

2022

**PALSOO**

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# PAL SOO

Plasma Portable  
Sterilizer Spray

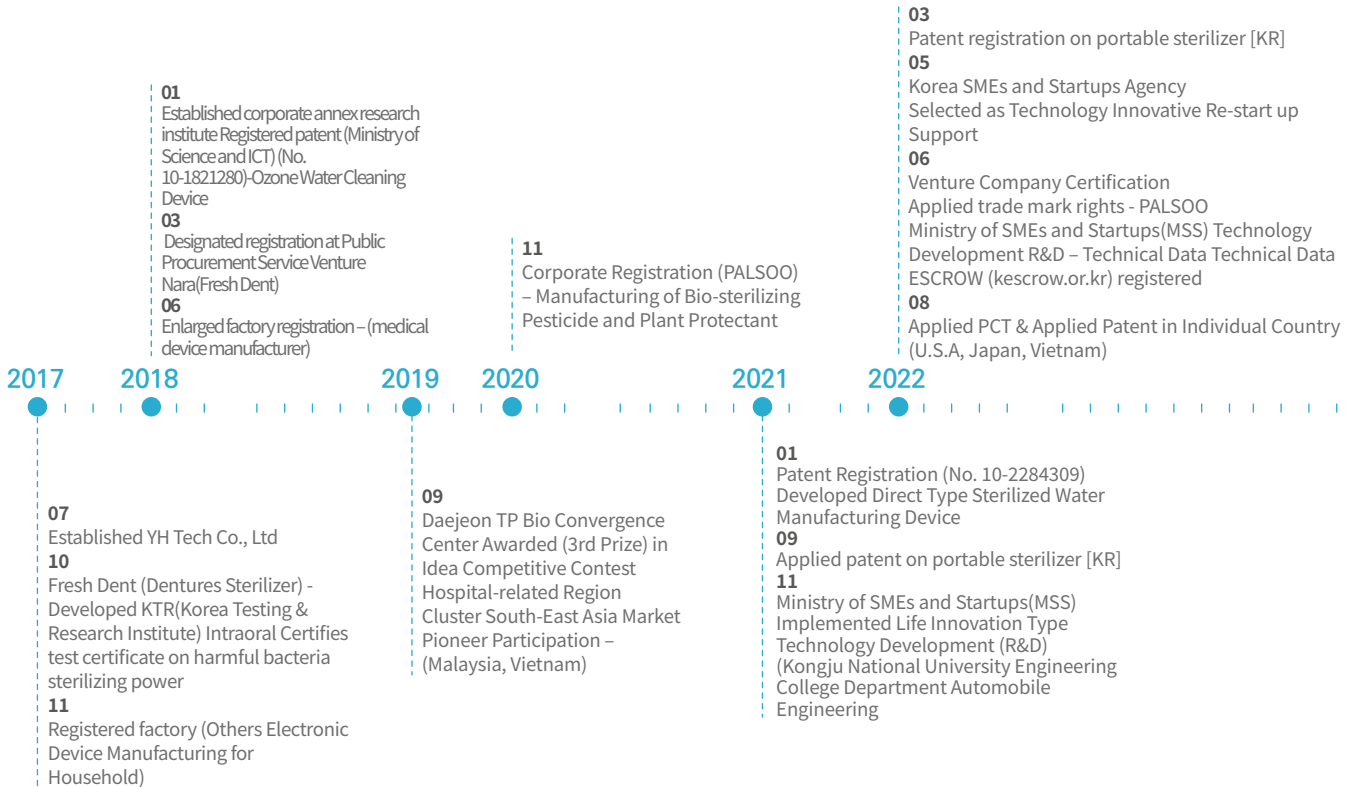
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Plasma Activated Water  
[Plasma Activated Water; PAW]

# What is Plasma Activated Water Technology?

It refers to utilizing a technology that includes various components in water by forming atmospheric plasma and reacting various activated species (radical), ions, electrons, ultraviolet rays, etc. created in plasma with water. If discharge is performed in the atmosphere, large quantity of nitrogen and oxygen radicals is created and PAW (Plasma Activated Water) including these radicals have acidity and includes nitrogen component in the form of nitric acid. Since Plasma Activated Water can be created only with water and air, it is eco-friendly and due to its sterilizing power regarding microorganism, it is used as various disinfectants and the nitrogen components included in water has the function of liquid fertilizer. -KERI Korea Electrotechnology Research Institute Electrophysical Research Center Jin Yunsik Researcher's Thesis (Cited)

