

make **Earth** beautiful  
**Human** & value

think **Safety**  
**Life** change

**Green** company  
for **Nature**

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Sustainable Technology



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# Beautiful Earth Project

**SUS**TEC  
Sustainable Technology



**Green**  
company  
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**Beautiful  
Earth  
Project**  
—



—  
**for Nature**



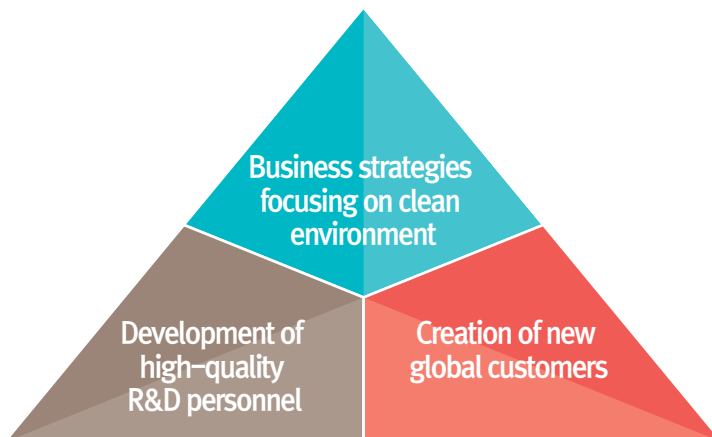
# Human & Value

SUSTEC is a dynamic green company that aims to achieve becoming a world-famous company specializing in removing pollution for clean environment to make a happier tomorrow with today's researches.

With the management philosophy of localizing advanced technology under the rapidly changing industrial environment to achieve the globalization of technology, we strive to always achieve creative management and technology innovation to enhance the excellence of product development service and design construction for facilities preventing air pollution.



**“A world-famous company specializing in depollution for clean environment”**



**“Developing good ideas for co-existence between nature and people!”**

**“Making a pretty earth” is SUSTEC’s environment-friendly product brand that makes a healthy product by thinking about people and nature by using environment-friendly materials**



## World premier materials business

- For treating harmful gases
- Coating Resin
- Catalyst



## System business

- Gas scrubber (Dry/Ion exchange/Wet)
- White lead reduction devices
- High-temperature white lead reduction devices
- Noise reduction devices
- Organic adsorption recovery device



## Pollution control business

- Chemical Air Filter
- Chemical filter for odor control
- Filter for air cleaner
- DFU Unit



## Living environment business

- Masks protecting against harmful gas
- Masks removing virus
- Odor control technology
- Restoration technology for polluted soil
- Fridge deodorizer
- Emergency evacuation protection equipment for fire protection





A woman and a child are walking away from the camera on a dirt path through a dense forest. The path is covered in fallen leaves and small stones. Tall, slender trees line both sides of the path, with sunlight filtering through the canopy on the left, creating a bright glow and lens flare. The child is wearing a white shirt and pants, and the woman is also in light-colored clothing. The overall atmosphere is peaceful and natural.

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# COATING RESIN

Removing corrosive, toxic, harmful and odorous gases, etc. that occur from semiconductor and industrial sites to be less than standard levels (TLV).

## :: Characteristics

- Maximizing chemical activation through special coating with specific chemical substances
- Outstanding life time through increased adsorption by using special coatingtime
- No desorption for harmful gases adsorbed selectively through chemical adsorption
- Selective removal of harmful gases
- Diverse resins customized to the design (pressure loss, temperature, humidity, efficiency)

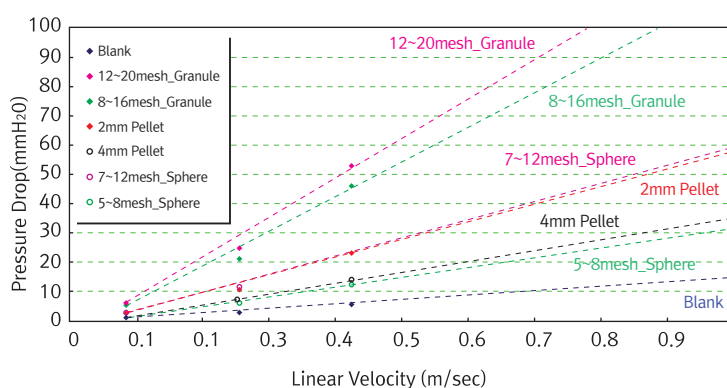
## :: Coating Resin Type

	Organic compounds Resin	Inorganic compounds Resin
Sphere Type		
Pellet Type		
Granule Type		

## :: Coating Resin Specification

Model No	Target Gas	Type
HM-A-108	SiH <sub>4</sub> / DCS	Pellet
HM-A-203	PH <sub>3</sub> / AsH <sub>3</sub>	Sphere
HM-A-09	NH <sub>3</sub>	Sphere
HM-A-08	TEOS	Sphere
HM-R-01	HCl	Sphere
HM-A-04	Cl <sub>2</sub>	Granule
HM-A-02	Cl <sub>2</sub>	Pellet
HM-A-06	HCl / HF / F <sub>2</sub>	Granule / Pellet
HM-A-07	BCl <sub>3</sub> / HCl / Cl <sub>2</sub>	Pellet
HM-A-03	HCl / SO <sub>2</sub> / HCN	Granule / Pellet
HM-A-01	H <sub>2</sub> S / CH <sub>3</sub> SH	Granule / Pellet
HM-A-05	NH <sub>3</sub>	Granule / Pellet
HM-C-01	PFCs / SF <sub>6</sub> / NF <sub>3</sub>	Sphere
HM-C-02	NO <sub>x</sub> / N <sub>2</sub> O	Sphere

## :: Resin Type &amp; Pressure by grading Pressure Drop



## Test Condition

- Carrier Gas : Air
- Total Flow : 10, 30, 50 L/min
- Volume : 50 ml
- Depth : 25.5 mm
- Column Dia :  $\phi$ 50 mm
- Test temp. : 23°C
- Humidity : less than 30 %
- Linear Velocity : 0.085 ~ 0.425 m/s
- Residence Time : 0.06 ~ 0.3 sec



# PFC CATALYST

Able to decompose more than 99% by lowering the temperature required for decomposing PFC gases from more than 1300°C to around 600°C by using the PFC catalyst.

