

Provide technical solutions for aerobic biological enhancement treatment that are affordable to build, use and manage well

Multiplicative Improved A2O Process Brief



Loren Industry Co., Ltd.

Add: No.136, Huaxia Yung City , Xishan District,Wuxi, China
Whatapp/wechat/Mobile: +86-13921106199
Contact: Bruce Xiong Mail: Lorenindustry@163.com
Web: www.Lorenenvirontech.com or www.lorenindustry.com

E-Catalogue

Brief

**Innovative
Technology**

**PTA20
Process**

**Typical
Case**

A glowing golden ring of particles, resembling a galaxy or a ring of stars, is centered on a dark blue background. The ring is composed of many small, bright golden particles that form a continuous, slightly irregular circle. The text "01 Brief" is centered within the ring.

01

Brief

Brief Introduction



Loren Industry Co., Ltd is a professional technology company engaged in the design, construction, commissioning and operation of environmental protection projects.

The company takes technology as its core and focuses on the R&D and application of environmental protection technology. It has long-term cooperation with Tsinghua/tongji/Henan /Zhengzhou/Zhejiang/ British Birmingham, University, Chinese Academy of Sciences, USA TETRATECH Company, Germany Osenten Group etc. We have mastered advanced technologies and practical experience in a variety of environmental protection fields.

Enterprise Culture



- * **Kindness**
- * **Thanksgiving**
- * **Enlightenment**
- * **Learning**
- * **Integrity**
- * **Focus on**
- * **Innovation**

Crowdfunding wisdom, resource integration, platform construction, complementary advantages, symbiosis and win-win, sharing and co-creation. Group management, professional operation, and in-depth development.

Vision

Live an honest life, work conscientiously, and be worthy of your conscience.

Mission



Idea



Employees have a satisfying life, customers receive satisfactory services, and ecological civilization coexists harmoniously.



Value



Technology makes life better, environmental protection makes the world more beautiful.

Company Charity Activities



Corporate Social Responsibility



We hosts the Environmental Forum



Company Exchange Activities



In 2021, our company has reached multiple cooperations with Muyuan Meat Group and jointly held annual environmental protection technology seminars.





02

Innovative
Technology

Scientific Research Strength

We have established long-term cooperative relationships with the School of Ecology and Environment of Zhengzhou University, the School of Environment and Planning of Henan University, and the Henan Provincial Soil Heavy Metal Pollution Control and Restoration Engineering Research Center. With enterprises as the main body of technological innovation, universities and research institutes collaborate to quickly Realize the application and transformation of advanced technologies in the field of environmental protection and further enhance the company's technical strength.

*Main members of the expert team: Dr. Zhang Jiansan, global chief scientist of Germany's Olson Environmental Protection Group, Dr. Jiang Ruiyuan, a senior environmental engineering expert from the famous American Tetra Tech company, researcher Li Handong of the Chinese Academy of Environmental Sciences, Professor Masato Nomura of Kinki University, Japan, Professor Wang Hailong of Zhengzhou University, Henan Professor Ma Jianhua from the University, Professor Ma Luming from Tongji University, and Dr. Lu Gongda from the University of Birmingham, UK.



Academic Exchange



- Invited to attend the Shiyao Annual Meeting of China Ecological Civilization Promotion Association



- Invited to participate in the 2021 (Second) Peking University Ecological Environment Development Forum



- Established a research institute jointly with Zhengzhou University

Cooperative Groups



**Aqseptence
Group**



Technology Leaders

1 Peng Yongzhen, Academician of Chinese Academy of Engineering

2 Xia Qing, Chief Engineer, Chinese Academy of Environmental Sciences

3 Ma Luming, professor at Tongji University, electrochemistry expert

4 Jiang Ruiyuan, senior expert at Tetra Tech

5 Zhang Jiansan, senior expert of German Osenten Group

6 Zhang Shuliang Henan University of Technology specializes in chemical wastewater

7 Li Shunyi, Professor of Zhengzhou University, specializes in biological deodorization of sewage stations

8 Deming Lai Taiwan LeadMed Environmental Technology specializes in the research and development of anaerobic ammonium oxidation technology

9 Wang Hailong, professor at Zhengzhou University, specializes in strong oxidation technology and sewage terminal treatment



Technology Patent



Core Technology

1. Anaerobic Ammonium Oxidation Technology

2. Fluidized Bed Fenton Oxidation Technology

3. Ozone Catalytic Oxidation Technology

4. Electrocatalytic Oxidation Technology

5. IC Anaerobic Technology

6. Biological Deodorization Technology

1. Anaerobic Ammonium Oxidation Technology

Anaerobic ammonium oxidation uses the biochemical reaction of anaerobic ammonium oxidizing bacteria to directly convert ammonia nitrogen and nitrate nitrogen contained in sewage into nitrogen gas. The bacteria involved in the anaerobic ammonium oxidation process are called anaerobic ammonium oxidizing bacteria. It is generally believed that anaerobic ammonium oxidizing bacteria are autotrophic bacteria, using carbon dioxide or carbonate as the carbon source, ammonium salt as the electron donor, and nitrite/nitrate as the electron acceptor.

Anaerobic ammonium oxidizing bacteria are a type of bacteria that belong to the Planctomycetes phylum. "Red Bacteria" is the common name for anaerobic ammonium oxidizing bacteria in the industry. Through biochemical reactions, they can convert ammonia nitrogen contained in sewage into nitrogen for removal. They are important to the global nitrogen cycle and are important bacteria in wastewater treatment.





Technique Merit



**Outlet Sludge
Reduce Over 30%
disposal Charge**



**Reduce aeration
volume and power
consumption**



**No external carbon
source is required,
and the produced
methane can be
recycled**



**It can reduce
denitrification
operation costs by
50% and save 50%
space area.**

2. Fluidized Bed Fenton Oxidation Technology

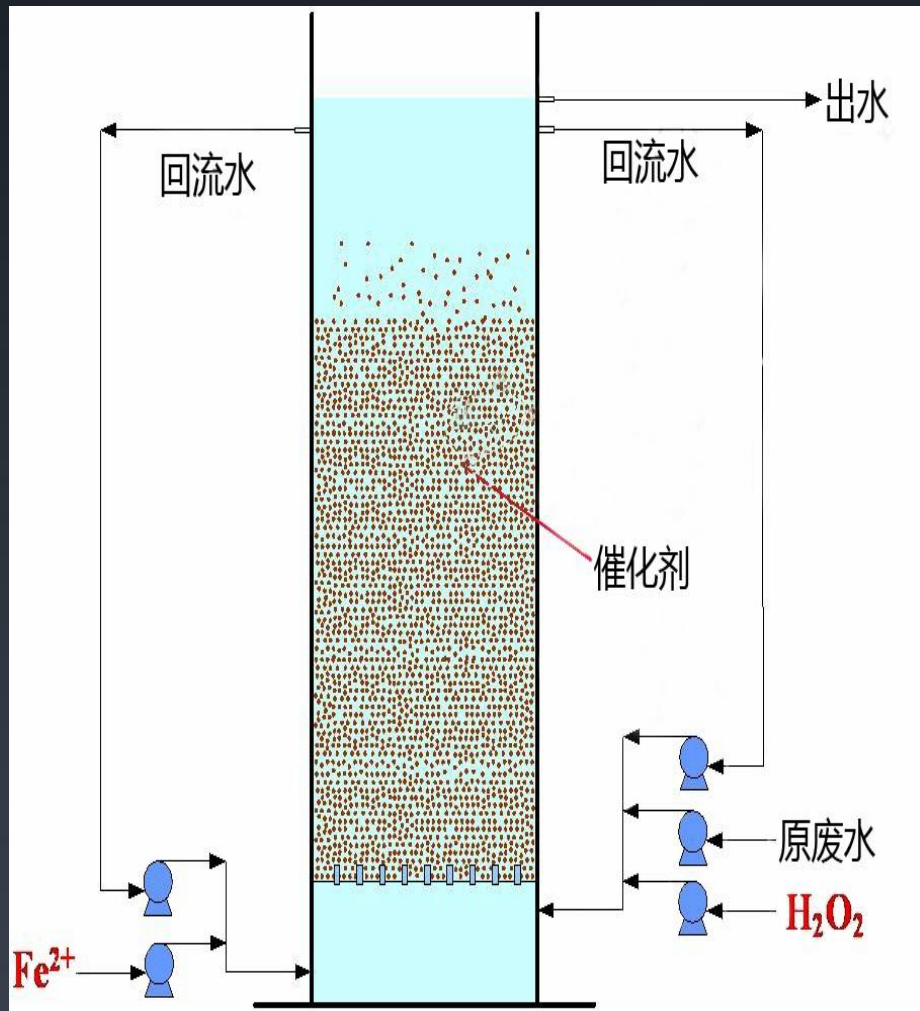


Technical Introduction

A new technology that improves the traditional fluidized bed Fenton structure and combines functions such as corresponding chemical oxidation, heterogeneous chemical oxidation, fluidized bed crystallization and reduction and dissolution of FeOH . This technology improves biochemical properties while reducing the amount of chemicals used and the sludge generated. quantity.

