Ordinary Electric Drive Style



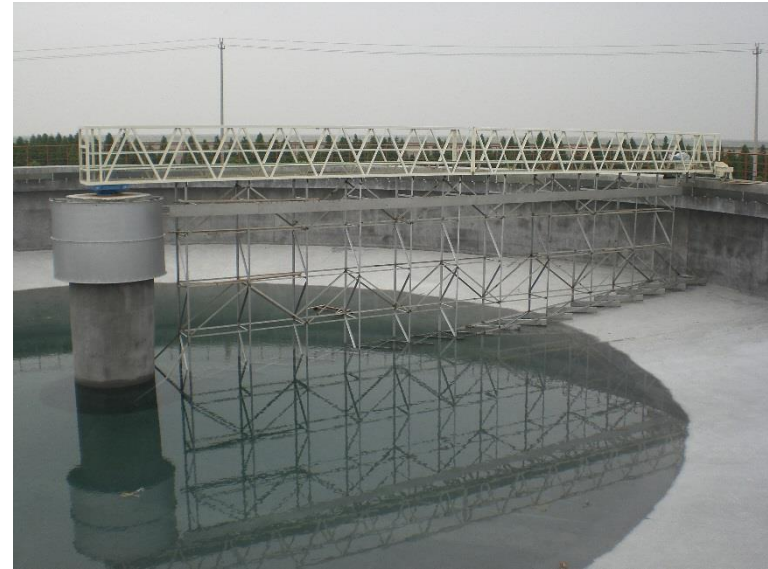
Sludge Scraper /Absorber



Full/half Bridge Center Drive Scraper



Full/half Bridge Peripheral Drive Scraper



Sludge Scraper /Absorber



Bridge Style Sludge Scraper



Fine Mine Slurry Deep Cone Thickener



Auto /Semi Auto Chemical Preparation and Dosing System



Agitator and Media or Packing



BIO-CHEMICAL TREATMENT CORE TECHNOLOGY



One

ERD-SMART



Two

LRO



Three

TenS



Four

E.C-SMART



Five

LIC



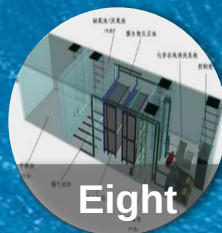
Six

LA-2



Seven

**EC/ Fenton
Electrolysis**



Eight

**FMF-Auto
Graphene Filter**



Nine

**HS-Bio
Biochemical
Reactor**



Ten

**LTE
Evaporator**

Intelligent reverse osmosis concentrated water reuse—ERD-SMART

Technology introduction

ERD-Smart is a set of energy saving and emission reduction device with basically no energy consumption. It uses the residual pressure of the original RO equipment to realize the energy saving recovery of water. The outlet water of ERD-Smart system can be recycled to the original water tank, ultrafiltration water tank or RO water tank according to the user's water acceptance level and water quality, so as to achieve the purpose of water saving and realize the real significance of energy saving and emission reduction.

The device does not need to add drugs, acid and other chemical agents, to avoid the secondary addition of soluble impurities water

ERD-SMART is equipped with pressure transmitter, flow meter, conductance meter and other measuring instruments, which can intuitively observe the operation status of the system.

ERD-SMART device is equipped with intelligent water quality disperser and water quality stabilizer to prevent fouling of membrane components.

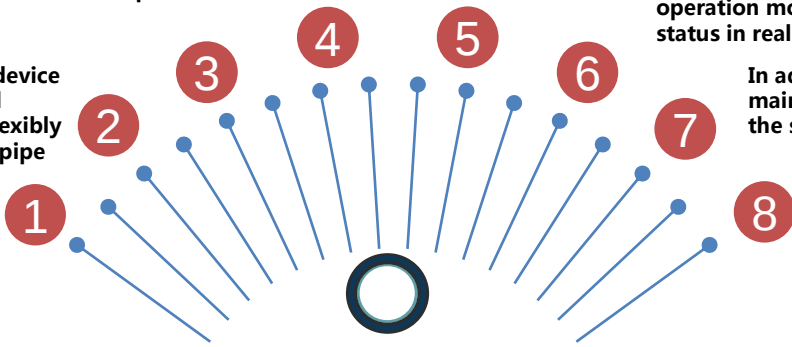
ERD-SMART device is equipped with proprietary intelligent automatic control software and various operation modes to monitor the system's operation status in real time, online and remotely.

