

ENERGY SAVING OZONE GENERATOR I-RON EXCHANGE FIBER



WWW.INWOOECO.CO.KR



Company Information



Inwoo Corporation, established in 1993, is one of the leading company in chemical industry. Now we are supplying world's best products across the nation form over 16 countries and 30 suppliers. We established our own technical research center from 2006. It is supporting not only for our current business but also for future preparation. After all, we developed Ozone Generator and ION Exchange fiber. With advanced technology, now Inwoo stepped forward to future with Eco-Friendly products. CEO SEONG WOOK, KONG

R&D Product







Ozone Generator



Inwoo Eco Ozone Generator

Technology coverage and application fields

INWOO-ECO



Environmental standards for ozone(Air)

Country	Korea	Japan	USA
Organization	Environment Agency	Japan Society for Industrial Hygiene	OSHA
Thresholds	0.06(8h)	0.06(8h)	0.1(8h)
(ppm)	0.1(1h)	0.12(1h)	0.3(15~30min)

• Effect of ozone concentration and exposure time

Concentration	Exposure time	Effect of Ozone on the body
0.02	5min	Sense smell
0.03 ~ 0.3	1h	Running record depression
0.05 ~ 0.1	30min	Anxiety
0.05 ~ 0.2	-	Nose and throat stimulation
0.05 ~ 0.6	1h	Increased frequency of seizures in asthmatic patients
0.1	30min	Headache, eye irritation
0.1	1h	Blindness Degradation of oxygen diffusion ability
0.1	2h	Increase pulmonary oxygen tension
0.1 이상	24h	Increased eye irritation
0.1 ~ 0.25	30min	Increase respiratory rate
0.2 ~ 0.8	-	eye irritation
0.3	-	Respiratory irritation Chest compression
0.3	5min	Increase breathing capacity



Inwoo Eco Ozone Generator



Miniaturization

Realization of miniaturization with ozone generation technology Easy to establishment/manage, no administrator required



Durability

Minimize power consumption compared to competitors Suitable for industrial use 1kg/hr power consumption about 8-10kW Accurate density output



Safety

- Preventing fire due to malfunction of device
- Ensuring Worker Safety through on-site ozone sensor
- Device control with secure sequence circuit



IOT(To apply)

- Remote control to check operation status and troubleshoot
- Immediate response in case of device error



about 7~10kW

Inwoo Eco Ozone Generator

Securing technology through self develop



Improved product durability



Introduction of Ozone Generator

Ensure safety through technology development



ensuring safety during operation

external factors when operating the device itself



Ozone Application

Technology coverage and application





FIELD TEST

Livestock excretion (Poultry) treatment TEST





KTR 한국화학용합시험연구

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Test	Before	After
BOD	1400	1.1
Suspended solid	2700	14.1
Total nitrogen	1750	145
CODcr	6100	13.0

FIELD TEST

Pigsty Lab Test

- Test : OZ-70 Air source lab test
 - Settling tank test

1st tank



✓ Oxygen rate : 95%

- ✓ Oxygen flow rate : 7 l/m
- ✓ Ozone concentration : 170 g/m
- ✓ Ozone production : 70g±1g

2nd tank





FIELD TEST

FIELD TEST



OUR BUSINESS

Ozone Dissolving Equipment





OUR BUSINESS

Ozone Dissolving Equipment









Company Certificate





Green Technology Certificate







Patents



Patent classification	Intellectual property rights
Registration	Ozone Generator by air cooling system / 공랭식 오존 발생 장치
Registration	Hydroxy Generation Device / 수산기 발생장치
Registration	Ozone Generator / 오존발생기
Registration	Base gas cooling and moisture removal system for Ozone Generator / 오존발생장치용 원료가스의 냉각 및 수분 제거 시스템
Registration	Discharge tube for ozone generator included cap / 한 쌍의 캡을 포함하는 오존발생장치용 방전관
Registration	Ozone generator control system and method / 오존발생장치의 제어 시스템 및 그 방법



오존발생기 (Ozone Generator)



오존 파쇄기 (Ozone disintegrator)



버블 발생장치 (Bubble Generator)



Reference



Reference

Customer	Product	Spec	Region
Incheon University	5g Discharging tube		Incheon
(否)WIN and WIN farm	AZ-5		Incheon
M-TECH	AZ-5		Jeungpyung
Food research institute	OZ-80M	40g	Incheon
Food waste water treatment plant	OZ-20	30g	Incheon
Anseong Pigsty	OZ-50	50g	Anseong
TS(CJ wonchen)	OZ-50	50g	USA
Waste water treatment	OZ-50	50g	China
Chemical waste water treatment plant	OZ-70	70g	Incheon
Chemical waste water treatment plant	OZ-70-M5	70g	Incheon
Chemical waste water treatment plant	OZ-70-M4	70g	Incheon
Chemical waste water treatment plant	OZ-70-M2	70g	Incheon
Chemical waste water treatment plant	Electric relay	70g*11EA	Incheon
Pigsty	Board-25g	25g	Kyungju
Pigsty	OZ-50	50g*5EA	Kyungju
Pigsty	Board-36g	36g	Kyungju
Incheon University	5g Discharging tube		Incheon
(否)WIN and WIN farm	AZ-5		Incheon
Metal Plating wastewater	OZ-50	50g	Ansan
Fishery processing factory	OZ-70	70g	Busan
Food manufacturing factory	OZ-200	200g	Boeun















