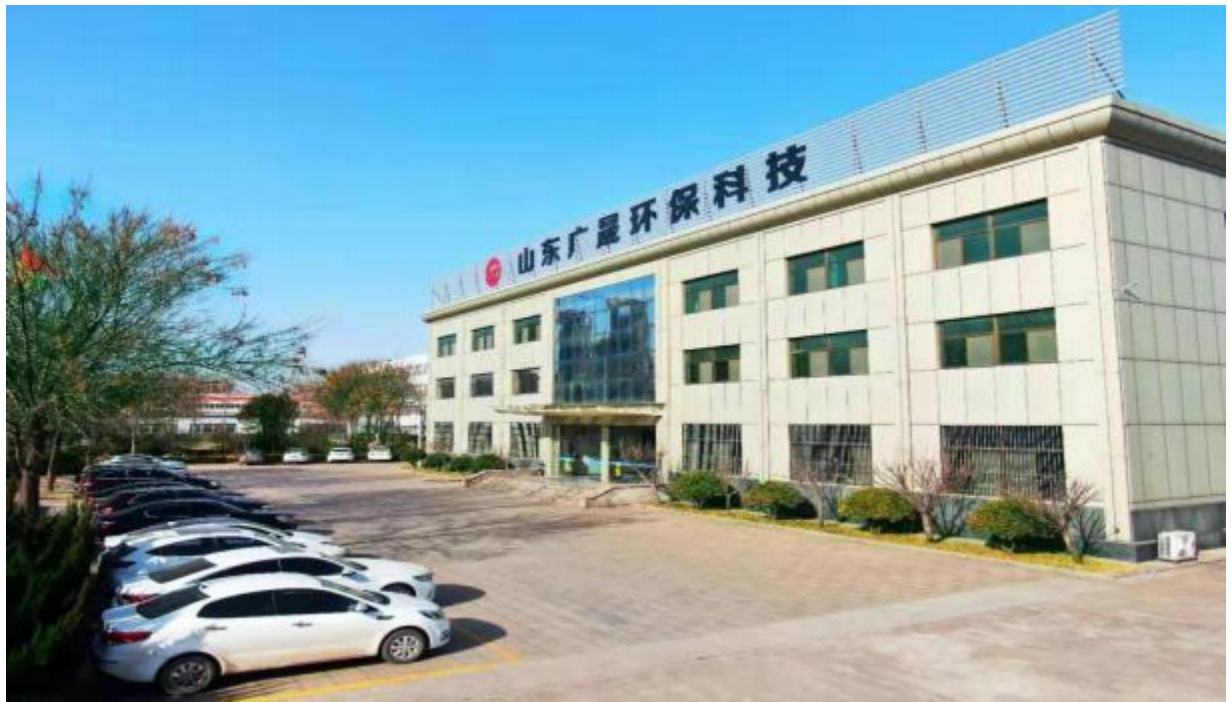


200 people domestic sewage treatment

30m³ /d
design scheme



Shandong Guangsheng Environmental Protection Technology Co., Ltd.

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1. Company introduction

Shandong Guangsheng Environmental Protection Technology Co., Ltd. is located in Zhucheng City, Shandong Province, which is known as the "Hometown of Dinosaurs" in China.

It is adjacent to Qingdao, a famous coastal city in the east, and Qingdao in the south. Adjacent to the emerging port of Rizhao, the railway, Highways extend in all directions, location is excellent.

The main products of the company wastewater pretreatment equipment Mechanical grid machine, air flotation machine, inclined tube precipitator; advanced treatment equipment equipment (integrated sewage treatment equipment, filtration equipment, disinfection equipment equipment, etc.); sludge treatment equipment (screw stacking machine, plate and frame filter press, belt filter press, rubber belt vacuum filter, etc.) .

Products are widely used in domestic industrial and mining enterprises, living quarters, petrochemical, papermaking, slaughtering, breeding, Leather, textile, printing and dyeing, hospital, hotel and other fields. In order to make the company's development have a high standard and a high starting point At the beginning of the establishment, the company strictly followed the requirements of the construction of a modern enterprise at the beginning of its establishment, and the allocation of human resources and The organizational settings have been optimized and combined, and efforts have been made to build the company into a modernized company with standardized management and professional management. enterprise .

The company has professional technical personnel, engineers, and sales and after-sales service personnel, forming a high-quality annual Lighten the team with great team innovation spirit. The company has always been "integrity-based, quality first, leading technology, Create a well-known brand" as the purpose, as always, provide customers with reliable products, perfect services, and common development, Create success together. At the same time, Rising Environmental Protection is committed to the introduction, promotion and application of advanced equipment and technology. Continuously launch a series of environmentally friendly new products in line with modern production and life. The company will rely on cooperation with a number of environmental protection schools Cooperation, professional production R&D and engineering teams grow rapidly in the field of environmental protection, and the strength of

technology R&D will continue to increase Strong , continuous improvement in the quality of after-sales service. We always regard product quality as the lifeblood of enterprise survival, regard advanced Technical strength is the core competitiveness of an enterprise. Relying on a complete set of quality assurance system and efficient after-sales service System , Guangsheng Environmental Protection is looking forward to creating a green and warm home together with old and new friends. make our sky bluer, water More clear , and strive to contribute to "restore nature with green mountains and clear waters, and return human beings with a pleasant living environment".



2. Project overview

2.1 project name

30 m³ / d domestic sewage treatment project

2.2 construction site

Chengdu City, Sichuan Province

2.3 Construction scale

Daily processing 30m³

2.4 Process flow

Pretreatment process :

Septic tank + regulating tank

Biochemical treatment process:

Anaerobic pool + anoxic pool + aerobic pool + MBR Membrane pool + disinfection

Sludge treatment process:

fecal suction truck is regularly pumped away

2.5 emission standard

The wastewater treated by this project has reached the "Urban Sewage Recycling Urban Miscellaneous Water Quality" (GB 189 20-2002), the urban greening standard in.

2.6 whereabouts of the water

Park greening and watering

2.7 Sludge Disposal

The remaining sludge generated by the project will be regularly pumped away with a fecal suction truck .

3. Design Basis, Principles and Scope

3.1 Design Basis

- ✧ Information and data provided by the construction unit
- ✧ " Implementation Rules for Water Pollution Prevention and Control of the People's Republic of China "
- ✧ " Urban Sewage Recycling Urban Miscellaneous Water Quality" GB 1 8920-2002
- ✧ "Building Water Supply and Drainage Design Code " GB50015-2003
- ✧ "Design Standards for Ancillary Buildings and Auxiliary Equipment of Urban Sewage Treatment Plants " CJJ 3 1-89
- ✧ "General Graphic Design Specifications for Industrial Enterprises" GB 5 0187-2012
- ✧ "Code for Design of Reinforced Concrete Pool Structure for Water Supply and Drainage Engineering" CECS 1 38-2002
- ✧ Code for Design of Concrete Structures (2015 Edition) GB50010-2010
- ✧ Code for Design of Masonry Structures GB50003-2011
- ✧ " Steel Structure Design Code" GB50017-2003
- ✧ " Building Structure Load Code" GB50009-2012
- ✧ Code for Design of Building Foundation GB50007-2011
- ✧ " Low Voltage Distribution Design Code" GB50054-2011
- ✧ " Code for Quality Acceptance of Building Foundation Engineering" GB 5 0202-2002
- ✧ " Code for construction and acceptance of water supply and drainage structures" GB 5 0141-2008
- ✧ " Code for Acceptance of Construction Quality of GB50208-2011

Underground Waterproofing Projects"

- ✧ " Code for Construction and Acceptance of Building Foundation Engineering" GB50202-2009
- ✧ " Reinforcement Welding and Acceptance Regulations" JGJ 18-201 0
- ✧ "Code for Design of Power Supply and Distribution System " GB 50052-2009
- ✧ "Code for Design of Low-Voltage Power Distribution" GB 50054-2011
- ✧ "Code for Design of Power Distribution for General Electric Equipment" GB 50055-2 0 11
- ✧ Relevant Electrical Design Standards
- ✧ Design codes and standards of other countries and relevant current design codes;
- ✧ Experience in design and operation of similar sewage projects .

