

水魔岛®

Green & Low-Carbon Prefabricated Wastewater Treatment Plant

Advanced BIOCOS Process

- Short construction period
- Small footprint
- Low investment
- Low operating cost



PRODUCT
INTRODUCTION

Water Magic Cubes – Green & Low-Carbon Prefabricated Wastewater Treatment Plant 4.0

Water Magic Cubes 4.0 perfectly integrates the advanced **BIOCOS process** with welding-free assembly structure, empowering wastewater treatment with intelligent manufacturing and helping customers achieve green transformation and sustainable development. The product solves industry pain points and outperforms traditional concrete plants in construction period, investment, land occupation and environmental protection. It provides customers with an all-scene solution that is efficient, land-saving, time-saving and worry-free.

Safe Structure

ZCEN has established the Prefabricated Water Plant Innovation R&D Base with the China Institute of Building Standard Design & Research, focusing on R&D and design of steel structures for prefabricated water plants to build a safe and low-consumption structural system.

Advanced Process

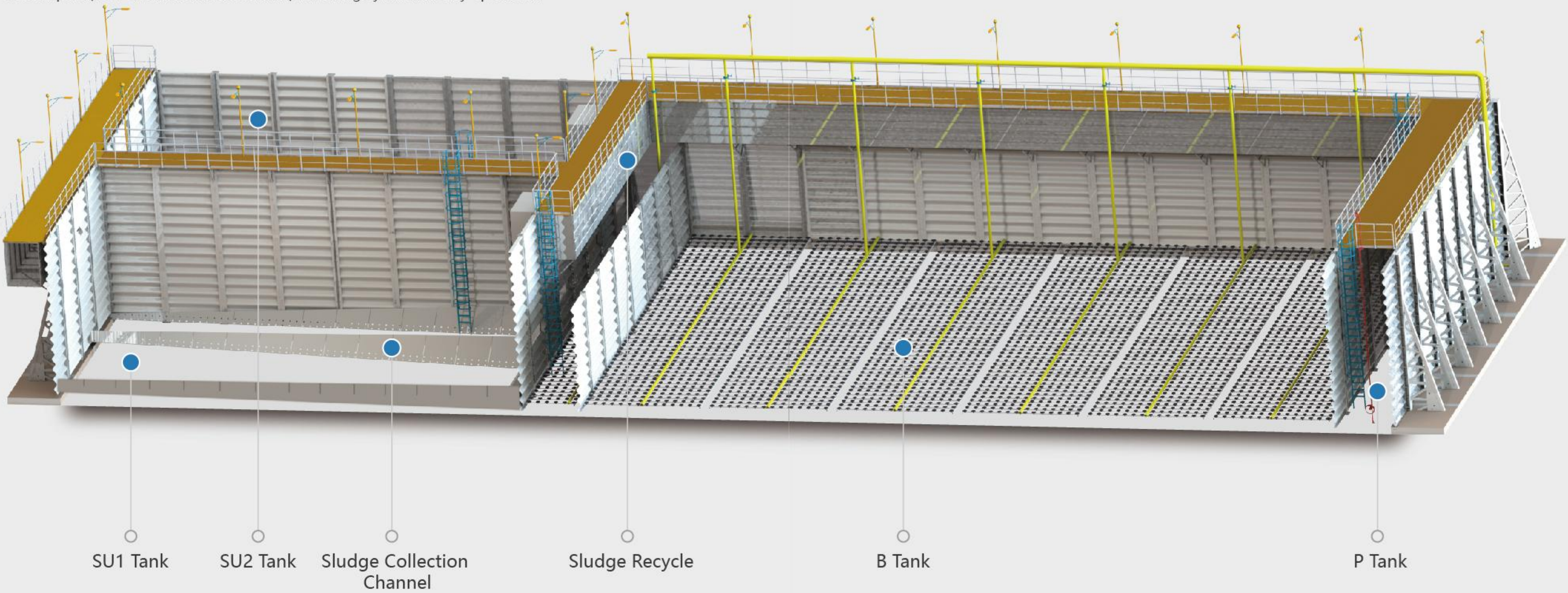
Adopting the **BIOCOS process** invented by Prof. Ingelr of the University of Innsbruck, Austria, it is an enhanced biological nitrogen removal process combining alternating A/O and endogenous denitrification. It integrates biochemical reaction and sedimentation in one compact system, featuring: strong nitrogen removal, land efficiency, fewer equipment, low energy consumption, low external carbon demand, low sludge yield and easy operation.