- Project : Kimchi factory Water recycling
- Facility capacity: 2 ton/hr
- · Ozone generator spec : Ozone production 200g/h

Electricity 1.5 kW(Included Oxygen concentrator)









- Project : Plated Wastewater Water Reuse
- Facility capacity: 10 ton/hr
- \cdot Ozone generator spec : Ozone production 70 g/hr

Electricity 1.5 kW(Included Oxygen concentrator)









- Project : KCL Tile immunity test
- Facility capacity : 1.8 ton/hr
- Water treatment capacity : dissolving pump capacity : 1.6 m^{*}/hr
- Ozone generator Spec : Ozone production 34.4 g/hr, oxygen flow rate 3~10 l/min,

Electricity 0.15~0.3 kW (Included oxygen concentrator)









- Project : Pigsty
- Facility capacity : 40 ton
- water treatment capacity : 5 ton/hr
- Ozone generator spec : Ozone production 50 g/hr, Oxygen flow rate 3~7 l/min,

Electricity 1.5 kW(Included Oxygen concentrator)







- Project : Kyungju city pigsty
- \cdot Facility capacity : 5 ton , 10 ton
- Treatment water volume : 0.5 ton/hr
- · Ozone generator spec : Ozone production 50~70 g/hr, Oxygen flow rate 3~7 l/min,

Electricity 1.5 kW(Included oxygen concentrator)











- Project : Cheon II Chemical
- Facility capacity : 100 ton
- Treatment water volume : 10 ton/hr
- Ozone generator spec :Ozone production 70 g/hr*11 EA , Oxygen flow rate 3~7 l/min, Electricity 1.5 kW/EA(included oxygen concentrator)





Reference



- Treatment water volume : 500 L
- Oxygen concentration : 95%
- Oxygen flow rate : 7 l/m
- Ozone Concentration : 34 g/m
- Ozone production : 14 g±0.5g
- On field test stage

- Disposal of non-degradable waste
- Treatment water volume : 5 ton
- Oxygen flow rate : 5 l/m
- Ozone concentration : 100 g/m
- Ozone production : 30g±1g
- On field test stage



Reference



- Concrete durability checking test facility
- Treatment water volume : 2 ton
- Oxygen flow rate : 4 l/m
- Ozone concentration : 54 g/m
- Ozone production : 13g±0.7g

- Food research institute
- Treatment water volume : 500L
- Oxygen flow rate : 3.5 l/m
- Ozone concentration : 144 g/m
- Ozone production : 30g±2g





ION EXCHANGE FIBER



ION Exchange Fiber

As a micro-sized fibrous adsorbent, a contaminant is adsorbed on the surface of a fiber to form heavy metals, Phosphorus, organic matter and pollutants in the air.

Advantages

- > 5 times more adsorption performance than other companies
- > Dual Function adsorbing both cation and anion
- Compact system is possible with less installation area than existing adsorbent
- High performance with long switching cycles



ION Exchange Fiber

\rightarrow Heavy Metal Adsorption				
	H NH2			
Lewis a	acid Heav	y metal		
H₂0	Chelating Fiber	Metal Chelated Fiber		
<u>28.5 µm</u> 20 µm	42.23 μm 20 μm			
Rem				

Manufacturing Aminated Ion Exchange Fiber from Acryl Fiber

	ION exchange Resin	ION Exchange Fiber (Other company)	ION Exchange Fiiber INWOO
Total amount of adsorption	0.5 ~ 2	3	6 ↑
Usable pH Range	1 ~ 14	1~8	1 ~ 12
Remove Material	Cation, Anion Small molecule	Separate adsorption Cation/ Anion	Cation & Anion Simultaneous adsorption (Dual Function) Orgamic Phosphorus



ION Exchange Fiber

Metal Adsorption Test







Phosphorus(p) adsorption





Copper(Cu) adsorption





Arsenic (V) adsorption





ION Exchange Fiber

Description	Acrylic fiber	I-Ron (Fiber)	Competitor (AK-22)
Color	White	Yellow	Pale Yellow
Diameter(µm)	29 ~ 32	37 ~ 54	17 ~
Adsorption Capacity(meq/g)	0.0	7.5	4.0
Functional Group	≡N	=NH, -NH2	≡N, =NH, −NH2, −COOH









Adsorption of anion & cation metal per pH





Copper(Cu) adsorption



Crystal Growth (SEM Picture)





Application





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Air conditioning facility

- Remove harmful gases from the atmosphere
- Low pressure loss

Wastewater purification

- Removal of heavy metal from water
 - + Hg, Cu, Bi, Cd, Sn, Sb, As, Pb, Cr, Fe... etc.
- Eliminate other sources

Livestock wastewater purification

- Removal of phosphorus from wastewater
- Eliminate other sources

Prevention of algae

- Removal of phosphorus from water
- Eliminate other sources