This technology can be applied to chemical wastewater such as pesticide wastewater, coking wastewater, printing and dyeing wastewater, etc., to effectively remove COD, SS and chroma, and improve the biodegradability of wastewater.





Technique Advantages



System Investment Reduce 20%



No external mixing required, saving energy and reducing consumption



Improve structure & mass transfer efficiency and shorten reaction time



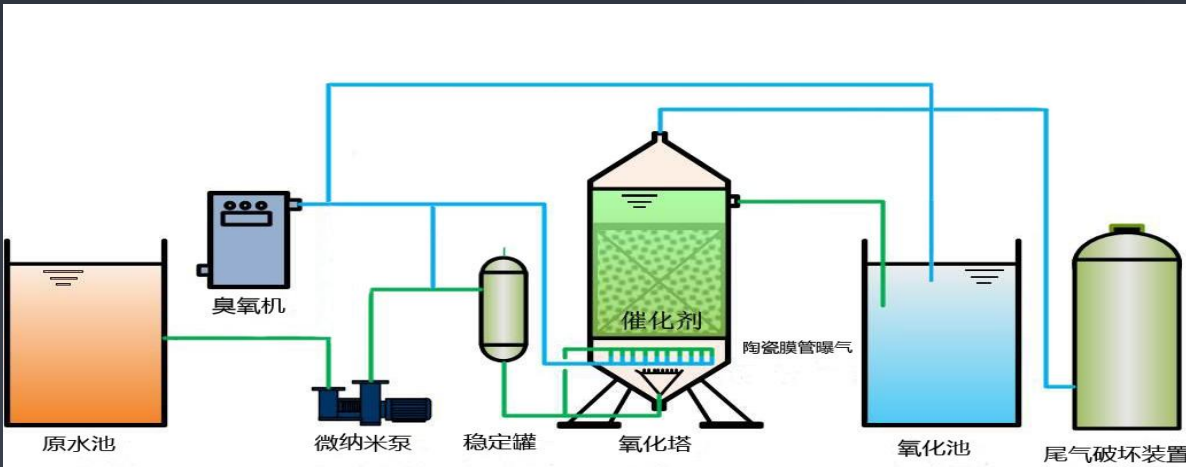
Use heterogeneous catalysts to improve treatment effects

3. Ozone Catalytic Oxidation Technology



Use multi-phase catalysts to promote the catalytic decomposition of ozone and the generation of hydroxyl radicals, improve the catalytic effect of ozone, strengthen the decomposition of highly stable and difficult-to-degrade organic pollutants in water, and solve the problems of low ozone utilization and low oxidation operation efficiency in traditional ozone processes. .

Mainly used in high-color, refractory wastewater such as spices, medicine, printing and dyeing.



Technique Advantages



Ozone utilization rate increased by more than 95%



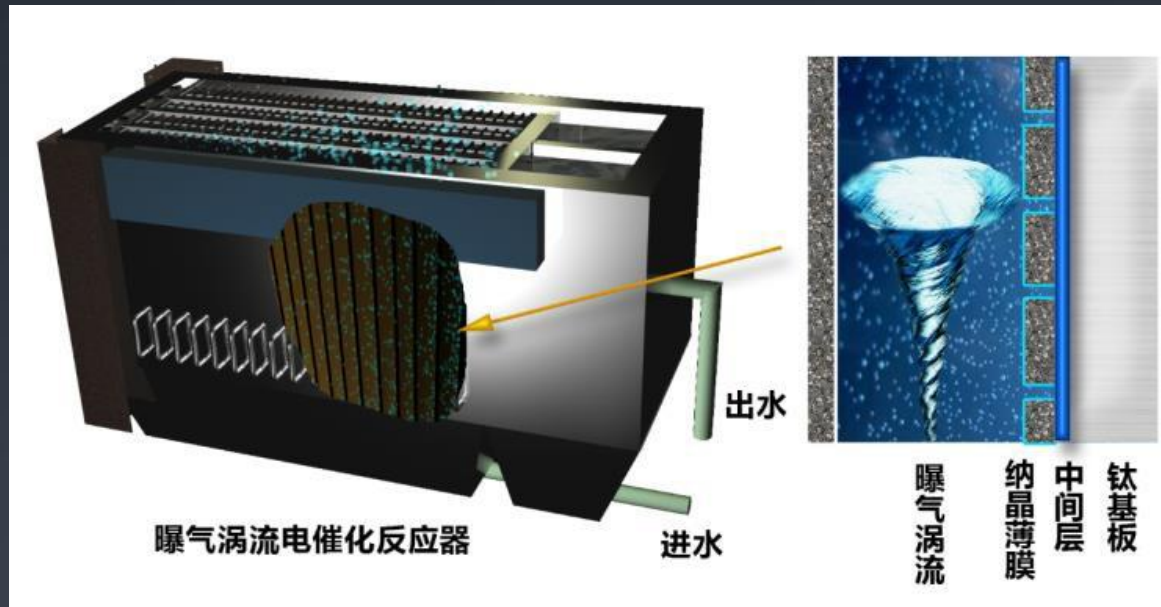
Easy to install and simple to maintain



The Run power is reduced Over 60% Under the same efficiency

4. Electrocatalytic Oxidation Technology

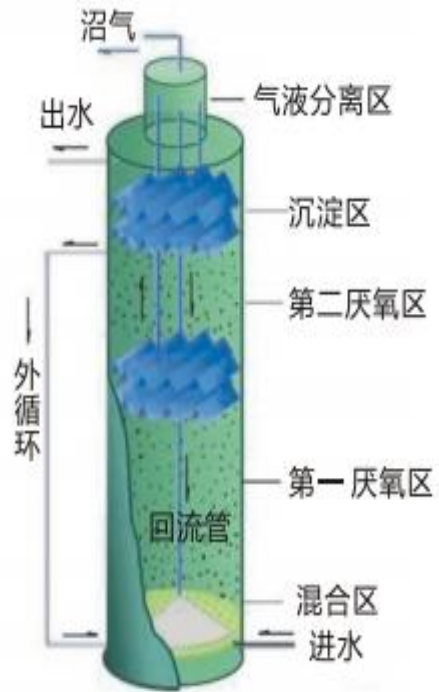
Electrocatalytic technology uses electrochemistry to generate a large number of highly active hydroxyl radicals ($\bullet\text{OH}$), which can react with organic compounds by adduction, substitution, electron transfer, bond breaking, etc., to oxidatively degrade refractory macromolecular organic matter in wastewater into low-density Toxic or non-toxic small molecular sub-substances, or even directly mineralized into CO_2 and H_2O . It is suitable for industrial wastewater that is difficult to biodegrade such as coking, coal chemical industry, petroleum, textile, printing and dyeing, tanning, fur processing, steel, pesticides, medicine, etc.



Technical Advantages

- (1) Using nanocrystalline composite metal oxide porous film electrode materials, the pollutant degradation efficiency is doubled.
- (2) The electrodeposition nanocrystal surface coating process is introduced to extend the service life to 30 years and reduce the initial investment cost and operating cost of the device.
- (3) It is easy to operate and manage, easy to realize automatic control, does not need to add chemicals, and occupies less space.