ERD-SMART device is a bypass of the original RO device concentrated water, which can replace the original concentrated water regulating valve, and can be flexibly switched with the original RO concentrated water pipe

In addition to normal maintenance of equipment, the system is fully automatic;

ERD-SMART device uses the residual pressure of the original RO device as power, with almost no power consumption

ERD-SMART device can be arranged on the upper part of the original RO equipment to realize zero occupation;



Process Description

Key Technical Points



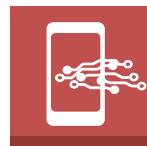
Special membrane element



Unique process design



Intelligent operation mode



With remote monitoring function



The water quality is high

ERD-SMART Specification table

Model	ERD-SMART-6	ERD- SMART-12	ERD- SMART-18	ERD- SMART-24	ERD- SMART-30	ERD- SMART-36
Technical parameters	ERD-SMART-6	ERD- SMART-12	ERD- SMART-18	ERD- SMART-24	ERD- SMART-30	ERD- SMART-36
Corresponding RO equipment (m ³ /h)	10~36	50~72	90~108	120~144	150~180	190~216
Water rate (m ³ /h)	5~6	8.5~12	15~18	20~24	25~30	32~36
Desalination rate%	98					
Recovery rate%	50~60%					
Control system	PLC+Touch screen+Remote monitoring					

Technology introduction

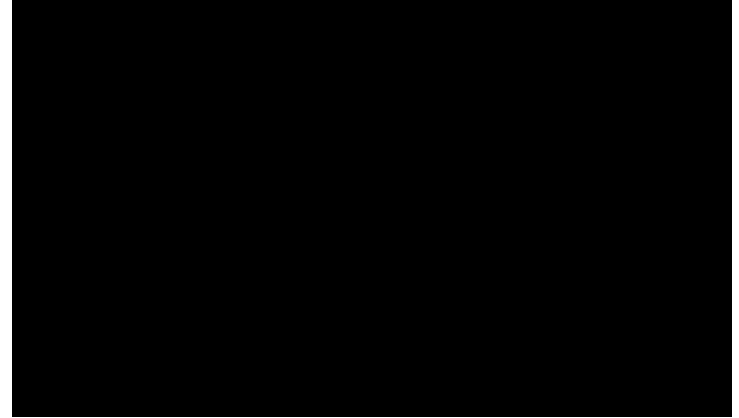
LRO water treatment technology, jointly developed by the group's research and development team and top foreign experts, is a single-stage closed-circuit water treatment technology beyond the traditional multi-stage RO reverse osmosis process.

Technical advantages

- Single stage water yield is over 85%
- Continuous uninterruptible discharge
- No offline cleaning
- Reduce dosage by 2/3 per unit
- Reduced the comprehensive operation cost by more than 50%

Desalination rate of 99% or higher

Water production rate of 85% or higher



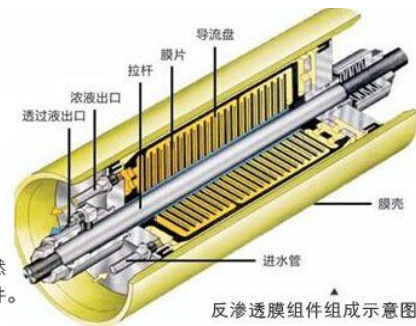
Technology introduction

This product is a unique membrane separation device. The component adopts open flow channel. The distance between adjacent flow plates of e. c-dt component is 4-6mm. This special arrangement of convex points enables the treatment liquid to form strong turbulence when flowing through the membrane surface, thus increasing the transmission rate and self-cleaning function, effectively reducing the membrane blockage and concentration polarization effect, and successfully extending the service life of the membrane. It is also easy to clean the scale on the diaphragm when cleaning, so as to ensure that the sphenoidal membrane assembly is suitable for the wastewater with high turbidity and high sand content coefficient and can adapt to the adverse water inlet conditions.