3.2 Design Principles

Strictly implement various regulations on environmental protection to ensure that the treated sewage meets the standards.

According to the principles of advanced technology, reliable operation, and simple operation and management, the treatment process is selected to make advanced and Reliability is organically combined. On the premise of ensuring that the effluent reaches the standard, the system should be easy to operate, manage and maintain. Energy saving and low daily operating costs.

In the plane layout and engineering design, combined with the current situation of the site, the layout strives to be compact and concise, and the process flow is consistent. According to the existing topography , adopt self-flowing method as much as possible to save land occupation and investment.

Process design and equipment selection can have greater flexibility and room for adjustment during production and operation . It can adapt to changes in water quality and water quantity, and ensure that the effluent water quality is stable and discharges up to the standard .

Strictly implement the relevant national design specifications and standards, and pay attention to fire protection and safety work.

3.3 Design scope

- (1) Pre-treatment wastewater treatment system (including septic tanks, regulating tanks).
- (2) Biochemical treatment system (anaerobic pool, anoxic pool, aerobic pool, MBR membrane pool, disinfection pool).
- (3) Carry out technical, civil and electrical design for the processing structures and necessary auxiliary buildings.

4. Water quantity and quality and post - treatment standards

4.1 Design water volume

According to the data provided by the owner, determine the treated water volume of the sewage treatment station as shown in the table below (Table 3-1)

Table 3-1: Design water volume table

Design water volume		
craft	Design daily processing capacity (Q_d)	Design hour processing capacity (Q_h)
Biochemical process	30 m ³ / d	1.5 m ³ / h

4.2 design water quality

The wastewater treated by this project is rural domestic sewage, and the pollutants contained in domestic sewage are mainly organic matter (such as protein , carbohydrate, fat, urea, ammonia nitrogen, etc.) and a large number of pathogenic microorganisms (such as parasite eggs and enteroviruses, etc.). The organic matter present in domestic sewage is

extremely unstable and easily rots to produce nasty smelly . Bacteria and pathogens multiply by using organic matter in domestic sewage as nutrients, which can lead to the spread of infectious diseases OK . According to the previous engineering experience of our company, the design water quality index of the sewage treatment station is determined as follows See Table 3-2:

Table 3-2: Design Influent Water Quality Table

project	C OD _{cr}	BOD ₅	NH ₃ - N	S S	pH value
unit	mg / L	mg / L	mg / L	mg / L	dimensionless
Influent water quality	350~400	140	40	100	6-9

4.3 design process target

Table 3-3: Design effluent quality table

The waste water of the project has been pretreated to meet the requirements of "Urban Sewage Reuse and Urban Miscellaneous Water Quality" (GB 18920-2002), See the following table for the urban greening standards and wastewater discharge standards.

Table 3-3: Design effluent quality table

project	C OD _{cr}	BOD ₅	NH ₃ - N	S S	pH value	Total Phosphorus	total nitrogen
unit	mg / L	mg / L	mg / L	mg / L	immeasurable outlining	mg / L	mg / L
Enffluent Quality	--	20	20	10	6-9	--	--

5. Characteristic analysis of wastewater and selection of wastewater treatment process

5.1 Wastewater Source Analysis

Rural domestic sewage mainly comes from domestic water and toilet flushing sewage. Pollutants contained in domestic sewage are mainly organic matter (such as protein, carbohydrate, fat, urea, ammonia nitrogen, etc.) and a large number of pathogens Microorganisms (such as parasite eggs and intestinal infectious viruses, etc.).

5.2 _ Wastewater Water Quality and Quantity Analysis

The distribution of domestic sewage in rural areas is relatively scattered, involving a wide range and strong randomness, and the collection of pipe networks is not perfect. General The amount of domestic sewage in rural areas is small, but the coefficient of variation is large, and the living patterns of residents are similar, so the discharge will sooner or later be higher than that in white areas. The sky is big , the drainage volume at night is small, and the flow may even stop, and the water volume changes significantly.

to be treated are COD_{Cr} , BOD₅ , SS , N , P , etc.

The characteristics of domestic sewage can be summarized as follows:

☛The volume of domestic sewage varies greatly .

☛domestic sewage also contains kitchen waste, shower wastewater, and laundry wastewater.

☛The B / C of domestic sewage is about 0.5, and the biodegradability is good.

It can be seen that the treatment of this type of wastewater and the removal of COD_{Cr} , BOD₅ , ammonia nitrogen, etc. The key not only determines the treatment effect of the entire project, but also directly determines the total investment and operating costs of the project. high and low .

5.3 Fundamentals of Contaminant Removal

The purpose of wastewater treatment is to remove pollutants in wastewater and purify wastewater. In the waste water of this project The main pollutants are COD_{Cr} , BOD₅, ammonia nitrogen and so on. All kinds of pollutants in wastewater are produced through different functions Processing units are removed individually or in combination.

(1) Pretreatment process

SS in wastewater mainly relies on septic tanks, grilles, microfilters, air flotation, sedimentation, etc. Except .

The physical and chemical pretreatment methods of this project include septic tanks and regulating tanks .

❖ Removal of large particles and floating matter

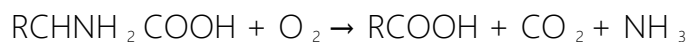
Large-diameter inorganic particles and floating matter in wastewater are removed by artificial grills.

(2) Biochemical treatment process (biological denitrification)

in nature mainly exists in the form of nitrogen gas, so the goal of biological denitrification is to convert the nitrogen in wastewater Through biochemical treatment, it is separated from the wastewater in the form of gas to achieve the purpose of degradation.

