



Low cost

Energy saving

Space saving

High speed and Super high load EGSB wastewater treatment equipment

# SUPER *Depcer*



*Creating Human Life* - Life with Water -

**Aiken Kakoki K.K.**

ISO14001 · Kyoto Protocol (CO<sub>2</sub> reduction)

London Convention · Cogeneration correspondence

## Super Depcer Super high load anaerobic treatment method

Super high load wastewater treatment equipment without using oxygen

Low cost

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Energy saving

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Space saving

### Super high load anaerobic wastewater treatment equipment “Super Depcer” is...

Super Depcer is a high speed EGSB which applies UASB method anaerobic wastewater treatment equipment was developed in Netherlands, and causes turbulence for the organic water by circulation in the reactor was filled to high concentration by about 1 ~ 2 mm granule (anaerobic bacteria) and is load diversity space saving wastewater treatment equipment which does high speed treatment by increasing the contact efficiency. Compared to the conventional aerobic treatment, essential aeration on process (the process of contacting the water to the air by sending the air into the wastewater in order to supply oxygen to the microorganisms) is unnecessary. In other words, power consumption is extremely less (conventional 1/8 ~ 1/15). In addition, against the aerobic treatment which 30 ~ 50% of raw water organic matter become excess sludge, the conversion of excess sludge is 10% or less because Super Depcer convert 80% of organic matter to methane gas. Sludge disposal costs are also drastically reduced.

Our company make a suggestion to match the individual needs such as power cost reduction, sludge disposal cost reduction together with space saving of wastewater treatment equipment through the latest biotechnology.

#### Granule



On the Granule formation has been said that Methanosaeta (formerly academic name Methanotherix) among methane bacteria plays an important role. Methanosaeta forms a yarn ball when it is given a moderate flow by rising liquid stream and generated gas. This yarn ball is Granule.

UASB method [ Upflow Anaerobic Sludge Blanket ]  
EGSB method [ Expanded Granular Sludge Bed ]

### Characteristic of Super Depcer

#### Drastically reduce the generation amount of excess sludge

It can reduce the sludge disposal costs to about 1/10 or less of aerobic treatment because the generation amount of sludge is drastically reduced.

#### Drastically reduce the power consumption

It can be extremely less the power consumption and can be reduced running costs because there is no need for aeration power since oxygen is unnecessary unlike the activated sludge method using aerobic microorganisms.

#### Treat the high concentration wastewater

It can be treated more than 90% of the high concentration wastewater of more than BOD40,000mg/ℓ that was impossible to treat until now.

#### Low cost, Space saving

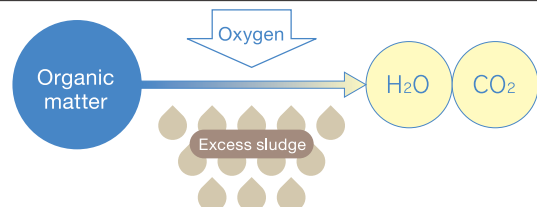
It became CODcr volume load 30kg/ m<sup>3</sup> and enabled super high load treatment and was achieved miniaturization of equipment. Moreover, it doesn't impose a burden on the expenses because it is low cost.

#### Recovery of methane gas

It can use as fuel for the boiler, etc., by using recovered methane gas because it converts 80% of the organic matter to methane gas. Cogeneration by biogas will apply national subsidy system.

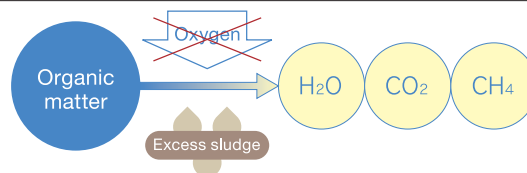
## Differences of aerobic treatment and anaerobic treatment

