

A circular wreath of various botanical illustrations surrounds a central white circle. The illustrations include green ferns, yellow flowers, a red leaf, purple flowers, and green leaves with prominent veins.

nanoseed Inc.

# Product Outline

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# Product Outline

nanoseed Inc manufactures the Silent Nano Diffuser, a space sterilization and deodorization device that uses a unique, patented discharge technology.

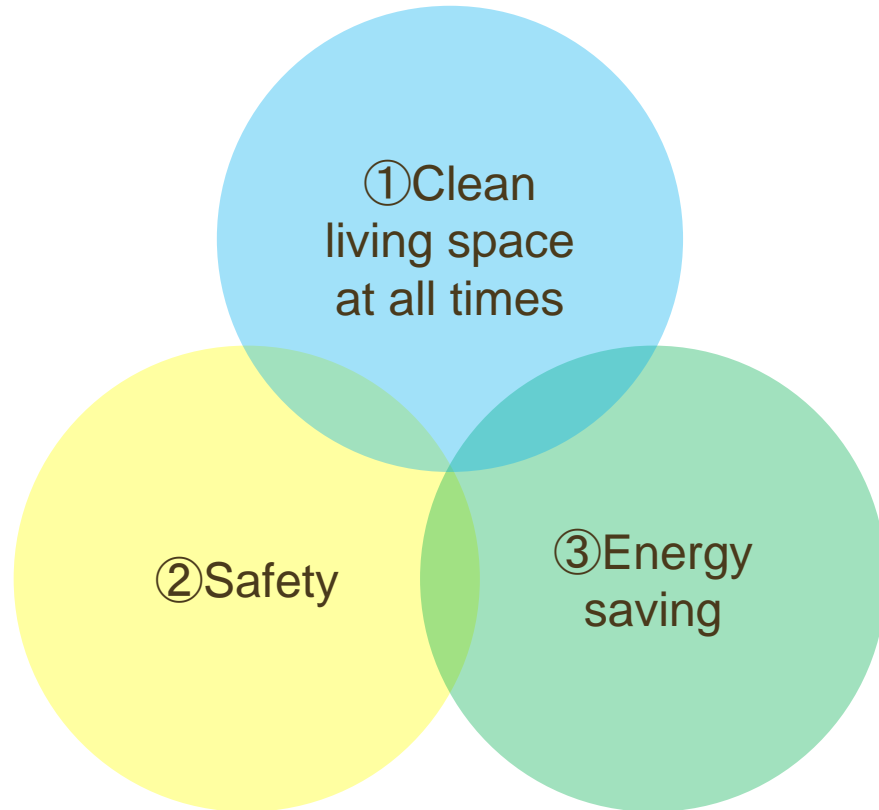
This technology is based on the technology used in the space satellite Hayabusa, which uses a compact engine to create microscopic water molecules, which are then negatively charged and diffused throughout the room.

In addition to corona discharge, ionized water is used to generate reactive oxygen species to sterilize and deodorize the space.



# Features of Silent Nano Diffuser

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## ① Clean living space at all times

- Inactivates bacteria and viruses
- Inactivates odor-causing substances

## ② Safety

- Products with excellent safety that do not harm the human body or precision machinery such as home appliances even when used constantly in living spaces

## ③ Energy saving

- Energy-saving and environmentally friendly due to extremely low power consumption



# Product Lineups



# Three Silent Nano Diffusers for different room sizes

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nanoseed M



For spaces up to 40 tatami mats  
Also available as an air freshener

nanoseed  $\alpha$



For spaces up to 100 tatami mats  
Works well in offices, etc.

Anqu



For spaces up to 15 tatami mats  
Compact and portable

# Product Introductions



Tokyo Metropolitan  
Government Office



Saku University





Restaurants and retail stores

Medical and nursing care facilities

### Other Introductions (Approximately 15,000 units are currently in operation in Japan)

- Toppan Printing Co., Inc.
- Nomura Real Estate Holdings, Inc.
- HAPPINET CORPORATION
- ZOZO, Inc.
- The Westin Tokyo
- TANAKA Kikinzoku Jewelry K.K.
- Jupiter shop channel Co., Ltd.
- ASICS Corporation
- Oji steel Co., Ltd. Gunma Works
- TBWA \HAKUHODO(TH)
- Autobacs Utsunomiya South Store
- Dokkyo Medical University Hospital, Department of Diagnostic Pathology
- Osaka Institute of Technology
- Matsumoto dental University
- Konosu City Hall
- Koki Holdings Co., Ltd.
- Tokyo Metropolitan Government Office
- YOSHIMOTO KOGYO HOLDINGS Co., Ltd.
- Filming for TV Asahi drama series Doctor X
- A total of 12 kindergartens, elementary schools, and junior high schools in Saku City, including Saku University, Summit Academy Elementary School SAKU
- Clinics in Saku city including otorhinolaryngology, internal medicine, dentistry, dermatology, etc.





