

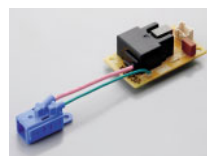
Murata Ionisimo Solution 2020 [Ionizer & Ozonizer]



Confirmed : Ozone gas kills COVID-19



- Confirmation that ozone gas is effective against COVID-19
- Nara Medical university in Japan, first worldwide confirmation published on May 15th 2020.



- Ozonizers generate Ozone
- Ionizers generate not only Ion but also Ozone

Test data for Ionissimo

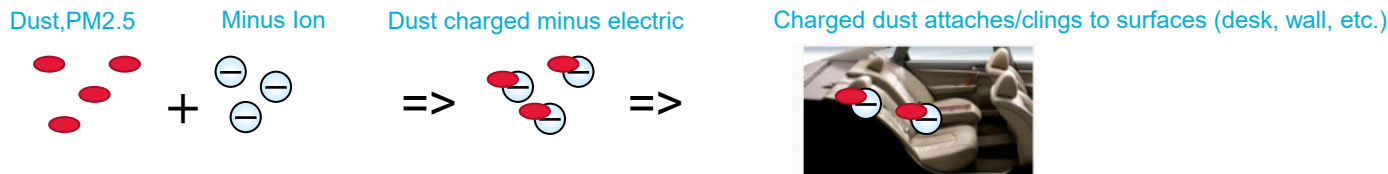
Test items	Material	Test result	Test condition	Joint test facility
Deodorant test	Ammonia	Reduced over 80%	After 180min.	Japan Spinners Inspecting Foundation(Boken)
	Hydrogen sulfide	Reduced over 70%		
	Formaldehyde	Reduced over 90%	After 120min.	Kinki Bunseki Center Ltd
	Methyl mercaptan		After 180min.	
Sterilizing test	Colon bacillus	Reduced over 99%	After 24hours	Japan Spinners Inspecting Foundation(Boken)
	Staphylococcus			
	Pathogenic coli O-157	Reduced over 90%	After 1 hours	FALCO biosystems
Anti-Influenza virus	HongKong A type H3N2	Reduced over 99.98%	After 2min.	Biomedical Science Association(BMSA)
Anti-allergen	Cedar pollen allergen (Cryj1)	Reduced over 99%	After 4 hours	Institute of Tokyo Environmental Allergy
	House tick allergen (Derf1)	Reduced over 80%		
	Dog allergen (Canf1)	Reduced over 99%		

What Ion or Ozone do best?



Ion:

Ion elements will negatively charge dust => Charged dust will attach itself to for instance walls and floors => But after discharge the dust will be airborne again.

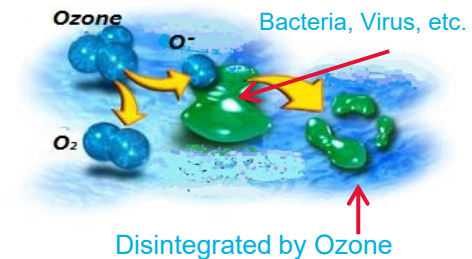


Ozone:

Ozone is a radical molecule which has an ability of oxidation => a chemical reaction will take place and the material will be disintegrated

