

2 | Wastewater treatment without the need for pressurized flotation

- First class hotel kitchen wastewater treatment example



■ Problems solved and costs reduced

Aquablaster diffusion pipe



Sewage treatment room in the basement



Pressurized flotation device

Before installing an Aquablaster diffusion pipe system, 100m³/day of kitchen wastewater treatment was carried out using a pressurized flotation device.

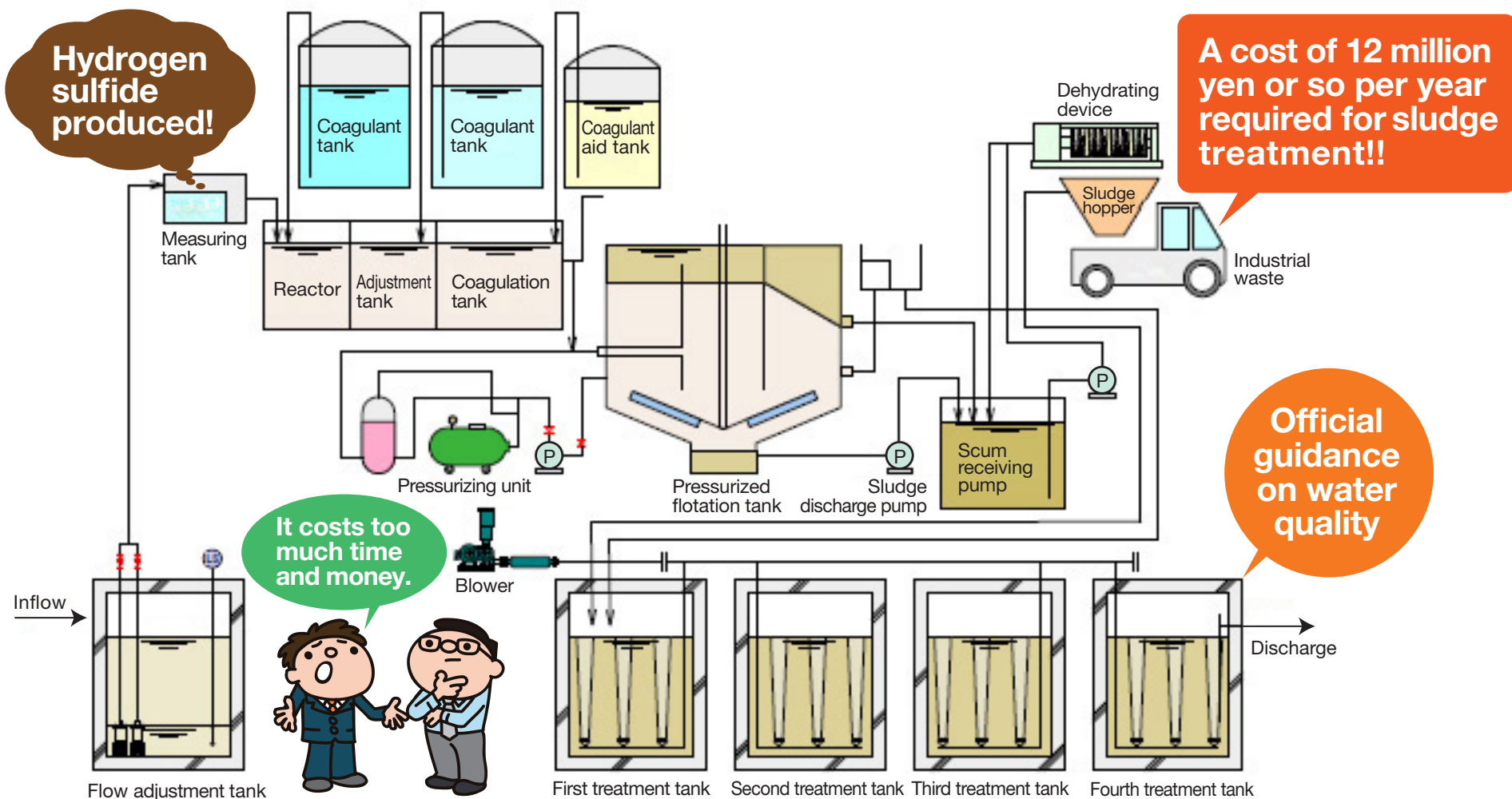
Treatment using a pressurized flotation device had the following problems.

- The cost of sludge treatment was high.
- It took too much labor and cost for maintenance.
- A toxic gas such as hydrogen sulfide was generated.
- BOD was not likely to decrease easily.

These are some of the problems that occurred.

Conventional treatment flow

Aquablaster diffusion pipe



■ Aquablaster diffusion pipe system installed in the tank

Aquablaster diffusion pipe

To solve the problems, the Aquablaster diffusion pipe type AS was installed in the water tank and bio-supply was introduced.