# Introduction to Technology

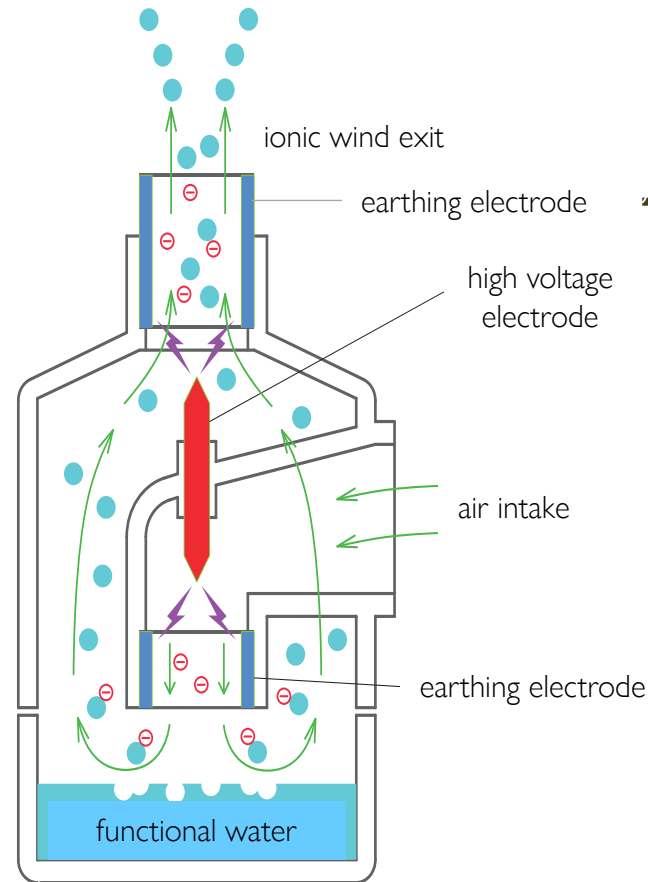
Patented unique ion engine



# nanoseed ion engine technology



Laminar flow (ionic wind)  
diffusion image



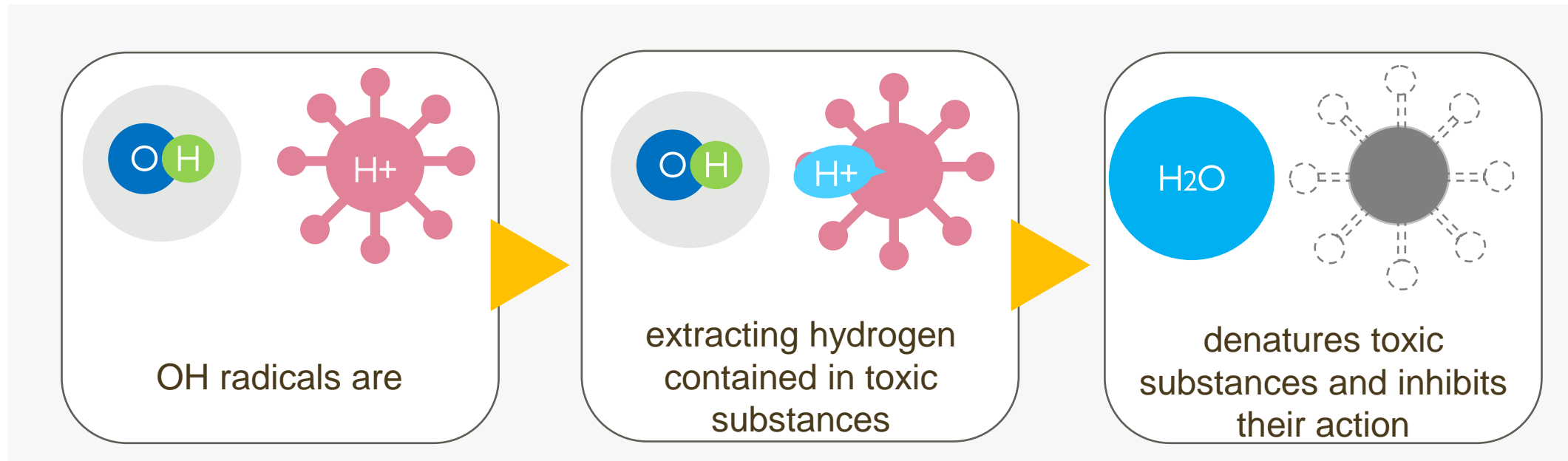
## Feature

- Functional water particles negatively charged by two degrees of corona discharge are nano-sized and released
- Generation of ionic wind through the use of cylindrical electrodes to diffuse over a wide area
- Effective generation of reactive oxygen species (e.g. ozone and OH radical) through the use of ionized water