碟管式膜组件主要由：

- 1、RO膜片
- 2、导流盘
- 3、中心拉杆
- 4、外壳
- 5、联接螺栓
- 6、两端法兰

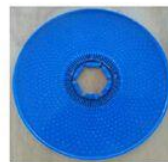
等部件组成。通过把过滤膜片和导流盘叠放在一起，用中心拉杆和端盖法兰进行固定，然后置入耐压外壳中，就形成一个碟管式膜组件。



反渗透膜组件组成示意图



DTRO膜片



DTRO导流盘



装有膜片的导流盘



密封圈

Key Performance Indicators

Indicators (mg/L)	COD	BOD	NH ₃ -H	SS
Raw Water	30000	10000	1500	1000
DTRO Produced water	<60	<30	<25	<5
Removal Rate	>99%	>99%	>98%	>99%

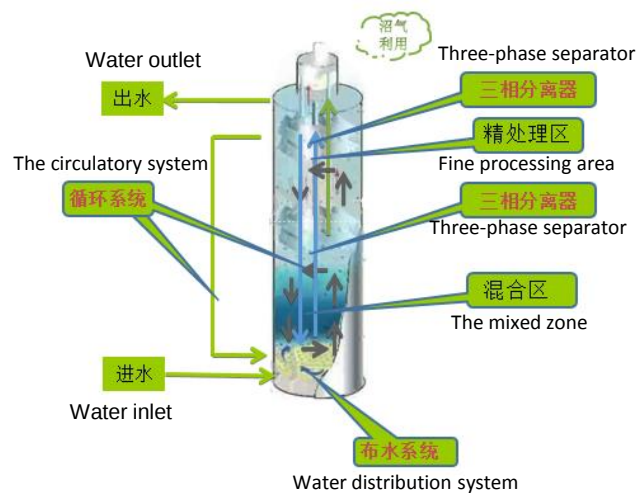
The Technology Principle

E.C-smart special membrane is a new type of membrane separation module mainly used in liquid desalination and purification. Its characteristics of high pressure resistance and anti-pollution are very obvious. Even in the case of high turbidity, high SDI value, high salt content and high COD, it can operate economically, effectively and stably.

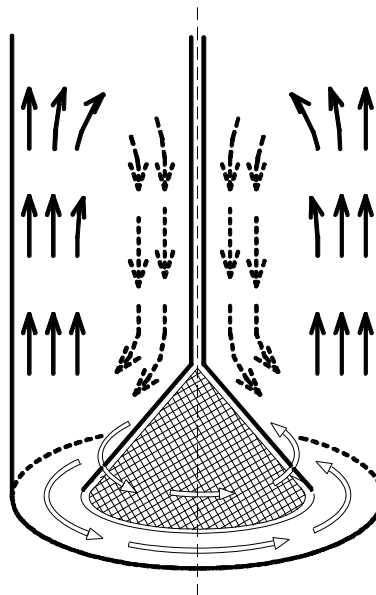
Technical advantages

- Simple pretreatment
- High recovery, long service life and high return on investment
- Free (less) dosing, free (micro) cleaning, free (light) maintenance