Function table as Ion and Ozone

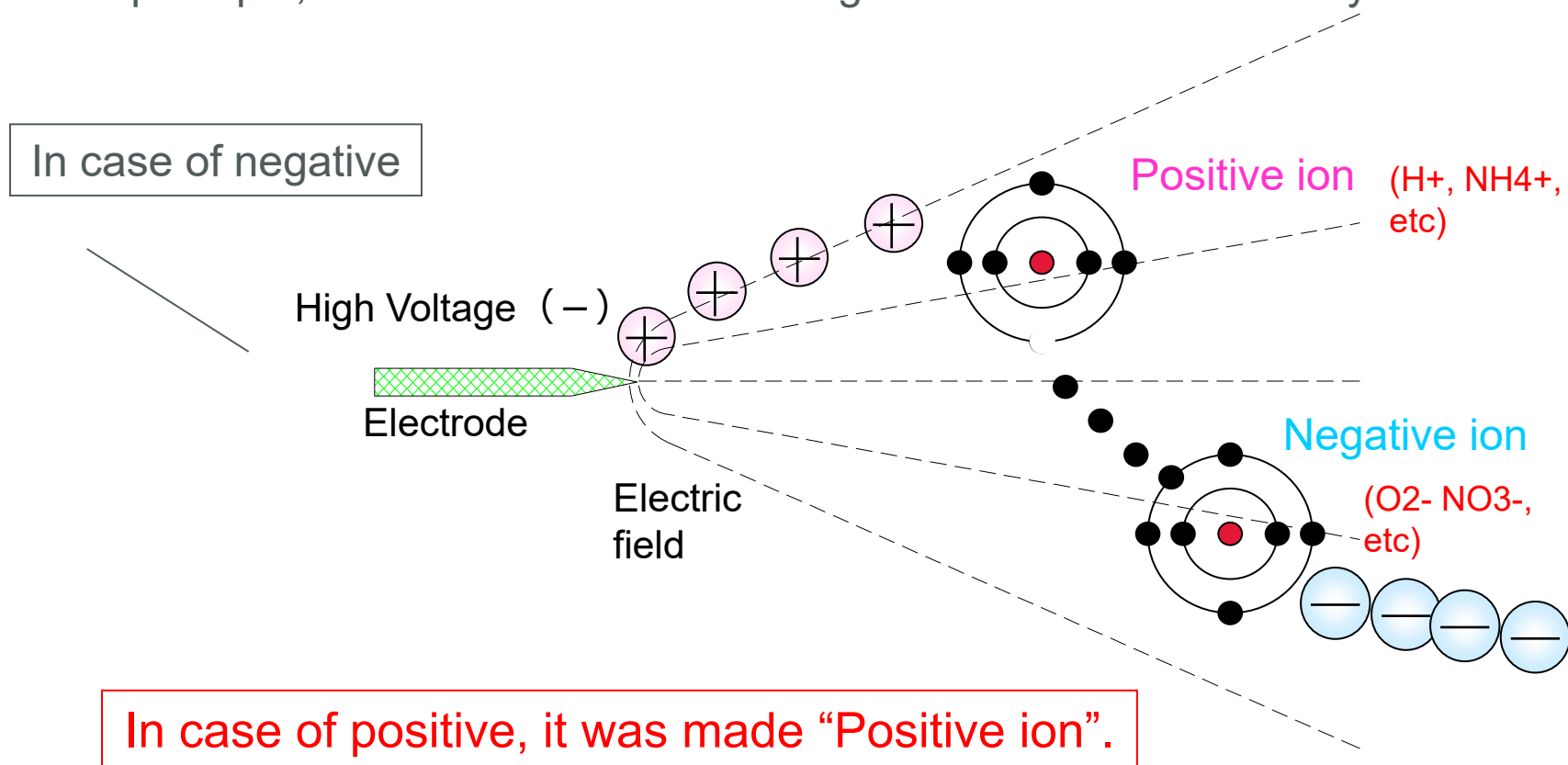
	Main element	
	Ion element (e^-)	Ozone element (O_3)
Effective function	Dust, Smoking dust	Anti-bacteria
	PM2.5	Anti-Allergen
	Keeping moisture on skin	Anti-Virus
	Keeping delicate in the skin	Anti-Mold
	Keeping elasticity in the skin	Sterilizing
	Static elimination	Deodorant
		Nutrient Up (Vitamin A, B, C, etc) for vegetable & fruits
		Keeping freshness for vegetable & fruits
		Reducing agrochemical for vegetable & fruits



Mechanism of Ion generation

- Ionizer is

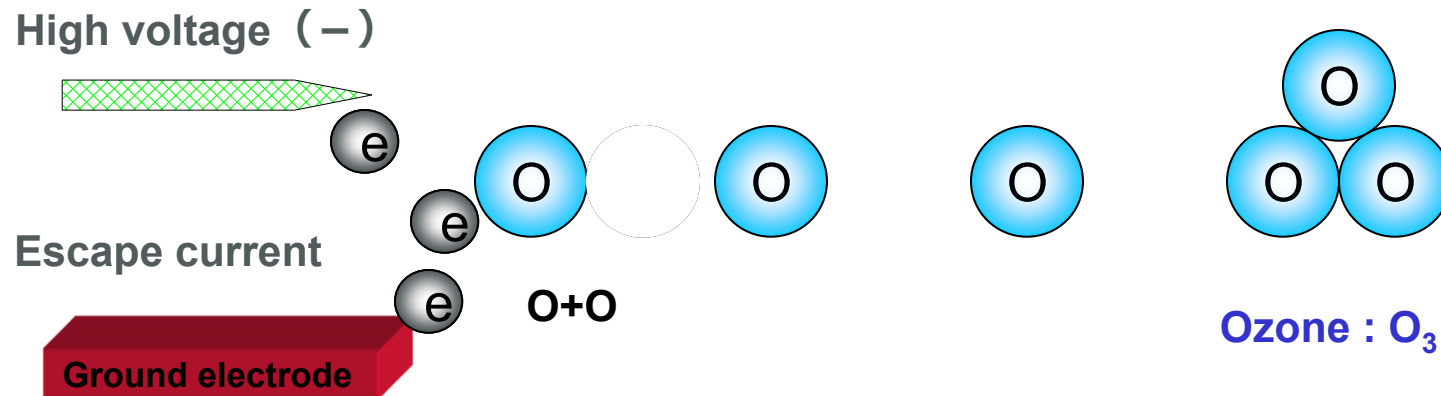
High electric field will be created by applying high voltage on a sharp-edged electrode. Air molecules will be ionized by high electric field, and its electron jumps out. Other air molecules which receive electron, are repulsed from electrode as “Negative ion”. The ionizer applies this principle, and it is an element ionizing an air molecule efficiently.