# About Radicals

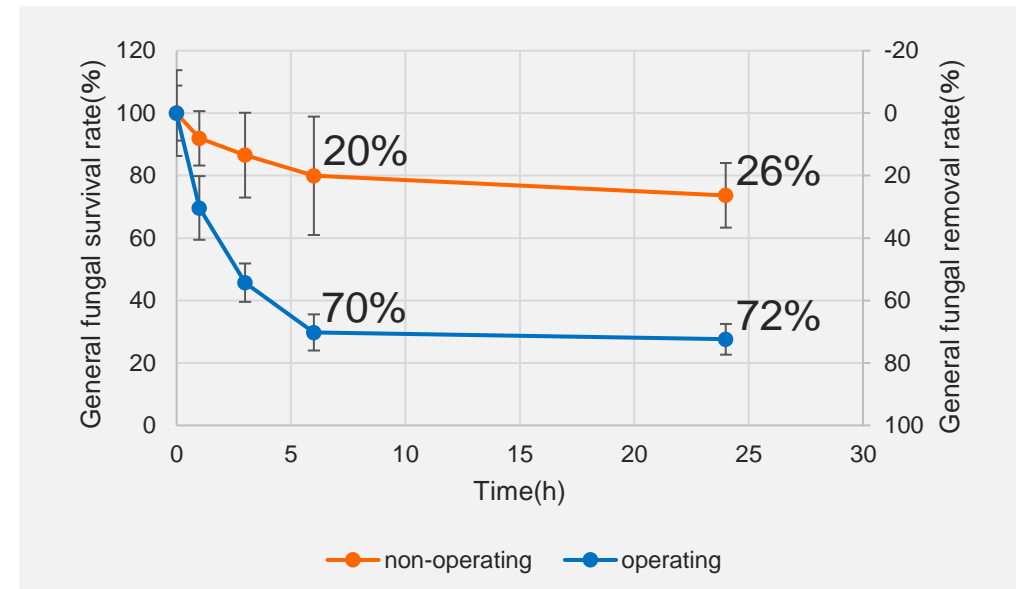
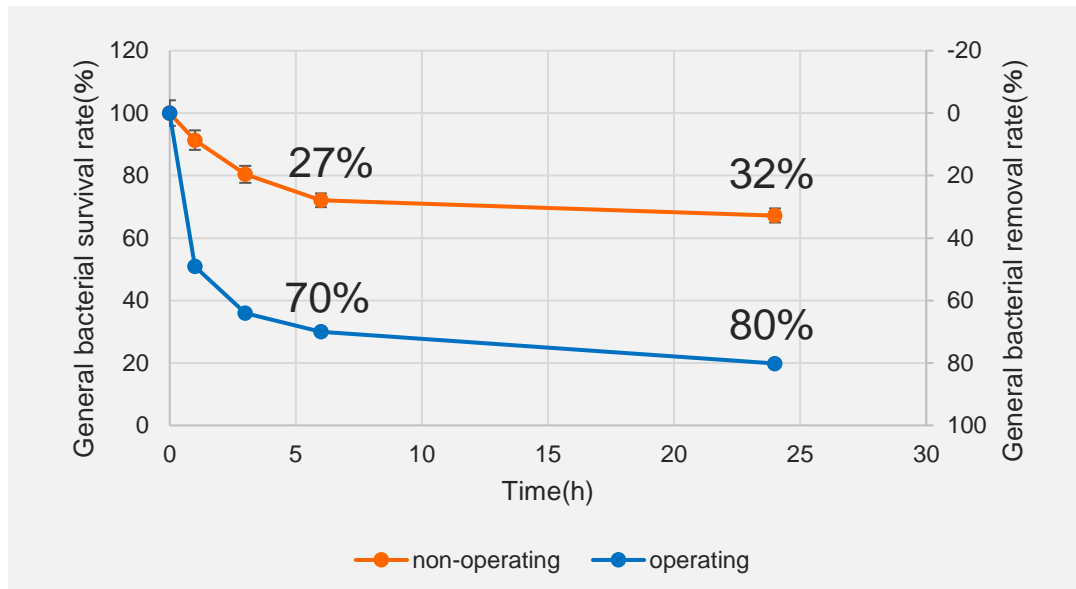
What is Radical . . . One of the states of an atom, an atom or molecule with one or more unpaired electrons. It is electrically very unstable and extremely reactive as it attempts to steal missing electrons from surrounding atoms and molecules. OH radicals are particularly reactive and effective in inactivating bacteria and odorous substances.