### Aerobic treatment



Aeration power is unnecessary because oxygen is unnecessary. ► **Energy saving**

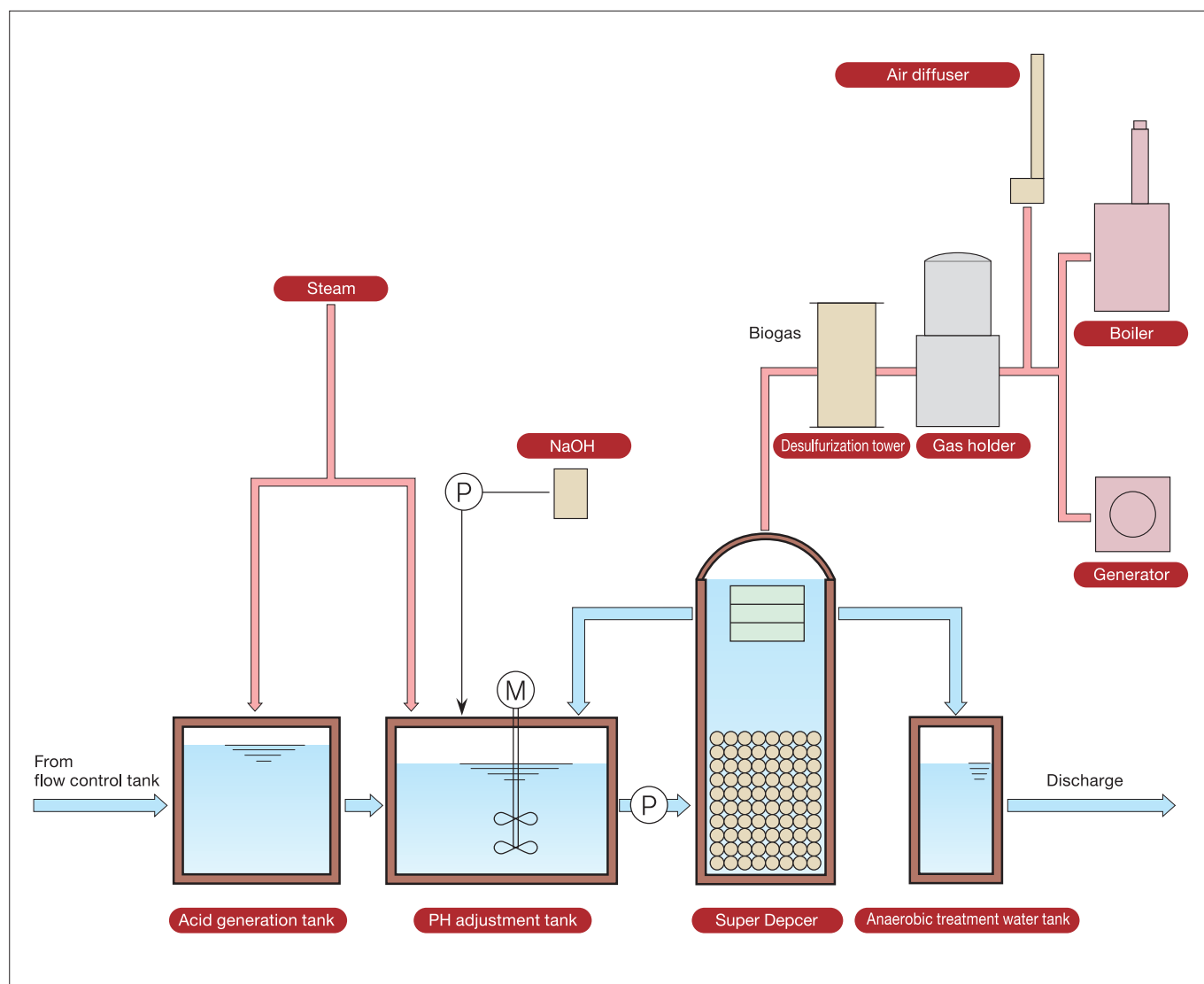
### Anaerobic treatment



Disposal costs are reduced because generated amount of sludge is less. ► **Cost saving**

## System flow chart

For the high concentration wastewater of BOD concentration 1,000~40,000/l or more, it is possible to super high load treatment of CODcr volume load 10~30kg/m<sup>3</sup>/day.