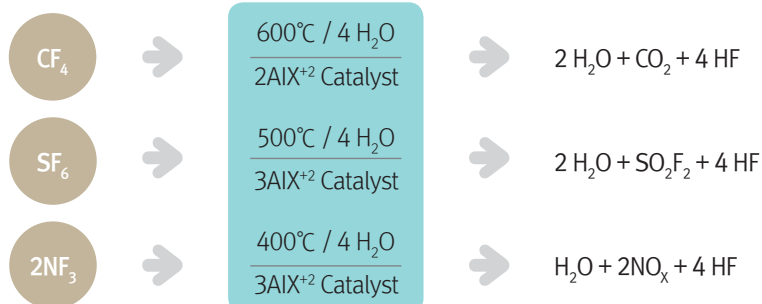
## :: Characteristics

- Easier to remove (more than 95%) global warming exhaust gases and maintenance control
- Reducing fire hazards and pipe corruptions caused by low-temperature operating conditions
- Minimizing maintenance costs through the low-temperature catalyst (300~600°C) method
- Non-precious metal catalyst
- Use of H<sub>2</sub>O reducing agents

## :: PFC Catalyst



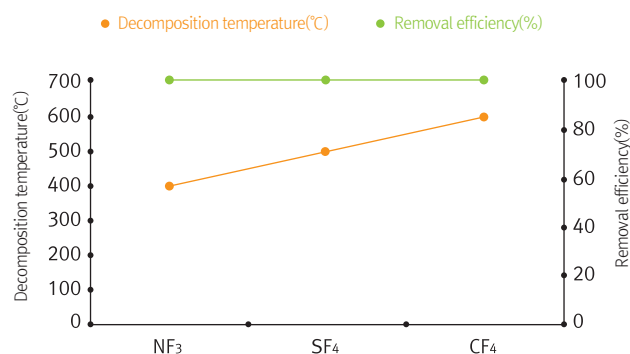
## :: Mechanism of PFC



## :: Catalyst function

Division	Decomposition temperature(°C)	Removal efficiency(%)
NF <sub>3</sub>	400	99.9
SF <sub>6</sub>	500	99.9
CF <sub>4</sub>	600	99.9

Temperature for removing the PFC gas catalyst







# DRY SCRUBBER

Device that safely removes various harmful gases arising from the semiconductor process at hot temperature through high performance absorbent.

## :: Characteristics

- No need for a separate operating energy through room temperature method
- Applying the function of drifting prevention inside the canister
- Easier to determine the time for replacement with the functions of temperature sensing and sight glass
- Applying the simple P.M function
- Safe and no need for other expenses with low-priced operating costs
- Excellent adsorption efficiency resulting from physical and chemical adsorption for applicable gases
- Application of diverse absorbents possible according to process type

## :: Applicable gas by process

Process	Gas
Poly Etch	Cl <sub>2</sub> , HBr, HF
Metal Etch	Cl <sub>2</sub> , BCl <sub>3</sub> , HF
Cleaning	HF
Diffusion	TEOS
	DCS, NH <sub>3</sub>
	ClF <sub>3</sub>
	DCS, WF <sub>6</sub>
Thin Film	NF <sub>3</sub> , SiH <sub>4</sub> , NH <sub>3</sub>
Ion Implant	AsH <sub>3</sub> , PH <sub>3</sub> , BF <sub>3</sub>

## :: Application area

- Semiconductor and display industries • Schools, research institutes
- Laboratories, industrial sites, odor occurring places



▲ Dry Scrubber cabinet



▲ Dry Scrubber canister



# PLUME ABATEMENT SYSTEM



Technology that efficiently removes the supersaturated visual pollutants discharged from the cooling tower.

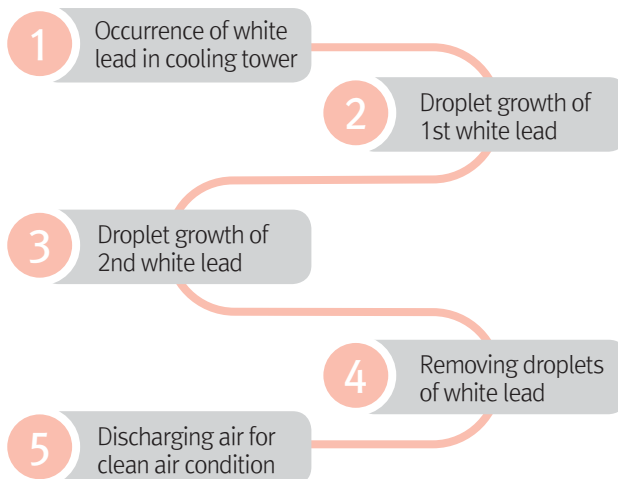
## :: PAS characteristics

- Applying the liquid growth technology
- Applying the filter system
- No need for a separate heat source
- Efficiently removing white lead

## :: PAS expectation effectiveness

- Reducing water costs through recovering evaporation and spray water
- Resolving the problems of surrounding environmental corrosion caused by spray water
- Minimizing neighboring complaints by removing visible white lead

## :: Principle of PAS technology



## :: Application results

- 〓社 13 Cell Cooling tower

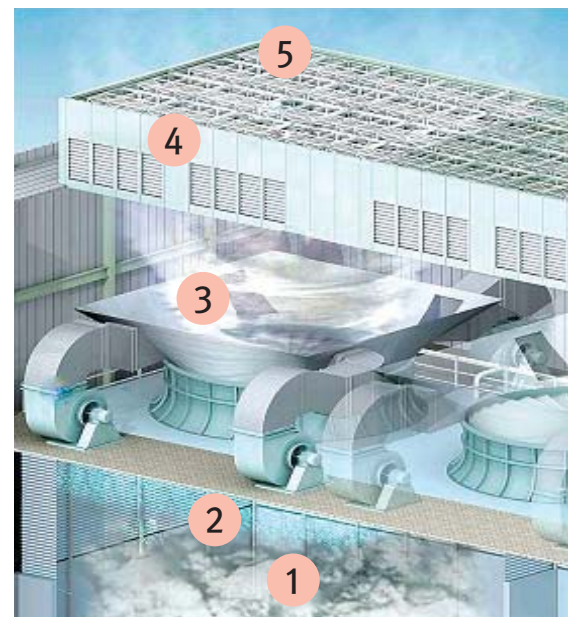
## :: 〓社 Applying facilities for removing white lead



▲ PAS Before operation



▲ PAS After operation



# STEAM RECOVERY SYSTEM



Removing white lead and recover waste heat by using exhaust air through the SRS, with lots of water and waste heat in the high-temperature air discharged through the process.