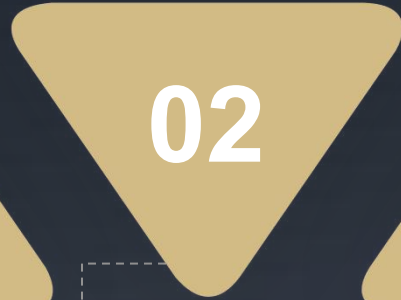
5. IC Anaerobic Technology



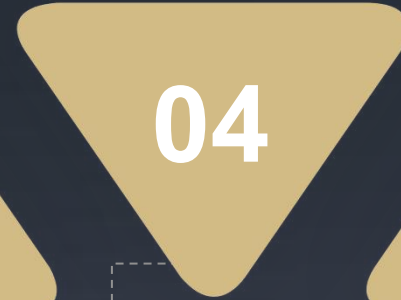
The IC reactor consists of two layers of UASB reactors connected in series, and is divided into 5 zones from bottom to top: mixing zone, first anaerobic zone, second anaerobic zone, sedimentation zone and gas-liquid separation zone.

The height can reach 16-25m, the height-to-diameter ratio is generally 4:8, and it is composed of 5 basic parts: mixing zone, granular sludge expanded bed zone, fine treatment zone, internal circulation system and water outlet zone. The internal circulation system is the core structure of the IC process and consists of a three-phase separator, a biogas riser, a gas-liquid separator and a mud-water downcomer. bacteria. It is often used in brewing wastewater, soy product processing wastewater, food processing wastewater, slaughtering wastewater, breeding wastewater, etc.

• **Inlet Organic Load Can Be Over 3 times than that of Ordinary one**



• **Save Investment and Mounting Room is 1/4 of That Ordinary One**



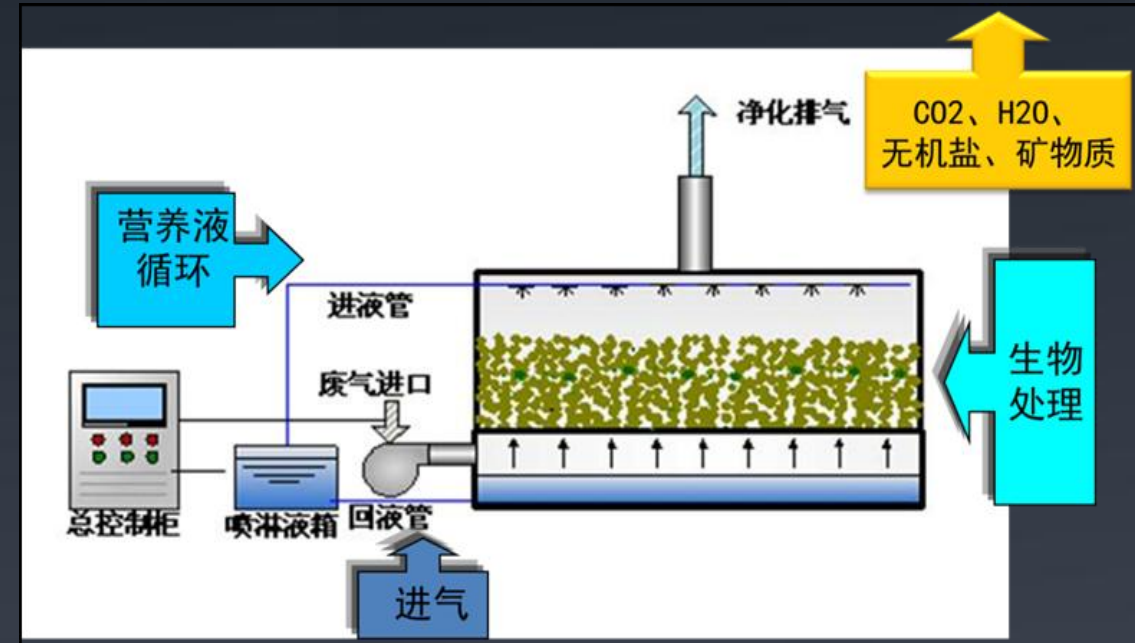
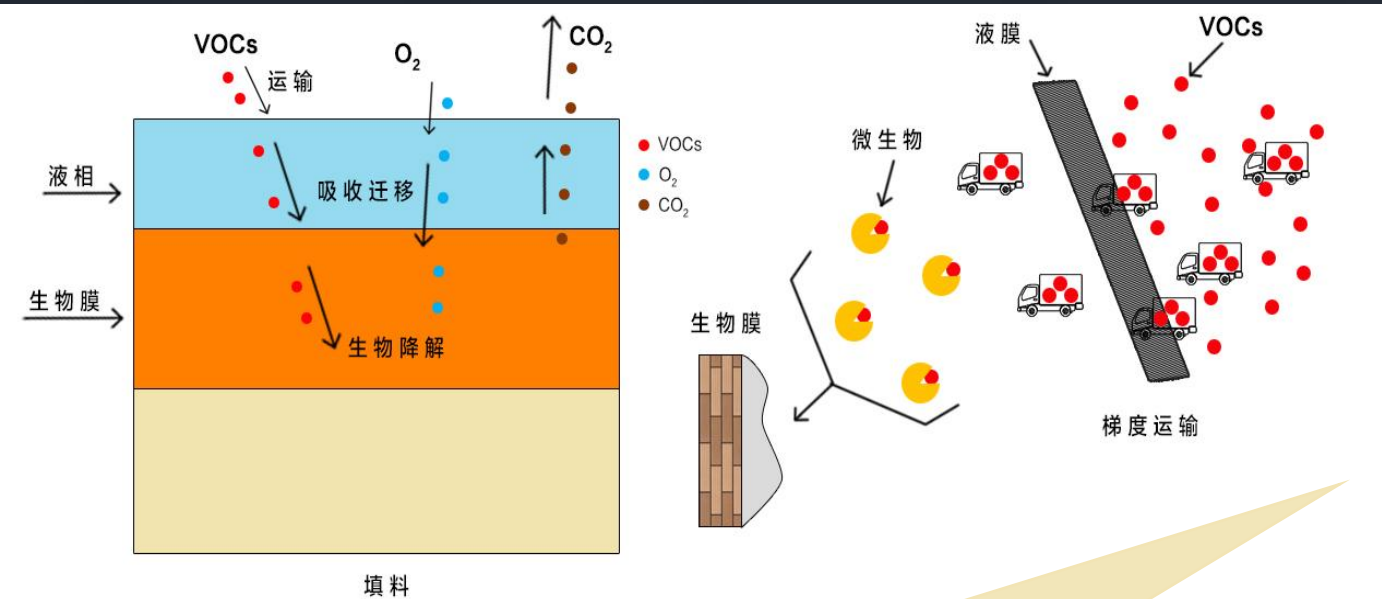
• **About 1~2 Months Short Starting Period**



• **It has strong low temp. resistance, the ability to buffer pH, and good water output stability**

• **Strong impact load resistance: when processing low-concentration wastewater (COD2000~3000mg/L), the internal circulation flow rate in the reactor can reach 2~3 times of the incoming water; when processing high-concentration wastewater (COD10000~15000mg/L), the internal circulation flow rate It can reach 10 to 20 times the water inflow.**

Biological Deodorization Technology



The conditions are mild, normal temperature and pressure; the equipment is simple and easy to maintain; there is no secondary pollution; and the operating cost is low.



03

PTA20

Process



PTA20 Process Technology Brief

PTA20 (Perfect Type Anaerobic Anoxic Oxidation) It Is Our Newly Developed Leading Innovative Microbial Universal Sewage Treatment Process That Uses Air As The Only Power Source For Removing Major Biological Nitrogen And Phosphorous By Absorbing Newly German Bio-Multiplication Process In The Industry As Its Technological Source.

- Simplify Air Power As Its Unique Mechanical Power**
- Achieves Coupled Denitrification In Both Time & Space from Simple Variable**
- Obtain Low DO, High Sludge Concentration & Short-Process Denitrification by Controlling DO Change**
- Flexible Large Parameter Adjustment or Change from Difficult to Easy In Big Site Change Condition**



Save 30% of The Total Investment

3 Large Merits of PTA20 Process Compared with Traditional One



Save 30% of the Taken Up Room



Save 30% of the Running Cost



It Can Solve Industry Difficulties & Pain Points

1) The current STP has a lot of power equipment & a high accident rate!