Mechanism of Ion generation



■ The mechanism of generating ozone



How do an ion and the ozone fly?



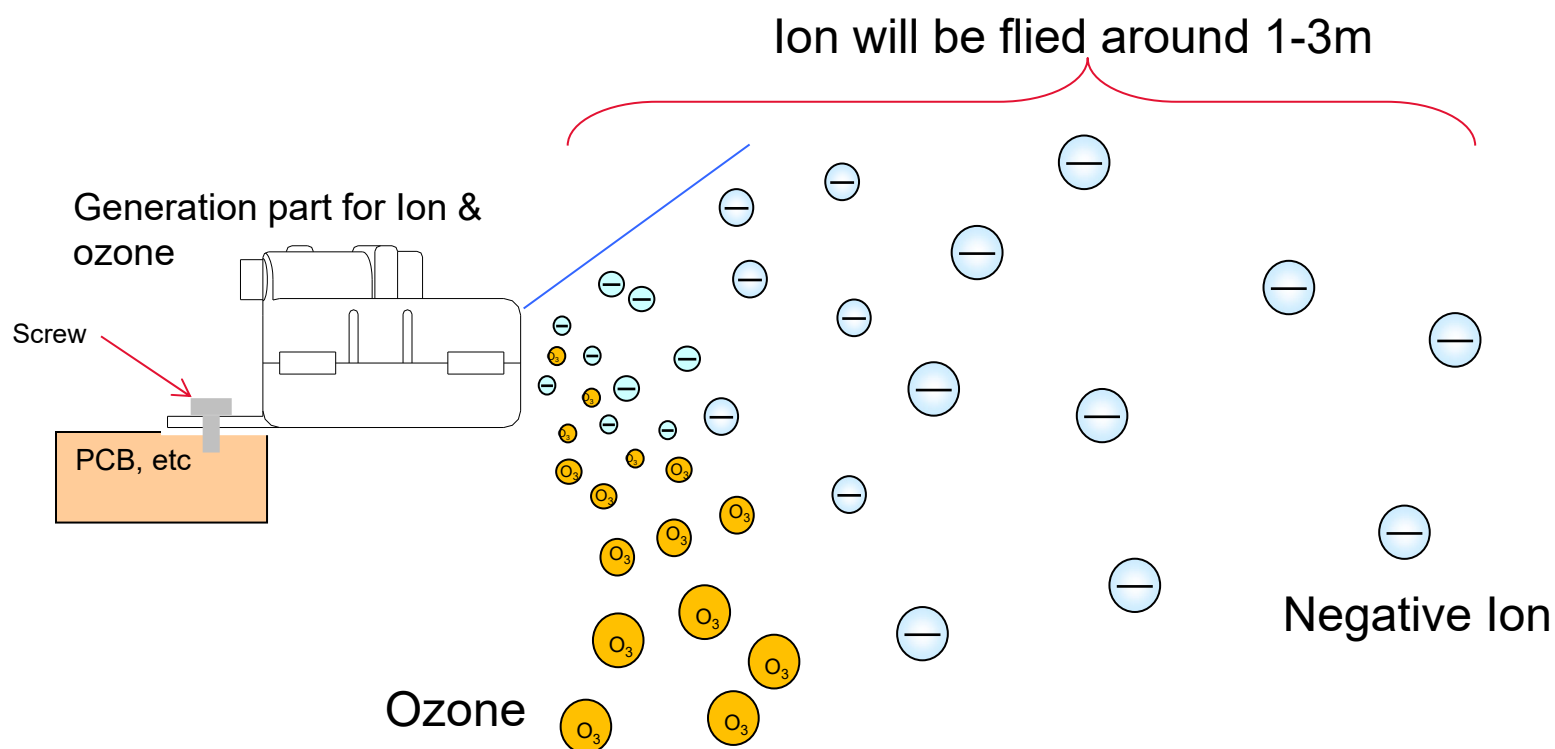
【How do Ion and Ozone fly in Murata Ionizer?】

<No air flow case>

- Ion will be flied around 1-3m due to it has repulsive force between negative high voltage and negative ion..
- The ozone drops with own heaviness due to ozone is heavier than the air.

Ion of effect are dust and smoke.

Ion is better to install in the space of a room or the inside of car room, etc.