## :: SRS System

### :: Environmental effect

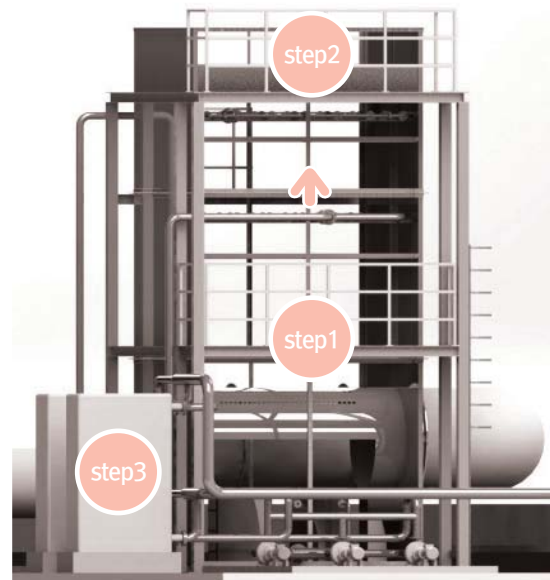
- Reducing water costs by recovering evaporation and spray water
- Simplifying the corporate image for green growth by removing white lead
- Minimizing visible pollutants by removing vapor (white lead)

### :: Economic effect

- Recovering evaporation water discharged as white lead
- Reducing costs by not using a separate heat source
- Preventing corrosion caused by environmental pollution and reducing recovery costs
- Reducing energy costs caused by recovering waste heat

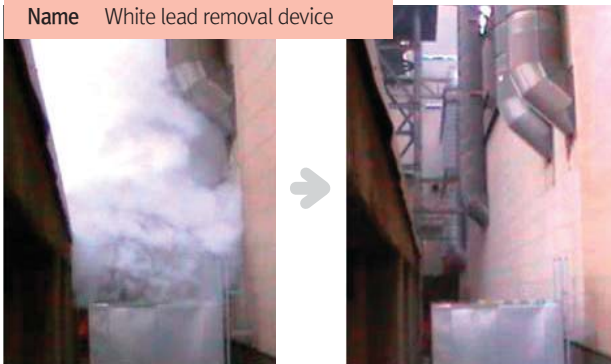
### :: Application results

- Applying high-temperature stack of 500CMM at steel mills in 2010
- Applying high-temperature stack of 50CMM at chemical plants in 2011
- Applying high-temperature stack of 350CMM at tire plants in 2014
- Applying high-temperature stack of 350CMM at tire plants in 2015



Patent application 10-2011-0071327

Name White lead removal device



▲ Before and after operating the white lead removal facility

step1

Spray Part  
heat exchange part

step2

Filter Part  
white lead removal part

step3

heat recovery part





# ION EXCHANGE SCRUBBER

## For low quantity and high concentration

Devices that removes various harmful gases that occur during the industrial or semiconductor manufacturing processes through the ion exchange handling method.

### :: Characteristics

- High removal efficiency for acid & alkaline gases
- Convenient management through consecutively regenerating system
- One-sixth of the wet scrubber level for pressure loss
- Ensuring system safety through the high- temperature operating method
- Applying systems for preventing powder deposition
- Handling acid and alkaline gases using the ion exchange filter
- Reduce wastewater inflow rate (One-tenth level compared to the wet scrubber)
- Reduce maintenance costs (Low power)
- S-MARK certification

### :: Application area

- Semiconductor production process
- LCD manufacturing process
- Optical fiber manufacturing process
- Water treatment equipment
- Research institute, school laboratories
- Army units
- Chemical plants



▲ Ion Exchange Filter (IEF)

### :: Equipment important performance

(1) Total treatment capacity : 400 ~ 800 LPM (include N<sub>2</sub> Gas)

(2) Equipment pressure : less than 10mmH<sub>2</sub>O (flux : 800LPM)

(3) Utility Specification

Division		Pressure(kgf/cm <sup>2</sup> )	Range of use(LPM)	Note
N <sub>2</sub>		2~3	10~20	1Port (Inlet)
City water		2~3	10~20	1Port (Inlet)
Power supply	Equipment capacity	(1Phase, AC220V, 60Hz, 15A)		Separate for overseas
	Average consumption power	3KVA		

(4) Specification table

	Division	Specification	Note
Cabinet	Size[Dimension] [mm]	750[W]x1050[D]x1800[H]	
	Weight[kg]	450	
Connecting pipe	Gas entrance	NW40, 4Port	SUS304
	Gas exit	NW100, 1Port	SUS304
	N2entrance	3/8" [1Port]	SUS304
	Water entrance	1/2" [1Port]	SUS304
	Damper	MF100A Open/Close	SUS304
	Drain	20A Union	C-PVC
	Over Flow	20A Union [2Port]	C-PVC
Monitor	Monitoring Signal	Stand-by Total alarm	PLC communication is optional

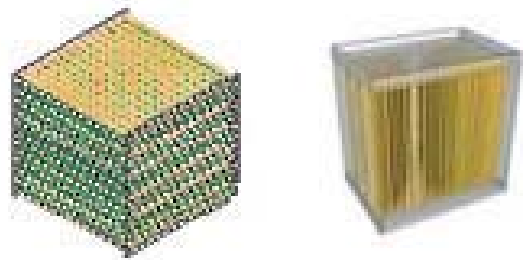
## For high quantity and low concentration

### ■ Ion Exchange Scrubber(IES)

Technology that highly efficiently removes acid and alkaline gases by using the ion exchange technology and filter

#### :: Characteristics

- Able to go through complex process for acid and alkaline gases
- Lower pressure loss compared to other filters through the patent technology of ion exchange filter
- Reducing the amount of wastewater generation and medicine use compared to the wet scrubber
- Maintaining high efficiency and life extension of filters through the consecutive revival of ion exchange filters



▲ Ion Exchange Filter

#### :: Application results

- Honam Petrochemicals

### ■ Cleaning scrubber (WS)

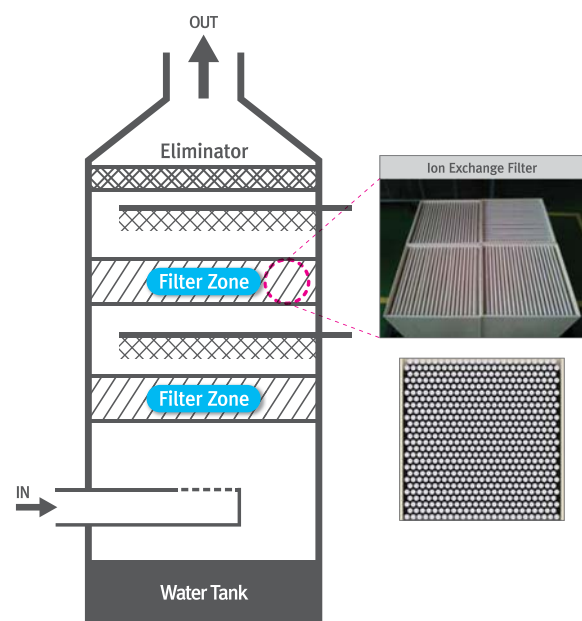
Technology that highly efficiently removes water soluble gases by using the structure of IES filters

#### :: Characteristics

- Able to go through the complex process for water soluble harmful gases
- Loss of lower pressure compared to other filters through the patent technology of filter structure
- Able to minimize the amount of waste water generation through highly efficient treatment