Technology introduction



Three-dimensional swirling water distribution



Three-dimensional swirling water distribution

Three-phase separator

Internal external circulation system

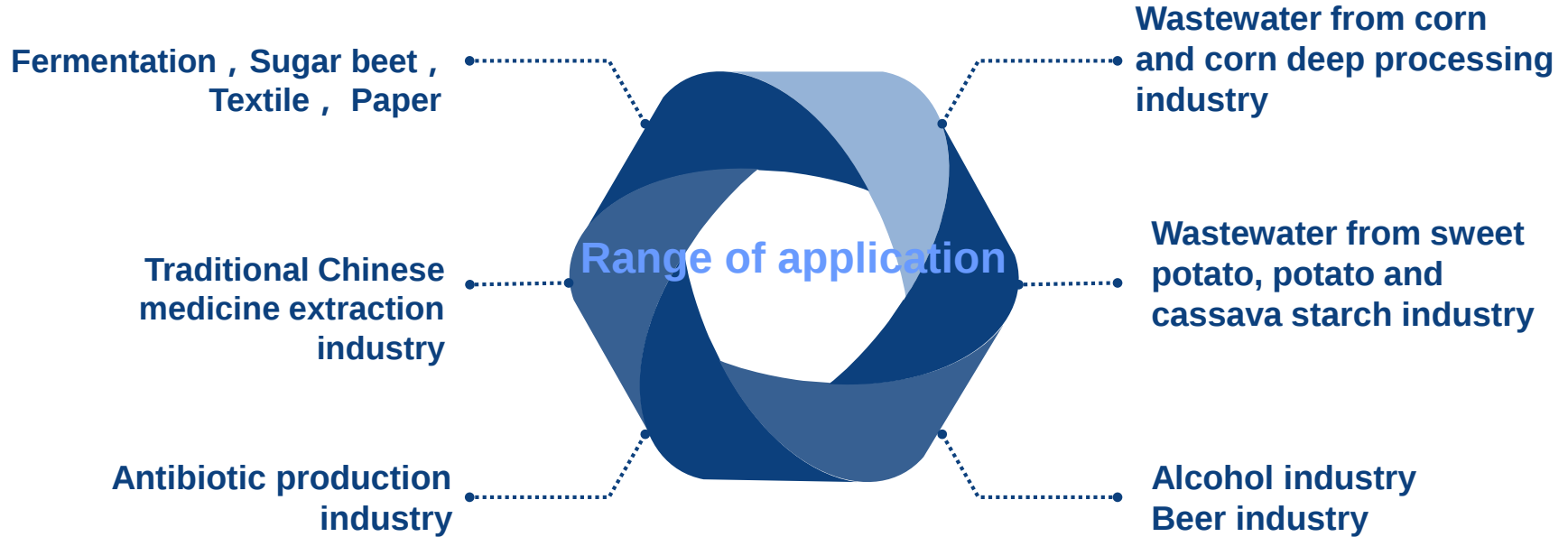
The monitoring system

Technical advantages

- High volume load: the sludge concentration in the LIC reactor is high, the microorganism quantity is large, and there is internal circulation, the mass transfer effect is good, the influent organic load can be more than 3 times of the ordinary anaerobic reactor.
- Saving investment and occupying area: the volume load rate of LIC reactor is about 3 times higher than that of ordinary anaerobic reactor, and its volume is about 1/4 ~ 1/3 of that of ordinary reactor.
- Strong impact load resistance: when low concentration wastewater is treated (COD=2000 ~ 3000mg/L), the circulating flow rate in the reactor can reach 2 ~ 3 times of the water inflow. In the treatment of high concentration wastewater (COD=10000 ~ 15000mg/L), the internal circulation flow can be up to 10 ~ 20 times of the incoming water.
- Strong resistance to low temperature: due to the large number of microorganisms in the LIC anaerobic reactor, the influence of temperature on anaerobic digestion is no longer significant and serious. Usually LIC anaerobic reactor, anaerobic digestion can be (20 ~ 25 °C) under the condition of normal temperature, so that reduce the difficulty of digestive insulation, save the energy.
- The ability to buffer pH: the internal circulation flow is equivalent to the outflow of the first anaerobic zone, and the alkalinity of COD conversion can be used to buffer the pH, so that the pH in the reactor can be kept in the best state, and the amount of alkali input into the water can be reduced at the same time.
- Powerful internal automatic circulation, after normal operation can shut down the external circulation system, saving power consumption.
- Good water stability: secondary UASB series and stage anaerobic treatment can compensate for the adverse effect of high K_s in the anaerobic process. It has been proved that reactor fractionation can reduce the VFA concentration of effluent, prolong the biological residence time and stabilize the reaction.
- Short start-up cycle: the sludge in the anaerobic reactor of LIC has high activity and fast biological proliferation, which provides favorable conditions for the rapid start-up of the reactor. The start-up cycle of LIC anaerobic reactor is generally about 7 days, while that of ordinary UASB is as long as 4 ~ 6 months.
- High utilization value of biogas: stable biogas production, high yield, 0.45 ~ 0.5m³/kg COD, heat value =1kg standard coal, 1.5 KWH electricity /m³ biogas. The purity of biogas produced by LIC anaerobic reactor is high, with CH₄ being 70% ~ 80%, CO₂ 20% ~ 30% and other organic matter 1% ~ 5%, which can be used as fuel.