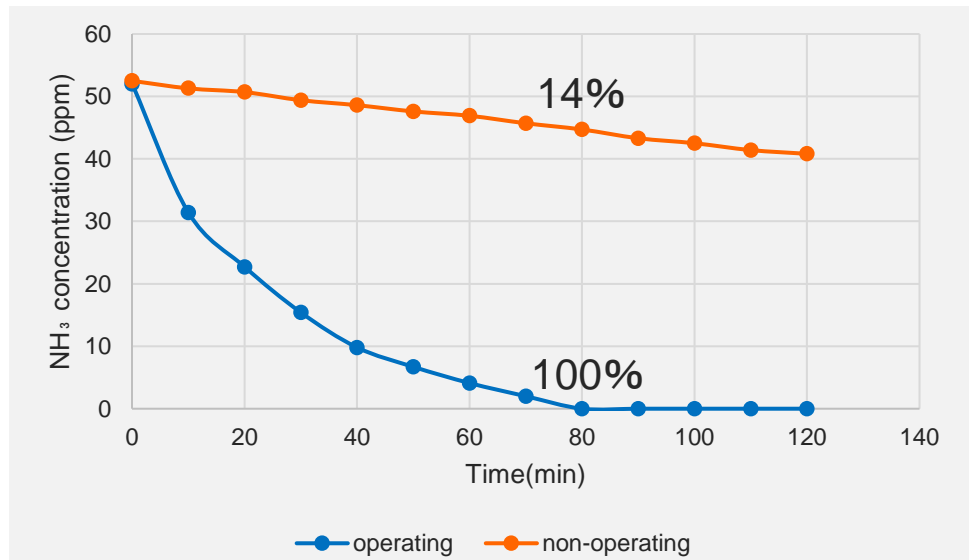
# Sterilization effect by nanoseed $\alpha$



Tests conducted in a space at the 500m<sup>3</sup> level (approx. 100 tatami mats) confirmed more than 70% sterilization effectiveness in 6 hours for both general bacteria and general fungi.



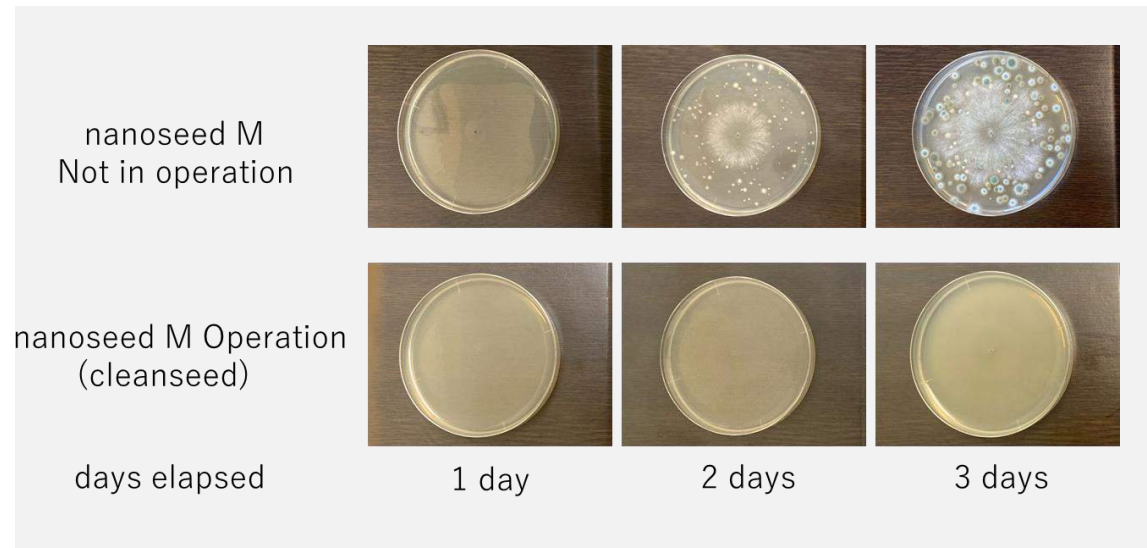
# Ammonia deodorizing effect by nanoseed $\alpha$