# Super Doctor Environment Purity Collaborator ER

## Comparison of running costs (comparison with high load activated sludge treatment alone) Food processing wastewater

	Anaerobic treatment + Aerobic treatment	High load aerobic treatment
Reactor tank capacity	EGSB reactor tank 170m <sup>3</sup> (CODcr volume load:20kg/m <sup>3</sup> )	Aeration tank 2,320m <sup>3</sup> (BOD volume load:1.0kg/m <sup>3</sup> )
	Aerobic aeration tank 360m <sup>3</sup> (BOD volume load:0.5kg/m <sup>3</sup> )	
Electric power costs	¥15,300/day	¥32,400/day
Chemical costs (Including dehydrating agent)	¥17,100/day	¥59,700/day
Sludge disposal costs (As dehydrated cake)	¥8,800/day	¥65,000/day
Total running costs	¥41,200/day	¥157,100/day

## Design conditions

1) Water volume	400m <sup>3</sup> /day	6) NaOH unit price	¥100/kg
2) Raw water BOD concentration	5,800mg/ℓ	7) Dehydrating agent unit price	¥800/kg
3) Raw water CODcr concentration	8,500mg/ℓ	8) Sludge disposal cost	¥15,000/m <sup>3</sup>
4) Discharged BOD concentration	10mg/ℓ or less	9) Fuel cost	Use of generated CH <sub>4</sub>
5) Electric power cost	¥14/kw		

## Adaptation example

It can be applied to various types of organic wastewater.

Food processing wastewater  
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Beverage production wastewater  
-----  
Fermentation and brewing wastewater  
-----  
Pharmaceutical industry wastewater  
-----  
Chemical industry wastewater  
-----  
Textile industry wastewater  
-----  
Scouring and dyeing wastewater  
-----  
Oils and fats industry wastewater  
-----  
Paper pulp wastewater  
-----  
Other wastewater



Model Type	SD-24010	
Size	2,400 (φ) ×10,000mm (H)	
Item	Raw water	Treated water
Treatment water volume	110m <sup>3</sup> /day	110m <sup>3</sup> /day
Raw water BOD	2,500mg/L	100mg/L
Raw water CODcr	3,800mg/L	500mg/L



Model Type	SD-22010	
Size	2,200 (φ) ×10,000mm (H)	
Item	Raw water	Treated water
Treatment water volume	70m <sup>3</sup> /day	70m <sup>3</sup> /day
Raw water BOD	5,000mg/L	800mg/L
Raw water CODcr	7,700mg/L	1,000mg/L



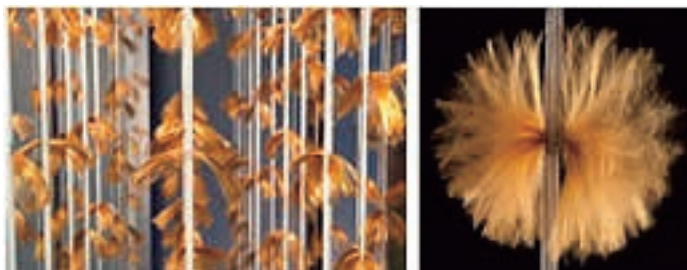
Model Type	SD-26015	
Size	2,600 (φ) ×15,000mm (H)	
Item	Raw water	Treated water
Treatment water volume	240m <sup>3</sup> /day	240m <sup>3</sup> /day
Raw water BOD	2,500mg/L	800mg/L
Raw water CODcr	7,000mg/L	1,200mg/L



## Super Depcer FB Anaerobic fixed bed method

The method of using granule sludge is very efficient in the case COD<sub>Cr</sub> concentration of wastewater is high (approximately 2000mg/L or more as COD<sub>Cr</sub> concentration), on the other hand, it becomes necessary to flow a lot of water into the reaction tank in the case COD<sub>Cr</sub> concentration of wastewater is low (approximately 2000mg/L less as COD<sub>Cr</sub> concentration), stable performance may not be exhibited because granule tend to outflow.