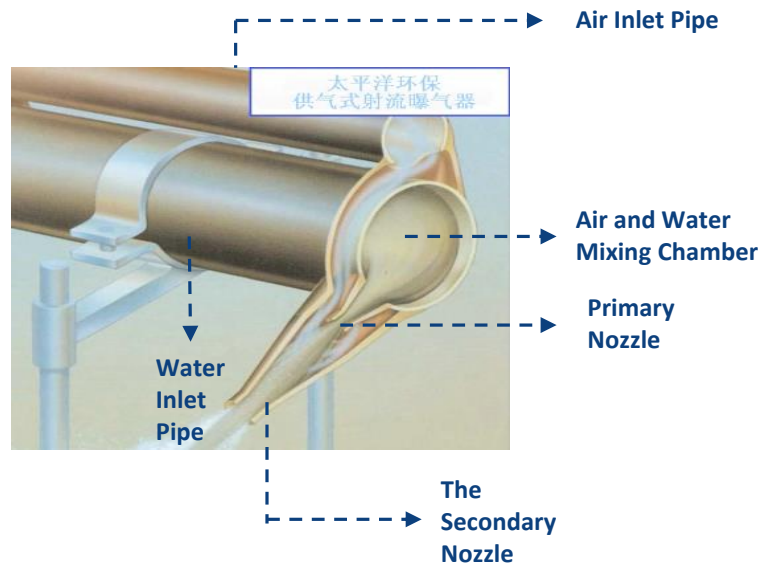
Range of Application



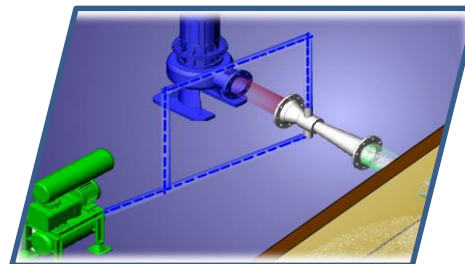
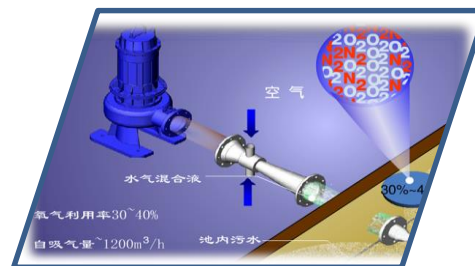
Project Photos



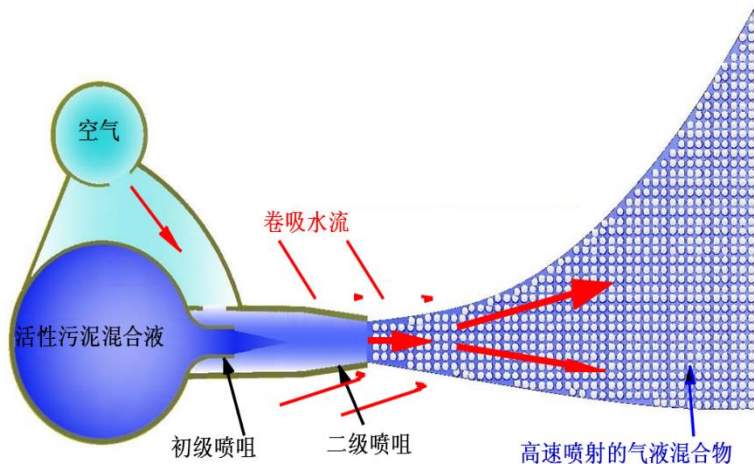
Technology Introduction



LA aeration system is composed of LA aerator, matching fan and circulating pump.



