

Aience has redefined wastewater treatment worldwide!

Aience's

New Definition

To those having difficulties with wastewater treatment, we offer a “new definition” for the future that eliminates unpleasant odors and the need for sludge treatment.

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- New definition of required air volume
 - New definition of oxygen dissolution efficiency
 - New definition of microorganisms
 - New definition of processing concepts
 - New definition of diffuser
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AIENCE

ANGING WAT EATMENT ORLDWIDE

Why don't people question the system design status quo?

Everything is functioning as designed...
but unpleasant odors and large amounts of sludge
are generated anyway. That's because wastewater
isn't being treated effectively!
Contact Aience without delay. We'll tell you about
our optimal system that offers a "new definition"
of wastewater treatment for the future!

Were you aware that no matter how impressive a system is,
if it is generating more unpleasant odors and sludge more than necessary,
it is basically not achieving treatment of wastewater?

With the innovative Aquablaster diffuser developed by Aience,
and our design theory based on a "new definition," putrefaction
that is the source of foul odors does not occur, and

sludge treatment is no longer necessary for sewage discharge,.

Although it seems to do something impossible according to conventional wisdom thus far,
our system is backed by technical strength cultivated through collaborative research
with universities and enterprises, and an extensive track record in and outside Japan.

Furthermore, its outstanding wastewater treatment power has been recognized internationally,
and it was adopted as a model ODA project for Vietnam in 2016.

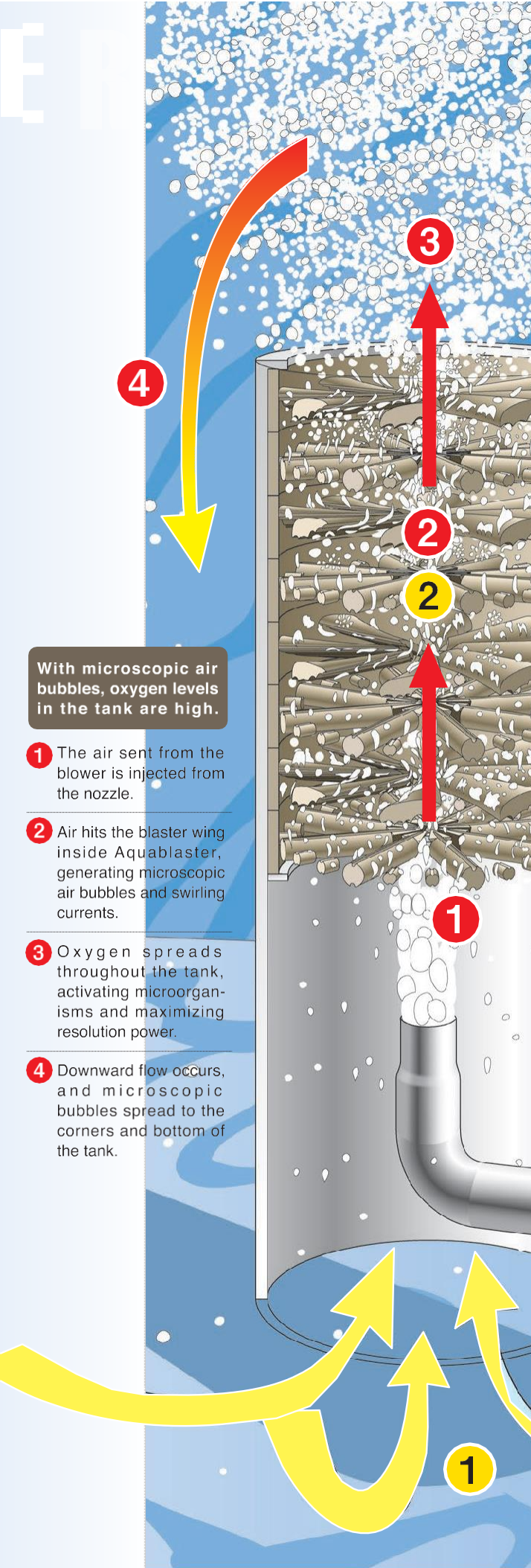
Aience is redefining wastewater treatment for the future,
and the message is reaching the world.