#### :: Application results

- Samsung Electro-Mechanics



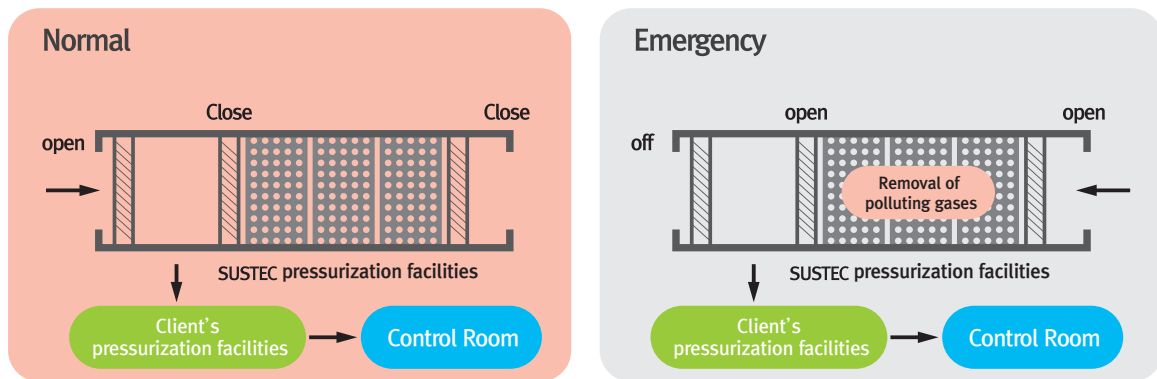
▲ IES / Wet Scrubber structure



# PRESSURIZATION FACILITIES

Protect the health of indoor workers by using the filter to remove air polluting gases, so that the indoor air pressure is higher than the outside.

## :: Installation concept map



## :: Installation effects

- ① Maintain the indoor pressure to prevent the outside air coming inside
- ② Maintain the indoor pressure by using resin to supply clean air inside
- ③ Maintain the pressure in case of accident occurrence by purifying polluted gases to allow it to come inside the control unit
- ④ Able to use as a shelter by maintaining the pressure inside the control unit during accident occurrence

## :: Main constitution

### ① Gas Detection Division

- Determine whether or not an accident occurred by using a detector by gas characteristic

### ② Gas Handling Division

- Remove corrosive gas or harmful gas by charging resin
- Remove harmful gas by designing resin by gas characteristic that occurred from an industrial site

## :: Application results

- Electrical room for the Onsan filtering plant
- CCR pressurization facilities at the Yeosu Plant of Daelim
- Completed the proposal for the CCR pressurization facilities at the Yeosu Plant of YNCC



▲ The pressurization facilities of Company D at the Yeosu Industrial Complex



# TOTAL OFF-GASES CONTROL SYSTEM

Removal and recovery system that efficiently handles harmful gases (acidity, alkalinity, neutral, VOCs, etc.) caused by the industrial site through the combination of the ion exchange filter and the coating resin VSA technology.

## :: Characteristics

- Able to go through the complex process for harmful gases (acidity, alkalinity, neutral, VOCs, etc.)
- Maximizing the gas treatment efficiency by efficiently composing the gas treatment technology
- Increasing economic feasibility by minimizing the amount of 2nd pollutant (wastewater, waste absorbent) generation
- Able to recover waste resources of VOCs by using the VSA technology

## :: System composition

### Part 1 : IES (Ion Exchange Scrubber)

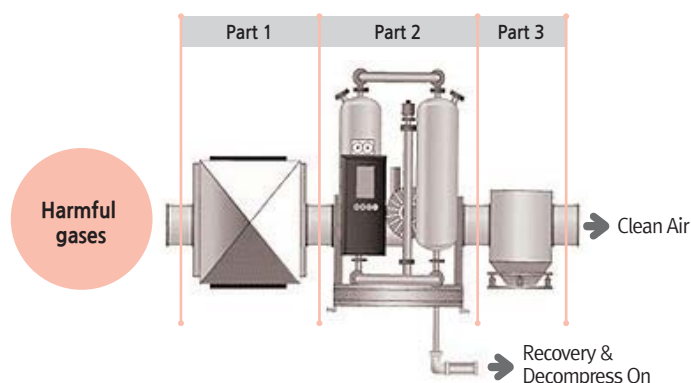
- Technology that highly efficiently removes acid and alkaline gases by using the ion exchange technology

### Part 2 : VSA ( Vacuum Swing Adsorption)

- Technology that recovers or removes through the concentration and desorption process for high concentration gases by using decompression and heating methods, to remove and adsorb VOCs through the complex adsorption process

### Part 3 : Coating Resin

- Technology that highly efficiently removes untreated VOCs, acid, alkaline and neutral gases by using the coating resin



## :: Application area

- Exhaust process for semiconductor acid/alkaline gases
- Tire curing/refining plant
- Incinerator and power plant
- Sewage/waste water treatment plant
- Industrial site for discharging other odorous harmful gases
- Automobile painting process
- Petrochemical/cement plant
- Steel mill
- Textile, paper, dye, color plants, etc.

## :: Application results



▲ VSA for recovering VOCs at Hyundai and Kia Motors' automobile painting shops (Pilot test facilities)



▲ Honam Petrochemicals



# DRIFT FILTER UNIT

## For PIT & Tank

Removing various harmful gases occurring through evaporation from all sorts of waste water PIT and tank through the natural exhaust process.

### :: Characteristics

- Easier to install equipment through the flange type
- Able to make customized design to suit the site's conditions
- Able to replace separately in case of life time completed through the filter installation type
- Nonpowered operation through the natural exhaust process

### :: Removable gases

- DFUF-A Filter :  $H_2S$ , HCN etc. Acid Gas processible form
- DFUF-B Filter :  $NH_3$ , Amine etc. Base Gas processible form
- DFUF-O Filter : Benzene, Naphthalene etc. VOCs Gas processible form
- DFUD Filter : Mist, Removal of various foreign substances like dusts, etc.

### :: Major specification of equipment

Division	Specification
MODEL	DFU-300, DFU-500
FILTER (standard DFU-300)	DFUF-A300, DFUF-B300, DFUF-O300
UNIT MATERIALS	SUS304, SCS13
FILTER MATERIALS	SUS304, Urethane, Active Carbon, Cation Resin
GAS Amount of treatment (standard DFU-500)	DFUF-A300 : 84L/EA DFUF-B300 : 59L/EA DFUF-O300 : 84L/EA
GAS Amount of treatment (standard DFU-500)	DFUF-A500 : 233L/EA DFUF-B500 : 164L/EA DFUF-O500 : 121L/EA

※ Able to make order production upon client's request for standard model



### :: Application results

- About 450 goods from steel mill
- Regular supplies (replacement of filter)

Patent application	10-2011-0079841
Name	Condensate water collection device among coke-oven gases



▲ DFU-300 Filter installation appearance

## For Pipes

Remove odorous gases that occur from pipes through the natural exhaust process.

### :: Characteristics

- Easier to install equipment through the flange type
- Able to separately replace with filter installation-type in case of end of life time
- Nonpowered operation through the natural roof method
- Release pressure in case of high pressure (more than 0.03bar) occurring when installing to pressure variation

### :: Removable gas

- DFUF-110 Filter :  $\text{H}_2\text{S}$  , HCN Acid Gas processible form  
 $\text{NH}_3$  , Amine Basw Gas processible form  
Benzene , Naphthalene VOCs Gas processible form
- DFUD-110 Filter : Mist, removal of various foreign substances like dusts, etc.