Murata ionissimo as Ionizer

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Ionissimo : Products landscape 2020



Items	Parts number	Picture	Status	Input voltage	Ion amount at 20cm	Ozone density	Applications
Ionizer	MHM305 series		MP	12Vdc	-5Mpcs/cc	0.04mg/h	Air conditioner, Refrigerator, Dishwasher, Air cleaner, Car accessory for air cleaner, Humidifier, Dehumidifier, e.g.
	MHM306 series		MP	12Vdc	-5Mpcs/cc	0.6mg/h	
	MHM314 series		MP	12Vdc	-8Mpcs/cc	0.1mg/h	
	MHM400 series		MP	12Vdc	+5Mpcs/cc	0.1mg/h	
	MHM402 series		MP	230Vac	-4Mpcs/cc	0.4mg/h	
Active Oxygen Module (Ozonizer)	MHM500-00A		MP	12Vdc	-	3.5mg/h	Dishwasher, e.g.
	MHM501-00 (High reliability)		MP	12Vdc	-	3.0mg/h	Refrigerator, Air purifier, Humidifier, Dehumidifier, e.g.
	MHM502-01A (High density Ozone)		MP	12Vdc	-	45mg/h	Washing machine
	MHM503-00 (New generation for MHM501)		Under development	12Vdc	-	2.0mg/h	Refrigerator, Air purifier, Humidifier, De-humidifier, e.g.

NEW

Murata's Ionizer

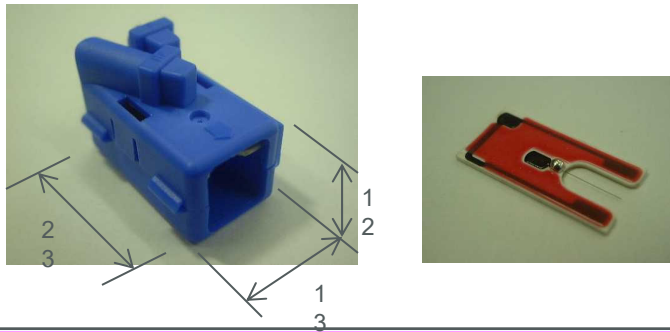


■ Summary

Ionizer is an unique device which ionizes air molecules.

Air molecules are ionized by high electric field created by high voltage.

Murata ionizer 'ionissimo[®]' can ionize air molecules very efficiently.



Murata ionizer is produced based on high voltage technologies cultivated by long business experience of high voltage resistors.

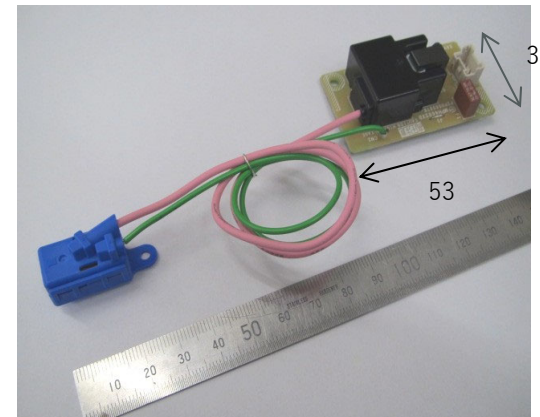
■ Feature

JPN Pat:4114573,4371142,4462348

US Pat:7199993,7564671,7636229,7706121

KOREA Pat:10-0901986

1. Murata ionizer can create a large mount of Ions.
2. Murata ionizer can control ozone density.
Also "No Ozone" can be realized, if requested.
3. Murata ionizer is designed compactly.
4. Murata provides high voltage power supplier.
Perfect match with the ionizer.



Input voltage:

DC12.0V

Wattage : 0.6W



Murata ionissimo as Ozonizer

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Ionissimo : Products landscape 2020

Items	Parts number	Picture	Status	Input voltage	Ion amount at 20cm	Ozone density	Applications
Ionizer	MHM305 series		MP	12Vdc	-5Mpcs/cc	0.04mg/h	Air conditioner, Refrigerator, Dishwasher, Air cleaner, Car accessory for air cleaner, Humidifier, Dehumidifier, e.g.
	MHM306 series		MP	12Vdc	-5Mpcs/cc	0.6mg/h	
	MHM314 series		MP	12Vdc	-8Mpcs/cc	0.1mg/h	
	MHM400 series		MP	12Vdc	+5Mpcs/cc	0.1mg/h	
	MHM402 series		MP	230Vac	-4Mpcs/cc	0.4mg/h	
Active Oxygen Module (Ozonizer)	MHM500-00A		MP	12Vdc	-	3.5mg/h	Dishwasher, e.g.
	MHM501-00 (High reliability)		MP	12Vdc	-	3.0mg/h	Refrigerator, Air purifier, Humidifier, Dehumidifier, e.g.
	MHM502-01A (High density Ozone)		MP	12Vdc	-	45mg/h	Washing machine
	MHM503-00 (New generation for MHM501)		Under development	12Vdc	-	2.0mg/h	Refrigerator, Air purifier, Humidifier, De-humidifier, e.g.