Water quality of raw water and treated water

Aquablaster diffusion pipe

Raw water

BOD : 800mg/L
S S : 600mg/L
n-hex : 150mg/L



Treated water

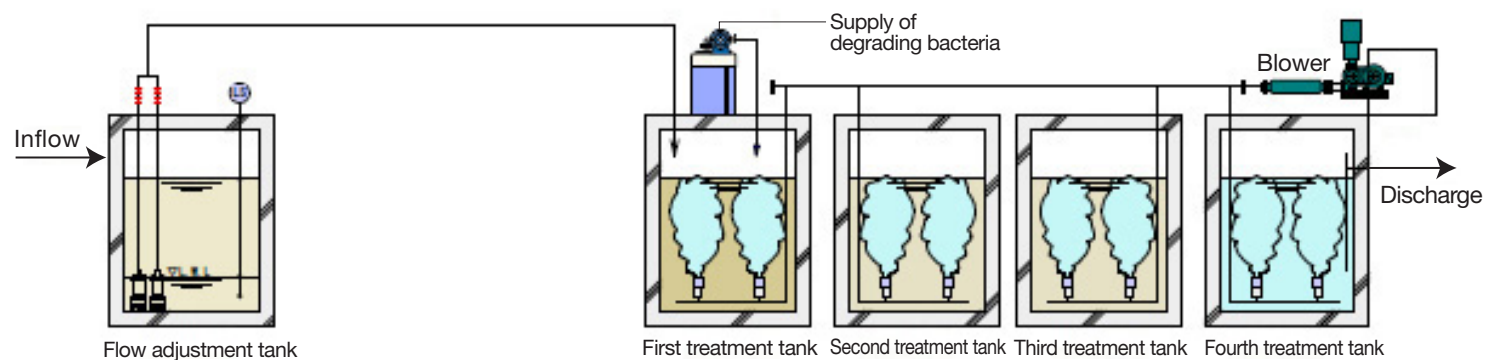
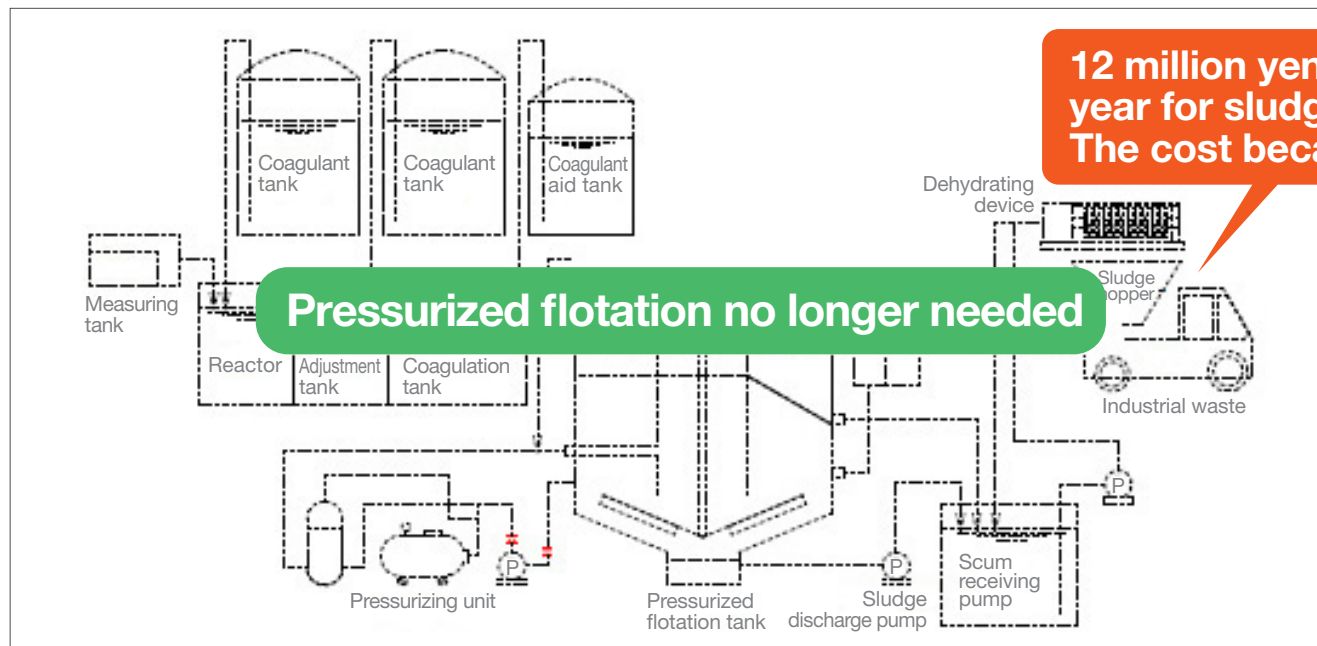
BOD : 120mg/L
S S : 80mg/L
n-hex : 10mg/L



As shown in these photos, the difference in quality can be seen clearly.

■ Pressurized flotation no longer needed

Aquablaster diffusion pipe



■ Cost comparison before and after introduction

Aquablaster diffusion pipe

The calculation result shows that since the installation of the Aquablaster diffusion pipe in 1998, costs have been reduced by almost 20 million yen per year.