### :: - Major specification of equipment

Division	Specification
MODEL	DFU-110 (Standard model)
FILTER	DFUF-110 (Same filter installed by model) DFUD-110
UNIT Materials	SUS304, SCS13
FILTER Materials	SUS304, Urethane, Active Carbon, CationResin
GAS Amount of treatment	DFUF-110 12.6 L/EA (GAS Density 100% standard)

※ Able to make order production upon client's request for standard model



### :: Application results

- About 1,300 goods from steel mill
- Regular supplies (replacement of filter)

Patent application	10-2011-0086032
Name	Condensate water collection device among coke-oven gases



▲ Filter





# PRE GAS AIR FILTER



By removing odorous elements of chemical pollutants caused by outside influences, such as VOCs, ammonia and sulfides, the worker can maintain a pleasant working environment.

## :: Characteristics

- Remove dusts in the inflow air
- Remove harmful gases and chemical pollutants including  $\text{NH}_3$ ,  $\text{O}_3$ ,  $\text{SO}_x$ ,  $\text{NO}_x$  and TVOC
- Provide field-oriented filter by attaching various types of coating resins
- Minimize dusts through the media type filter
- No occurrences of odors through desorption

## :: PGA filter

### • Filter standards

595mm X 595mm X 50mm

595mm X 595mm X 80mm

Able to customize standards according to the application area



### • Area of product installation

Semiconductor & display industry

Industrial sites that generate harmful gases


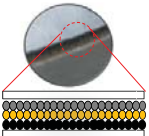

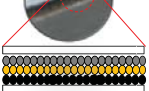
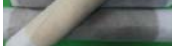
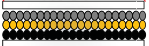
Large-scale indoor facilities, including hospitals, public institutions, etc.

Other odor-generating places

### • Examples of installation

Supplying to a semiconductor company in Cheongju

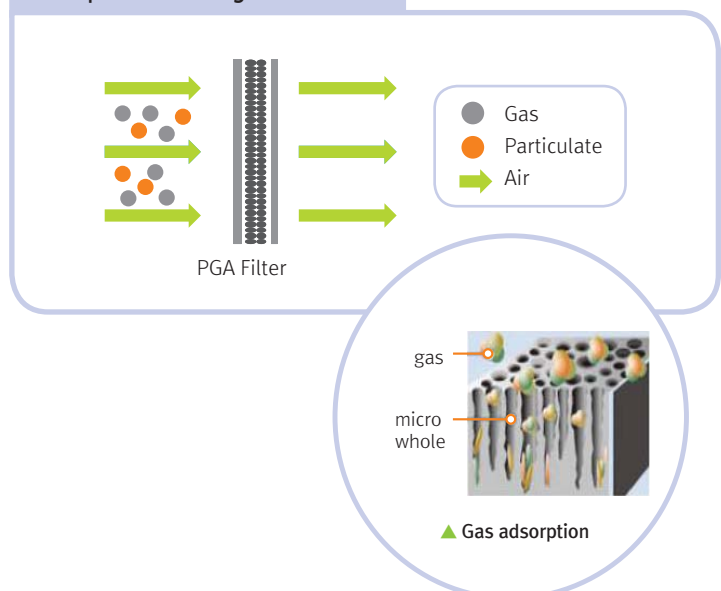
## :: Introduction of the PGA filter media

Classification	Composition of media	Functions	Filter Media	Media section
A	Non-woven (PP)	Removal of inflow dust		
B	Coating resin	Removal of target gas		
C	Non-woven (PP)	Removal of dust		

## :: Principles of removing the PGA filter's target gas

Media coating resin is designed according to the target gas by using the principles of physical adsorption, chemical adsorption and ion exchange to remove harmful gases, while also designed as an optimized filter pressure suitable for the applicable filter system and region

### Principles of removing the PGA filter



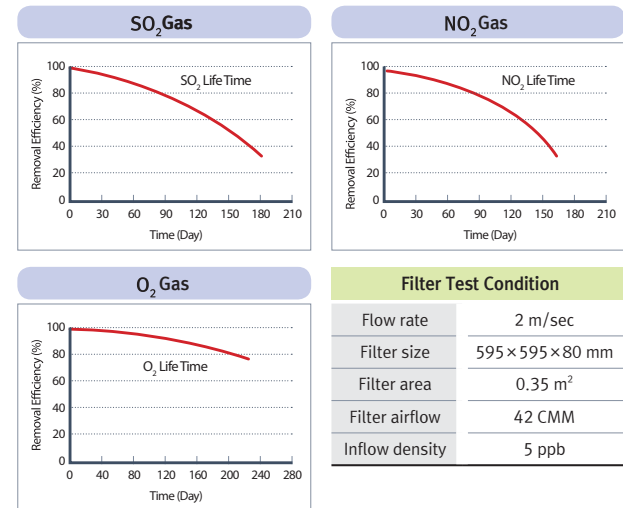
## :: Target gas and mechanism by using the PGA filter's coating resin

Target Gas	Mechanism
TVOC	Physical adsorption (Van der Waals force)
O <sub>3</sub>	$2O_3 + 2X \rightarrow 2XO_2 + O_2$ $2O_3 + X \rightarrow XO_2 + 2O_2$
H <sub>2</sub> S	$2H_2S + O_2 + 4KX \rightarrow 2K_2S + 2X_2 + 2H_2O$
HCl	$HCl + XOH \rightarrow XCl + H_2O$
SO <sub>2</sub>	$SO_2 + 2XOH \rightarrow 2X_2SO_4$
NO <sub>x</sub>	$NO_2 + XOH \rightarrow KNO_3$
NH <sub>3</sub>	$H_2XO_4 + 2NH_3 \rightarrow (NH_4)_2HXO_4$
NH <sub>3</sub>	$R-SO_3H + NH_3 \rightarrow R-SO_3NH_4$

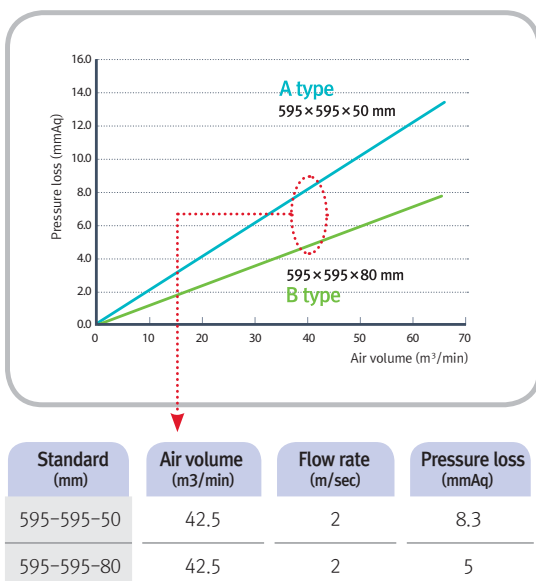


## :: Functions of the PGA filter's target gas

Functions of removing representative pollutants in the air (Day)