## 1. Corporate History



## 2. Utilization in Agrifood Field

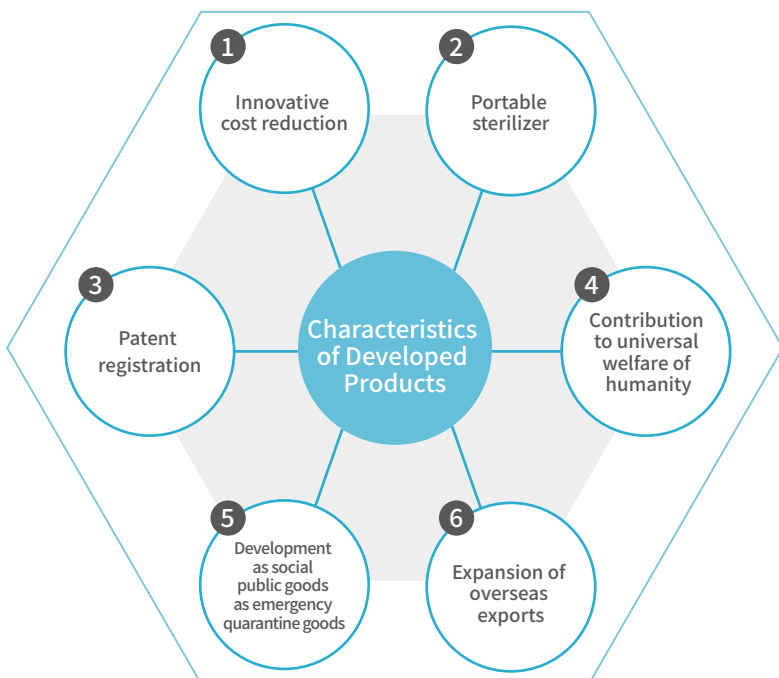
- Plasma which can be utilized in agrifoods has numerous elementary compositions such as ions, electrons, radicals, and UV due to low temperature and it has diverse characteristics. The three control functions of activation, sterilization, catalyst induced by these various elementary compositions can be applied throughout the entire cycle of agriculture. Plasma technologies can be applied in all processes from farm to table such as increase of seed germination rate, cultivation of agricultural crops, harvest and storage, cleaning, packaging, delivery, store window display, household storage, cooking, and food waster process. The method which can be applied to the entire cycle of agriculture was named ‘Plasma Farming’ and this comes to applying plasma technology throughout the entire cycle of agriculture ‘from farm to table’
- In case of application of activation characteristics of plasma, there is seed processing. Seeds processed with plasma not only has increased germination rate but also increased sprout growth. Sterilization characteristic of plasma can include storage of agricultural products and cleaning of agricultural products. In addition, as plasma has functional feature as a catalyst, it extends storage period by removing ethylene gas which becomes a problem during fruit storage and if nitrogen in air is fixed in the form of nitrate by dissolving in water after efficient dissociation utilizing plasma, by utilizing nitrogen in air on plasma, the effect of nitrogen fertilizer can be acquired.
- While plasma is generated between the gaps of water and the electrode, nitrogen molecule is dissociated and it is fixed in the form of nitrate as it dissolves in water. Moreover, for other nitrogen fixation methods, there are cases where nitrate is formed through direct plasma discharge in water.  
-Vacuum Magazine 2015.12. Korea Institute of Fusion Energy “Utilization of Plasma Technology on Agricultural Food Field” (Cited)

### 3. PALSOO

# PALSOO

Plasma Automizer nozzle Lithium-ion battery Sterilizing Origin Operating

### 4. Characteristics of Developed Products



Technology development product 'Wireless Sterilizer Spray' was developed as a system that fills tap water and directly transforms to and sprays sterilized water through a sterilized water dissolution technology using plasma forming device and Atomizer nozzle and cost was innovatively reduced.

Wireless sterilizer spray was developed with a system of charging and discharging lithium-ion battery built in the main body and it is effectively used in various fields without limitation of space with charging (complete charge 60 minutes and continuous spray sterilizing running time (60 minutes).