世界の水処理を変える

AIENCE

Changing Water Treatment Worldwide



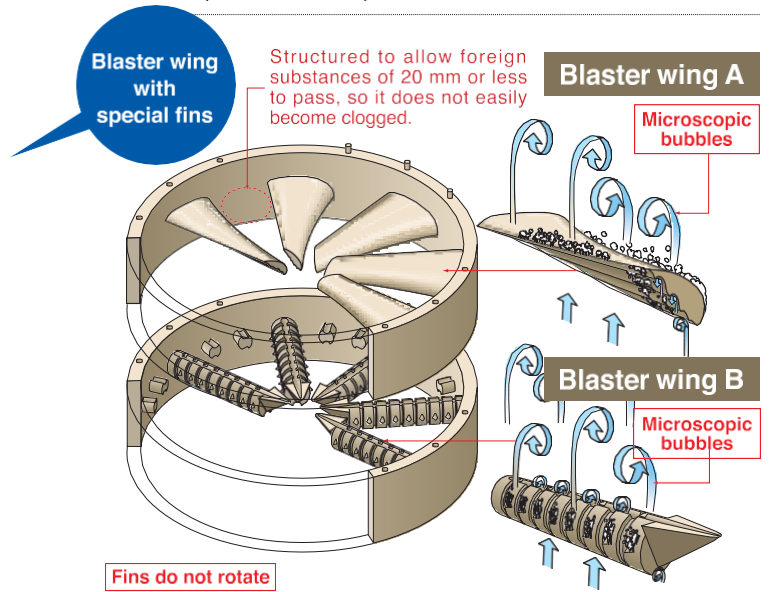
With microscopic air bubbles, oxygen levels in the tank are high.

- 1 The air sent from the blower is injected from the nozzle.
- 2 Air hits the blaster wing inside Aquablaster, generating microscopic air bubbles and swirling currents.
- 3 Oxygen spreads throughout the tank, activating microorganisms and maximizing resolution power.
- 4 Downward flow occurs, and microscopic bubbles spread to the corners and bottom of the tank.

“New Definition”:
 Activate microorganisms by increasing the concentration of dissolved oxygen in the tank, and finely pulverize sludge so the microorganisms easily decompose it.

“New Definition”: Protrusions are located in the center of the diffusing tube.

The closer liquid gets to the center, the faster it moves... in other words, the higher its energy. However, for some reason, thus far diffusing tubes have had protrusions located in outer areas where liquid flow is slow. For this reason, the patented technology of Aquablaster has protrusions located at the center and generates microscopic bubbles with powerful force.



Oil drops and sludge are finely pulverized

- 1 An air lift effect occurs when air is injected, rolling up water and sludge from the bottom. *2.2 to 3.7 times stronger when compared to other companies
- 2 Sludge is pulverized finely by the blaster wing in the aqua blaster.

Patented / Patent number: 4749961

If we adhere to conventional system design, it is impossible to t

1 "New definition" of required air volume



Why are unpleasant odors (hydrogen sulfide) emitted even though the required air volume meets design specifications?



This is because according to conventional calculations, **“it is not possible to supply enough air for microorganisms to convert organic matter into energy.”**

When calculating the necessary amount of air with conventional design guidelines, the air volume required is approximately 20 to 25 liters per min per cubic meter of the tank, but with this air volume industrial wastewater with a higher load than sewage cannot be treated effectively, and hydrogen sulfide and excess sludge are generated. Since Aience **calculates the amount of air required specifically for each worksite using a “new definition” reverse-calculated based on empirical values**, we are able to minimize hydrogen sulfide generation and reduce organic matter to the greatest extent possible with aerobic degradation.

Estimated required air quantity design value obtained from empirical values

BOD load (mg / L)	Air volume per 1 m ³ of tank (L / min)
~500	30~50
500~1000	40~60
1000~2000	50~70
2000~3000	60~80
3000~	70~

“Set your mind at ease.”

Even if air volume is increased, with low-pressure-loss Aquablaster, electricity bills will scarcely change, and if anything will be lowered.



Caution

The above values are air volumes when Aquablaster is used. Treatment efficiency will not increase if this amount of air is delivered to an existing installed diffuser.

2 "New definition" of oxygen dissolution efficiency

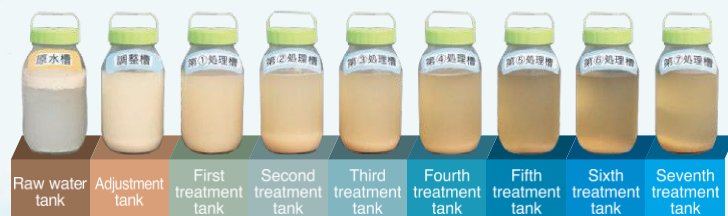


Why are there no standard figures for oxygen dissolution efficiency even though there are systems with excellent oxygen dissolution efficiency?