In contrast, the method of using abiotic carriers of the fixed bed secure the support bed for holding the biological membrane inside the reaction tank, and is intended to use microorganisms that grow on the surface. And there is an advantage that can be also applied to low concentration COD<sub>Cr</sub> wastewater and wastewater that will be dismantled by granule because the fixed bed carrier surface is always possible to ensure as rearing place of microorganisms.



## Super Depcer SB Anaerobic sponge bed method

It is applicable to low concentration wastewater that had difficulty to treatment in conventional method by using the carrier of new development, and can realize energy saving of wastewater treatment and deletion of amount of waste.

It is possible to high load and stable treatment for low organic matter concentration wastewater and single composition wastewater and is possible to efficiently remove the organic matter (removal rate 80% or more) by filling the reaction tank with carriers for anaerobic treatment having liquidity and depositing anaerobic microorganisms on the carrier surface.

In addition, it can be adapted to various conditions (concentration, component, temperature), also strong to load fluctuation, and it can be applied to not only organic wastewater of food systems factory having many achievements so far but also wastewater of wide range of properties such as organic wastewater of chemical factory, paper mill, LCD and semiconductor factory.



**Comparison table of Super Depcer Fixed Bed and Super Depcer Sponge Bed  
(Comparison: EGSB method)**

	Fixed Bed (FB)	Sponge Bed (SB)	EGSB method
SS	Large	Medium	Small
Water temperature	25℃	25℃	35℃
Raw water concentration (BOD)	2000mg/ℓ less	2000mg/ℓ less	2000mg/ℓ or more
N-hex	Large	Medium	Small