NEW

Murata's Ozonizer (Active oxygen module)



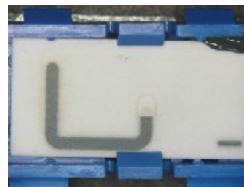
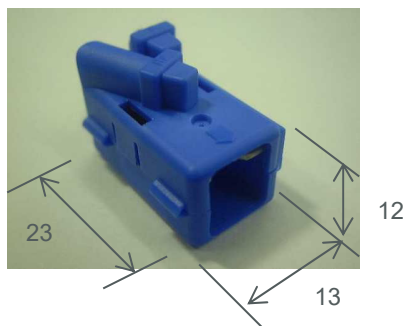
■ What is “Ozonizer”

Surface discharge is made by AC high voltage applying between top and bottom of Dielectric substrate.

The discharge makes Ozone from Oxygen molecular around electrode.



Ozonizer module will ozonize Oxygen molecular efficiently by above principle.



■ Feature

1. Murata Ozonizer “ionissimo[®]” module can create large ozone efficiently with original device structure.
2. Ozone density will be controlled duty cycle by intermittent operation.
3. intermittent operation can save power consumption of ozonizer module.
4. Ozonizer module can be longer life from Needle type.

Murata Ozonizer module is used high voltage technology cultivated by high voltage.

Each test data [Ionizer & Ozonizer]



Each data 1



Murata Ionizer is most effective for PM2.5, Sterilizing, Deodorant, Anti-virus, Anti tick, Anti mold, Skin moisture, Stress and Anti allergen, etc.

Items	Material	Test result	Test conditon	Joint test facility
Dust test	Cigarette in a car	Redused over 90%	After 10min.	Murata
Deodorant test	Ammonia	Redused over 80%	After 180min.	Japan Spinners Inspecting Foundation(Boken)
	Hydrogen sulfide	Redused over 70%		
	Hormaldehyde	Redused over 90%	After 120min.	Kinki Bunseki Center Ltd
	Methyl mercaptan		After 180min.	
Sterilizing test	Colon bacillus	Redused over 99%	After 24hours	Japan Spinners Inspecting Foundation(Boken)
	Staphylococcus			
	Pathogenic coli O-157	Redused over 90%	After 1 hours	FALCO biosystems
Anti-Influenza virus	HongKong A type H3N2	Redused over 99.98%	After 2min.	Biomedical Science Association(BMSA)
Prevent from Tick test	House Tick	Redused over 99%	After 3weeks	Viable Co., Ltd.
Preserving from mold	Mold (JIS Z 2911)	Preserving over 97%	After 28days	Japan Spinners Inspecting Foundation(Boken)
Skin moisture test	Mesurement of Skin moisture	13%UP	After 120min.	Soiken inc
Stress task test	Cortisol level in saliva	No stress up	After 60min.	Kyoto Prefectural University of
Anti-allergen	Cedar pollen allergen (Cryj1)	Redused over 99%	After 4 hours	Institute of Tokyo Environmental Allergy
	House tick allergen (Derf1)	Redused over 80%		
	Dog allergen (Canf1)	Redused over 99%		
Murata lonizer installs in air conditioner (Test camber : 30m ³ , China standard : GB215516-2010)				
Sterilizing test	Staphylococcus	Reduced 99.9%	After 1hr	Guangzhou Microbe Research Institute
Deodorant test	Ammonia	Reduced 91.5%	After 24hrs	
	Benzene	Reduced 92.8%		
	Formaldehyde	Reduced 88.6%		
Mesuring of Ozone density		0.0065ppm(0.013mg/m ³)	Mesuring distance 5cm from lonizer	
Mesuring of UV strength		0μW/cm3		

Each data 2



Murata Ozonizer/Ionizer is best for:

- Sterilizing,
- Deodorant,
- Mold ,
- Agrichemical,
- Freshness
- Nutrient up for vegetable and flutes

Items	Material	Test result	Test condition	Joint test facility
Sterilizing test	Colon bacillus	Reduced 99.9%	After 12hr	Guangzhou Microbe Research Institute
	Staphylococcus	Reduced 92%		
Deodorant test	Trimethylamine	Reduced over 91.2%	After 2hr	
Preserving from mold	Mixed mold set in laboratory dish	Please see picture	After 10days % 28days	
Decomposition of agrichemical	Dichrolvos	Reduced 93%	After 48hr	Shokukanken Inc. (Japan)
	Phorate	Reduced 94%		
Freshness keeping for vegetable	Spinach	Please see picture	After 48hr & 114hr	
Nutrient up	Vitamin A	Up 110%	After 3days	
	Vitamin C	Up 30%		

Murata Ionizer / Active Oxygen module (Ozonizer)