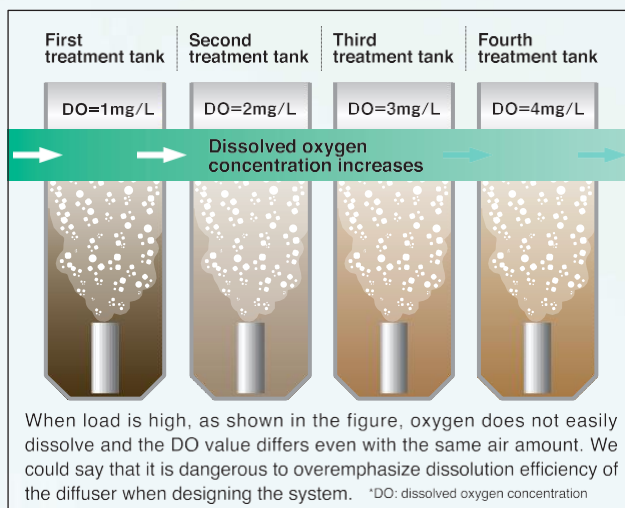


Do not be deceived by oxygen dissolution efficiency figures: because **“the higher the wastewater load, the more difficult it is for oxygen to dissolve.”**

The numerical values for oxygen dissolution efficiency are freely calculated by each manufacturer using their chosen method, without a consistent measurement standard such as JIS. **What is important is not oxygen dissolution efficiency, but whether or not wastewater is truly treated effectively.** As evidence of this, in wastewater treatment at a chicken processing plant (see section below), we did not use any pressurized flotation equipment, and met the standards for sewage discharge with only Aquablaster and bio treatment.



Wastewater treatment photo taken at a chicken processing plant



treat wastewater “properly,” “efficiently,” and “economically”!

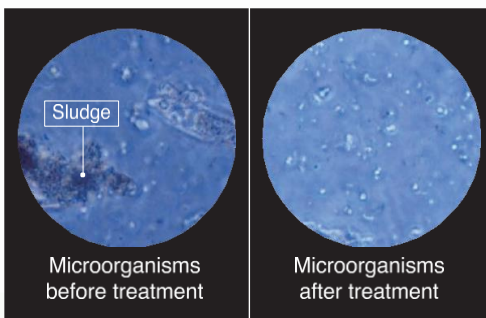
3 "New definition" of microorganisms

Q Why are results not improving despite introduction of optimal microorganisms?

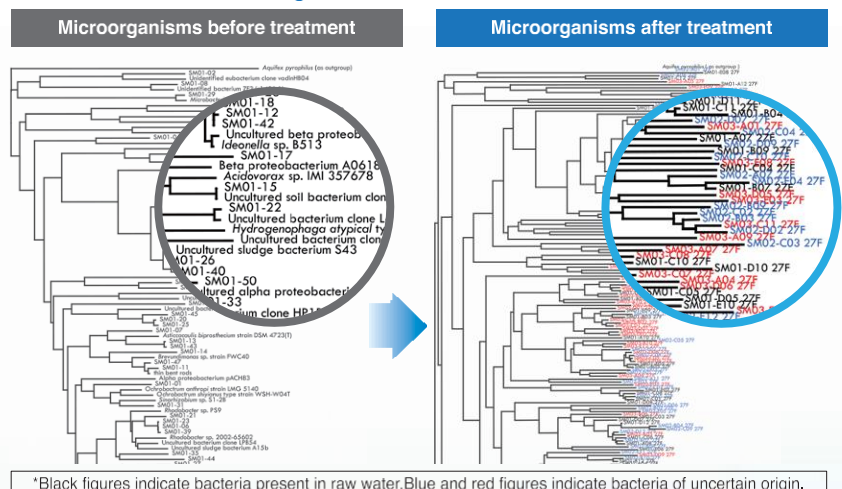
A Because attention must be paid not only to the type of microorganism, but also to **what kind of metabolizing is performed** by microorganisms in the tank.

No matter what high-performance microorganisms are introduced, if insufficient oxygen is available for decomposition, no effect will be obtained. **How to induce “metabolism with totally aerobic respiration” is an extremely crucial factor.**

[Micrograph of microorganism]



[Look at the dramatic difference in type and number of microorganisms before and after treatment]



*Black figures indicate bacteria present in raw water. Blue and red figures indicate bacteria of uncertain origin.

