

# Effective in various genres

Agriculture/  
Hydroponics

Fishing  
industry

Food/  
Factory

Cosmetics

Ultrafine-Bubbles Generator

# SORA

Japan technology



Ultrafine-Bubbles  
LAB

technical cooperation THAILAND



Rajamangala University of Technology

There are nine campuses in Thailand with a total enrollment of 150,000 students.  
There are also many exchanges with Japanese universities, and agreements have been made for joint development.



# Nano-size effect

Physiological activation of organisms

Get into tiny gaps

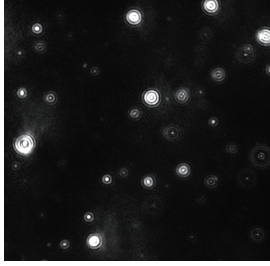
Fine particle adsorption effect

Improved functionality

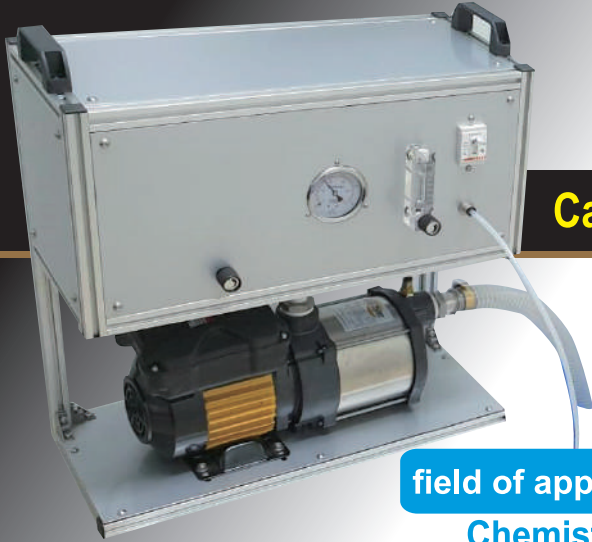
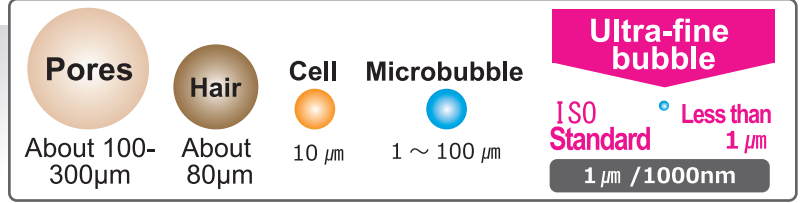
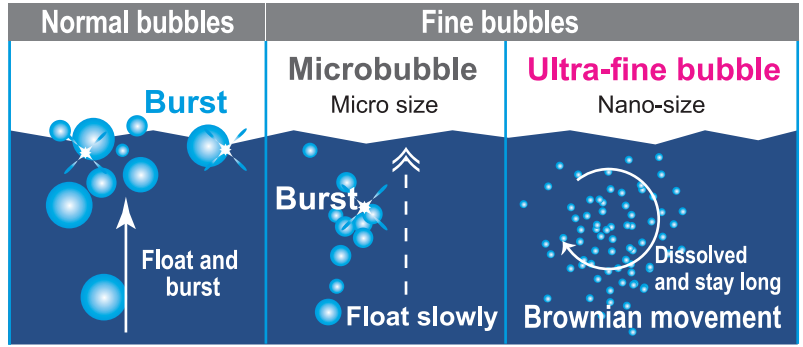
Cleaning without chemicals

Brownian motion observation

Visualization of nanoparticles



The nano-sized gas gradually becomes transparent. ▲



Capable of enclosing various gases

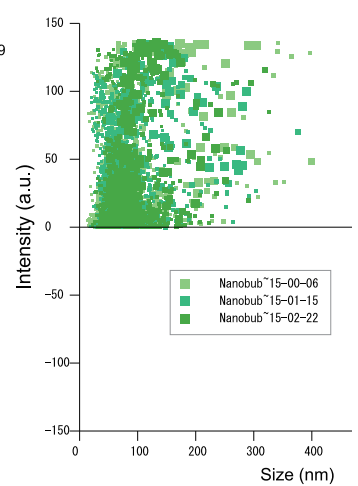
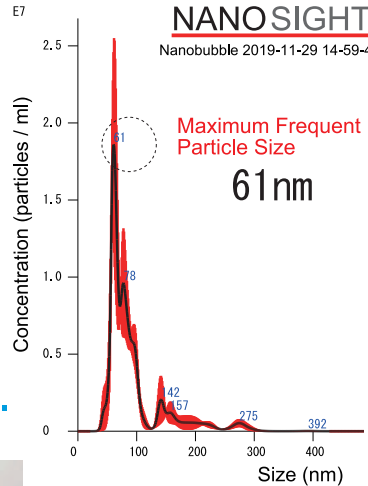
high efficiency  
Compact size