Exported to
18 countries


Serving **370 cities**
worldwide


Water treatment
capacity :
1 billion m³/day

Exported to 18 countries and 370 cities worldwide, with a water treatment capacity of 1 billion m³/d.



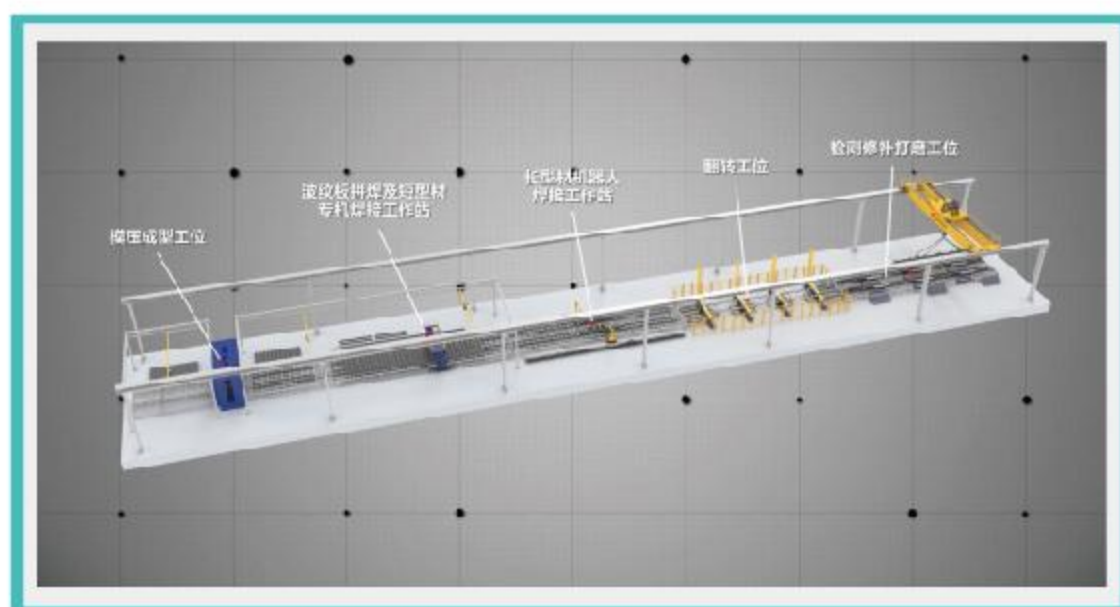
Awards & Honors



The company has participated in drafting more than 10 industrial standards, including: CJ/T 47-2016 Filter Blocks for Water Treatment; CJ/T 83-2016 Inclined Tubes for Water Treatment; CECS 178:2009 Technical Specification for Monolithic Cast Filter Plates and Adjustable Filter Nozzles for Air-Water Washing Filters. It owns more than 10 software copyrights and over 60 authorized patents.