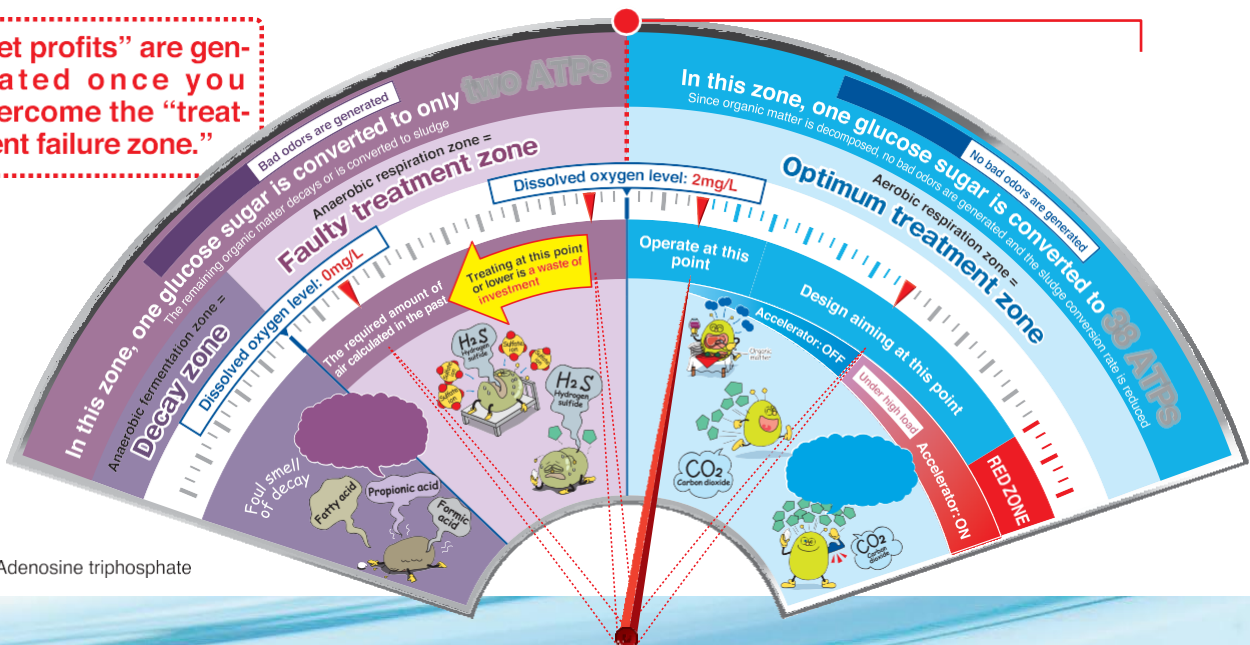
*Source: Joint survey conducted with Shimadzu Corporation

4 "New definition" of treatment concepts

Q What is the secret to successful wastewater treatment?

A A system designed with breathing room, and energy-efficient operation **without “revving up the system to max”!**

“Net profits” are generated once you overcome the “treatment failure zone.”



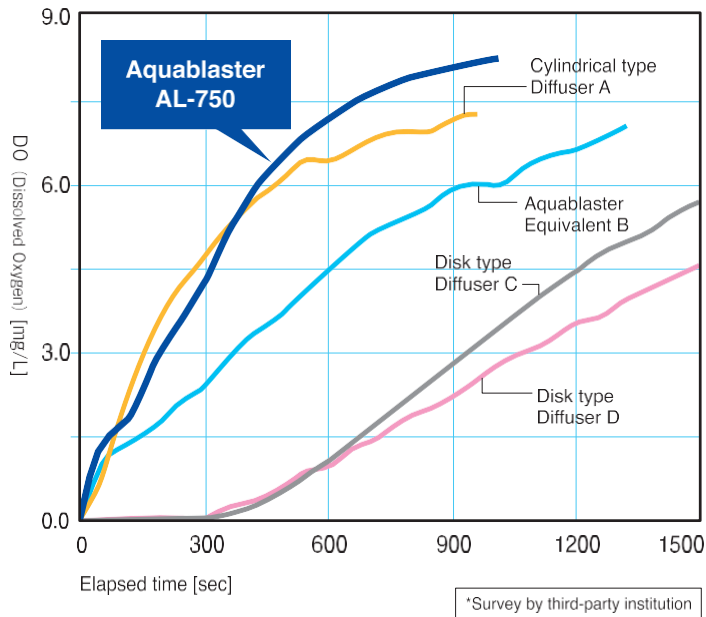
*ATP: Adenosine triphosphate

5 "New definition" of diffuser

Q Why do users choose Aquablaster?