The removal of nitrogen in sewage is completed by ammonification reaction-nitrification reaction-denitrification reaction. The process principle is as follows:

①Amination reaction. Under aerobic conditions, ammonifying bacteria decompose and convert organic nitrogen compounds in sewage into NH₃ - N , taking amino acids as an example, the reaction formula is:



② Nitrification reaction . Under aerobic conditions, nitrifying bacteria further oxidize NH₃ - N to NO₂⁻ and NO₃⁻ , which The simplified reaction formula is



In the nitrification process, the following environmental conditions must be met in order to complete a better nitrification reaction:

a . Aerobic state, DO ≥ 1.5 mg / L , and maintain a certain alkalinity, the appropriate pH value is 8.0-8.4;

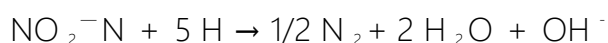
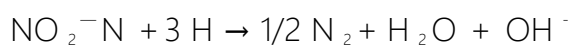
b . The content of organic matter should not be too high, and the organic matter load is $\leq 0.15 \text{ kgBOD}_5 / \text{kgMLVSS} \cdot \text{d}$, this is because of nitrification Bacteria are autotrophic microorganisms, when the concentration of organic matter is too high, the heterotrophic flora rapidly proliferates and become the optimal Potential, $\text{BOD}_5 / \text{TKN} = 2-3$, the smaller the ratio, the higher the proportion of nitrifying bacteria, and the stronger the nitrification reaction.

c . Sludge age θ_c of nitrifying bacteria As long as possible, generally not less than 6 days

d . The optimum temperature is 20-30°C, and the nitrification rate decreases when the temperature is below 15°C.

e . The concentration of inhibitory substances should be as low as possible. In addition to heavy metal ions, there are some organic substrates and high concentrations of $\text{NH}_4^+ - \text{N}$ ($\geq 200 \text{ mg} / \text{L}$), $\text{NO}_x^- - \text{N}$ ($\geq 100 \text{ mg} / \text{L}$), etc.

③Denitrification reaction. Under anoxic (facultative) conditions, denitrifying bacteria can assimilate a small part of $\text{NO}_x^- - \text{N}$ into Most of the organic nitrogen compounds in the bacteria (70-75%) are dissimilated (reduced) into gaseous nitrogen N_2 , and the reaction formula is



In the denitrification process, the suitable environmental conditions are :

a . Hypoxic (facultative oxygen) state, $\text{DO} \leq 0.5 \text{ mg} / \text{L}$;

B, the suitable pH value is 6.5-7.5;

c . There is sufficient carbon source (higher organic matter content), $\text{BOD}_5 / \text{TKN} \geq 3-5$, because denitrifying bacteria

For heterotrophic facultative microorganisms.

d . The optimum temperature is 20-40°C , and the denitrification rate decreases when the temperature is below 15°C.

membrane bioreactor (MBR)

Membrane bioreactor (MBR) is a new type of high-efficiency sewage treatment that combines membrane separation technology with biotechnology. new technology. That is to combine the membrane treatment process with the traditional activated sludge method, and replace the traditional active sludge with membrane modules. The secondary settling

tank in the permanent sludge method uses the high-efficiency retention of the membrane to separate the solid from the liquid, thus forming a membrane biodegradation system. bioreactor sewage treatment process. This is a new and efficient sewage treatment process. In the field of sewage treatment has been It has attracted attention and is considered to be one of the most developed high-tech in the world in the 21st century. After MBR treatment Sewage can be reused directly. The effluent water quality is good and stable, not only can completely remove suspended solids, but also can Remove almost all bacteria and viruses, the turbidity of the product water is close to zero, and the removal rate of the main pollutants is very high. Reduce expenditure and discharge, and realize the utilization of sewage resources.

MBR The advantages

(1) High-efficiency solid-liquid separation technology makes the separation effect far better than that of ordinary secondary sedimentation tanks, and can completely The suspended matter in the effluent is completely removed, the turbidity of the effluent is close to zero, and the quality of the produced water is good and stable. The produced water can be reused directly .

(2), Since the MBR combines the aeration tank and the secondary sedimentation tank of the traditional sewage treatment into one, it greatly reduces the land area and save civil construction investment.

(3) The sludge concentration of the biological treatment unit is high and the sludge age is long, which greatly improves the refractory organic degradation efficiency . At the same time, due to the adsorption of activated sludge, the main pollutants (C o D) the go The removal rate can reach 90%.

(4) Due to the interception effect of the membrane, the nitrifying bacteria are completely trapped in the bioreactor and reproduce, The nitrification capacity of the system is enhanced , and the removal of pollutants such as nitrogen and phosphorus is improved.

(5) The reactor operates at a low organic loading rate, and the amount of residual activated sludge is much lower than that of the traditional process The amount of activated sludge of the method , without sludge bulking, reduces the disposal cost of excess sludge.

(6) The system realizes automatic control, convenient operation and management, and low noise.

Table of Traditional Sewage Treatment Process and Membrane Bioreactor (MBR)

project serial number	Traditional sewage treatment process	Membrane Bioreactor (MBR)
1	Low MLSS (3~ 5mg / l)	high MLSS (10~ 20mg / l)

2	Sludge age is short, not suitable for control	The sludge age is long and completely out of control
3	Can only breed fast- reproducing bacteria	All kinds of suitable bacteria can grow and grow
4	Only those capable of forming micelle bacteria	Specific bacteria can develop well
5	large area	Small footprint, only traditional craft 1 /3~1/5
6	Large sludge production	Sludge production is small
7	The effluent quality is not stable enough, basically Can discharge up to the standard, but the water quality cannot reach the return Application requirements require in-depth processing.	Strong impact load resistance, good water quality Good and stable, high-quality water, can reach the return with request.

Process selection for biological nitrogen and phosphorus removal:

Biological methods are divided into two types: activated sludge method and biofilm method, so the process of biological nitrogen removal is in these two categories to choose from . The principle of process selection is:

technical feasibility, low investment, low operating cost and advantages of sewage treatment process.

Activated sludge method: At present, almost all secondary urban sewage treatment plants in China use activated sludge method (A²/O, AB, SRB and its improved types and various oxidation ditch processes), except for some processes that have In addition to the nitrogen function, basically through transformation, such as setting an anoxic zone before the aerobic tank and returning nitrification liquid and sludge The treatment process can meet the nitrogen removal requirements.

Biofilm method: The biofilm sewage treatment process is a new method that utilizes microorganisms attached to fillers (carriers). Metabolism, absorbing and decomposing organic pollutants in sewage to achieve the effect of purifying sewage; at the same time, biological The biofilm of the membrane method has a longer sludge age, which is suitable for the biophase requirements of sewage nitrification and denitrification. For aerobic Biofilm process, due to the high DO in the sewage, the outer biofilm is in an aerobic state, and the organic matter is completed Oxidation and nitrification of ammonia nitrogen, while the DO in the inner layer is very low, and the microorganisms are in an anoxic state, which meets the needs of denitrifying bacteria.

Environmental conditions, so denitrification also occurs during nitrification, so it has a certain nitrogen removal function.

this project chooses A²O + MBR membrane process.