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| • Class II General Contracting Qualification for Mechanical and Electrical Engineering | • ISO 9001 Quality Management System Certification |
| • Class II Professional Contracting Qualification for Electronic and Intelligent Engineering | • ISO 14001 Environmental Management System Certification |
| • Class II General Contracting Qualification for Municipal Public Works | • ISO 4500 Occupational Health and Safety Management System Certification |
| • Luban Award for China Construction Projects (National Quality Project) | • Five-Star After-Sales Service Certification |
| • National High-Tech Enterprise | • Certification Intellectual Property Management System |
| • Zhejiang Provincial SRDI SME | • Certification National Benchmark Enterprise for Energy-Saving Water Treatment Equipment |
| • Zhejiang Provincial High-Tech R&D Center | • China Well-Known Environmental Protection Brand |
| • Hangzhou High-Tech Enterprise | • Top 10 Domestic Brands in the water treatment Engineering Industry |
| • Hangzhou High-Tech R&D Center (Industrial) | • Municipal Famous Trademark Council |
| • China Quality & Reputation Assurance Enterprise | • Member of China Urban Water Supply and Drainage Association |

Intelligent Production Line



Fully automatic robotic intelligent production

Stamping forming: one-step stamping according to designed corrugated plate curvature.

Automatic welding: full robotic welding for corrugated plates, columns, beams.

Double-sided reinforcement: double-sided welding for all structural parts for stability.

Full inspection: weld inspection to ensure quality.



Technological innovation

complete R&D and innovation team



Engineering design

professional water treatment engineering design & manufacturing capacity



Construction & operation

mature construction and operation team



Full industrial chain

one-stop full-chain service



Service philosophy

customer first, attentive service

Safe Structure

• Safe & Stable Structural System

A complete “beam-column-slab” structural system is designed considering permanent loads (self-weight, internal water pressure) and variable loads (seismic, wind, snow, geological settlement).

• Welding-free Assembly & Triple Sealing

On-site installation uses bolted connections for welding-free assembly, speeding up construction and improving quality. ZCEN’ s patented triple-seal structure ensures safe, zero-leakage tank performance.

• Flexible Configuration & Process Compatibility

Beams, columns, and slabs adopt standardized design for fast production and high universality. The structure can be flexibly adjusted to match various common water treatment processes.



Green & Prefabricated Advantages



Lower Carbon Emissions

Reduces reinforced concrete consumption and cuts use of cement, sand, formwork, machinery, and labor; **overall carbon emissions reduced by over 70%.**



Shorter Construction Period

Standardized design, intelligent manufacturing, and prefabrication. On-site assembly like “building blocks” . **Construction period: approx. 3 months, saving over 80% time.**



Greener Construction

Reduces civil engineering works by over 90%, minimizing dust, noise, waste, and sewage.