Application note

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ionissimo®



Air conditioner 1

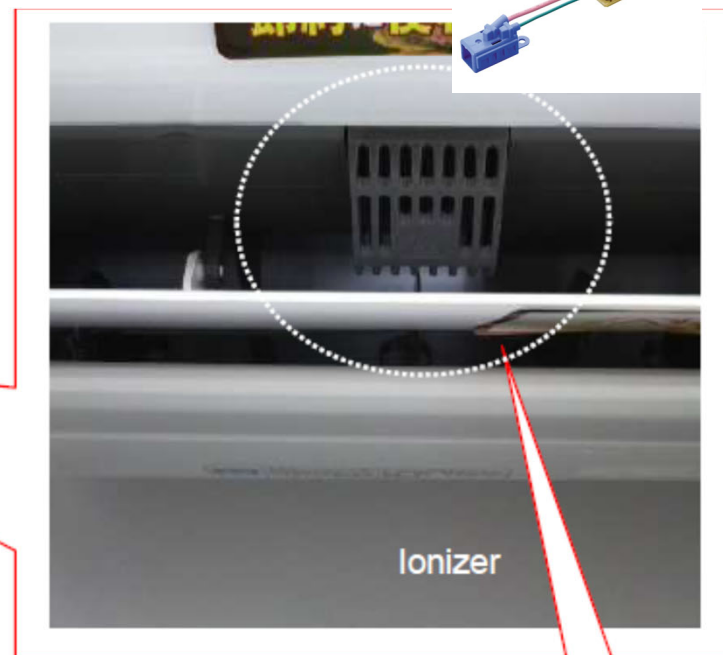
Ionizer (P/N : MHM306-01)



Negative ion + ozone air is emitted in the room.



Sterilizing floating bacteria, virus
Deodorant



Ionizer



Air conditioner 2



Ozonizer (P/N : MHM500-01)



Inside self-cleaning

Ozone air is filled inside air conditioner



***Keeping inside clean
Prevent mold and smell
inside***

Application case

**Ozonizer module will work for a few minute after main switch off
and ozone air will be filled inside air conditioner**

Air conditioner 3



Ionizer (P/N : MHM306-01)



Air conditioner
for building

Negative ion + ozone air is
emitted in the room.



Keeping room air clean

Prevent smell

*Sterilizing floating
bacteria, virus*

PM2.5 dust catching



Ionizer (P/N : MHM306-01)



In order to create more clean air

Negative ion + ozone can make air more clean



Application case
Negative ion + ozone air will blow.

Keeping room air clean

Prevent smell

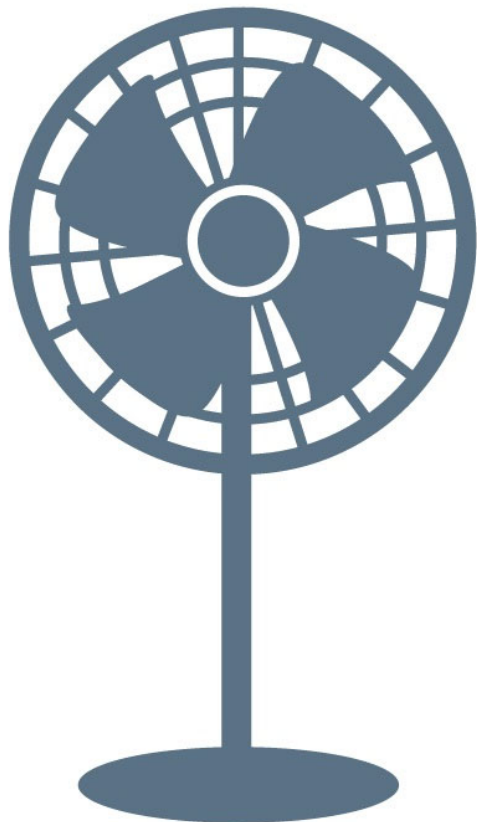
Sterilizing floating bacteria, virus

PM2.5 dust catching

Fan, circulator



Ionizer (P/N : MHM306-01)



Negative ion + ozone air is emitted in the room



Keeping room air clean

Prevent smell

***Sterilizing floating
bacteria, virus***

PM2.5 dust catching

Refrigerator

Ozonizer (P/N : MHM501-00), Ionizer(P/N : MHM402-00)



In order to sterilize bacteria in a refrigerator and keep freshness

ozone air can sterilize these bacterial

Plasma
oxygen air

Keeping inside clean
Prevent smell inside
Keeping freshness

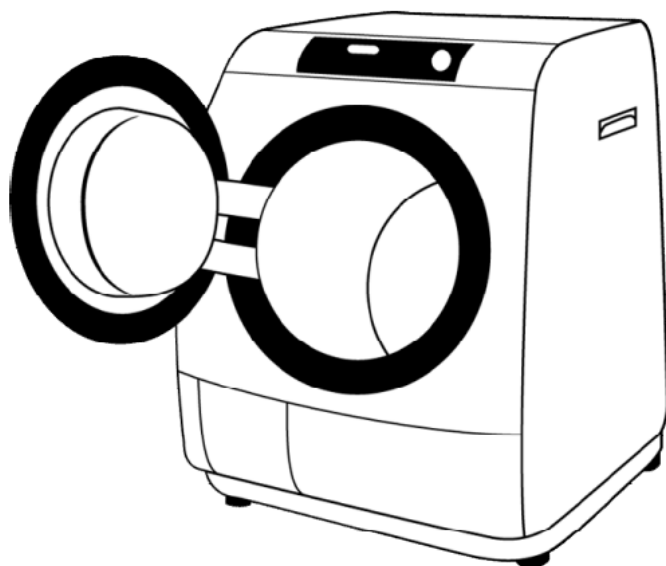
Application case

Ozonizer module will work for a few minute linked with cooling fan and ozone air will be filled inside.