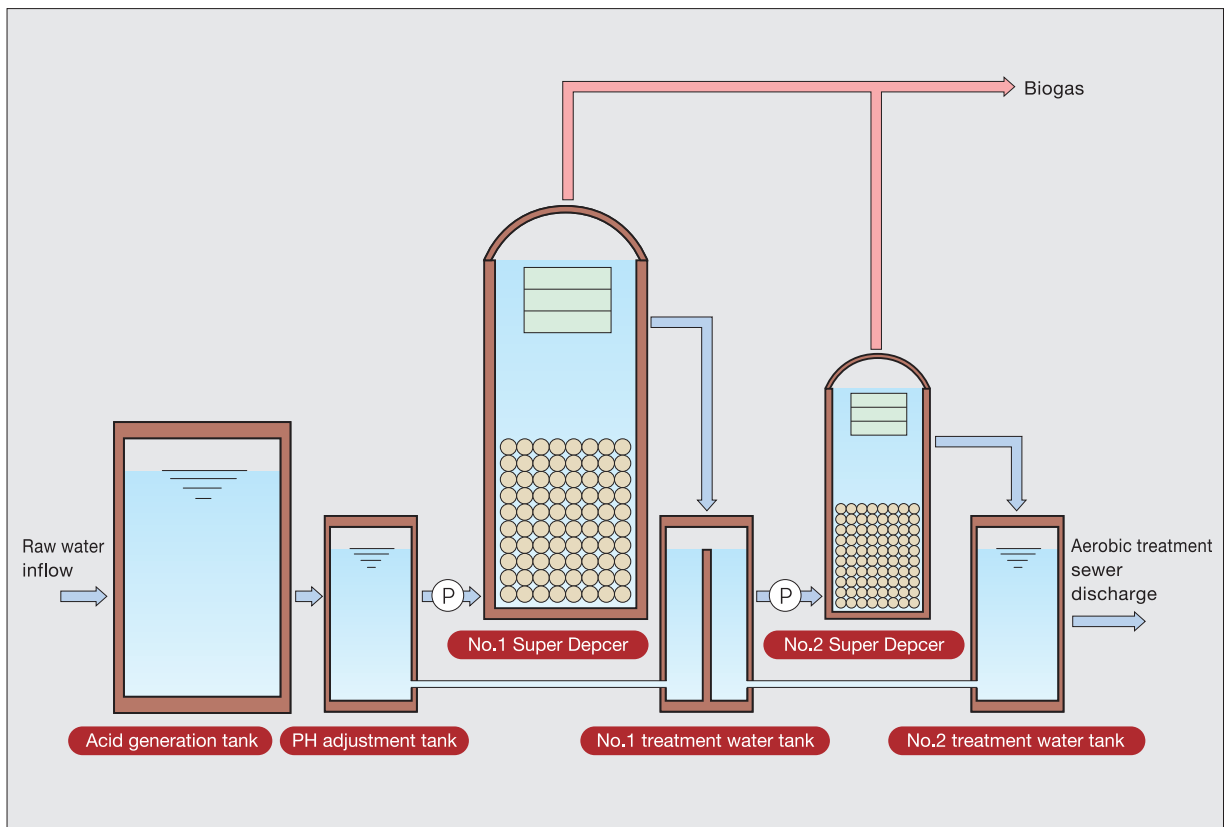
# 2 step EGSB treatment system



Conventionally, when raw water BOD is high concentration, there was need to perform such as aerobic treatment at subsequent stage of EGSB treatment. However, when introducing aerobic treatment equipments at subsequent stage, it takes of cost to power of aeration blower and excess sludge disposal. Therefore, we have developed the system doesn't require aerobic treatment of subsequent stage by taking advantage of excellent properties possessed by EGSB treatment system and performing in 2 step. In the case of abatement facility, it is possible discharged to sewer without the installation of aerobic treatment at subsequent stage by introducing 2 step EGSB treatment system.



## 2 step EGSB treatment flow sheet



※No.2 Super Depcer is possible corresponding to all of EGSB, SB,FB.