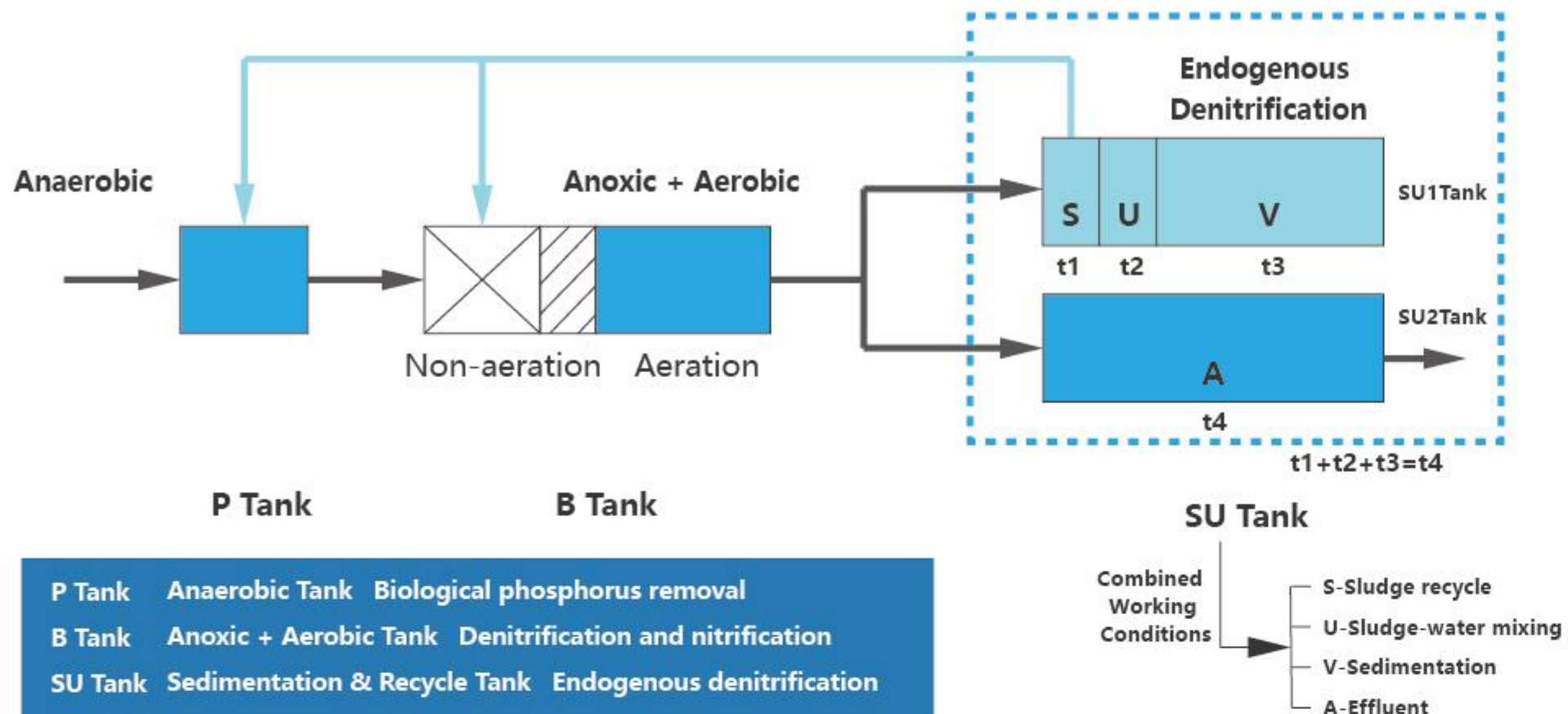


Welding-free Connection

Standardized, prefabricated beams, columns, and slabs feature strong interchangeability and universality. All on-site connections are **bolted, with no welding required.**

Process Flow

• Process Flow



• Process Description

The BIOCOS process consists of 1 P Tank, 1 B Tank and 2 SU Tanks:

P Tank: Anaerobic tank, mainly for biological phosphorus removal.

B Tank: Anoxic + aerobic (alternating A/O) tank for denitrification and nitrification.

SU Tank: Static sedimentation tank with alternating operation for continuous effluent, sludge recycle, mixing, sedimentation and endogenous denitrification.

• Process Advantages



Enhanced nitrogen removal

Strengthened endogenous denitrification; effluent TN ≤ 8 mg/L in stable operation.



Simplified equipment

Blowers used for aeration, mixing and recycle; lower investment and operation cost.



Lower energy consumption

Low DO control at A/O end; precise aeration reduces power consumption.



Lower carbon source demand

Adapts to low C/N ratio; no external carbon needed when influent C/N ≥ 2.8 .



Strong shock resistance

High sludge concentration and retention capacity.