Wireless sterilizer spray (natural water filling method) was developed as public goods that can be used in emergency situation at any time even an environment where it is not easy to purchase and store a sterilization solution or where a sterilization solution is not prepared

Due to spread of COVID 19 and continuance of pandemic situation in all fields of politics, economy, society, culture in the entire world, it is a product that contributes to the universal value of humanity through eco-friendly technology advancement of sterilization

# PALS00

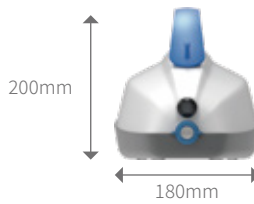
Plasma Portable Sterilizer Spray



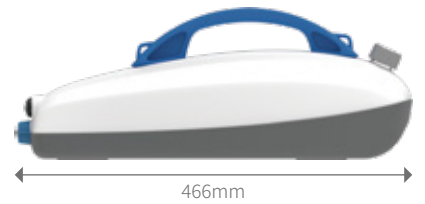
• Top view



• Front view



• Side view

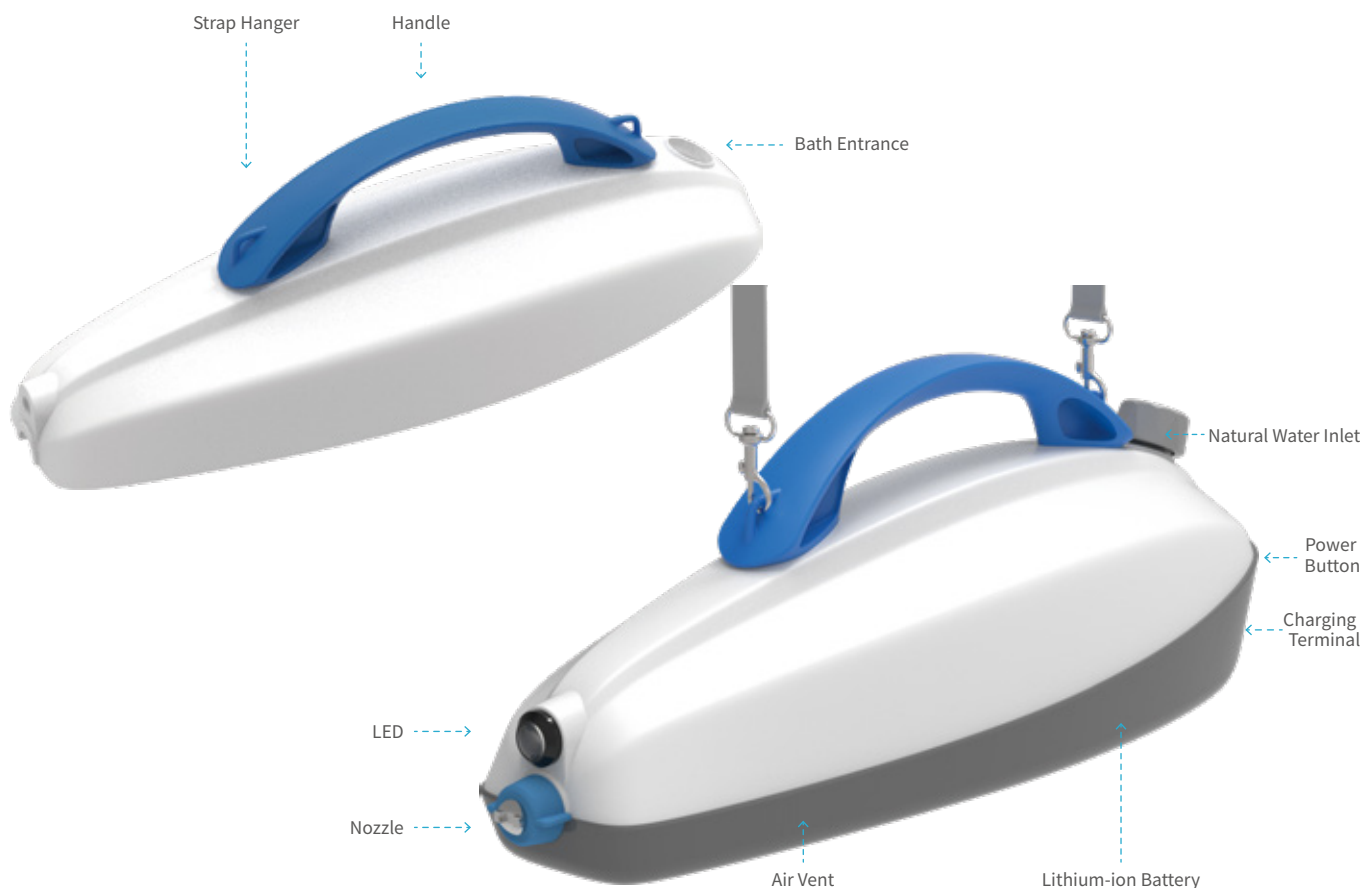


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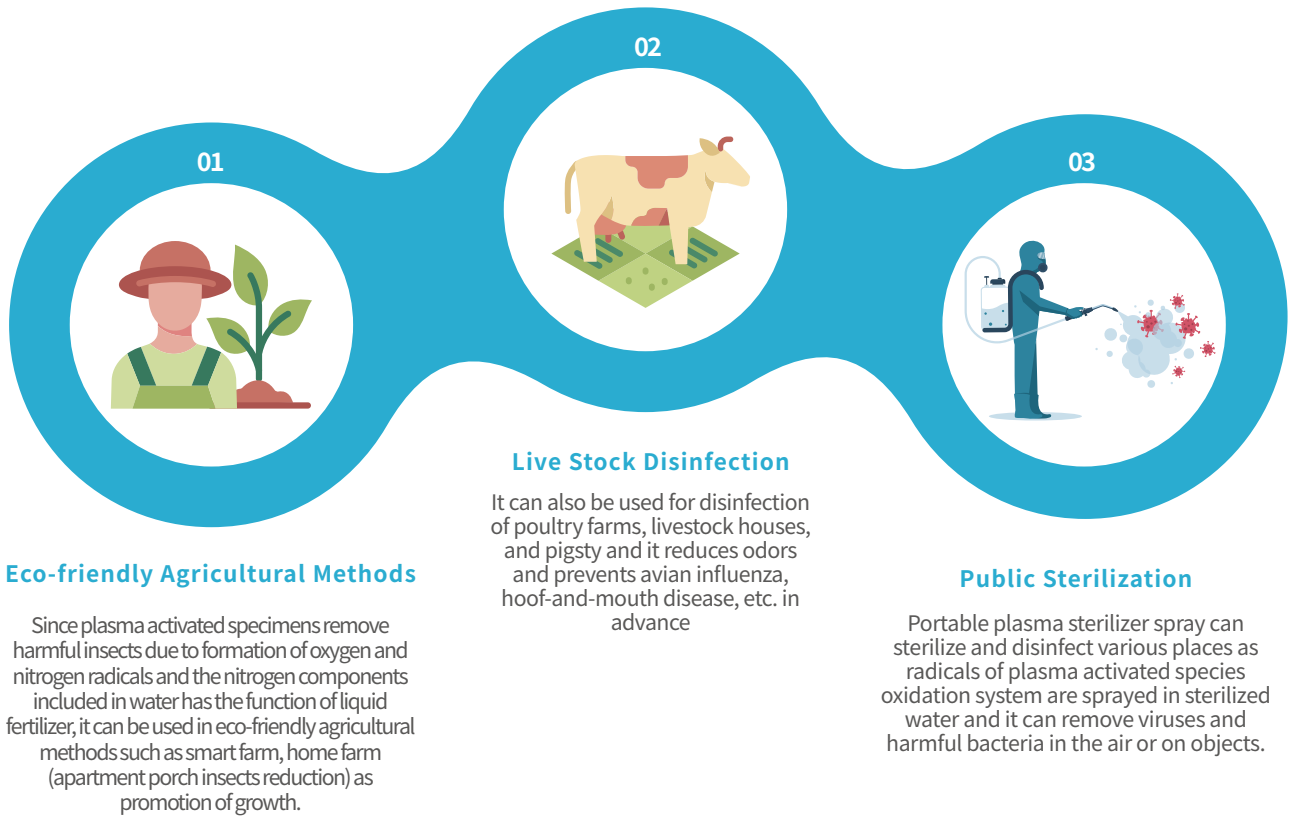
## 5. Plasma Activated Water Technology