Test results in a 1m<sup>3</sup> glass case

After operating nanoseed  $\alpha$ , 50 ppm ammonia was reduced to 0 ppm in 80 minutes.

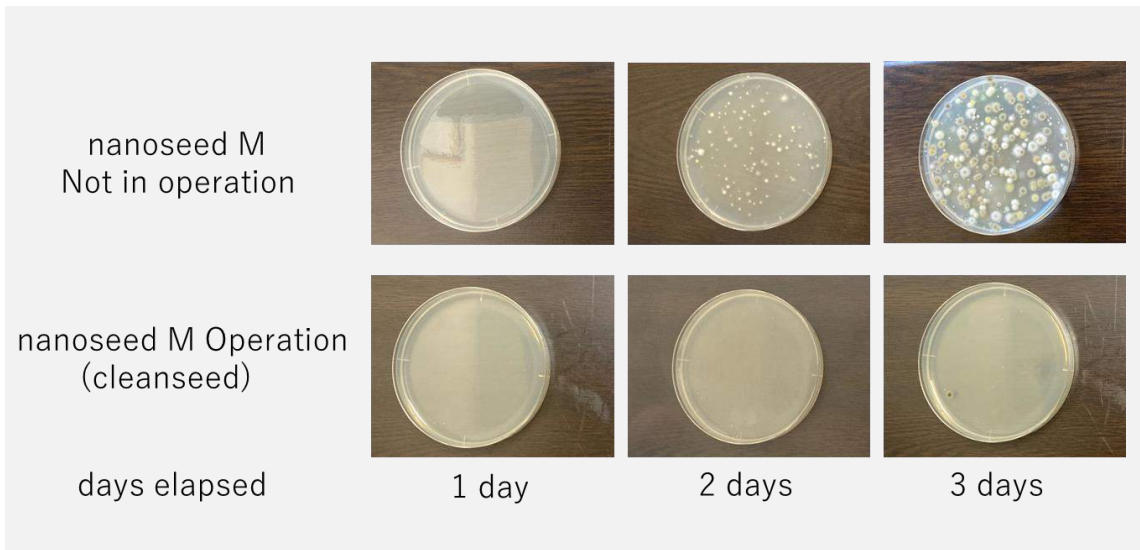
# Growth inhibition test against fungi by nanoseed M



Test results in a 1m<sup>3</sup> glass case

When nanoseed M was operated, it was found to have an inhibitory effect on the growth of fungi.

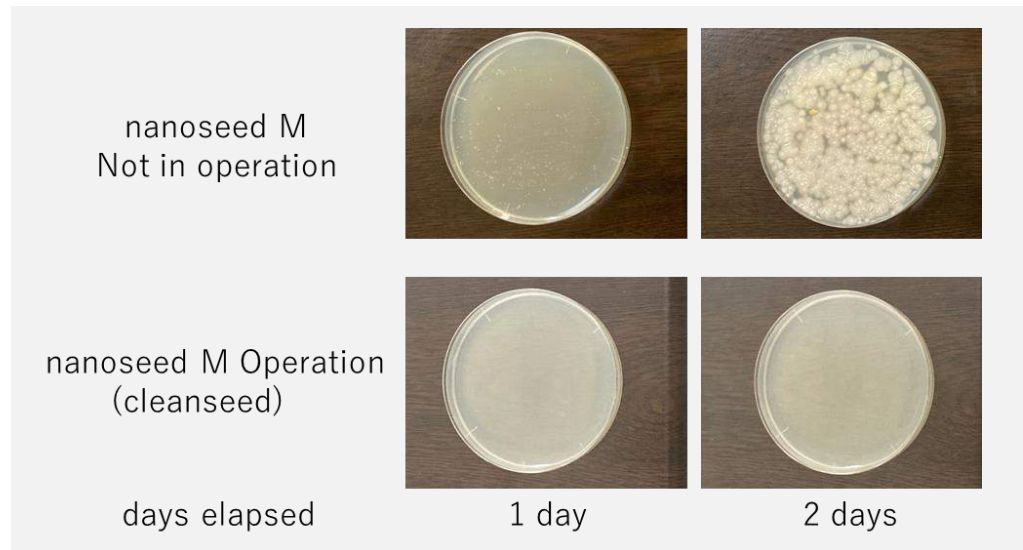
# Sterilization test against falling bacteria by nanoseed M