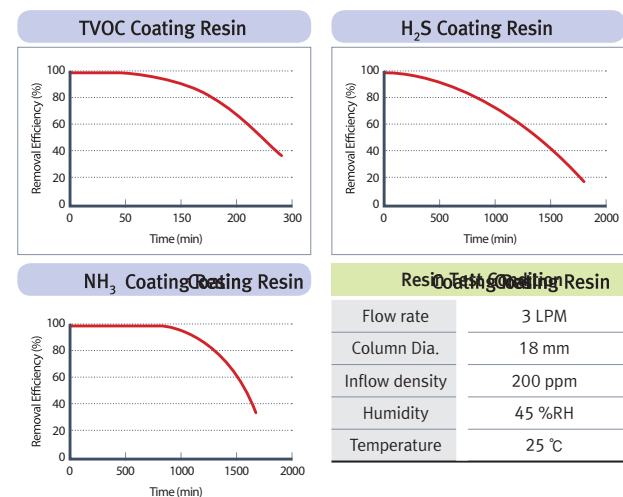


## :: Pressure loss of PGA filter



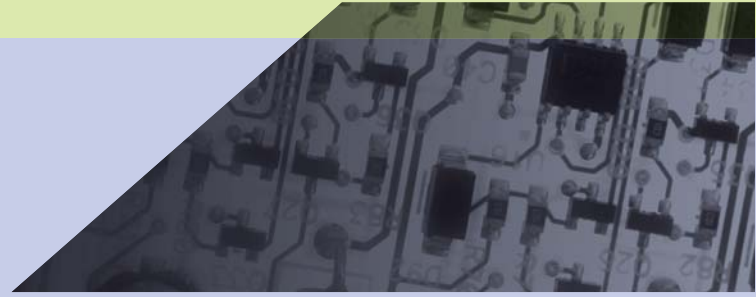
## :: Functions of the PGA filter's coating resin

Able to produce products that can change the filter coating resin according to the target gas





# CHEMICAL AIR FILTER



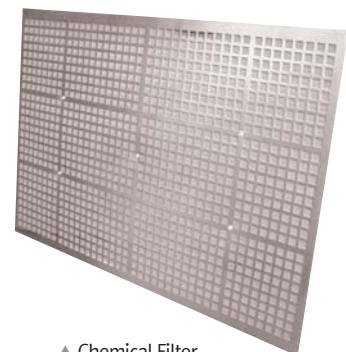
Filters for removing chemical pollutants NH<sub>4</sub> and harmful gases that affect the product yield during the manufacturing process of semiconductor and display.

## :: Characteristics

- Applying a variety of chemical air filters that suit different purposes
- Low loss of pressure
- Long life cycle (more than 95% of removal efficiency)
- Able to produce customized filters

## :: Application area

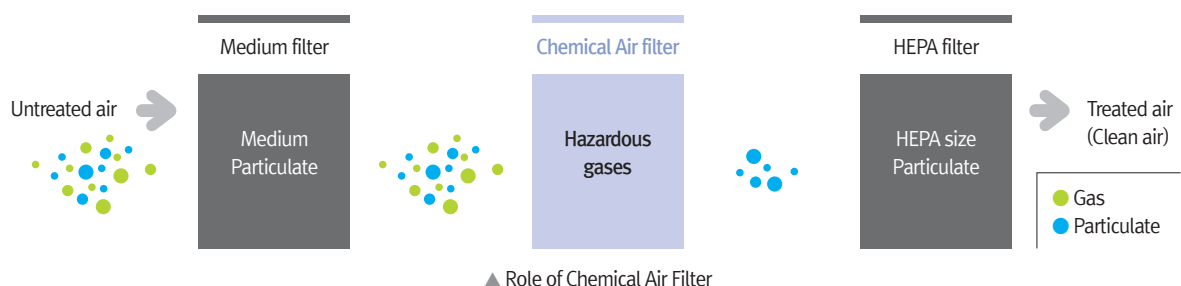
- Semiconductor & display industries
- Industrial site with harmful gases occurring
- Large-scale indoor facilities like hospitals, public institutions, etc.



▲ Chemical Filter

## :: Purpose

- Semiconductor & display industries ► Improving integration technology through advanced refining process
- Controlling particles and solid particles ► Controlling particles and solid particles + inorganic chemical pollutants, volatile organic matters  
(chemical pollutants: Acid, Alkali, Ozone, Boron, Phosphate, Organics)
- Chemical substance reduction technology ► Chemical air filter using absorbents equipped with adsorption and ion exchanging functions



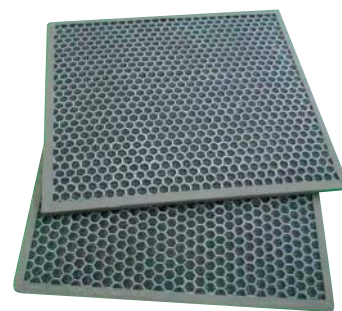


# FILTER FOR AIR CLEANER

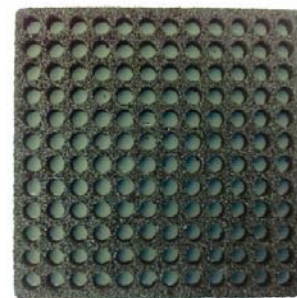
In order to maintain a pleasant air inside that is sealed without natural purification function, the filter is used for the purpose removing harmful organisms like formaldehyde, etc. and various gases that exist everyday life like cigarette smoke

## :: Characteristics

- Impregnated activated product with chemical adsorption function added to physical adsorption function
- Minimization of dusts occurring due to the use of assembly activated carbon
- Ensuring outstanding efficiency by removing organic matters and odorous gases (ammonia, acetaldehyde, acetate, etc.)
- Endurance without discoloration and deterioration by stabilizing the crystal structure of impregnated charcoal coating after special coating