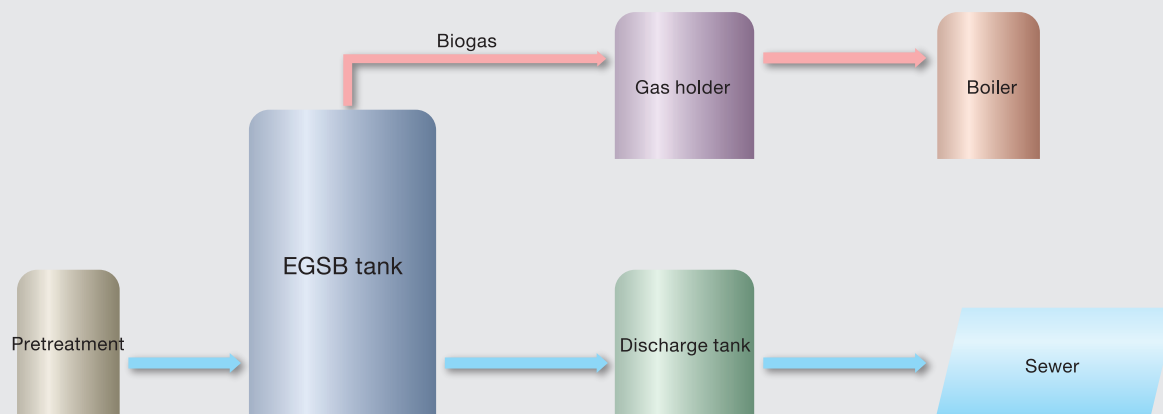


## Merits of “2 step EGSB treatment”

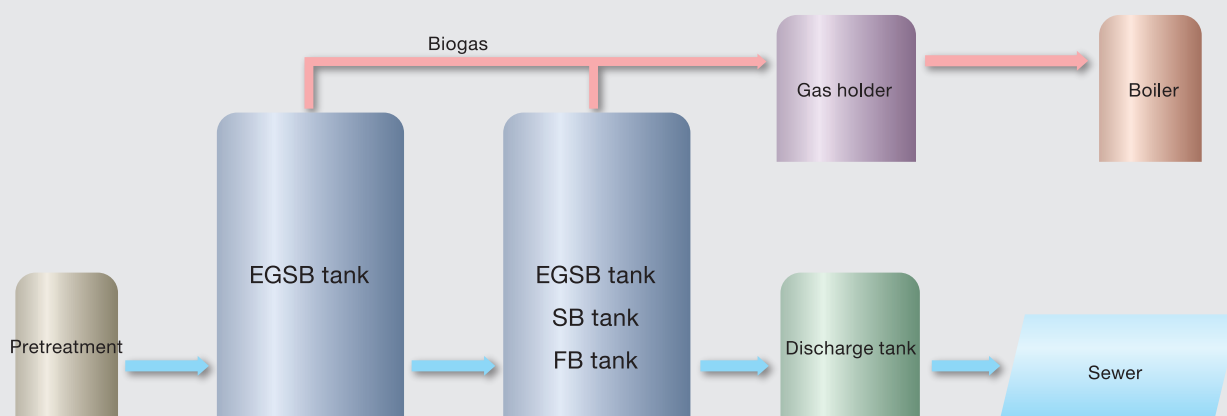
- Aeration equipment for aerobic treatment is unnecessary because it is possible to discharge to sewer by anaerobic treatment only.
- Maintenance of the subsequent stage aerobic treatment equipment becomes very easy.
- Sludge disposal cost is greatly reduced because the amount of generation of excess sludge due to EGSB treatment is less.
- Compared with aerobic treatment, it is possible to install in a space saving because it can high load design.

※When raw water BOD concentration is 5000mg/ℓ or less, the sewer discharge is possible with only normal EGSB treatment.

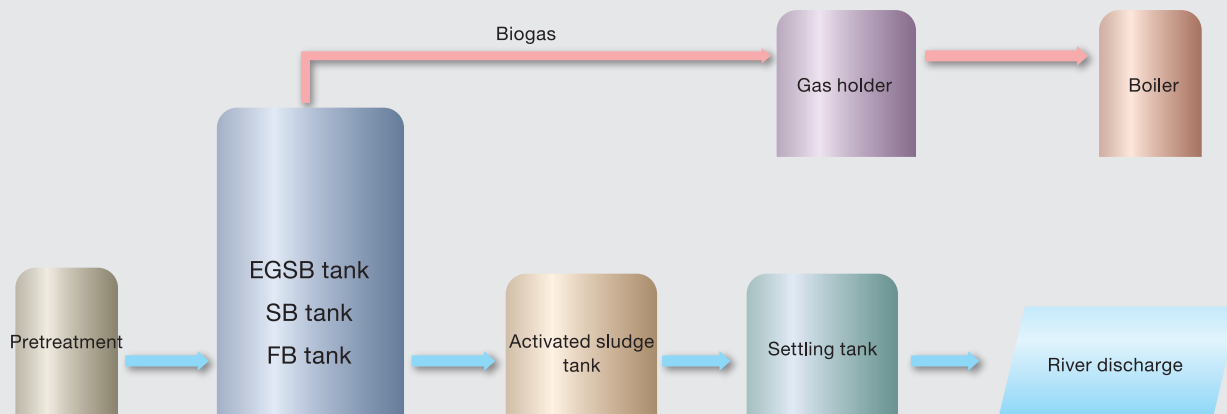
### Standard EGSB treatment method



### 2 step EGSB treatment method



### EGSB + Activated sludge treatment method





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Piping Works (Standard-18 No. 9136)  
Business conducting general sales of poisonous and deleterious substances No. 265

Agents: Fukuoka/Wakayama/Nagoya/Kanagawa/Hiroshima  
History: Founded on October 2, 1982  
Established on June 17, 1983  
Increased capital on March 28, 1996

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### Service companies

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ANLET Co., Ltd. .... (Shikoku Service Center)  
TACMINA CORPORATION..... (Shikoku Service Center)  
Kurita Water Industries Ltd..... (Special agent)  
Tsurumi Manufacturing Co., Ltd..... (Service center)

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### Main banks

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Iyo Bank and Ehime Bank and Mizuho Bank



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### Business

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Design and construction of wastewater treatment equipment  
Design and construction of tap water/utility water treatment equipment  
Design and construction of refrigeration air conditioners and circulation cooling-water treatment equipment  
Inspection and maintenance of various types of water treatment equipment  
Inspection and maintenance of industrial machines  
Industrial instruments and analytical equipment  
Various water treatment chemicals

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