A It's because **"pressure loss is low, even though the power to dissolve oxygen is strong."**

■ Comparison of dissolved oxygen concentration trends



Figures are nominal values stated by each manufacturer

Product name	Oxygen dissolution efficiency at water depth of 5m	Pressure loss
Aquablaster AL-750	23%	None
Cylindrical type Diffuser A	24%	280mmAq
Aquablaster Equivalent B	13%	None
Disk type Diffuser C	28%	300mmAq
Disk type Diffuser D	30%	600mmAq

JIS (Japan Industrial Standards) do not set any standard for oxygen dissolution efficiency. As a result, currently each manufacturer measures it independently and publicizes the figures. This is not a problem in and of itself, but when these figures are superimposed on the graph at left, the contradictions cannot be denied. Aience calculated oxygen dissolution efficiency in the corner area of a water tank measuring 1800 width x 1800 horizontal depth x 5000 water depth (unit: mm), but the results are only an indicator. Please be aware that **"it is not oxygen dissolution efficiency that performs water treatment."**

Please refer to the power differential table on p.6.

6 Comparison with equivalent products

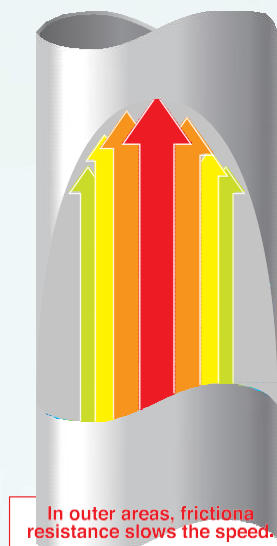
Q What is the difference from equivalent products?

A The **"collision energy"** inside is totally different.

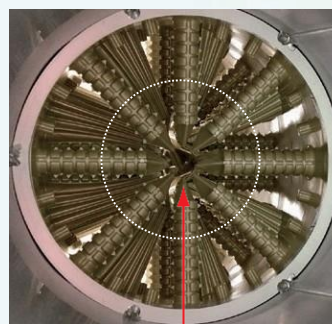
Design based on analysis of liquid properties

Velocity distribution of liquid

The closer liquid gets to the center, the faster it moves... in other words, the higher its energy. However, for some reason, thus far diffusing tubes have had protrusions located in outer areas where liquid flow is slow. For this reason, the patented technology of Aquablaster has protrusions located at the center and generates microscopic bubbles with powerful force.

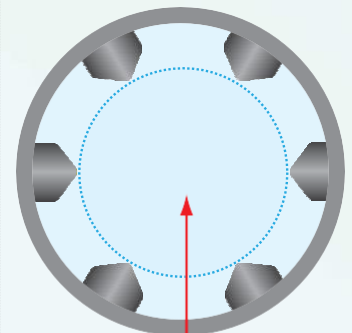


Aquablaster AL-750



Our patent is for a shape that efficiently utilizes the powerful force in the central area.

Equivalent products



If the center is empty, the force of the liquid where it is most powerful will be wasted!

7 Comparison with ordinary diffuser

Q What is the difference from an ordinary diffuser?

A “Stirring ability, oxygen dissolution efficiency, pressure loss, and electricity cost.”

The keys to purification are microscopic bubbles and pulverizing stirring convection!!

1 Comparison with disk type diffuser

Disk type diffuser

Pressure loss About 200 mmAq

Sludge deposits on the bottom

Aquablaster

To maintain a wastewater tank environment, it is crucial to promote the aerobic respiration metabolism of microbes. Installing Aquablaster in the wastewater tank enables high-speed, high-efficiency decomposition and purification.

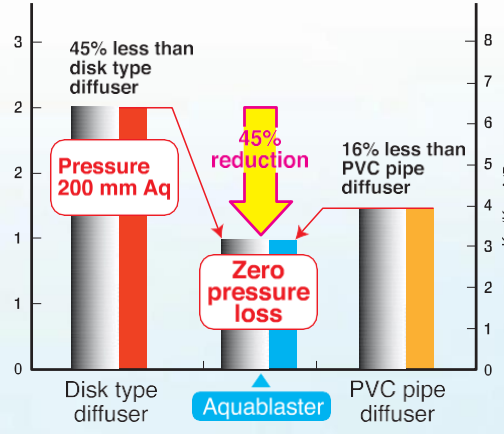
Microscopic bubbles spread throughout the water tank

Zero pressure loss

Sludge does not accumulate on the bottom.



See the difference in power consumption



2 Comparison with cylindrical diffuser

Pressure loss is even greater with cylindrical type diffusers

Power consumption reduction is even more dramatic when compared with a cylindrical diffuser!

Pressure loss about 700 mmAq

High pressure loss

Please compare the generated bubbles in videos on our [Website](#) and [YouTube](#).





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