## Ultra-fine bubble generator SORA-EX

Gas (O<sub>2</sub>, CO<sub>2</sub> etc.) is finely crushed to nano size.  
Can generate 100L in about 45 minutes.

field of application

Chemistry,  
health,  
drinking water,  
beauty, food, etc.



Averaged FTLA Concentration / Size for Experiment:  
Error bars indicate + / - 1 standard error of the mean  
Concentration: 6.00e+008 +/- 7.06e+007 particles/ml

600 million (density/ml)

Nano-size 61~93nm

About 80% of the oxygen of size can be stored in the water produced by this generator.

O<sub>2</sub> Oxygen

Hydrogen

Nitrogen

Argon

Fluorine

CO<sub>2</sub>

Ozone

Capable of enclosing various gases



It can be used in various applications including shampoos, hair tonics, products requiring higher absorption, water and food. Enhance moisturizing effect, cell activity and cleansing performance.

### The Grace of Oxygen

## SORA

shampoo  
hair treatment  
body wash  
face wash



Support various OEM and product creation of ultra-fine bubble applications.

Ultra-fine Bubble Natural Soap



Ultra-fine Bubble face lotion  
No chemicals or alcohol are used.

It penetrates the skin's stratum corneum with oxygen and water, which are essential for the skin, and creates a healthy, non-sticky condition while retaining moisture.

Water of Hokkaido



**Take in oxygen from the outside air** **Compact size**

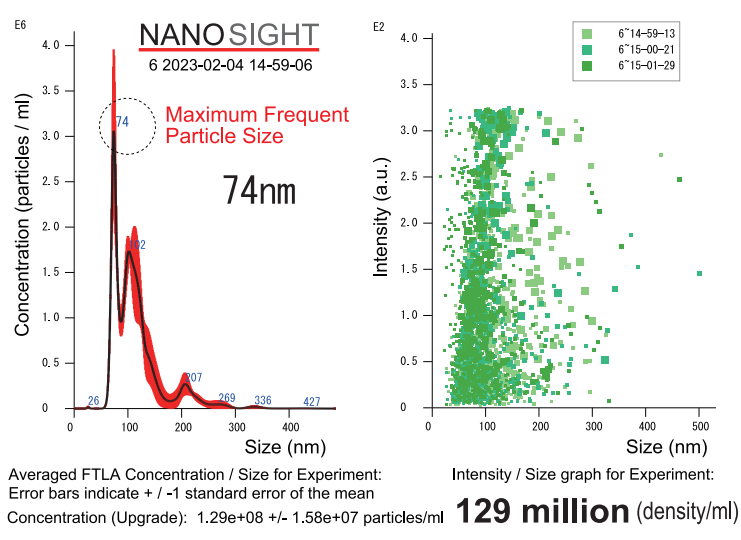


**field of application**

**Ultra-fine bubble generator**  
**SORA-GR**

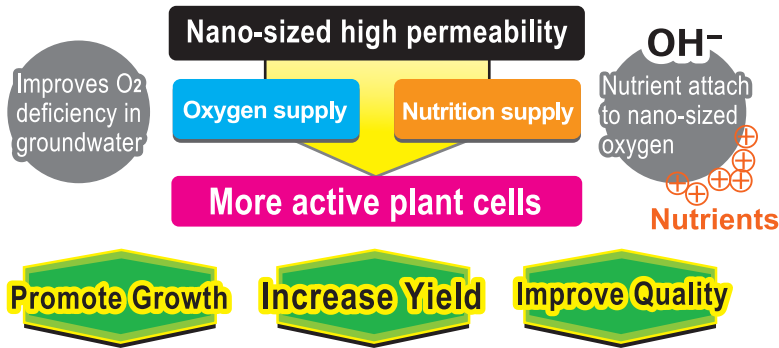
**Agriculture, fisheries, water quality improvement, cleaning, etc.**

Oxygen in normal water decreases as the temperature rises.