Washing machine / Drying machine



Ozonizer (P/N : MHM502-00)



**In order to sterilize bacteria,
deodorant
in a washer**



***Sterilizing bacteria
Prevent smell
Prevent mold***

Application case

1. Ozonizer module will work for some minute during washing.
2. Ozonizer module will work for few minute after washing.

Dish washer

Ozonizer (P/N : MHM500-00)



**In order to sterilize bacteria
in a dish washer**

**Ozone air can sterilize
these bacterial**

**Plasma
oxygen air**

***Keeping inside clean
Sterilizing bacteria
Prevent smell inside***

Application case

Ozonizer module will work for a few minute after finish drying
and ozone air will be filled inside.

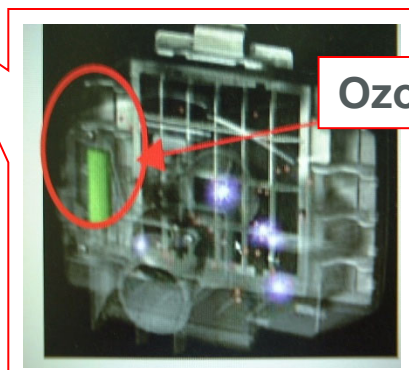
Vacuum cleaner



Ozonizer (P/N : MHM500-00)



Ozone air is filled inside cleaner.



Ozonizer

Inside self-cleaning.

Ozone air is filled inside cleaner.



Keeping inside clean
Preventing smell of exhaust air
Preventing breeding of house tick inside

Application case

Ozonizer module will work during main switch on and for a few minute after main switch off and ozone air will be filled inside cleaner.

Air cleaner for car



Ionizer (P/N : MHM306-01)



Set in cup holder of a car

Keeping room air clean

Prevent smell

***Sterilizing floating
bacteria, virus***

PM2.5 dust catching



Ionizer (P/N : MHM306-01)



Negative ion + ozone air is emitted in the room.



Keeping room air clean

Prevent smell

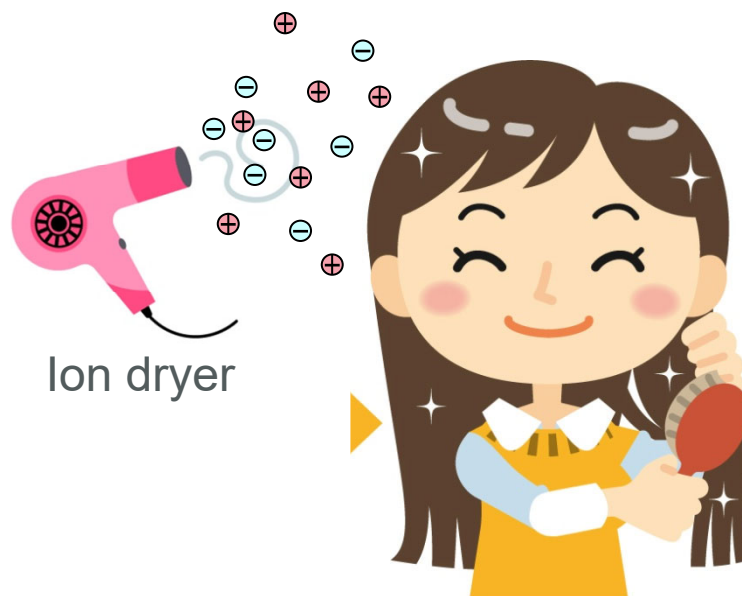
*Sterilizing floating
bacteria, virus*

PM2.5 dust catching

Hair dryer



Ionizer (P/N : MHM403-00)



Static elimination of hair
Reduction of damage

Bedding dryer



Ozonizer (P/N : MHM500-00A), Ionizer (P/N : MHM306-01)