Test results in a 1m<sup>3</sup> glass case

When nanoseed M was operated, it was found to be effective in inhibiting growth against the falling bacteria.

# Growth inhibition test against *B. subtilis natto* by nanoseed M

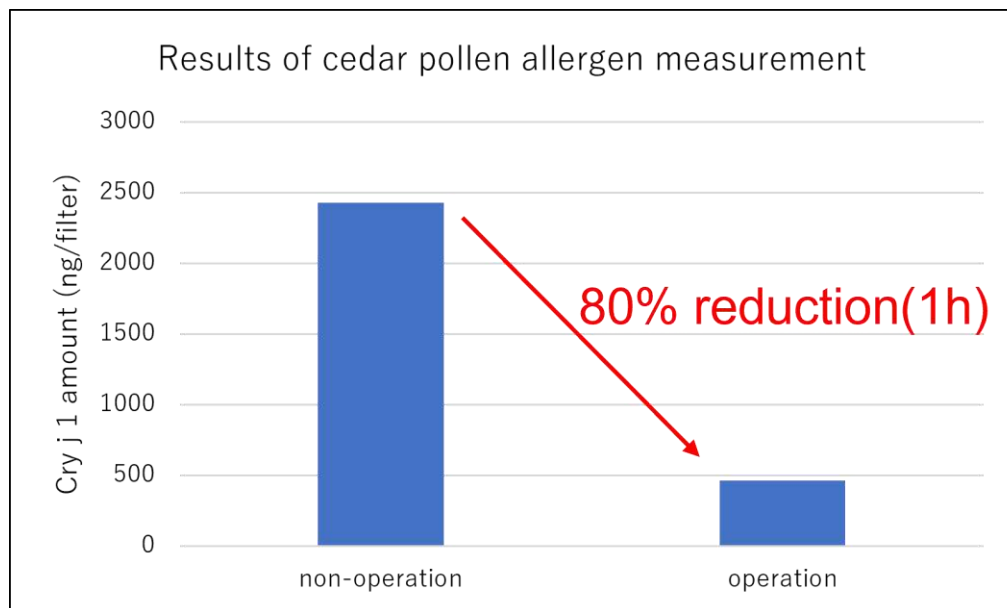


Test results in a 1m<sup>3</sup> glass case

When nanoseed M was operated, it was found to be effective in inhibiting growth against the *B. subtilis natto*.



# Inactivation of cedar pollen allergen



Pollen testing using the device (nanoseed Inc.)  
Allergen measurement (Environmental Allergens Info and Care, Inc.)

Test results in a 1m<sup>3</sup> glass case

It was found that one hour of operation of nanoseed  $\alpha$  could inactivate 80% of Cry j 1, a major allergen of cedar pollen.

※Cry j 1 is one of the major allergens of Japanese cedar (Cryptomeria japonica) pollen

# Use as an aroma diffuser



nanoseed M



Anqu

As shown in the photo on the left, nanoseed M can also be used as an aroma diffuser by setting the cup that holds functional water with aroma oil.

nanoseed M can be used with functional water on one side to simultaneously sterilize, deodorize, and diffuse aroma.

As for Anqu, it comes with a dedicated aroma cup, which can be used as an aroma diffuser by filling it with aroma oil and setting it in place.

Anqu is an aroma-only device when used as an aroma diffuser.