5.4 Selection of Wastewater Treatment Processes

Sewage treatment equipment is an important part of infrastructure and a key link in water pollution control. The construction and operation of sewage treatment projects is of great significance. Since the construction and operation of sewage treatment projects not only cost It is relatively large, and is restricted and affected by many factors, among which the optimal selection of the treatment process plan is of great importance to ensure the treatment the station are the most critical, so it is necessary to start from the Starting from the concept of overall optimization, combined with the design scale, wastewater quality characteristics and local actual conditions and requirements, Choose a feasible and economical and reasonable plan, and optimize the best overall process after a comprehensive economic and technical comparison programs and implementations.

in the selection of equipment and processes for pretreatment and biochemical treatment:

(1) The selected pretreatment process must be technologically advanced and mature, with strong adaptability to water quality changes, and Stabilize;

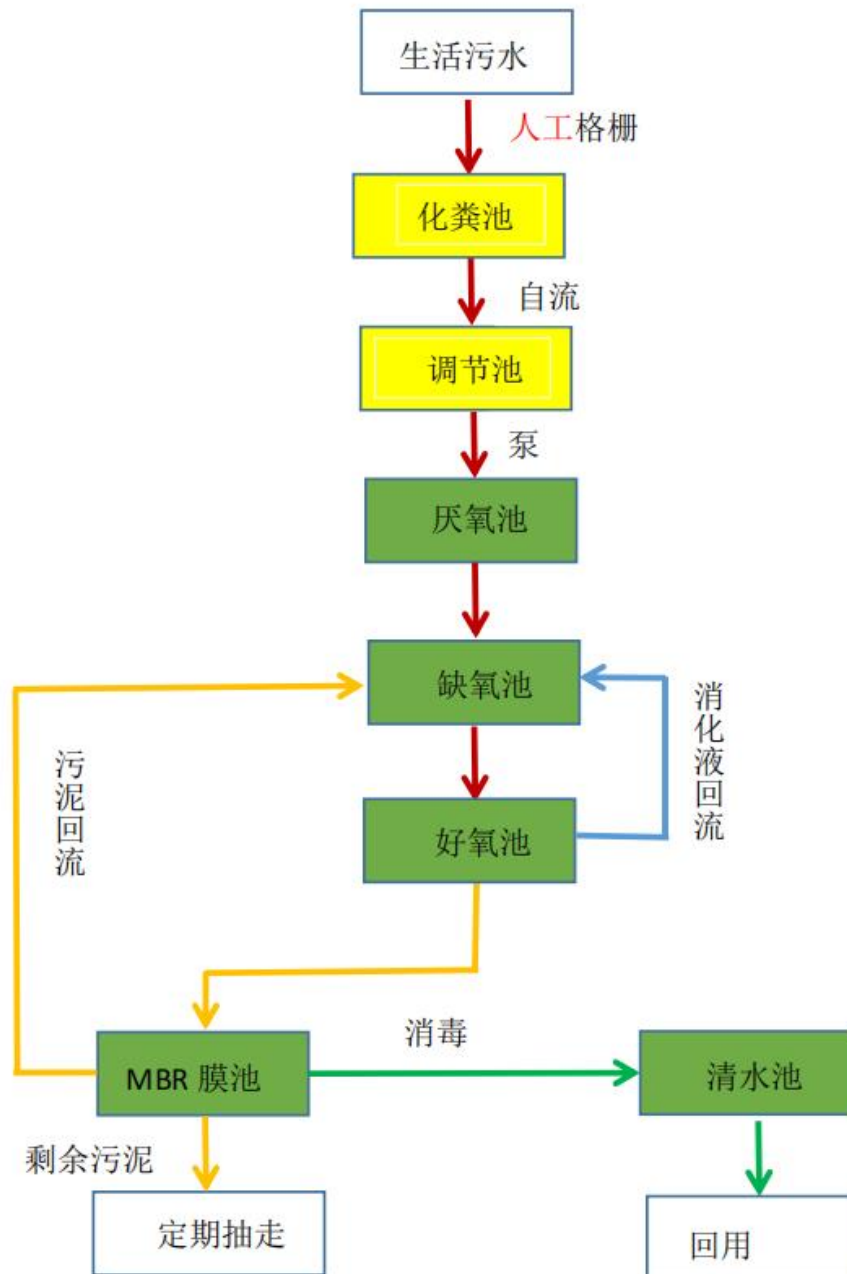
(2) The selected biochemical process should reduce infrastructure investment and operating costs, save floor space and reduce energy consumption ;

(3) The selected process should be easy to operate, flexible in operation and easy to manage. According to the quality and quantity of influent water, the Able to make appropriate adjustments to process operating parameters and operations;

(4) Shock load resistance, great diluting capacity for influent water quality and water volume, not affected by water quality The rapid change of the volume will cause the processing system to be paralyzed, shut down, and lose its processing capacity.

According to the above characteristics, you can choose "septic tank + regulating tank + anaerobic tank + anoxic tank + aerobic tank + MBR membrane tank + Disinfection" combined combined treatment process to treat the wastewater .

.5 Process flow diagram



If you need English Diagram Please contact Iris WhatsApp: 0086-17560054088

6. Main structure design and equipment selection

6.1 pretreatment system

6.1.1 __ septic tank (customer self-built)

achievement Function: equipment for treating feces and filtering sediment. The principle is that the cured substance decomposes at the bottom of the pool, The hydrated objects in the upper layer flow into the pipeline to prevent the pipeline from being blocked and give solidified objects (feces and other garbage) Allow sufficient time for hydrolysis. Precipitate impurities and hydrolyze macromolecular organic matter into small molecules such as acids and alcohols. Organic matter , improve subsequent sewage treatment.

Structural dimensions: 4 m × 3 m × 3.5 m (length × width × height)

Structural form: steel concrete structure

Quantity : 1 seat

6.1.2 __ Regulation pool (customer self-built)

荷

achievement Function: adjust the water volume and homogenize the water quality, ensure the uniform water inflow of the next treatment equipment, and reduce the impact load

Structural dimensions: 2 m × 3 m × 3.5 m (length × width × height)

Structural form: steel concrete structure

Quantity : 1 seat



Supporting equipment :

A. Lift water pump

Device model: 25 WQ 1.5-10-0.37

Technical parameters: $Q = 1.5 \text{ m}^3 / \text{h}$, $H = 10 \text{ m}$, $N = 0.37 \text{ KW}$

number Quantity: 2 sets (1 for use and 1 for spare)

B. Liquid level controller

Equipment model: GS - YF

Quantity : 2 sets



6.2 Biochemical treatment system

6.2.1 _ Anaerobic pool

achievement Function: convert macromolecular organic matter into small molecular organic matter, convert insoluble organic matter into soluble

Soluble organic matter, improve the biodegradability of wastewater , reduce the operating load of subsequent treatment facilities, and increase the ratio of BOD/COD.

Structural form: carbon steel anti-corrosion structure

Quantity : 1 seat

Supporting equipment: packing, packing support

A. Filler

type Size: $\phi 150 \times 2500$ mm

material Quality: three-dimensional combined

B. Packing bracket

Model: $\phi 12$

Material : carbon steel anti-corrosion

Quantity : 1 set



6.2.2 _ _ anoxic pool

achievement Function: In a facultative environment, use microbial flora to metabolize and remove organic pollutants in wastewater, making

The effluent is degraded, and at the same time, the nitrate is denitrified to generate nitrogen, which escapes into the atmosphere to achieve denitrification .