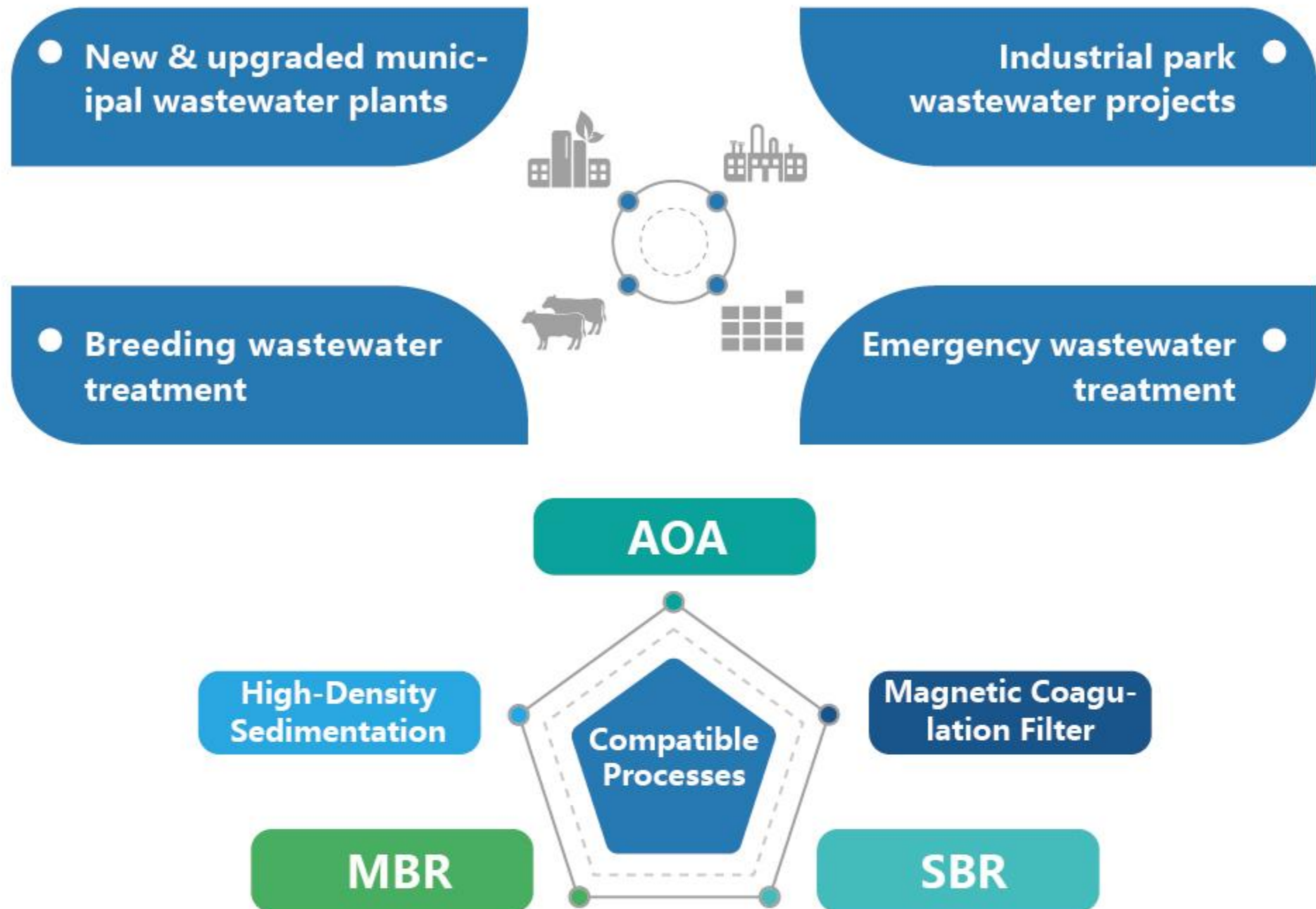


Flexible & compact layout

Modular design; over 20% land saving vs. conventional A²O.

Application Scenarios

Water Magic Cubes can be flexibly configured for various processes, including AAO, MBR, SBR, high-density sedimentation, magnetic coagulation filter and other rectangular tanks. Suitable for:



Project Cases

A Wastewater Treatment Plant Expansion Project, Shanxi

A prefabricated wastewater plant with 10,000 m³/d capacity. Scope: pretreatment workshop, biochemical tanks, membrane treatment workshop, Parshall flume and supporting facilities.