PTA20 process will make a new era of using Single air power as future nitrogen and phosphorus biochemical removal Process

2) Its Low tank capacity utilization rate & it is difficult to further Upgrading or reduce consumption

The PTA20 process opens a new era of nitrogen and phosphorus removal which is equivalent to biological multiplication process without using membrane filtration with low dissolved oxygen ($\leq 0.5\text{mg/L}$) and high sludge concentration (5~12g/L).

3) The current STP consumes much energy & it is difficult to improve its removal efficiency of nitrogen and phosphorus.

The PTA20 process allows future biochemical treatment processes to simultaneously denitrify in both space and time, ushering in a new era of coupled denitrification and phosphorus removal.

4) The current STP has limited response to Impact Load Change & it is difficult to safeguard stable outlet standards.

The PTA20 process assures flexibly adjust changing operating conditions and the effluent water quality stable and up to standard

5) Current STP has multiple on-site long period concrete construction projects, which has difficulty in ensuring Quality

The PTA20 process adopts factory modular prefabrication and on-site skid-mounted construction, thus realizes a new era of leap-forward development of new assembly methods.

6) It is difficult to reuse recycled water from urban sewage treatment nearby and to utilize its water resources as well as build water ecology.

The PTA20 process will make it easier to popularize and build modern garden underground STP in central urban areas in the future, moving urban STP towards repeatable recycling and utilization, and realizing a new era of new resource-creating station construction.



The Technology Service We Can Provided

- Aeration System Upgrading And Transformation
- Sludge Return System Upgrading And Transformation
- Sludge Water Separation System Upgrading And Transformation
- Blast Control System Upgrading And Transformation
- In-Situ Standard Improvement Transformation
- In-Situ Capacity Expansion Transformation
- Energy Consumption Reduction Transformation
- Sewage Treatment Plant Resource Creation Transformation
- Intelligent Unmanned a Package Of Comprehensive Solutions For Technological Transformation Of Process Packages That Are Urgently Needed For Sustainable Operation Of Future Sewage Treatment Plants And Carbon Emission Reduction, Such As Duty-Based Transformation
- Cost-Effective Overall Solutions For Resource-Creating Station Construction
- Modular New Prefabricated Sewage Treatment Plant Construction In Urban Centers Required By The Future Market
- Providing Process Package Technology.



1

Technology Sources and Advantages Comparison

Process Production Background and Technical Support

Process Production Background

1. Environmental protection emission standards and supervisiol are becoming increasingly stricter and tighter.
2. The existing traditional standard is getting longer,the investment and operating costs are getting higher, and it is becoming more and more difficult for the STP , ETP to operate sustainably

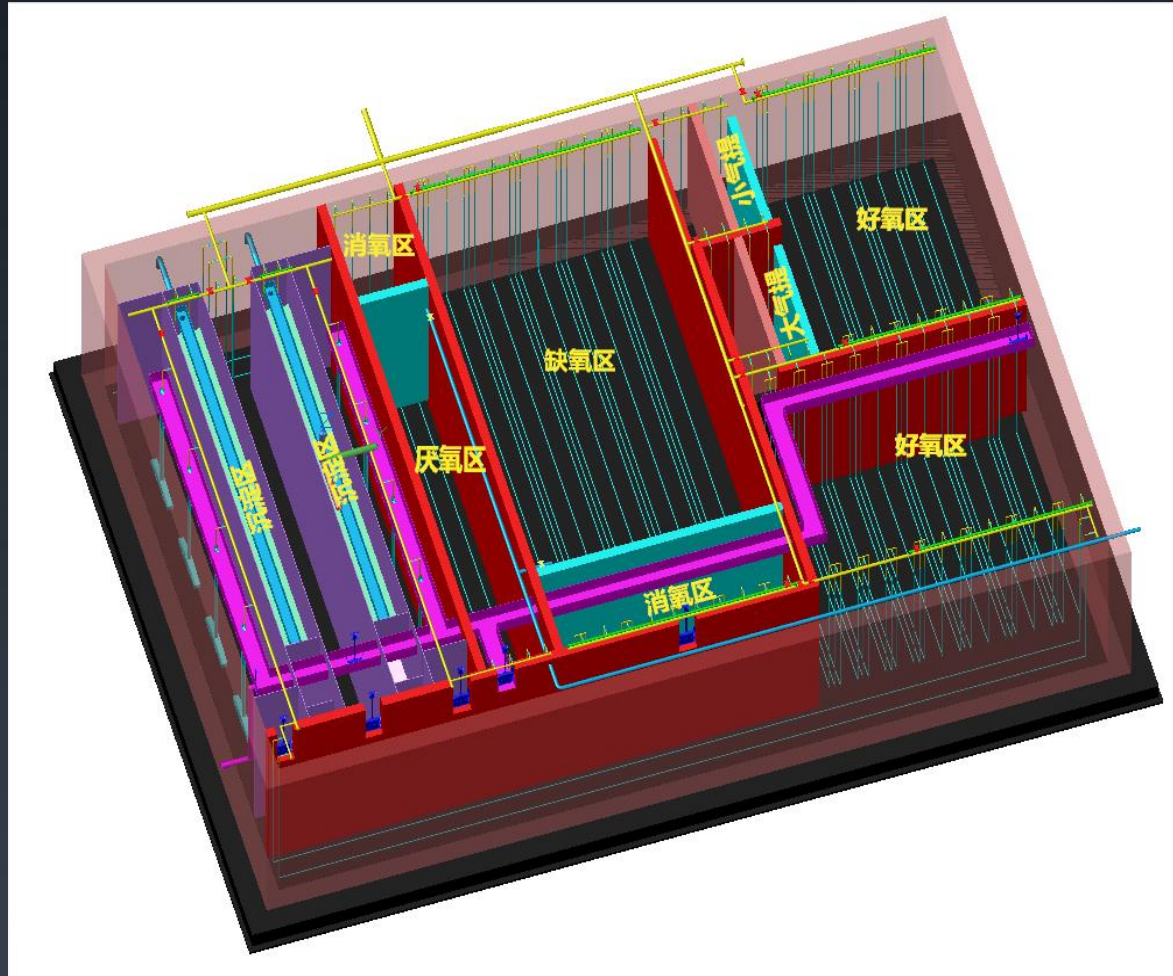
Relying on pioneering core process technology sources

- New technological achievements relys on traditional A2/O process
- Our Newly System bases on German biological multiplication technology .
- Relys on SBR spatio-temporal denitrification automatic control technology
- Relys on our independetly researched Groundbreaking integrated floor plan

Relying on pioneering core key machinery &superior technologies

- Relying on groundbreaking new energy-saving hose aeration device
- Relying on new mud-water separation device with high solid retention
- Relying on new high-ratio sludge return gas lift and return device
- Relying on the new automatic control device of precise blowing





1) Relying on the main technical advantages of the traditional A2/O process

Inheriting the traditional A2O process, the anaerobic, anoxic, aerobic and sedimentation functional areas are clearly divided, the internal and external sludge used for denitrification and phosphorus removal is clearly recirculated, and the technical advantages are easy to control. It continues the technical advantages of multi-point distribution of incoming water and multi-point return of sludge and nitrification liquid that have been newly developed in recent years in the traditional A2O process.