Structural form: carbon steel anti-corrosion structure

Quantity : 1 seat

Supporting equipment: packing, packing su

A. Filler

type Size: $\varphi 150 \times 2$

material Quality

B. Packing brack

Model: $\varphi 12$

Material : carbon

Quantity : 1 set



6.2.3 _ _ Aerobic pool

achievement Function: the role of aerobic bacteria in the wastewater in the aerobic pool

Use it to further reduce the content of organic matter in wastewater.

Structural form: carbon steel anti-corrosion structure

Quantity : 1 seat

Supporting equipment: packing, packing
Fan, nitrification liquid return pump

A. Filler

type Size: $\varphi 150 \times 2500\text{mm}$

material Quality: three-dimensional com

B. Packing bracket

Model: $\varphi 12$

Material : carbon steel anti-corrosion

Quantity : 1 set

A. Aeration system

Aerator

Model: $\varphi 215$

Material : EPDM diaphragm, ABS skeleton

Air distribution pipe



Model : $\phi 80$

Material : UPVC

D. Fan _

type No.: NSR -50 1.1 KW

Power : 1.1 Kw

Material : cast steel

Quantity : 1 set



E. Nitrate return pump

type No.: 40 WQ 6-10-0.75

Flow rate : 6 m³ / H

Lift : 10 m

Power: 0.75KW

Material : cast iron

Quantity : 1 set

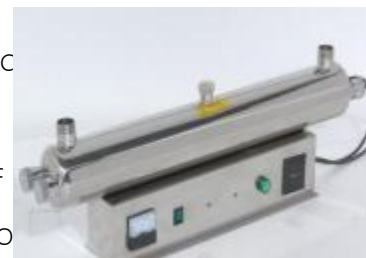


6.2.3 MBR Membrane pool

Function: efficient solid-liquid separation technology, making the separation

The effect is much better than that of ordinary secondary sedimentation tanks, and it can completely remove

Suspended matter in the effluent , the turbidity of zero, and the quality of the produced water is good



good and stable. Due to the interception effect of the membrane, the nitrifying bacteria are completely

fully trapped in the bioreactor and propagated, enhancing the

The system 's nitrification ability improves the removal of nitrogen, phosphorus and other pollutants.

Structural form: carbon steel anti-corrosion structure

Supporting equipment:

A. Sludge return pump

type No.: 40 WQ 6-10-0.75

Flow rate : 6 m³ / H

Lift : 10 m

Power: 0.75KW

Quantity : 1 set

B. Product water pump

Model : 25 CX 5-15-1.1

Flow rate : 5 m³ / H

Lift : 10 m

Power : 1.1KW

C. Backwash pump

Model : 25 CX 5-15-1.1

Flow rate : 5 m³ / H

Lift : 10 m

Power : 1.1KW

D. MBR _

Membrane,

Membrane

Holder Material :

PVDF Quantity:

108 m² Material :

SS 304

E. Fan

Model : NSR -50-1.1

6.2.4 UV disinfection

Model: GSZW 40

Power: 0.18KW

Flow rate : 3 m³ / H

7. Overall Design

7.1 general layout

7.1.1 _ Design scope

The overall layout of the sewage treatment station, the technological and civil engineering design of the sewage treatment structures, and the design of the auxiliary buildings .

7.1.2 _ floor plan

The overall layout of the sewage treatment station needs to be closely connected with the environment, so that it is naturally coordinated and integrated; according to the process sequence

Smooth, easy to manage , convenient to carry out the construction principle, each structure is compactly arranged, the utilization rate is high, and the land occupation is small. for The construction of the wastewater treatment station does not affect the surrounding environment, and the blower is arranged in the equipment room to reduce the waste water disposal The noise problem generated by the management station.

7.1.3 _ Auxiliary buildings

According to the specific situation of this wastewater treatment project, and referring to the Ministry of Construction standard " Affiliated to Urban Sewage Treatment Plant Design Standards for Buildings and Auxiliary Equipment" (CJJ 31-89), arrange dosing above the ground and control the duty room .

7.1.4 _ Accessory equipment

The wastewater treatment station shall be equipped with laboratory equipment, mechanical repair equipment and transportation equipment, and the specific configuration shall be unified by the owner consider .

7.2 _ Elevation layout

7.2.1 _ Design scope

The waste water is transported by the owner to the location designated by the waste water treatment station, and begins to reach the standard discharge outlet.

7.2.2 _ Elevation layout

In the elevation design, the feasibility of the technological process and the rationality of the project cost are fully considered, so in the process When designing, try to use self-flow to reduce lifting and save energy .

7.3 _ piping arrangement

The buried pipeline adopts ordinary welded steel pipe, and the dosing pipe adopts UPVC . Pipeline anticorrosion method: metal welding After the connected steel pipe is derusted, brush primer twice, anti-corrosion paint twice, buried pipe primer twice, asphalt paint twice, water Metal pipes are used as anti-corrosion layer of epoxy asphalt paint.

7.4 _ public works

7.4.1 _ water supply system

The owner is responsible for accessing the water from the water supply pipe network for the waste water treatment station to be used for on-site preparation of medicines, etc.

7.4.2 __ powered by

the wastewater treatment station requires 380 v power supply to ensure the normal operation of the sewage treatment system.

7.4.3 _ labor safety

The cover plates of the reserved holes are solid and load-bearing, and the installation, protection and operating conditions of all electrical equipment are in accordance with electrical regulations. Design in accordance with relevant safety regulations.

8. Civil engineering design

8.1 _ Design Principles

In the design, it is not only necessary to choose advanced technological processes and reasonable technical parameters, but also to arrange The layout plane strives to be compact and concise, so that the lines are smooth and clear, simple and practical, and satisfies the maximum While meeting the technical requirements, make the building (structure) durable.

8.2 _ Anti-seepage design

used in this project is S6, and 1:2 cement waterproof mortar (thickness 20 mm) is applied on the outer surface below the groundwater level .

For the anti-corrosion of structures, by increasing the density of concrete and controlling the water-cement ratio, the thickness of the protective layer of steel bars can be ensured And so on.

8.3 _ structural design

8.3.1 structure type

In line with the principles of safety, economy, convenience for construction and reasonable structure, the basic seismic intensity of structures is tested according to seven degrees

Considering the thickness of reinforced concrete foundation according to the groundwater level, determine the anti-seepage requirements. Anti-floating safety of underground structures The full coefficient is taken as 1.05.

8.3.2 _ _ Selection of building materials

〈1〉 The reinforced concrete structure adopts C 30, the impermeability grade is S 6, and the cushion layer adopts C 10; 〈2〉 Reinforcing bar: $D \leq 10$, use grade I steel; $D \geq 12$, use grade II steel, embedded parts Using A 3 steel; 〈3〉 Cement: use $\geq R 32.5$ ordinary portland cement; 〈4〉 Steel : Q235A is used;

8.4 Construction technology and safety measures

8.4.1 Foundation pit excavation and support

In order to ensure the smooth progress of the foundation project, geological survey should be carried out first, and after comprehensive and careful design calculation , After confirming the support scheme and construction method, the foundation pit can be excavated to ensure safety.

When excavating the foundation pit, special attention should be paid to the safety of the slope during the construction process. At the same time, pay attention to the groundwater level possible impact on neighboring buildings .