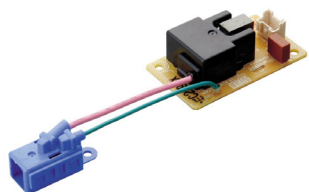
***Deodorant
Sterilizing***



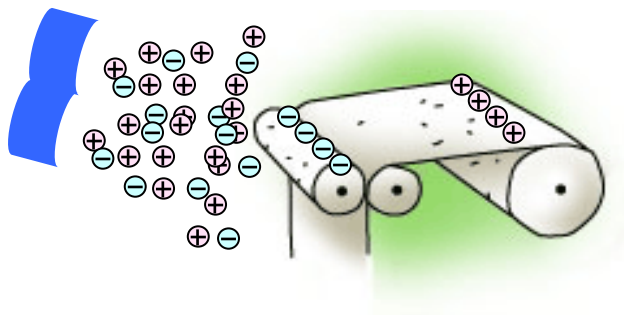
Shoes dryer



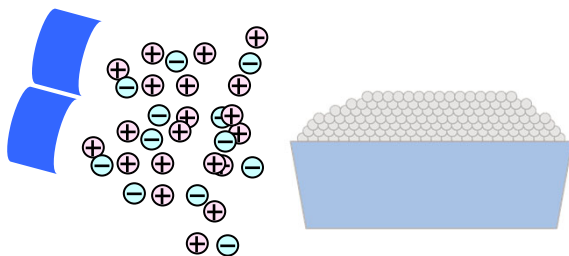
Ionizer (P/N : MHM305-01/MHM400-01)



For static elimination



Paper production,
Film production
Textile production



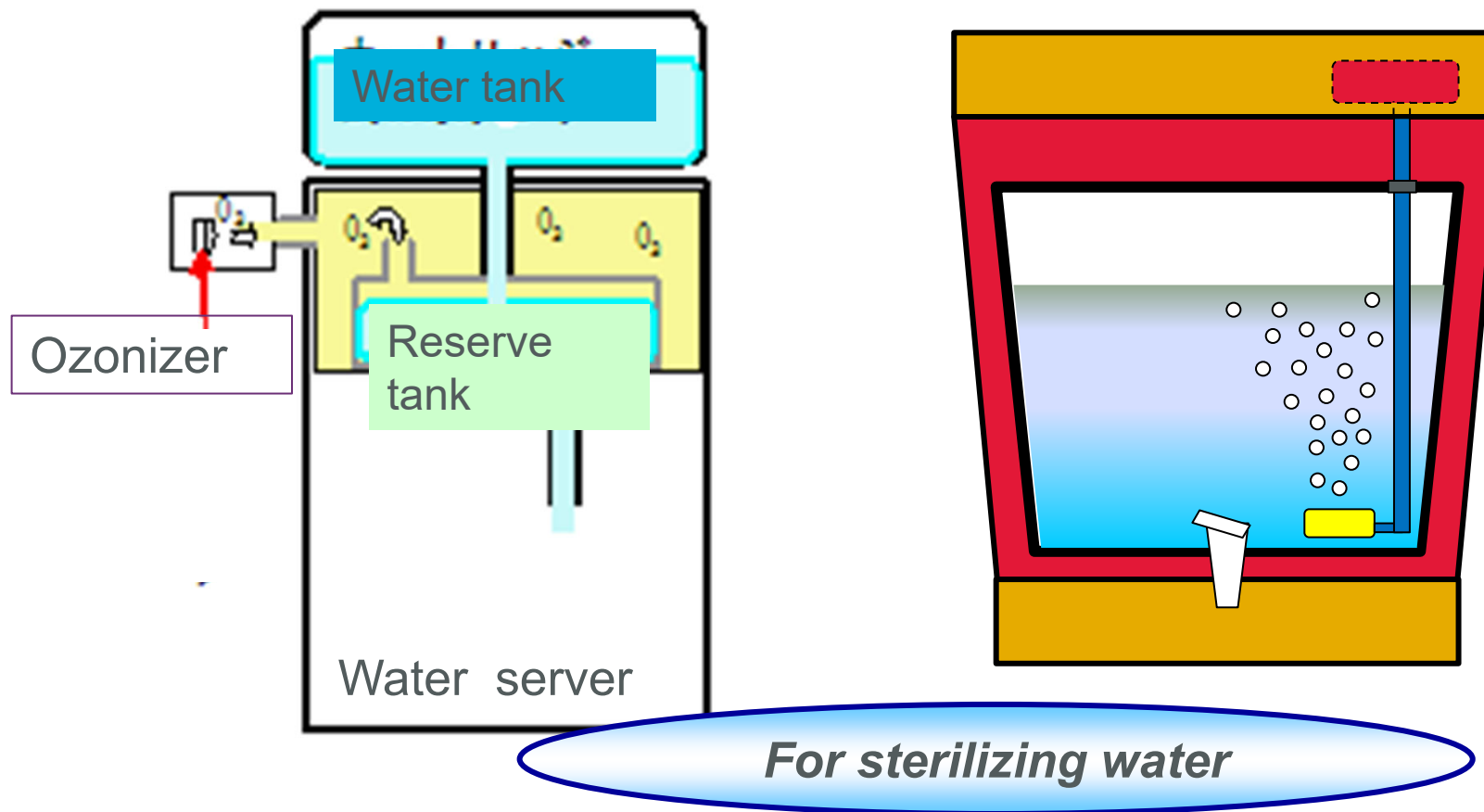
Powder production,
coffee mill

Water server, water tank



Ozonizer

(P/N : MHM500-00A/MHM501-00/MHM502-01A)



Thank you
for your attention!

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