2) Relying on the main technical advantages of German biological multiplication technology

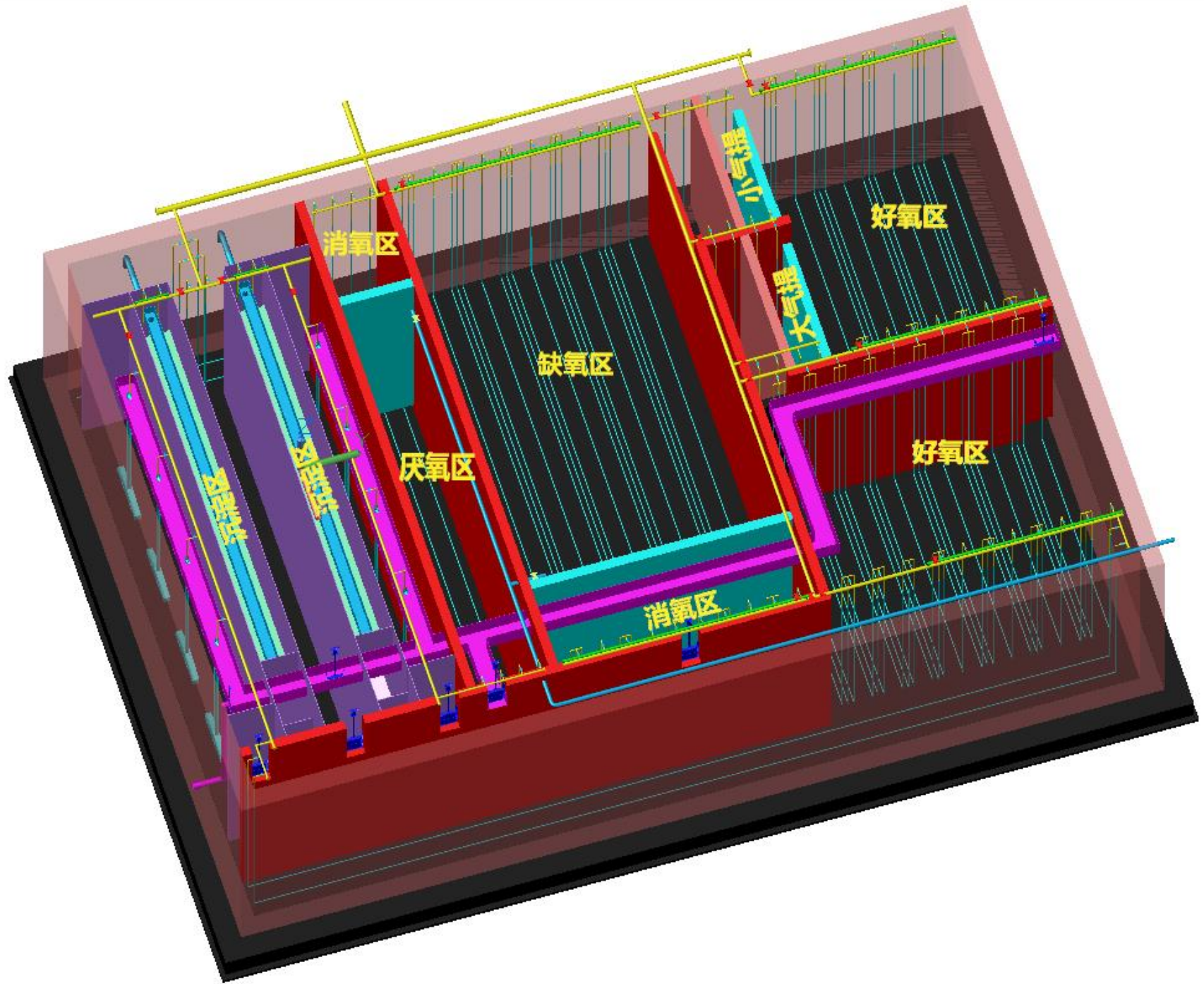
- Original low ventilation hose aeration technology
- Original air stripping and reflux technology
- Original high-load inclined tube sedimentation interception technology
- Original precise dissolved oxygen control technology
- Original low DO (0.1~0.3mg/L), high sludge concentration (5~12g/L) process route
- Original integrated structural design concept

3) Relying on the main technical advantages of SBR spatiotemporal denitrification automation control

Original SBR spatio-temporal denitrification automatic control technology

4) Relying on the technical advantages of independently developed integrated floor plan

The anaerobic, anoxic, aerobic and precipitation functional areas of the traditional A2O process have been integrated into an integrated structural design. Realized the energy-saving design of replacing "pipe" with "canal" and dual-purpose "gas"





Stable

Only 1 Blower Drive, Run Model Flexibal ; Reflux dilution in large proportions, The number of microorganisms per unit pool capacity, utilization rate, and oxygenation efficiency are doubled; the Sludge Dencity can be controlled separatedly



Precise

Achieve precise control of dissolved oxygen, aeration time, and aeration tank volume, thereby achieving precise control of energy consumption.



Save

It can save more than 30% in investment, land occupation and operation costs..



Simple

There is little human intervention, it does not rely on professional operation and maintenance personnel, and it is easy to achieve unattended and intelligent management.





2

Introduction to PTA20 Process Technology

Relying on core equipment technology introduction

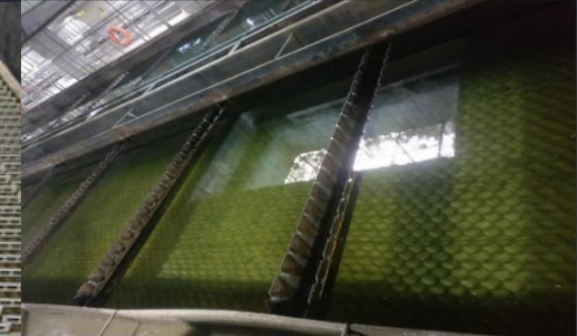
The existing domestic aerobic process core equipment consists of: aeration and oxygenation systems, mud-water separation systems, sludge internal and external return systems, and blast automation control systems.

However, the technological development of the four core equipment mentioned above in the existing aerobic process has actually been basically stagnant, with almost no substantial breakthroughs. Therefore, this directly restricts the further upgrading of the existing aerobic process to a large extent! It directly hinders the further improvement of the processing capacity and processing efficiency of the traditional aerobic process.

Based on this, the PTA2O process took the lead in realizing the upgrade of the above four key core equipment.



New aeration & oxygenation system



New high solids retention mud-water separation system

New sludge return system



New Blower Control System



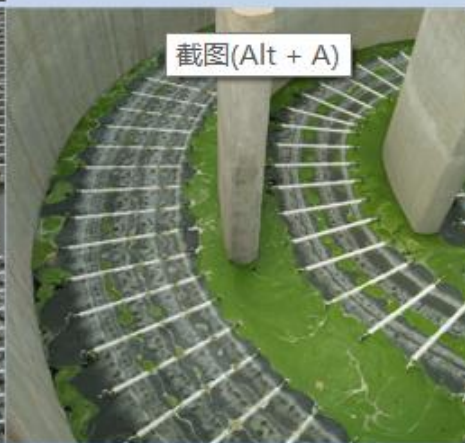


Technical advantages of new aeration system



新型曝气系统

- 利于实现同步短程硝化反硝化，厌氧氨氧化，节省碳源及运行能耗；
- 氧传递效率50%以上，动力效率12kgO₂/KWh以上，效率提升30%~50%，节能效果显著；
- 可不停产维护维修及更换，省去清淤等工作量及费用，简化日常管理；
- 可满足矩形、弧形、圆形等不同池形改造布置设计需求，适应性广；
- 自带防堵塞设计模式，长效延寿更有保障；
- 助力实现空间脱氮与时空脱氮并存设计；
- 助力单位池容微生物数量倍增时充足供氧需求；
- 助力运行参数及运行模式实现灵活调整；



The innovative aeration system creates a new model of energy saving with low ventilation volume and "one" air with multiple uses.

结论：创新后的曝气系统开创了低通气量节能及一“气”多用的新设计方式



Technical advantages of new airlift sludge return system



新污泥回流系统

- 基于流体力学原理，借助生化池自身曝气和特殊的结构形式，达到“一气两用”，实现泥水混合液的提升，以满足整个生化系统污泥内外回流比的需求，同时还可提供好氧类似氧化沟流态所需的自我循环回流所需的高倍比的推流稀释比，以降低反应池内污染物浓度梯度，使其达到近乎完全混合及推流的效果，以提高生化系统的抗冲击能力和池容利用率。这种类似气提泵以空气为动力源的气提回流系统，取缔了水下推流器、回流泵等动力设备，可省去大量的动力设备维护维修费用和工作量，大幅降低污水处理厂的事故率。

The innovative sludge return system creates a new design model for energy-saving large-scale return using gas as the power source.