8.4.2 Material

All kinds of steel bars and section steel need to bring the factory certificate when entering the site, and they can be used only after passing the quality sampling inspection.

R 32.5 ordinary Portland cement is used for the concrete , the water-cement ratio of the concrete is controlled within 0.55, and aggregates such as sand and stone must meet the quality requirements .

8.4.3 _ _ Fabrication and installation of steel bars and concrete pouring

steel bars are carried out in strict accordance with the construction specifications to ensure that the thickness of the protective layer of steel bars is correct.

The formwork should be firmly supported, with dense joints, sufficient rigidity, and watertight. Do not use iron wire to pass through the waterproof structure Base level fixed formwork.

The pouring should be carried out strictly according to the operation rules to ensure the compactness of the concrete.

9. Electrical and automatic control design

9.1 Power supply design basis

- (1) "Code for Design of Industrial and Civil Substations 10 KV and Below"
- (2) "Code for Design of Industrial and Civil Power Supply System"
- (3) "Code for Design of Low-Voltage Power Distribution Devices and Circuits"
- (4) "Code for Lightning Protection Design of Buildings"
- (5) "Code for Grounding Design of Industrial and Civil Power Installations"

(6) "Code for Design of Relay Protection and Automatic Devices for Industrial and Civil Power Installations"

(7) Equipment capacity and layout provided by the process
diagram provided by the process

9.2 _ Power supply design range

sewage treatment station consists of the following contents:

(1) Design of power distribution device and relay protection of sewage station.

(2) Power supply and control design of electrical equipment in sewage station.

(3) Cable laying design for sewage station .

(4) The grounding design of the sewage station power supply system.

(5) Design of various structures of the sewage station and on-site lighting.

9 .3 Detailed design of power supply

9.3.1 Power supply

The power supply of this project is a 380 V special line, and the lighting power supply is 220 V. It is introduced from the community power distribution room (the owner is responsible for leading the power to the power distribution room of the sewage treatment station). own room The external cables are buried underground through steel pipes, and the passing cables are introduced through cable bridges.

9.3.2 _ _ Laying of power lines

The power supply is introduced into each electrical equipment point by radiation to improve the reliability of power supply.

The outdoor lines are laid with cables along the cable trench or directly buried, and the indoor power lines are laid with V -500 Copper core plastic

wires, use steel pipes to lay concealed along the walls and ceilings; use G (thick-walled steel pipes) in the ground floor or pass through laying , and the rest are laid with TC (electrical conduit).

9.3.3 _ _ Power supply protection measures

The electrical system adopts zero-connection protection. Electrical equipment and dead metal casings should be reliably grounded. Use a combined grounding body, the grounding resistance is not greater than 10 ohms, and the power frequency grounding resistance of the outdoor grounding system is less than 1 Ω ; In addition, the power distribution and automatic control systems have moisture-proof, leakage-proof and measures, and all kinds of electrical equipment are equipped with circuit short-circuit and Overload protection device to ensure safe operation of electrical equipment. For the connection and installation of electrical equipment, press Installation, construction and testing shall be carried out in accordance with relevant national regulations.

9.3.4 _ Electric control cabinet

(1) The electric control cabinet takes certain measures, a good grounding screen, and has a high ability to resist radio frequency interference.

(2) The installation wiring part in the electric control cabinet is more than 300 mm from the bottom of the cabinet and less than 150 mm from the top of the cabinet. Sub-rows have a 15% margin .

(3) Various accessories in the electric control cabinet, such as terminal blocks, cable clamps, and wiring troughs, are all made of flame-retardant materials .

(4) The electric control cabinet is equipped with 220 VAC lights and sockets, and a leakage protector is equipped on one side of the power supply.

X. List of engineering structures and equipment

10.1 List of new buildings

new buildings (customer self-built)

serial number	name	Standard sizes	unit	quantity	remark
1	septic tank	4m x 3m x 3.5m _	seat	1	steel concrete
2	Adjustment pool	2 m x 3 m x 3.5 m	seat	1	steel concrete
3	Integrated equipment base	7 m × 3 m × 3. 2 m	seat	1	steel concrete
4	reuse pool	2 m x 3 m x 3.5 m	seat	1	steel concrete
5	equipment room	5×3×4m, Including control room, fan room, etc.	seat	1	Brick and mortar

10.2 List of technical parameters of main equipment for sewage treatment

List of technical parameters of integrated equipment

sequenc	service area	device name	Specifications	one bit	number	remark
one	pretreatment system					
1.	septic tank	septic tank	4m x 3m x 3.5m _	set	1	Customer self-built
2.	Adjustment pool	lift pump	25 WQ 1.5-10-0.3 7	tower	2	1for1 backup
3.		level gauge	GS - YF	set	2	Rising Environmental Protection
4.						
two	Biochemical treatment system					

5 .	Integrate d device prepar e	Integrated equipment Dimension s	6 m × 2 m × 2.5 m (excluding manhole)	set	1	Rising Environm ental Protectio n
6 .	Anaerobi c pool	filler	φ 150×2500m	set	1	Rising Environm ental Protectio n
7.		packing bracket	φ 12 GSHB-15	set	1	Rising Environm ental Protectio n
8.	anoxic pool	filler	φ 150×2500m	set	1	Rising Environm ental Protectio n
9.		packing bracket	φ 12 GSHB-15	set	1	Rising Environm ental Protectio n
10.	Aerobic pool	fan	NSR - 50	tow er	1	Shandong Zhaner
11.		distributio n device	φ 63	set	1	Rising Environm ental Protectio n
12.		Nitrification solution backflow Pump	4 0 WQ 6-10-0.75	tow er	1	Zhejiang Jiabo
13.		Microporou	φ215	set	1	Rising

		s aerator				Environm ental Protectio n
19.		equipment inspector hole	matching	set	1	Rising Environm ental Protectio n
20 .	MBR membrane pool	sludge return pump	4 0 WQ 6-10-0.75	set	1	Zhejiang Jiabo
2 1.		Product water pump	25 CX 3.2-15-1.1	tow er	2	Zhejiang Jiabo
2 2.		backwash pump	25 CX 3.2-15-1.1	tow er	1	Zhejiang Jiabo
2 3.		MBR membrane	PVDF , 108m ² , 304 membrane frame	set	2	Rising Environm ental Protectio n
2 4.		fan	NSR - 50-1.1	tow er	1	Shandong Zhaner
2 5.	disinfect ion	UV disinfection	GSZW - 50 0.18kw	set	1	Rising Environm ental Protectio n
2 6	backwash dosing	500PE _	Including stirring motor, dosing pump	set	1	Rising Environm ental Protectio n
thre e	Electronic control system					
2 6.	Electric control	On-site operation control box	Control tank level controller, agitator, water pump	set	1	Rising Environm ental Protectio

		making				n
2 7.		Field instrument box	matching	set	1	Rising Environmental Protection
2 8.		PLC control cabinet	PLC control , process chain control	set	1	Rising Environmental Protection
Four	Equipment quotation : Contact IrisWhatsApp:0086-17560054088					

12. On-site photos of the equipment



13. Company Qualification

business license

统一社会信用代码
913707820579017666



营业执照
(副本)
1-1



扫描二维码是
“国家企业信用
信息公示系统”
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备案、许可、监
管信息。