Technology Introduction



1) Extremely high oxygen efficiency , provides excellent mixing performance , the jet-flow creates a tremendous shear force to move the surrounding fluid , takes relatively less energy to mix and maintain the mixture

2) The aeration capacity per unit of energy consumption increases with the depth

3) For the project which need to improve oxygen demand and residence time , just increase the height of the original pool can realize the oxygenation efficiency increase

4) The upper and lower pipes are connected by flanges, can choose different aerator for aeration, realize more accurate aeration, also to achieve LA aerator rapid installation.

5) All equipment in the pool are static equipment, no power unit , the circulating pump is placed outside the pool , convenient for repair and maintenance

6) In the A2\O process, LA aerator has high oxygen - filling capacity, excellent mixing function, can be applied to various forms of A2\O process pool.

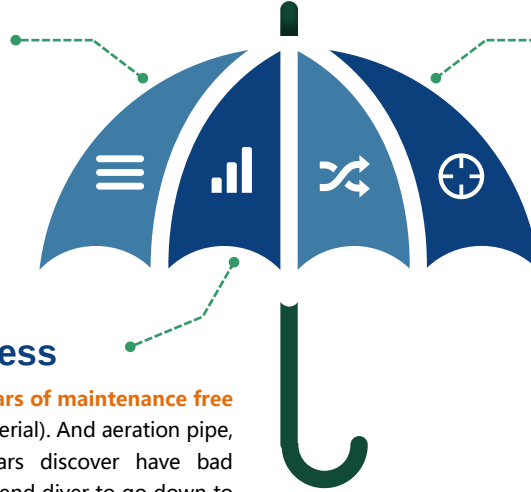
Product Advantage

Application in A/O process

In A\O process, LA aerator has high oxygenation capacity and good mixing function. It can be used in various forms of A/O pool to change the aeration intensity by controlling the air supply valve

Applied in MBR process

LA aeration equipment can achieve 20 years of maintenance free (using high strength corrosion resistant material). And aeration pipe, head is used in MBR commonly 3 years discover have bad monomer, cause aeration uneven, need to send diver to go down to change. Trouble is dangerous. The oxygen utilization rate of LA aerator can reach above 28%, which is achieved by strongly stirring the leachate to achieve a higher alpha value, which cannot be achieved by other equipment. In this way, the energy saving of MBR process with such a large gas-water ratio is obvious. LA aeration device can promote the formation of short-range denitrifying bacteria and remove nitrite nitrogen and ammonia nitrogen by short-range denitrification.



Application in SBR process

In this process, nitrification and denitrification process occur in sequence in a reaction in the pool, in the process of denitrification, and pipeline connection pool, circulating pump pumping the fluid flow in the fluidic device will form a negative pressure suction pipes on wastewater, power sewage by jet device toward the pool, sewage is wound with a lot of in the pool, flow, make fully mixing pool sewage. On nitrification phase, the pipe connected to the compressed air pipe connected to the power fluid, dynamic fluid pressure at nozzle jet device, a large amount of air inhaled and broken into tiny air bubbles, make the compressed air and sewage, activated sludge fully mixed at pool, to the oxygen in the reactor, ensure the microbiological and biochemical effects of dissolved oxygen, and to keep the reactors inside the mix of gas, water, mud for microbial degradation of organic matter provides favorable biochemical reaction conditions.

Product Advantage

Type of aerator	Hose aerator	Suspension chain aerator	Tubular microporous aerator	Jet aerator	LA-2 aerobic aerator
The oxygen transfer rate	Low	High	High	High	High
The installation	Simple	Complex	Complex	Complex	Simple
Service	Frequent	Frequent	Frequent	Frequent	Seldom
Replace	Difficult	Simple	Difficult	Difficult	Simple
Maintenance	High cost	High cost	High cost	High cost	Low cost
operation life	2-3Years	3-5Years	0.5-3Years	5-8Years	20Years
investment	Low	High	Moderate	High	Moderrat