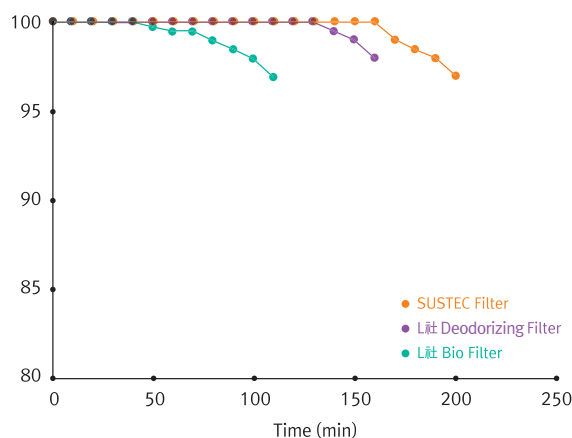


▲ HONEYCOMB Filter

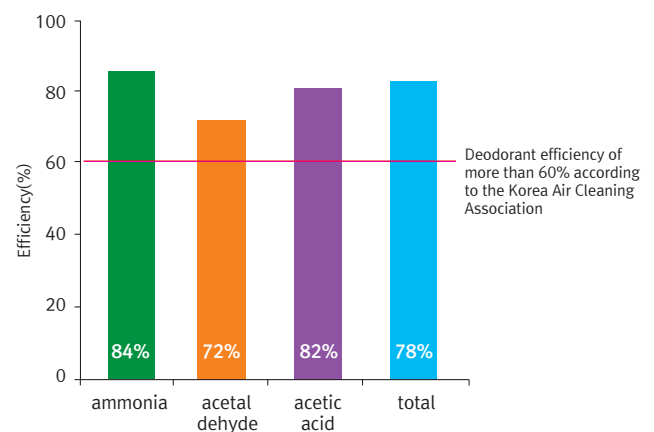


▲ Form type

## :: Evaluation of functional and deodorant performance for filter absorbents



▲ evaluation of formaldehyde  
(flux 1LPM, concentration 100ppm)



▲ Evaluation of deodorant performance  
(Test standard : SPS-KACA002-132)  
(Experiment concentration : 10ppm,  
Chamber standard : 1m3,  
Hours of operating air cleaner : 30min )



## FIRE GAS MASK



A new alternative for protecting you from harmful gases in case of fire.  
Now, respond to a crisis by using the emergency evacuation protection equipment for fire protection.

If oxygen is not supplied for more than 2 minutes due to inhaling gas or smoke caused by fire, you are left in a very dangerous situation that might result in cardiac arrest and brain damage because you cannot escape from the fire site due to lack of judgment and composure.

Time for survival! **「The golden time of 5 minutes.」**



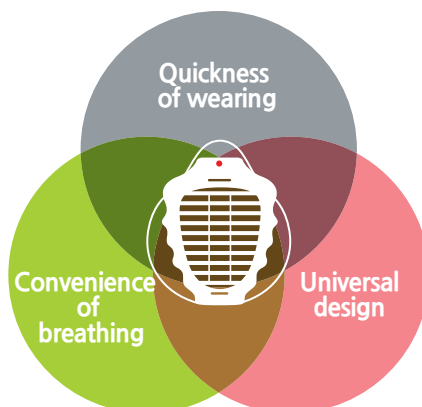
[ Main types of casualties in case of fire ]

**About 60% out of total casualties caused by fire due to suffocation from harmful gases**

Harmful gas and smoke are the direct reason behind casualties where suffocation account for **more than 60% of the total deaths in case of fire occurrence!**

Therefore, **the golden time of 5 minutes is very important** in determining whether or not you survive from a fire with harmful gases.

### :: Advantage of FIRE GAS MASK



- A design of really simple structure where you can wear within 3 seconds without a separate explanation
- Convenient breathing provided in emergency situation that allows breathing through both nose and mouth
- Universal product that is for everyone regardless of gender and age

## : : Major function of canister

**Pre-Filter**

Remove dusts and solid foreign substances by using non-woven

**CO remover**

Remove CO gases that are the cause of suffocation

**HEPA Filter**

Remove smoke and particle pollutants

**Gas absorbent**

Remove organic gases and acid gases caused by the fire situation

## : : Product data

Product name		FIRE GAS MASK
Model name		SUS 119
Materials	Filter case	ABS
	Facial cover	Silicon
Storage temperature		-5℃ ~ 50℃
Effective period		5 years from the manufacturing date
Total weight		170 g
Manufacturer		SUSTEC

## : : Evaluation conditions for removing combustion gases

Intake flow	30L/min, breathing device 20 times/min. 1.5L/time
Gas concentration (ppm)	CO(2500) / HCl(1000) / SO <sub>2</sub> (100)
Absolute humidity	20.7g/m <sup>3</sup>
Temperature	25±1℃
Exhaust relative humidity	95~100%
Exhaust temperature	37±1℃
Break-through time	CO: less than 200ppm (5 min.)
	HCl: less than 5ppm (5 min.)
	SO <sub>2</sub> : less than 3ppm (5 min.)

\* Korea Institute of Civil Engineering and Building Technology (KICT) recognized the outstanding function that exceeds standard concentration through the toxicity test result

## : : Removal function

Gas name	Test gas concentration	Break-through concentration	Removal function
	ppm	ppm	min
Carbon monoxide (CO)	2500	200	5
Hydrogen chloride (HCl)	1000	5	15
Hydrogen cyanide (HCN)	400	10	15
Sulphur dioxide (SO <sub>2</sub> )	100	3	15
Propenal	100	0.5	15

\* This product may be changed without prior notice to improve performance

## ▼ FIRE GAS MASK CABINET

**FIRE GAS MASK**

Patent Number : 10-1419649

2014 GOOD DESIGN



# HYBRID MASK

Dust and Gas



High performance mask that protects the worker from various dusts and odor that occur at the work site.

## :: HYBRID MASK Advantages

- Effectively prevent dusts by using highly efficient non-woven filter
- Ensuring excellent function by applying the experience in producing gas filters and the patent acquired for masks
- Highly effective compared to other products due to high contents of deodorizer
- Last for long period due to superior deodorization effect compared to other products
- Maximize deodorization effect that had reached its limit in the existing mask market
- Outstanding adhesion and wearability by using functional materials with a pad close to the face area

※ Patent application: mask equipped with an adsorption medium that is detachable (10-2012-0115328)



▲ Mask safety certification 1st grade

## :: Product model & specification

Grade	STMS-WV-1	STMS-WV-2
Safety grade	1st grade	2st grade
Dustproof efficiency	94%	80%
Induction resistance	70 Pa or below	60 Pa or below
Odor adsorption efficiency	8 hours-time for maintaining 90% efficiency	



▲ Mask safety certification 2nd grade

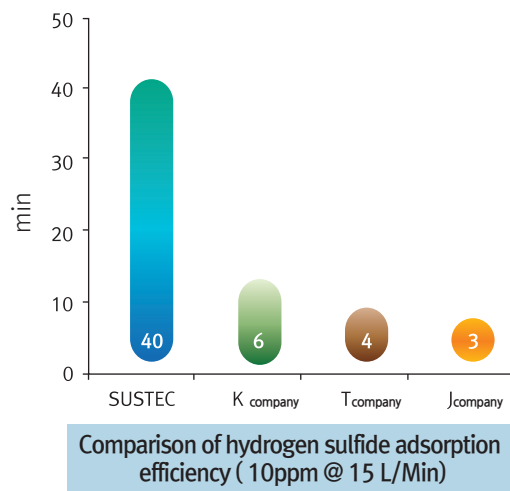
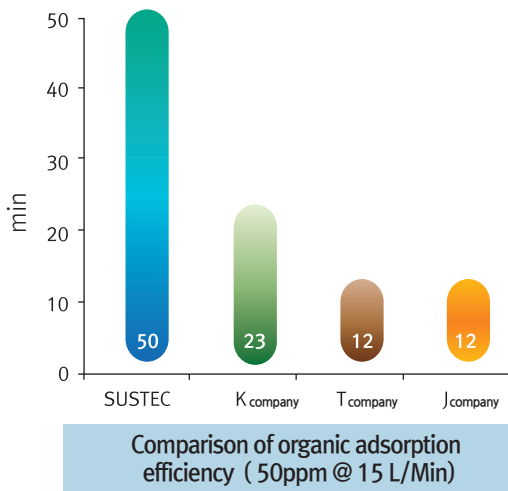
## :: Applicatio