名称 山东广晟环保科技有限公司

类型 有限责任公司(自然人投资或控股)

法定代表人 李华

经营范围 研发、加工、销售环保设备及配件、食品机械及配件、造纸机械及配件、农业机械及配件、屠宰机械及配件；电气安装；水利水电工程、环保工程、市政工程、园林绿化工程设计、施工。（依法须经批准的项目，经相关部门批准后方可开展经营活动）

住所 山东省潍坊市诸城市开发区老泰商路南

注册资本 伍仟零捌拾捌万元整

成立日期 2012年11月02日

营业期限 2012年11月02日至年月日

登记机关 诸城市行政审批服务局

2021年08月11日

仅限于本次招标项目使用

国家企业信用信息公示系统网址: <http://www.gsxt.gov.cn>

市场主体应当于每年1月1日至6月30日通过
国家企业信用信息公示系统报送公示年度报告

国家市场监督管理总局监制

Construction industry enterprise qualification certificate

	
建筑业企业资质证书	
(副本)	
企业名称:	山东广晟环保科技有限公司
详细地址:	山东省潍坊市诸城市开发区光亚路以南
统一社会信用代码 (或营业执照注册号):	913707820579017666
法定代表人:	李华
注册资本:	5088万元人民币
经济性质:	有限责任公司(自然人独资)
证书编号:	D337186410
有效期:	至2023年12月19日
资质类别及等级:	
	市政公用工程施工总承包二级
	建筑机电安装工程专业承包二级
	环保工程专业承包二级

	发证机关:
	2021年08月24日
	中华人民共和国住房和城乡建设部制
全国建筑市场监管公共服务平台查询网址: http://jzsc.mohurd.gov.cn	
NO.DF 22017015	

safety production license

国家安全生产监督管理局 监制  安全生产许可证 (副本) 编号: (鲁)JZ安许证字〔2020〕071493-02 单位名称: 山东广晟环保科技有限公司 主要负责人: 李华 单位地址: 山东省潍坊市诸城市开发区老泰山路南 经济类型: 有限责任公司(自然人投资或控股) 许可范围: 建筑施工 有效期: 2020年5月29日至2023年5月28日  发证机关: 山东省住房和城乡建设厅 2020年6月24日	
延期 自: 至: 延期核准机关(章) 年 月 日	核准 经审查, 准予该企业安全生产许可证有效期延期三年。 自: 至: 延期核准机关(章) 年 月 日
核准 经审查, 准予该企业安全生产许可证有效期延期三年。 自: 至: 延期核准机关(章) 年 月 日	延期 自: 至: 延期核准机关(章) 年 月 日

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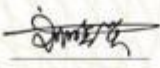
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Three system certificate


职业健康安全管理体系认证证书
兹证明
山东广晟环保科技有限公司
证书编号: 672521121217183
统一社会信用代码: 913707820579017666
地址: 山东省潍坊市诸城市开发区老泰薛路南
经评审符合以下标准要求
ISO 45001:2018 idt GB/T 45001-2020
认证范围
环保设备(污水处理设备、动物尸体无害化处理设备)的研发、加工、销售及相关场所所涉及的职业健康安全管理活动。(需资质许可的凭资质经营)
本认证证书的范围和所涉及的法律法规标准一并使用。该要求包含但不限于行政许可、资质范围及 GGG 认证等。在证书持有者的职业健康安全管理体系持续符合标准要求的前提下,本证书的注册有效期是三年,证书的有效性需经 SCI 定期的监督审核确认有效,本证书使用期限至 2022 年 12 月 16 日,请于此日期前完成监督审核或再认证,逾期未通过审核,本证书作废。
注册有效期: 2021 年 12 月 17 日至 2024 年 12 月 16 日
签发: 

青岛标认检验检测有限公司
证书查询方式: 1. 全国认证认可信息公开服务平台: http://cn.cca.cn/
2. 公司官网: www.hiaozhengzhenzhang.com
邮箱: hiaozhengzhenzhang@163.com



环境管理体系认证证书

兹证明

山东广晟环保科技有限公司

证书编号: 672E21121217183

统一社会信用代码: 913707820579017666

地址: 山东省潍坊市诸城市开发区老泰薛路南

经评审符合以下标准要求

ISO 14001:2015 idt GB/T 24001-2016

认证范围

环保设备(污水处理设备、动物尸体无害化处理设备)的研发、销售及相关场所涉及的环境管理活动。(含资质许可的凭资质经营)

本认证证书的范围和其涉及的法律法规要求一并使用。该要求包括但不限于行政许可、资质范围及 ODC 认证等。在证书持有者环境管理体系持续符合标准要求的前提下,本证书的注册有效期是三年,证书的有效期需经 SCI 定期的监督审核确认有效。本证书使用期限至 2022 年 12 月 16 日,请于此日期前完成监督审核或再认证。逾期未通过审核,本证书作废。

注册有效期: 2021 年 12 月 17 日至 2024 年 12 月 16 日

签发:



青岛标认检验认证有限公司

证书查询方式: 1. 全国认证认可信息公共服务平台: <http://cx.cma.cn/>

2. 公司官网: www.hiaocertnzheng.com

邮箱: hiaocertnzheng@163.com



质量管理体系认证证书

兹证明

山东广晟环保科技有限公司

证书编号: 672021121217183

统一社会信用代码: 913707820579017666

地址: 山东省潍坊市诸城市开发区老泰薛路南

经评审符合以下标准要求

ISO 9001:2015 idt GB/T 19001-2016

认证范围

环保设备(污水处理设备、动物尸体无害化处理设备)的研发、加工、销售。(需资质许可的凭资质经营)

本认证证书的范围和所涉及的法律法规要求一并使用,该要求包含但不限于行政许可、资质范围及CCC认证等。在证书持有者的质量管理体系持续符合标准要求的情况下,本证书的注册有效期是三年。证书的有效性需经SCI定期的监督审核确认有效,本证书使用期限至2022年12月16日,请于此日期前完成监督审核或再认证,逾期未通过审核,本证书作废。

注册有效期: 2021年12月17日至2024年12月16日

签发:



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证书查询方式: 1. 全国认证认可信息公共服务平台: <http://cx.cnca.cn/>

2. 公司官网: www.biaorenrenzheng.com

邮箱: biaorengroup@163.com

Safety Production Standardization Certificate

	
安全生产标准化 Work Safety Standardization	
证书 CERTIFICATE	
证书编号: 鲁 AQE3707JAIII202000117	
山东广晟环保科技有限公司	
安全生产标准化三级企业	
(机械)	
有效期至: 2023 年 10 月	 2020 年 10 月 23 日
	国家安全生产监督管理总局监制 State Administration of Work Safety

证书印制编号: 1003947622

Environmental protection product certification

(副本)