结论：创新后的污泥回流系统开创了以“气”为动力源的节能型及大比倍回流新设计模式



new high-solid mud-water separation system

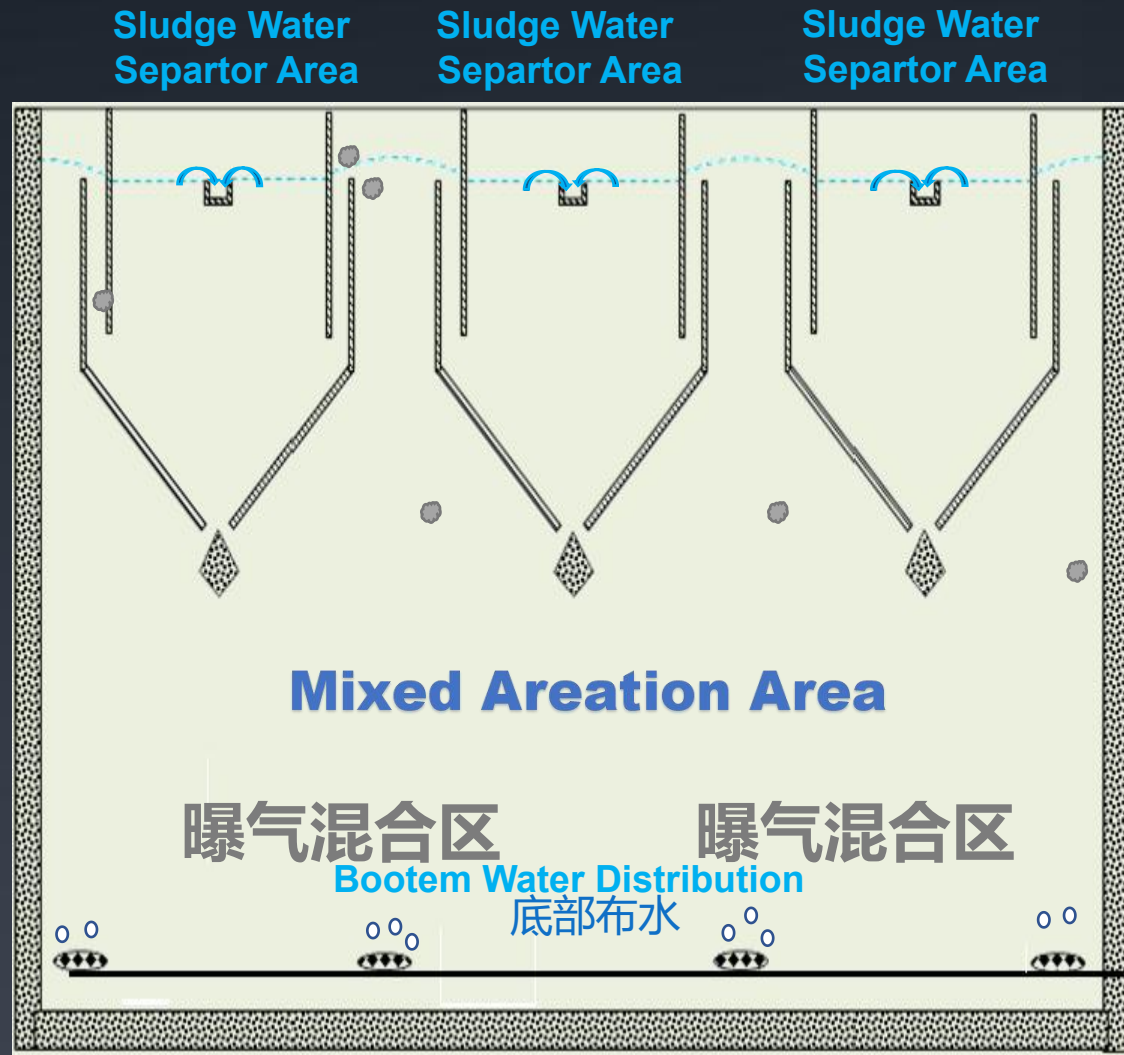


新型高固泥水分离系统

- 沉淀系统高固体通量 ($350\text{kg}/\text{m}^2\cdot\text{d}$ 以上) 及高表面负荷 ($1.8\sim 2.7\text{m}^3/\text{m}^2\cdot\text{h}$) ;
- 曝气与沉淀组合, 一体化集约式结构设计, 具有生物代谢功能;
- 可省去刮泥机、回流泵等动力设备, 能够做到污泥无动力全回流;
- 可实现无膜类似MBR高污泥浓度 ($5\sim 12\text{g}/\text{l}$) 运行;

Creative Mud-water Separation System Make The Activated Sludge Method Can be Run under high Sludge Density without Membrane inside.

结论: 创新后的泥水分离系统开创了活性污泥法无膜也可以高污泥浓度运行的新设计方式



Sludge Water
Separator Area

Sludge Water
Separator Area

Sludge Water
Separator Area

Mixed Aeration Area

曝气混合区

曝气混合区

Bootem Water Distribution

底部布水





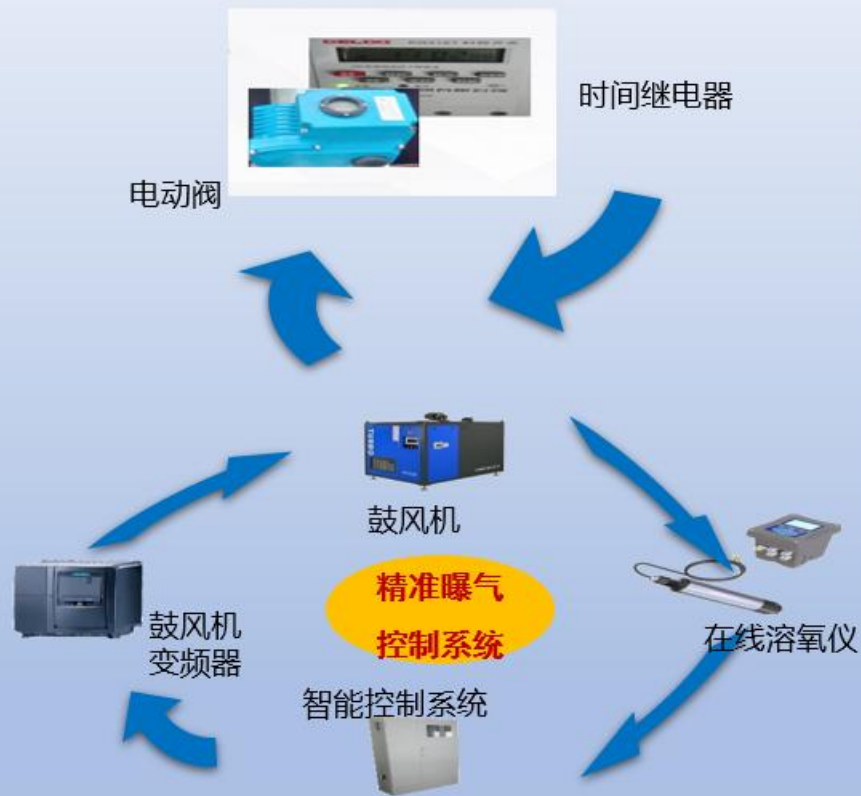
New Precise Blower Control

Merit

新型精准曝气控制系统

精准曝气控制系统是指在风机变频器、在线溶氧仪和溶氧PLC智能控制系统三者之间实现实时联锁及通过以时间为自动化控制技术手段，实现精准控制曝气池容及曝气时间。

- 可实现生化系统随水质水量变化按需供风，以确保溶氧稳定精确的控制
在所设定的范围内(最小控制精度可达0.1~0.3mg/l);
- 可同步调整生化系统的回流稀释比以及污泥内外回流比;
- 极大的提升了生化系统的抗冲击能力和出水水质稳定达标的保障性;
- 有利于生化系统在较低的溶氧下稳定运行，实现同步短程硝化反硝化;
- 可精准曝气池容及曝气时间，实现缺氧池容最大化，总氮去除效率最大化，节省能耗及降低碳源投加量;



**The precise blast control system creates a new design model
for online and time dual-mode control**

结论：创新后的精准鼓风机控制系统开创了在线和时间双模式控制的新设计模式

A glowing golden ring of particles, resembling a galaxy or a ring of stars, is centered on a dark blue background. The ring is composed of many small, bright golden particles that form a continuous, slightly irregular circle. The text "04 Typical Case" is centered within the ring.