# CO<sub>2</sub>-reduction technology



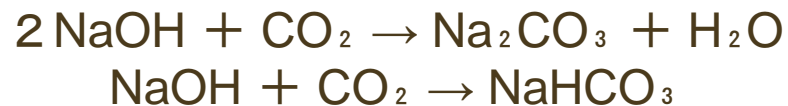
Further advances will be made using corona discharge technology developed by nanoseed. It is a technology that can reduce carbon dioxide in the atmosphere.

【 About the mechanism of CO<sub>2</sub> reduction 】

OH<sup>-</sup> produced from O<sub>3</sub> and H<sub>2</sub>O collides with ionic water by ionic wind to form NaOH.



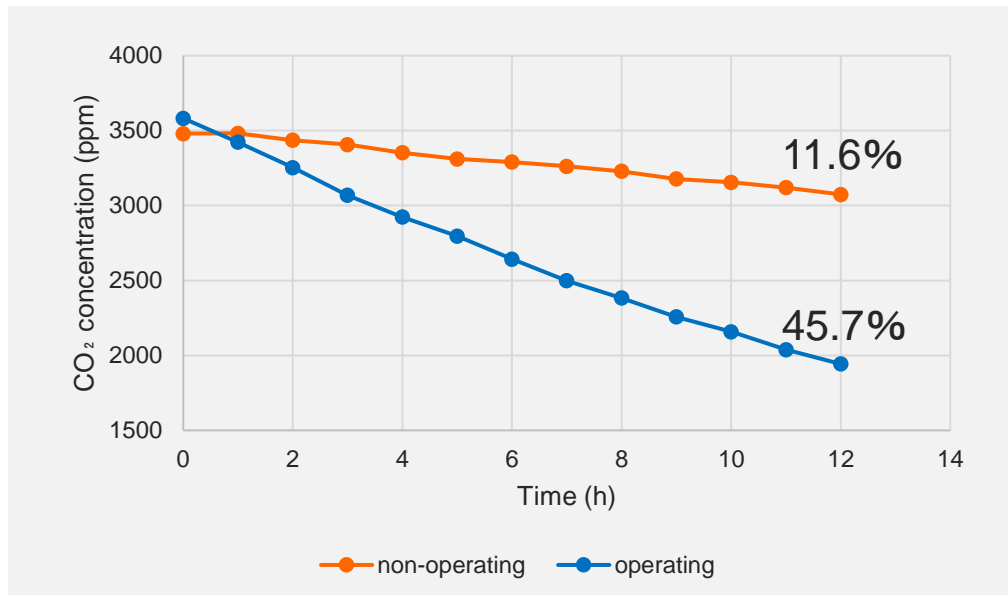
The NaOH produced is thought to react with CO<sub>2</sub> in the air to produce the carbonates Na<sub>2</sub>CO<sub>3</sub> and NaHCO<sub>3</sub>.



CO<sub>2</sub>-reduction device  
(temporary name) nanoseed X  
(Patented)  
Patent No. 7309165



# CO<sub>2</sub>-reduction effect



Test results in a space of 4m<sup>3</sup>

When the nanoseed  $\alpha$  was in operation, it reduced CO<sub>2</sub> by 34.1% in 12 hours compared to the non-operation.

# Ion engine application technology proposal

Some examples of possible applications in various fields based on the basic technology



## Allergen countermeasure

By inactivating allergenic substances such as pollen and dust mites in living spaces, it is possible to propose comfortable living environments.

## Improved storage length of fresh flowers and vegetables

By breaking down ethylene, a known plant hormone that promotes plant maturation, the storage length of fresh flowers and vegetables can be extended.

## Isolation of solutes

It is possible to extract ionized substances dissolved in solution as single crystals.

## Diffusion of GABA components

The nanosized release of GABA, a component of GABA that is expected to improve relaxation and sleep quality, is expected to lead to high-quality relaxation in living spaces.

## Propulsion and attitude control of satellites

It is expected that the use of water to generate thrust without the use of harmful gases will make it possible to make the ion engines of satellites ultra-compact.



# conclusion

## Proposal of comfortable living space

- Continuous operation maintains a clean environment at all times
- Can be used at home, in the office, in the car, and many other locations
- Safety and energy-saving machine
- Numerous voices saying they have seen the benefits at the places where they have been introduced.

## Application of "nano-technology" in various fields

- Currently, the company is focusing on its function as an air purifier, but in the future it plans to work toward practical application with an eye toward various fields of application.



Thank you



<https://nanoseed.jp/>