中国环保产品认证证书

证书编号: CQC315083783

申请人名称及地址: 山东广晟环保科技有限公司
山东省潍坊市诸城市开发区老泰祥路南

品 牌: /

制造商名称及地址: 山东广晟环保科技有限公司
山东省潍坊市诸城市开发区老泰祥路南

生产企业名称及地址: 山东广晟环保科技有限公司
山东省潍坊市诸城市开发区老泰祥路南

产品名称: 研发、加工、销售环保设备及配件、食品机械及配件、造纸机械及配件、农业机械及配件、屠宰机械及配件; 电气安装; 水利水电工程、环保工程、市政工程、钢结构工程设计、施工。(依法须经批准的项目, 经相关部门批准后方可开展经营活动)

认证模式: 产品型式试验+初次工厂检查+获证后监督

产品标准/技术要求: CQC51-381001-2009墙漆环保认证规则
上述产品符合CQC51-381001-2009墙漆环保认证规则的要求。

证书有效期: 2021年06月24日至2024年06月23日

证书有效期内本证书的有效性依据发证机构的定期监督获得保持。



主任:

张鹏



中国产品质量认证监督管理中心

<http://www.cqc315.net.cn>

HC 0007324

Various patent certificates

证书号 第14860667号





实用新型专利证书

实用新型名称：一种真空带式干燥机

发 明 人：王进金;李华;李志华

专 利 号：ZL 2021 2 0861629.0

专利申请日：2021年04月25日

专 利 权 人：山东广晟环保科技有限公司

地 址：262200 山东省潍坊市诸城市开发区老泰薛路南

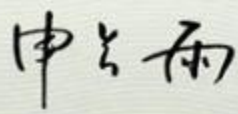
授权公告日：2021年11月26日 授权公告号：CN 214892189 U

国家知识产权局依照中华人民共和国专利法经过初步审查，决定授予专利权。颁发实用新型专利证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。专利权期限为十年，自申请日起算。

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局长
申长雨





第1页(共2页)

其他事项参见续页

证书号 第 14754723 号



实用新型专利证书

实用新型名称：一种新型污水过滤器

发 明 人：王进金;李华;李志华

专 利 号：ZL 2021 2 0859822.0

专利申请日：2021 年 04 月 25 日

专 利 权 人：山东广晟环保科技有限公司

地 址：262200 山东省潍坊市诸城市开发区老泰薛路南

授权公告日：2021 年 11 月 19 日

授权公告号：CN 214763749 U

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申长雨



第 1 页 (共 2 页)

其他事项参见续页

证书号第 14855636 号



实用新型专利证书

实用新型名称：一种污泥浓缩脱水一体机

发 明 人：王进金;张尊娇;李华

专 利 号：ZL 2021 2 0859834.3

专利申请日：2021 年 04 月 25 日

专 利 权 人：山东广晟环保科技有限公司

地 址：262200 山东省潍坊市诸城市开发区老泰薛路南

授权公告日：2021 年 11 月 26 日

授权公告号：CN 214881047 U

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其他事项参见续页

证书号第 14843798 号



实用新型专利证书

实用新型名称：一种微纳米高效气浮机

发 明 人：王进金;张尊娇;李华

专 利 号：ZL 2021 2 0861636.0

专利申请日：2021 年 04 月 25 日

专 利 权 人：山东广晟环保科技有限公司

地 址：262200 山东省潍坊市诸城市开发区老泰薛路南

授权公告日：2021 年 11 月 26 日

授权公告号：CN 214880356 U

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2021 年 11 月 26 日

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其他事项参见续页

证书号第 14753971 号



实用新型专利证书

实用新型名称：一种撬装一体式污水处理设备

发 明 人：赵只增;王进金;李华

专 利 号：ZL 2021 2 0694559.4

专利申请日：2021 年 04 月 06 日

专 利 权 人：山东广晟环保科技有限公司

地 址：261000 山东省潍坊市诸城市开发区老泰薛路南

授权公告日：2021 年 11 月 19 日

授权公告号：CN 214781105 U

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专利证书记载专利权登记时的法律状况。专利权的转移、质押、无效、终止、恢复和专利权人的姓名或名称、国籍、地址变更等事项记载在专利登记簿上。



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其他事项参见续页

证书号第6809169号



实用新型专利证书

实用新型名称：一种膜生物反应器

发 明 人：王进金;李华

专 利 号：ZL 2017 2 0508816.4

专利申请日：2017年05月09日

专 利 权 人：诸城市广晟环保设备有限公司

授权公告日：2018年01月02日

本实用新型经过本局依照中华人民共和国专利法进行初步审查，决定授予专利权，颁发本证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。

本专利的专利权期限为十年，自申请日起算。专利权人应当依照专利法及其实施细则规定缴纳年费。本专利的年费应当在每年05月09日前缴纳。未按照规定缴纳年费的，专利权自应当缴纳年费期满之日起终止。

专利证书记载专利权登记时的法律状况，专利权的转移、质押、无效、终止、恢复和专利权人的姓名或名称、国籍、地址变更等事项记载在专利登记簿上。



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证书号第6809168号



实用新型专利证书

实用新型名称：一种溶气气浮沉淀一体机

发 明 人：王进金;李华

专 利 号：ZL 2017 2 0509307.3

专利申请日：2017年05月09日

专 利 权 人：诸城市广晟环保设备有限公司

授权公告日：2018年01月02日

本实用新型经过本局依照中华人民共和国专利法进行初步审查，决定授予专利权，颁发本证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。

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证书号第6809170号



实用新型专利证书

实用新型名称：一种地理式污水处理设备

发 明 人：王进金；李华

专 利 号：ZL 2017 2 0508813.0

专利申请日：2017年05月09日

专 利 权 人：诸城市广晟环保设备有限公司

授权公告日：2018年01月02日

本实用新型经过本局依照中华人民共和国专利法进行初步审查，决定授予专利权，颁发本证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。

本专利的专利权期限为十年，自申请日起算。专利权人应当依照专利法及其实施细则规定缴纳年费。本专利的年费应当在每年05月09日前缴纳。未按照规定缴纳年费的，专利权自应当缴纳年费期满之日起终止。

专利证书记载专利权登记时的法律状况。专利权的转移、质押、无效、终止、恢复和专利权人的姓名或名称、国籍、地址变更等事项记载在专利登记簿上。



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证书号第6804449号



实用新型专利证书

实用新型名称：一种沉淀过滤一体机

发 明 人：王进金;李华

专 利 号：ZL 2017 2 0508211.5

专利申请日：2017年05月09日

专 利 权 人：诸城市广晟环保设备有限公司

授权公告日：2018年01月02日

本实用新型经过本局依照中华人民共和国专利法进行初步审查，决定授予专利权，颁发本证书并在专利登记簿上予以登记。专利权自授权公告之日起生效。

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专利证书记载专利权登记时的法律状况，专利权的转移、质押、无效、终止、恢复和专利权人的姓名或名称、国籍、地址变更等事项记载在专利登记簿上。



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证书号第15335471号



实用新型专利证书

实用新型名称：一种节能型污水处理设备

发 明 人：赵只增;王进金;李华

专 利 号：ZL 2021 2 0694557.5

专利申请日：2021年04月06日

专 利 权 人：山东广晟环保科技有限公司

地 址：261000 山东省潍坊市诸城市开发区老泰薛路南

授权公告日：2021年12月31日

授权公告号：CN 215365298 U

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其他事项参见续页

