

June 26, 2023

Meidensha Corporation

To members of the media

## **Meidensha starts selling Ultra-high concentration/High purity Ozone Water Generator**

**Excellent cleaning effects and reduced negative environmental impact expected**

Meidensha Corporation (Meiden) has launched a comprehensive marketing campaign for its “Ultra-high concentration/High purity Ozone Water Generator” capable of attaining an ozone concentration of up to 450mg/L<sup>\*1</sup>, one of the highest levels in the industry.

Due to its high oxidation capacity, ozone water can be used for various purposes, including sterilizing viruses, deodorization, sewage treatment, and removing and cleaning organic matter in semiconductor manufacturing processes. Particularly, ultra-high concentration/high-purity ozone water has an excellent cleaning capability. Using this ozone water as an alternative to conventional chemical solutions in cleaning treatments is expected to help reduce environmental impacts.

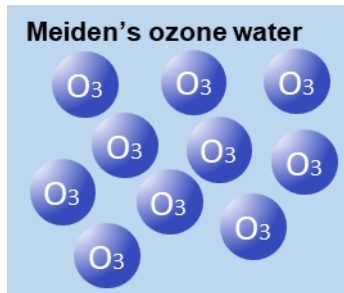
Since completion of the generator’s development in May 2022<sup>\*2</sup>, Meiden has conducted market research and development aimed at commercialization. These efforts have led to the small-capacity model for research and development being launched on the market. Meiden plans to accelerate development of a mass-produced model with higher flow rates to expand the product lineup. It aims to receive orders for the mass-produced model from the semiconductor sector from fiscal 2024 and achieve more than 100 orders in 2030.

### **1. Features of the Product**

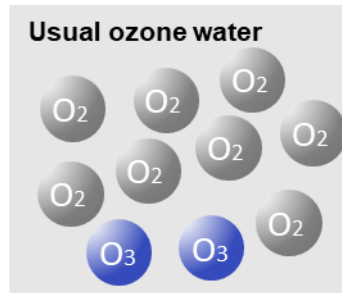
The product generates ozone water from pure ozone gas with a concentration of nearly 100% supplied by the Pure Ozone Generator<sup>\*4</sup> provided by Meiden Nanoprocess Innovations Inc.<sup>\*3</sup>, which uses a unique Meiden method to generate ozone water with reduced pressure. This method does not require the use of high-pressure or special chemical solutions. The product has added attractive value to usual ozone water, and is expected to be used in a wide range of fields.

### Ultra-high concentration/High purity

Meiden's ozone water has extremely high concentration and purity due to the presence of dissolved ozone gas that is free from impurities such as oxygen, other gases and heavy metals.



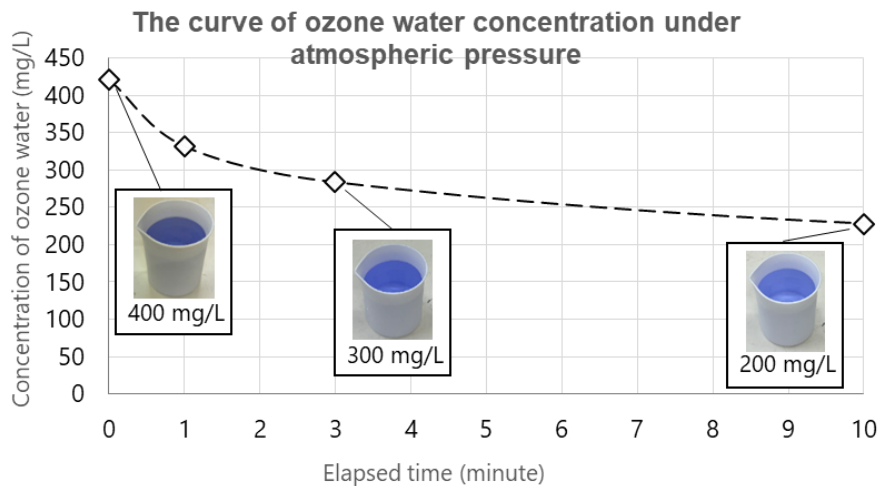
**theoretically contains no impurities such as heavy metals.**



**contains much amount of impurity gases other than ozone (O<sub>3</sub>).**

### Maintaining a high concentration for a long time

The product can generate ultrahigh-concentration/high-purity ozone water under atmospheric pressure and can maintain ozone concentration in water for a long time under atmospheric pressure.