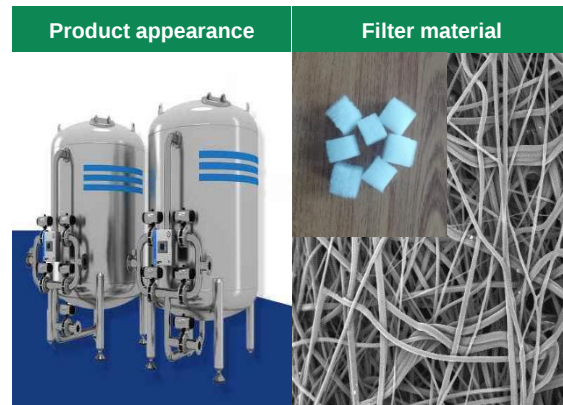
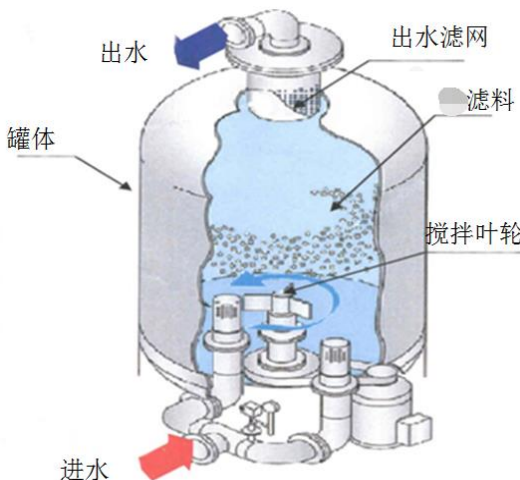
EMF-Efficient maintenance-free automatic filter

Product Introduction

EMF automatic filter is a kind of high-capacity filter equipment that can be used for ultra-high speed processing. It makes up for the shortcomings of the filters commonly used at present and can greatly improve the filtration efficiency. It is a new type of filter equipment with the main purpose of removing SS, COD, TP, water.

Product Features

- *The filter material has the fluidity, one-time investment, 5-10 years without replacement*
- *The graphene filter material has three-dimensional pores and good deep filtration effect*
- *Backflush saves water and time*
- *compact structure, it takes relatively small space*



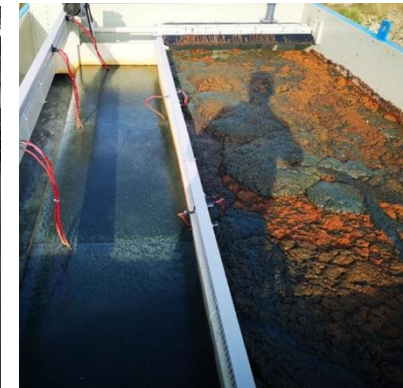
Electrical Coagulation/Flocculation Machine

Product Introduction

EC Is Chemistry Process For Decolorization, Sterilization, Removal Of Heavy Metal Ions, Organic Matter And Radioactive Material And Other Pollutants (At Least 50% Of Total Pollutant) By Carrying On Coagulation, Adsorption, Redox, Air Flotation With Different Material Of Anode And Cathode

Product Applicant

- Over 90% Oil Removal Ratio
- 30%- 80% COD Removal Ratio
- Over 90% SS/Turbidity Removal Ratio
- 70%- 90% SiO₂ Removal Ratio
- Over 90% Heavy Metal Ion Removal Ratio
- Over 80% Chroma Removal Ratio
- Over 80% Hardness Removal Ratio
- Over 80% Bacteria Removal Ratio
- Others



Contrast with Traditional Filters

Items	Traditional Filters	EMF automatic filter
Filter Material	Quartz sand, activated carbon and other common filter materials. Need regeneration, off-machine cleaning	The three-dimensional void filter material specially added with graphene composite material has larger porosity and specific surface area, larger SS capture capacity, and is easy to clean. No need for regeneration, off-machine cleaning
Filtering Rate	10-15m/h	40-70m/h
Filter Fineness	50-100um	10um
Cleaning Water	/	1/50 of the conventional water consumption
Clean Time	10-15minutes every time per day	5-8minutes every time per day
Cleaning Water	Filtered water	Raw water
Floor Area	/	1/5 of the traditional floor area
Application Fields	Municipal sewage treatment plant upgrading and reconstruction Basin treatment water purification project Various industrial circulating water filtration treatment systems Pretreatment of reverse osmosis system	