Water Magic Cubes – One-Stop Solution Provider

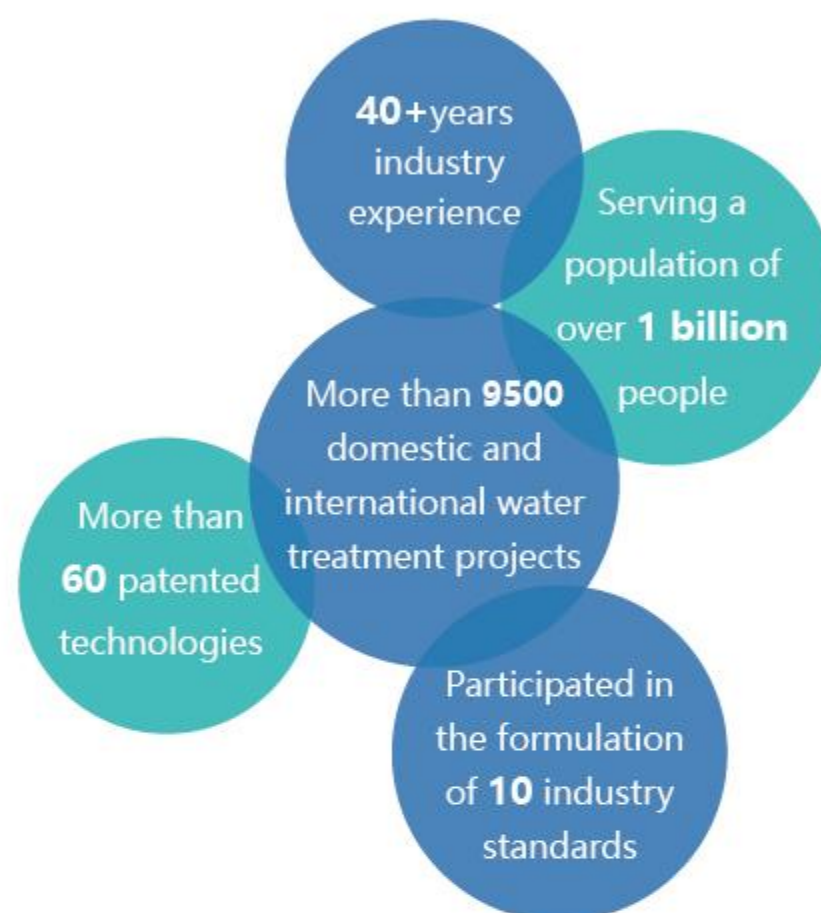
Founded in 1978, ZCEN has over 40 years of expertise in R&D, manufacturing, system integration, process development, engineering design, procurement, construction, and operation (EPC+O) for water treatment equipment.

The company holds qualifications including: Class I Water Plant Operation; Class II General Contracting for Mechanical and Electrical Engineering; Class II Professional Contracting for Electronic and Intelligent Engineering; Class II General Contracting for Municipal Public Works.

It is a national high-tech enterprise and provincial "Little Giant" enterprise, with intelligent production workshops, prefabricated water plant innovation bases, advanced water treatment equipment industrial parks, and provincial high-efficiency R&D centers. As a core drafting unit, the company has contributed to: GB/T 44325-2024 Code on Zero Discharge of Industrial Circulating Cooling Water; Industrial standards: Filter Blocks for Water Treatment, Inclined Tubes for Water Treatment; Association standards: Technical Specification for Prefabricated Sewage Treatment Plants, Technical Specification for Adjustable Filter Nozzles, Integrated MBBR Sewage Equipment, Integrated Water Purification Equipment, Deep Bed Filter Specification, Ultrafiltration Water Treatment Equipment.

The company has participated in numerous national key projects, including the South-to-North Water Diversion Project, Shanghai World Expo, and the Beijing Olympic Games Water Supply Project, and has been honored with awards such as the Luban Award for China Construction Projects, as one of the Top 10 Domestic Brands in the water treatment Engineering Industry, and China Well-Known Trademark. To date, Zhongchang has provided reliable products and high-quality services for more than 9,500 domestic and international water treatment projects.

Guided by the philosophy of "win-win cooperation and pragmatic innovation," the company continues to create greater value for customers through ongoing innovation and contributes to the preservation of lucid waters and lush mountains.



Full-chain service

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Technical Note All parameters are theoretical; actual values may vary

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