By supplying ozone water without compressed ozone gas, the ozone water can maintain an ozone concentration of more than 200mg/L after 10 minutes under atmospheric pressure and that of more than 100mg/L even after 80 minutes.

## 2. Product specification

Concentration	300-400mg/L
Water temperature	5-20°C
Flow rate	0.3-1.0L/min
Purity	Impurity concentration below the ppt level
Ozone generation method	Generation method with reduced pressure
Possible period for continuous supply	80 minutes (Flow rate in supplying ozone water: 1.0L/min; Concentration: 300mg/L)
Dimension	1900mm in width, 1000mm in depth, 1980mm in height (excluding protrusions)

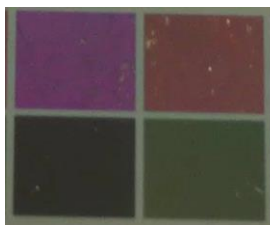
## 3. Effects of the product usage and applicable fields

- **High cleaning effects and reduced environmental impact**

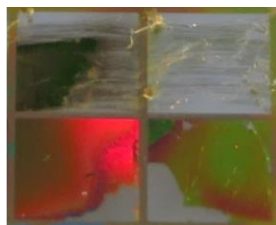
Using its unique OUR<sup>TS</sup> (patent pending) processing technology, Meiden has succeeded in removing organic matter, which previously could be removed only by using chemical solutions that have a considerable impact on the environment. Also, using the product can reduce the cost of treating waste water compared with treatment using chemical solutions, because ozone water eventually decomposed into harmless water and oxygen.

Applicable fields include cleaning semiconductors, degreasing and cleaning metals, as an alternative to cleaning agents that have a greater environmental impact, etc.

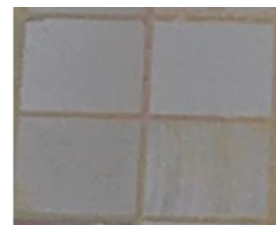
**Example of cleaning resist implanted with a high concentration of ions (part of the semiconductor manufacturing process)**



Before cleaning



During cleaning



After cleaning

Kind of resist: KrF resist/implanted ions: P/dose:  $10^{14} \text{cm}^{-2}$

- **Property modification**

With its high oxidation capacity, the ozone water is expected to turn hydrophobic substances, such as carbon powders and fibers, into hydrophilic, or to change the property of the surface of semiconductors, glass and other substances for bonding.

Applicable fields include those involving semiconductors, powders and battery materials.

- **Sterilization and disinfection effects through powerful oxidation reactions**

The generator is expected to yield sterilization and disinfection effects with powerful oxidation reactions achieved through an overwhelming amount of ozone. Because it generates high-purity ozone water that does not contain heavy metals or harmful substances, the generator can provide safe solutions and peace of mind to clients, particularly in the medical and food industries.

Applicable fields: Advanced medicine, food

4. For inquiries about the generator and requests for samples, contact Ms. Tsuji of the Private Sector Sales Section, FSE Business Planning Group  
Email: [ozone-uketsuke@mb.meidensha.co.jp](mailto:ozone-uketsuke@mb.meidensha.co.jp)

\*1 The maximum concentration of ozone water attained under a certain condition. Please refer to the product specification in 2. for concentrations attained in normal use.

\*2 Press release dated May 19, 2022

“Ultra-high concentration/High purity ozone water (400mg/L or more) generated successfully.”

[https://www.meidensha.com/news/news\\_03/news\\_03\\_01/\\_icsFiles/afieldfile/2022/06/07/20220607.pdf](https://www.meidensha.com/news/news_03/news_03_01/_icsFiles/afieldfile/2022/06/07/20220607.pdf)

\*3 Meiden Nanoprocess Innovations Inc.: Established April 1, 2021, as a wholly owned group company of Meiden.

\*4 Pure Ozone Generator: A unique Meiden Nanoprocess Innovations product that generates ozone gas with nearly 100% purity that theoretically does not contain impurities such as heavy metals

Website: [https://www.meidensha.co.jp/npi/products/prod\\_01/](https://www.meidensha.co.jp/npi/products/prod_01/)

\*5 OUR stands for Ozone water Used Radical generation. It allows a novel,

accelerated oxidation reaction by inducing the reaction of Ultra-high concentration ozone water with a unique technology.



Ultra-high concentration/ High purity ozone water generator, right  
Pure Ozone Generator, left