04

**Typical
Case**

Implementation project effect

Classic Case 1: CASS Process Transformation

Place:
Haerbin
Exection time:
Year 2021年
Original Scale:
50000TPD
Problem Existed:
Outlet Criterial From C
80000TPD Scale



Process flow after transformation:
Pretreatment+ Improved A2O Reactor +HD Settler+Fiber Disc Filter+ contact disinfection
Specific implementation plan for transformation:
Without increasing the biochemical reaction pool, the original eight groups of biochemical pools will be used for upgrading and transformation, so that the total treatment capacity will be increased from the original 50,000m3/d to 65,000m3/d. The main measures are: skid-mounted high-strength composite panels in the protization tank, and reorganize functional zoning according to the functional zoning requirements such as anaerobic zone, anoxic zone, aerobic zone and sedimentation required by the PTA2O process. After debugging, the actual water volume of the biochemical pool directly reaches 80,000 tons per day, and the water output is better than Class A, directly reaching the quasi-Class IV emission standard. The total residence time of the system is less than 15.5 hours, and the entire construction period is only 45 days. All electricity is used. The direct cost of water treatment per ton of chemicals and chemicals is reduced to less than 0.2 yuan (biochemical)

Design Effluent Water Quality

指标	COD _{Cr}	BOD ₅	SS	TN	NH ₃ -N	TP	设计水温
数据 (mg/l)	450	150	200	55	45	7	≥8°C

出厂水参数

- 出水COD: 14.707 mg/l
- 出水氨氮: 0.444 mg/l
- 出水总磷: 0.353 mg/l
- 出水总氮: 3.764 mg/l
- 出水PH: 7.051
- 出水SS: 4.066 mg/l
- 瞬时流量: 533.6 l/s
- 今日总流量: 31530.6 T
- 昨日总流量: 49558.8 T
- 累计总流量: 22275987.1 T

15:45 | 2021-08-24 | 星期二 多云 26°C | 水质报表

哈尔滨市·四平路 | 2021年8月24日

CAST3 0.00 m

CAST4 今日水印 - 相机 - 0.00 m 真实时间



Place: Anping, Hebei Province

1.Main Design Parameter

5.2 工艺设计说明

1、废水水量

该污水处理站设计处理规模为 1500m³/d。

2、设计进水

根据污水厂进水数据统计，污水站运行数据测试期间进污水中含有部分未处理养殖废水，因此 COD 值较高，改造后沼液直接进入污水处理站，进水指标如下：

COD: 3000mg/L 氨氮: 1100mg/L 总氮: 1200mg/L

3、设计出水水质

设计出水指标满足《畜禽养殖业污染物排放标准》GB18596-2001，即

COD ≤ 400mg/L 氨氮 ≤ 80mg/L 总磷 ≤ 8mg/L

4、工艺流程

沼液发酵预处理（利旧）+ 格栅（利旧）+提升泵（利旧）+初沉池（利旧）+调节水解酸化一体化池（利用原有 A/O 池进行改造）+ PTA2O 生化池（新建）+混合沉淀池（新建）+消毒池

5.3 调试运行情况说明

河北裕丰京安养殖有限公司养殖废水处理工程于 2018 年 4 月 3 日开始通水试车及生化调试，接种污泥采用市政污水处理厂污泥，经过近 2 个月调试，系统已稳定运行，生化系统末端溶解氧在 0.1-0.5mg/L 之间 pH 在 6.3-7 之间。出水各项指标明显优于《畜禽养殖业污染物排放标准》GB18596-2001，具体进出水情况如下：

京安养殖废水处理项目实际进水情况

项目	COD mg/L	氨氮 mg/L	总氮 mg/L	总磷 mg/L	来水量 m ³
最高值	8538	1040	1317	299	1871
最低值	1337	605	617	33.9	1009
平均值	2155	790	881	63.4	1445