Annual cost comparison table			
Item	Previous treatment	Aquablaster	Amount difference
Cost of sludge collection	12,000,000	0	▲ 12,000,000
Cost of chemical agents such as coagulants	5,840,000	0	▲ 5,840,000
Cost of power consumption	1,800,000	1,950,000	150,000
Labor costs for nighttime management	3,285,000	0	▲ 3,285,000
Bio	0	1,200,000	1,200,000
Periodic maintenance	0	600,000	600,000
Total	22,925,000	3,750,000	▲ 19,175,000

Comparison target table

Aquablaster diffusion pipe

	Activated sludge	Pressurized flotation device	Aquablaster diffusion pipe
Installation space	NO	YES	MAYBE
	A large area is required.	Installation is possible as far as the machine and installation space are available.	Installation is possible in a space equal to 1/3 to 1/4 of the space required for an activated sludge system.
Initial costs	NO	YES	MAYBE
	A large water tank and sludge treatment equipment are required.	Only the cost of a pressurized flotation device and sludge dehydration unit is required.	A treatment tank of a certain size is required.
Running costs	MAYBE	NO	YES
	Costs are mounting for sludge treatment and operation management.	Costs are mounting for sludge treatment, chemical agents, and operation management.	Only the cost of electricity and the cost of bio-supply are required.
Odor generation	MAYBE	NO	YES
	Hydrogen sulfide and rotting odors are generated in the sludge storage tank.	Structurally, hydrogen sulfide and rotting odors are generated.	An offensive odor substance such as hydrogen sulfide is not generated.
Treatment capability	YES	NO	YES
	Wastewater can be treated up to levels equal to river discharge standards.	A problem with BOD treatment remains.	Wastewater can be treated up to levels equal to sewage discharge standards.
Operation management	NO	NO	YES
	For such work as sludge concentration control, dedicated personnel need to be assigned.	For chemical agent injection, sludge control, and others, a considerable amount of labor is required.	Roughly, only machine operation check is required

■ Hydrogen sulfide generation suppressed

Aquablaster diffusion pipe

Before the installation of the Aquablaster diffusion pipe, the hydrogen sulfide concentration was so high that it was dangerous even for management operation. However, after the introduction of the Aquablaster diffusion pipe, no hydrogen sulfide was generated.

First treatment tank



H2S:
0.0ppm
PH value:
7.0

The measuring instrument in use is a precision sensor that issues an alarm signal when hydrogen sulfide is generated.

Fourth treatment tank / Discharge tank



H2S:
0.0ppm
PH value:
7.8

[Measuring instrument]
New Cosmos Electric Co.,Ltd.
Oxygen And Hydrogen Sulfide Detector
XOS326
Detection principle:
Constant potential electrolysis type
Indication accuracy: FS±0.5vol%

Other wastewater treatment equipment supply examples Aquablaster diffusion pipe



Waste plastic recycling plant (12 sets OEMed to Nikko)			
Unit mg/L	Raw water	Treated water	River discharge
BOD	2000	80	100 or less
COD	1600	70	100 or less
SS	2000	40	30 or less
N-Hex	200	1	5 or less



Food processing factory wastewater treatment			
Unit mg/L	Raw water	Treated water	Sewage discharge
BOD	450	5	300 or less
SS	430	4	300 or less
N-Hex	380	2	(Mineral) 5 or less



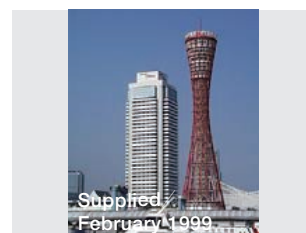
SHIMADZU CORPORATION Seta factory Kitchen & industrial wastewater treatment			
Unit mg/L	Raw water	Treated water	Sewage discharge
BOD	1200	85	300 or less
SS	800	80	300 or less
N-Hex	120	12	30 or less



Food waste recycling plant wastewater treatment			
Unit mg/L	Raw water	Treated water	Discharge standard
BOD	150	10	Water being circulated and reused as coolant water for machines
SS	100	10	
N-Hex	15	1	



Food processing factory wastewater treatment			
Unit mg/L	Raw water	Treated water	Value in the contract
BOD	2100	350	400 or less
SS	1500	200	300 or less
N-Hex	350	35	40 or less



Major hotel (modification work) Kitchen wastewater treatment			
Unit mg/L	Raw water	Treated water	Sewage discharge
BOD	680	78	200 or less
SS	500	57	200 or less
N-Hex	150	10	30 or less



Food processing factory wastewater treatment			
Unit mg/L	Raw water	Treated water	Discharge standard
BOD	1200	220	300 or less
SS	800	300	300 or less
N-Hex	400	20	30 or less



SHIMADZU CORPORATION Head office Kitchen wastewater treatment			
Unit mg/L	Raw water	Treated water	Sewage discharge
BOD	2000	100	200 or less
SS	2500	120	200 or less
N-Hex	250	15	30 or less



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