Product Introduction

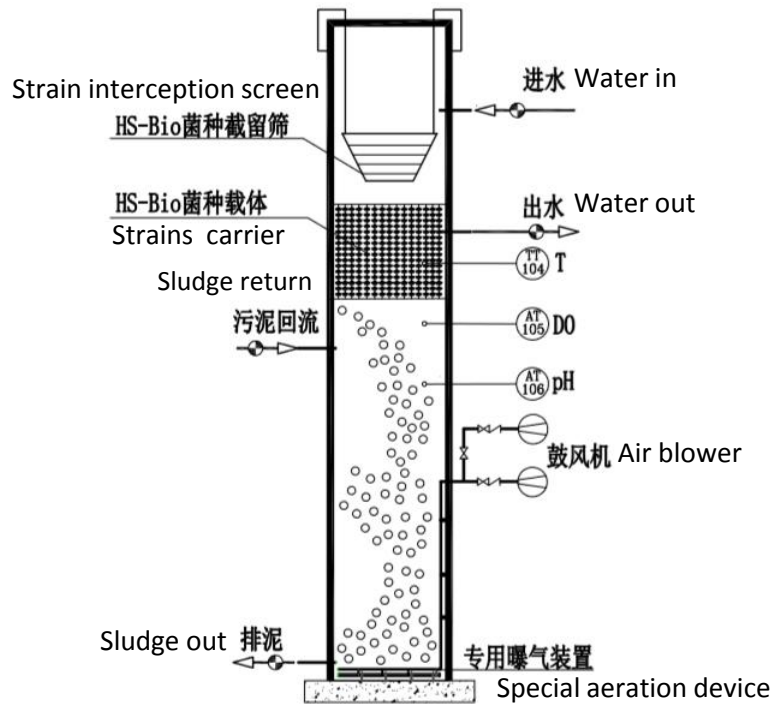
This product is jointly developed by our company and famous universities at home and abroad. It has a special structure and is made of special materials with high salt resistance imported from Germany. During operation, biochemical parameters such as DO, PH and temperature are precisely and strictly controlled to provide an adaptive environment for special HS-BIO bacteria species, so as to effectively remove COD and BOD in high-salt organic wastewater with a removal rate of over 90% and realize further reuse and zero discharge of sewage.

Product Features

- *Compared with the conventional biochemical process, the salinity of the treated sewage can be up to 3%*
- *As a pretreatment process with high salinity and zero discharge, the cost is lower than that of physicochemical method*
- *compact structure, it takes relatively small space*
- *Automatic and precise control of operation parameters, saving time and effort*
- *Advanced technology can solve the problem of waste water which cannot be treated by conventional technology*

HS-Bio Biochemical Reactor

Reaction Diagram



HS-Bio高盐有机废水生化反应器示意图

Particles Strains



Application Fields

- *High salt organic wastewater from fermentation industry*
- *Pickle processing wastewater*
- *Wastewater from seafood farming*
- *Wastewater from food curing industry*
- *Other industries such as pharmaceutical/chemical/high salt organic wastewater*

The background of the slide is a composite image. The top portion shows a bright blue sky with white, fluffy clouds. Below the sky is a city skyline featuring several tall, modern buildings with reddish-brown facades and many windows. In the foreground of the city scene, there is a body of water reflecting the buildings and sky. To the right, there are green trees and foliage. A semi-transparent rectangular box is centered over the city skyline, containing the text 'PROSPECT AND OUTLOOK' in large, bold, black capital letters.

PROSPECT AND OUTLOOK

!



Over the past 20 years since the company establishment, it has made significant contributions to the development of the industry and technological progress, and will continue to maintain the original heart of "creating value for customers and making contributions to the society", and sincerely provide professional services to customers at home and abroad

- Based on the Beidou navigation system of China North Industries Group, the whole sewage treatment plant will be monitored automatically and in real time
- We will accelerate cooperation with large international environmental protection enterprises, upgrade technology and expand business in the international market
- To train and introduce professional and technical personnel and build a first-class technical and service team
- Focus on environmental protection industry, build brand, strive to be a hundred years enterprise



THANKS!
谢谢观看

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web: www.lorenindustry.com

One Time Trust , Long Lasting Rewarding