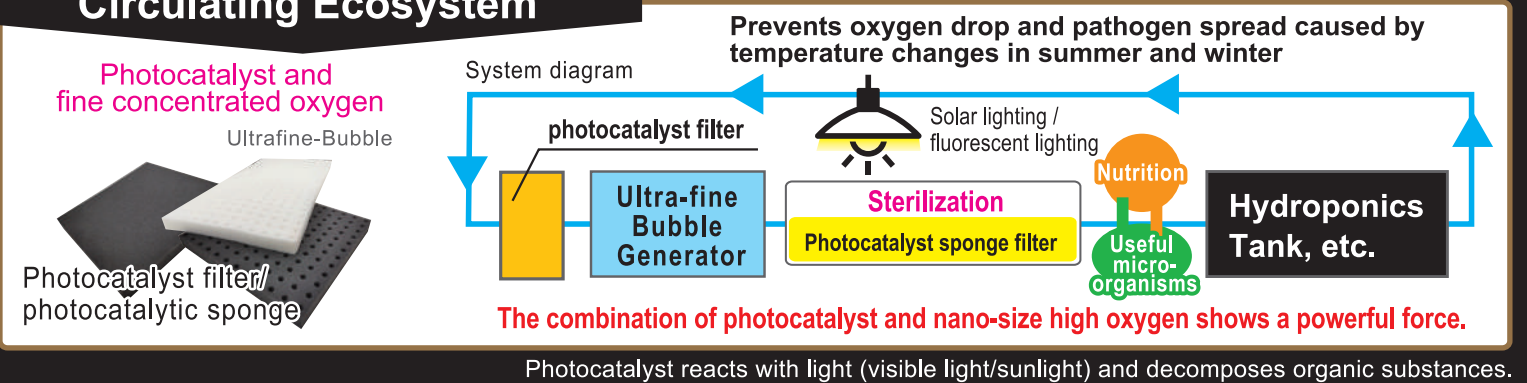
**Usage in Agriculture**

Absorb nutrients and oxygen from roots and leaves



The respiration speed of roots, and thus nutrients, is proportional to the amount of oxygen absorbed.

**Circulating Ecosystem**



**Early Growth**

**Hatchery / Farm**

**Oxygen Supply**

Oxygen is also used during feeding. Can get enough food without worrying about lack of oxygen.

Dirt that tends to accumulate at the bottom also rises to the surface, making it easier to manage water quality.

**Usage in Fisheries**

Become more active with increased dissolved oxygen  
Provide a safe breeding environment that does not cause gas disease.

**Grow Fast** **Decrease fish mortality** **Purify Water**

**Live fish transport** **Freshness retention**

**O<sub>2</sub>** **Prevent Oxidation** **N<sub>2</sub>**

Maintaining freshness with ultra-fine nitrogen bubble water is effective at the shipping and sales stage.

Encapsulating the oxygen remaining in the body can remove oxygen and prevents oxidation.



# Water treatment

## Wastewater treatment using microorganisms

Fine bubbles activate microorganisms and increase processing capacity.



Wastewater treatment tank (aeration)



Filtration tank



Algae treatment of ponds at parks



Factory, farm wastewater



Park fountain

### Water quality deterioration factor

Ammonium nitrogen concentration in the water increases when the water is polluted by sewage and domestic wastewater. It is oxidized by bacteria that feed on ammonium nitrogen, deteriorating water quality.

## Bio-friendly water purification liquid



Microorganisms are more activated with ultra-fine bubbles, further increasing processing capacity.

Effective Microorganisms  
**Bio-β**

Useful microorganisms born in a completely organic farm take the organic matter in the water and decompose it into nutrients.

Use Bio-β to improve water quality



### Breeding test of killifish



Killifishes grow big by maintaining water quality without moss and bad odour

Wastewater treatment problem due to residual of disinfectant and its cleaning

# Cleaning

Cleaning without using detergents or chemicals is possible. The nanobubble water has a surfactant effect.



machine / manufacturing line



Cooking machinery



Pesticide removal



Cut vegetables



Hot springs & pools

Wash and sterilize cut vegetables without damaging the vegetable cell membrane.

# Food and Beverage

Mayonnaise with ultra-fine nitrogen bubbles prevents oxidation. It is suitable for storage, has an improved texture, is low in calories, and thus widens the range of cooking applications.

# Make fertile soil

For soil



Effective Microorganisms  
**Bio-α**  
100% Organic  
Antioxidant solution

Useful microorganisms born in a 100% organic farm

# SORA

Ultrafine-Bubbles Generator

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