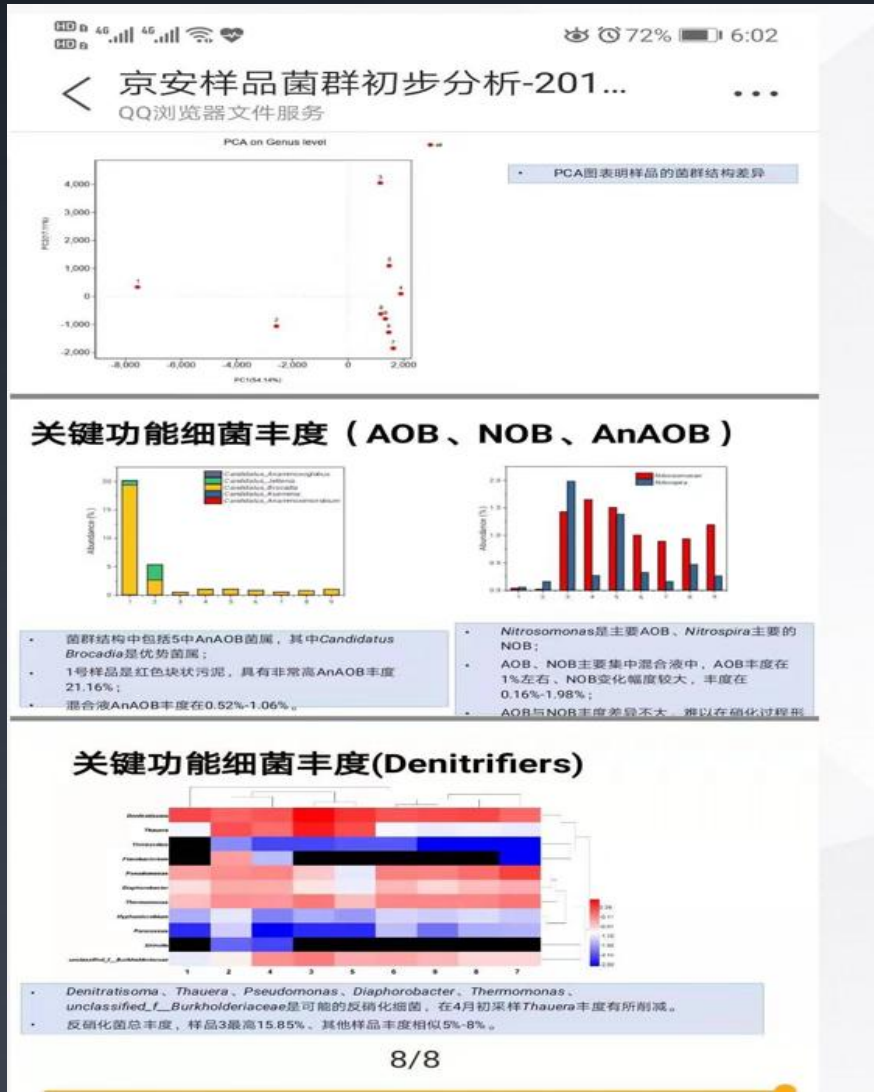
京安养殖废水处理项目出水情况

项目	COD mg/L	氨氮 mg/L	总氮 mg/L	总磷 mg/L
出水	≤150	≤10	≤60	≤5.0

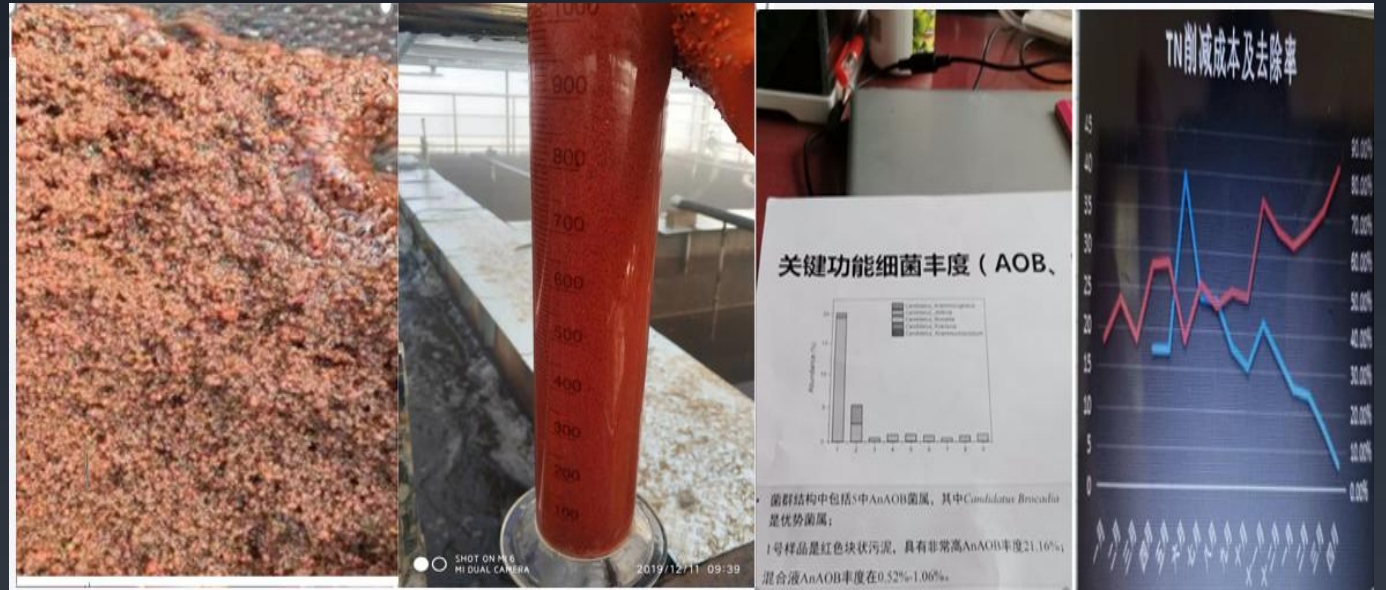
备注：未投加碳源。

This project finally realized anaerobic ammonium oxidation through debugging, and the operating power of the fan was reduced from 167KW at startup to the maximum operating power of 35kw. The cost of dosing has been reduced from about 10,000 yuan per day for adding alkali and carbon sources at the start-up to now without adding alkali and carbon sources, and the quality of the effluent is better.

2. Project Implementation Effect



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3. Project highlights:

- A. The sludge density is 5~10g/L high, the Ru DO≤0.1mg/L with small Pool Size
- B. The integted built-in aeration zone for Sludge totally return without power by eliminating the scraper and suction machine commonly used in sedimentation.
- C. Adopt Air Mixing to replace submersible mixing in anaerobic and anoxic zones without external carbon sources and alkali additions; the sludge reflux and nitrification liquid reflux are all replaced by air lift reflux. Mechanical pump backflow, no daily maintenance and repair costs.
- D. There is no mechanical power equipment underwater, and the power equipment is minimal. Only two pcs 35kw aerobic fans are running (1 in use and 1 in standby);



Peikin Changping District

As shown in the figure:

This underground sewage treatment station has clear water and gurgling streams. There are Pingshan Mountains in the distance and pavilions and buildings nearby. Walking slowly on the winding wooden plank road accompanied by the singing of birds and the fragrance of flowers, it is exceptionally quiet and elegant. The lighting and sound equipment embedded in the park naturally and perfectly integrate into the overall environment. The sound of silk and bamboo lingers, and the antique flavor is appreciated by both elegant and popular people. The entire station area replaces the roar of machines with beautiful music, and replaces unpleasant smells with the fragrance of flowers that are like spring all year round. Entering such a "garden attraction" without the roar of power equipment, there is only greenery, gurgling water, and different flower and tree landscapes in different seasons. It is difficult for people to realize that it is a sewage treatment station, which subverts people's inherent impression of sewage treatment.

Capacity: 3000m³/d; IV Standard Discharge



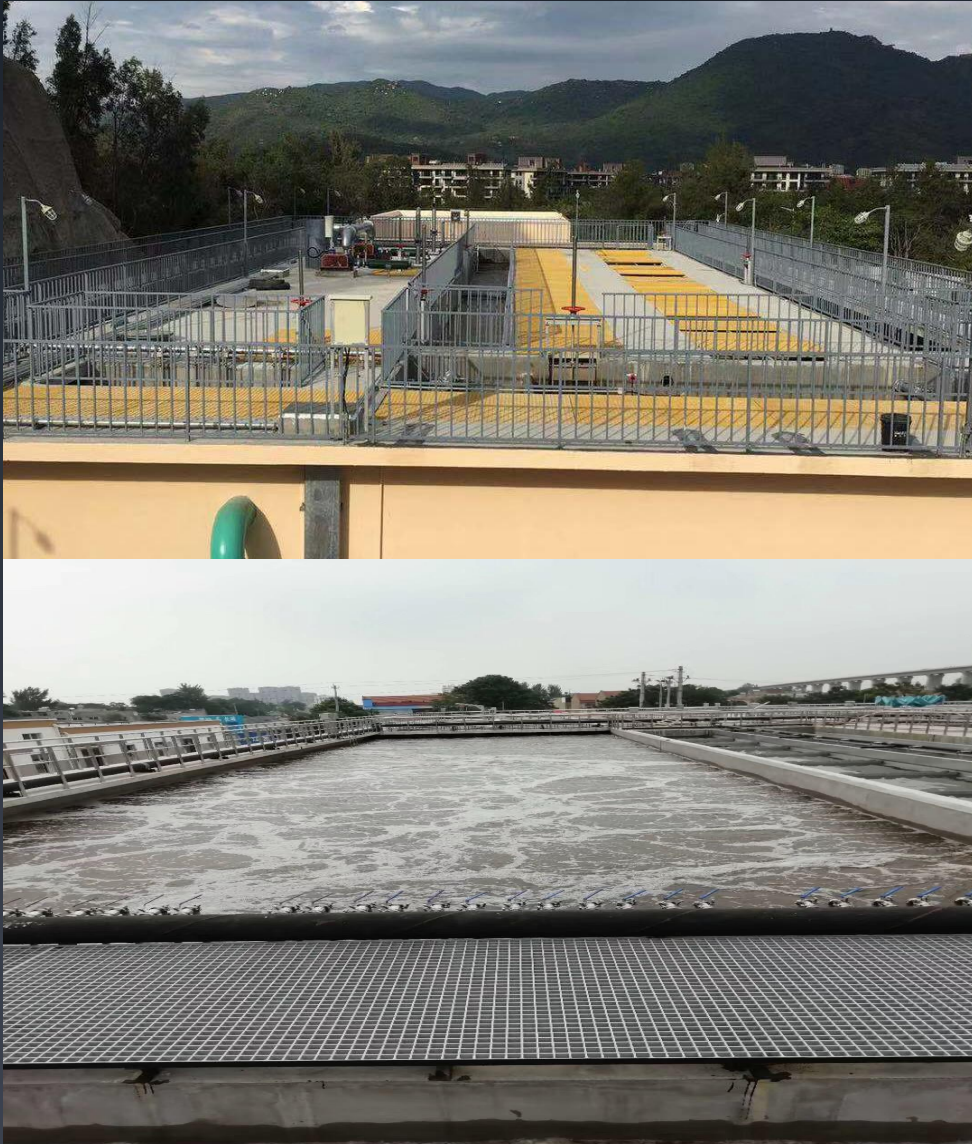
Xingtai Weizhai River Sewage Treatment Plant



Capacity: 12000m³/d Municipal 1st Class A Grade Criteria Standard



Bozhou STP and Sanya STP



Project Highlights:

- A. The sludge concentration is high 5~8g/L, $DO \leq 1\text{mg/L}$ and the tank capacity is small
- B. built-in aeration zone in an integrated Settler Tank for complete Sludge Returning without power, by eliminating the scraper and suction machine
- C. Adopts Air Agitation Instead of underwater mechanical push-flow agitation.
- D. The sludge return and nitrification liquid return all adopt the Air lift return method, replacing the mechanical pump return, and there is no daily maintenance cost.
- E. Only 2 Fans for underwater drive power to replace mechanical power
- F. High sedimentation load, design surface load $1.8\text{m}^3/\text{m}^2.\text{h}$, small pool capacity
- G. After the response time of each functional area is established, it can still be redistributed twice, which improves the utilization rate of pool capacity and improves the guarantee of water output.
- H. Multiple processes coexist in the same pool, the operation mode is adjustable to safeguard Outlet water quality .
- I. The aeration equipment can be maintained, repaired and replaced without stopping production
- J. The entire biochemical tank can be maintained and repaired without stopping
- K. Extremely low energy consumption, floor space and operating costs
- L. The total nitrogen of the biochemical effluent does not need to pass through the deep bed denitrification filter, which is better than quasi-Class IV

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