Major Performance Index	Unit	Final Development Objective	Requirement Level by the Demander	Certification Institute
Sterilizing Power (Virus)	Homogenized Water Quantitative Analysis	Evaluation of antiviral performance (antiviral test) regarding specimens, annihilation of over 95% quantitative index after 40 seconds, 90 seconds	Coronavirus Human coronavirus(OC43), Influenza A Virus - Influenza A(H1N1)	KTR / KRIBS
Sterilizing Power (Pathogenic Strains)	Homogenized Water Quantitative Analysis	Evaluation of antiviral performance (antiviral test) regarding specimens, annihilation of over 95% quantitative index after 40 seconds, 90 seconds	Staphylococcus Aureus, Colon Bacillus, Streptococcus pyogenes, Salmonella, Listeria monocytogenes, Vibrio	KTR / KRIBS
Sterilizing Power (Space Sterilization)	Homogenized Water Quantitative Analysis	Performance of floating virus reduction	SPS-KOUVA (Test conditions without filter media (filer))	ktl
Electromagnetic wave authentication (KC,CE)	Electromagnetic Wave Resistance	Conformity Test Report	Conformity Test for Electromagnetic Wave Synthesis Standards	SGS
Constant Temperature and Humidity	High Temperature High Humidity Environment	Conformity Test Report	Total r.m.s=1.15gn r.m.s (11.27m/s <sub>2</sub> r.m.s)	SGS
Vibration Test	PSD LEVEL	Conformity Test Report	Total r.m.s=1.15gn r.m.s (11.27m/s <sub>2</sub> r.m.s)	SGS
Lithium-ion Battery Pack/ Charger	Samsung 35E 18650	Nominal Capacity 3350mAh = 3.35Ah Nominal Voltage 3.60V*4s = 14.4V Electric Power 14.4V*3.35Ah = 48.24Wh	Measure charge and discharge voltage and current utilizing DC power supply and electronic load	Self-test
Nozzle test spraying angle/spraying distance, particle size	degree/m/μm	20~30/ 1.0/ 10~50μm	Spray angle 20~30 degree spraying distance spraying particle size 10~50 μm over 1.0m	Self-test
Charging and Discharging Time	m	Time Required for Complete Charge (60 minutes)	Continuous Spraying Time (60 minutes)	Self-test

## 6. Name of Each Part



7. BM(Business Model)



8. Storytelling



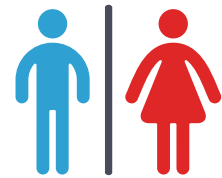
**01**  
**Weekend Farm**

Eco-friendly agricultural method establishment as liquid fertilizer



**02**  
**Sports Facility**

Sterilization, Disinfection



**03**  
**Public Facility**

Odor removal, sterilization and disinfection

9. Portable Sterilizer Trademark Application

Name of Applied Trademark	PALSOO [PALSOO]		
Applied Date	2022.06.04	Application	40-2022-0103801
Claimed Date of Accelerated Examination	2022.06.16	Product Type	Type 11
Designated Products	Air Sterilizer, Air Sterilizing and Disinfection Device, Sterilizer, Ozone Sterilizer, Ion Sterilizing Device, Medical Sterilizer and Sterilizing Apparatus, Steam Disinfectant, Household Sterilizer, Disinfection Device, Sprayer for Disinfection, Household Tableware Disinfection Device, Agricultural Irrigation Device, Agricultural Sprayer, Agricultural Spraying Device		

## 10. Government Support Business Participation Status

Project Name	Hosting Institute	Participated Project Name	Participation Date
Development of Plasma Wireless Sterilization Sprayer	Ministry of SMEs and Startups(MSS) Kongju National University Industry-University Collaboration Center	R&D Life Innovation Technology Development	2021.11
	Korea Invention Promotion Association	Patent-based Publicity Video Production	2022.06
	Institute of Design Promotion Daejeon Branch	Technology Convergence Innovative Product Design	2022.06
	Business and Employment Agency of Daejeon	Online export consultation for Brazil Serbia , China, Japan, Vietnam	2022.06
	Daejeon Techno Park	Innovative Technology Entitlement (Vietnam Patent)	2022.05
	Daejeon TP Webio Co., Ltd.	Patent Application in U.S.A, Japan	2022.07
	Korea SMEs and Startups Agency	Technology Innovation Type Re-start up Support	2022.05
	Daejeon Techno Park	Innovative Technology Entitlement (Drone Equipped Patent – Eco-friendly Agricultural Method Applied)	2022.07
	Daejeon TP Bio	Participation in BioTech Korea Exhibition	2022.09



“Plasma activated water technology has eco-friendly features that are not harmful to the environment without residual toxicity and carcinogenic by-products.”

In addition, PALSOO Co., Ltd. is currently proceeding patent (new technology) development on plasma eco-friendly control product equipped on drones without pesticides through numerous tests and research and developments.

Also, we are expected to launch plasma wireless sterilizing sprayer for large size 2.5L and small size 500ml

## 11. Certification