Grade	Special grade	1st grade	2nd grade
Place of usage	<ul style="list-style-type: none"> <li>• Place with dusts containing high levels of toxic materials like beryllium, etc.</li> <li>• Place handling asbestos</li> </ul>	<ul style="list-style-type: none"> <li>• Place where dusts, etc. occur excluding the place for wearing special masks</li> <li>• Place where dusts, etc. occur thermally because of metal home, etc.</li> <li>• Place where dusts, etc. occur mechanically (excluding cases where it is okay to wear the 2nd grade dustproof mask like silicon, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Place where dusts, etc. occur excluding the place for wearing special grade and 1st masks</li> </ul>
	Facial filter mask without exhaust valve cannot be used at special grade and 1st grade places.		



## :: Comparison between manufacturers regarding mask adsorption efficiency

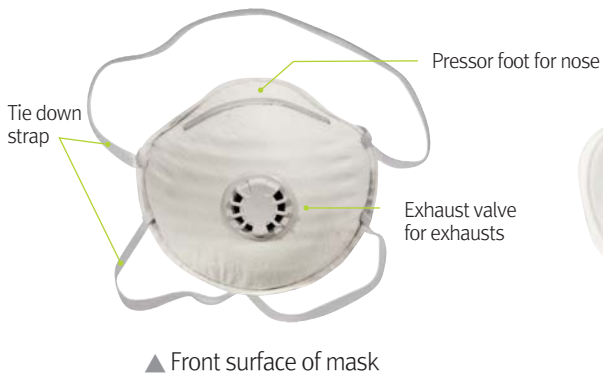
- Comparison of 90% efficiency standard time for removing harmful odor passing through the mask



※ Able to use at working conditions with low concentration (1ppm) gases for several days

## :: Product composition

※ Same as the product composition of ww-1 and ww-2





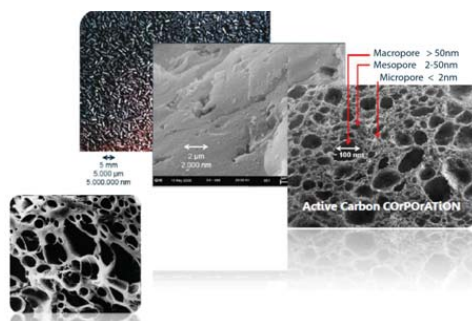
# DEODORIZER

As a company specializing in removing pollution for clean environment, SUSTEC has been using impregnated charcoal that ensure safety with environment-friendly materials under the philosophy of “Making a pretty earth” to improve deodorization without being harmful to human body and remove the smell from refrigerator, shoe rack and cars.

## :: Major function of deodorant

Impregnated charcoal deodorant that is 100% natural for physical adsorption of toxic, harmful and odorous gases contained in air with impregnated charcoal technology, as well as strong adsorption, decomposition and removal through chemical adsorption

A high-tech impregnated activated technology that maximized purification capacity by strengthening the existing activated carbon, to scientifically identify and selectively remove the cause and type of noise



## :: Impregnated activated technology

An environment-friendly impregnated charcoal deodorant that strengthens adsorption and decomposes and removes for physical adsorption of materials contained in the air, including harmful and odorous gases, as well as chemical adsorption

- **Physical adsorption**  
: adsorbed by using charcoal van der waals force
- **Chemical adsorption**  
: strengthen adsorption capacity with (impregnated) special coating of activated materials on the surface of charcoal



### Eco-friendly products

No detection of allergy-causing materials by using environment-friendly material



### Maximize affordability

More than 4 times the life time of the existing activated carbon air refreshers



### Cutting-edge technology

Removing harmful gases and odor by using the impregnated charcoal special coating technology



### No occurrence of dusts

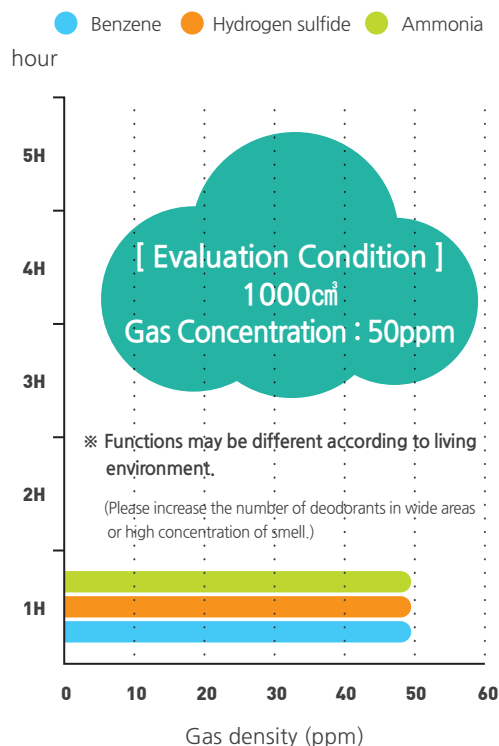
No occurrence of dusts by modifying activate carbon



### Super deodorization

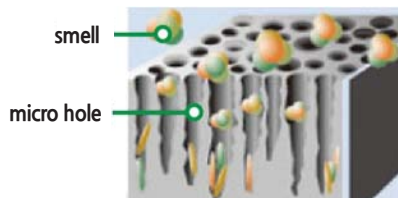
99.9% deodorization of smell and odor

## :: Performance evaluation of deodorant



## :: Principle of deodorant for removing odor

The principle of the existing deodorant that uses the masking method lacked deodorization by letting you feel the smell. Also, the existing air refreshers contained various allergy-causing materials that required caution in selecting the product.



However, the adsorption method adsorbed the smell through activated carbon, so that physical adsorption and chemical adsorption occurred to maximize the removal of odor.

■ Source: data from the Ministry of Environment



- Evaluation results of dangerous ingredients in air refreshers and deodorants detected allergy-causing materials from 34 products (80%) out of 42 products
- Detected 9 products without indication of the KC mark and 4 products exceeding the standard for containing formaldehyde
- Planning to strengthen the management of chemical products to evaluate the impact on public health and the environment by hosting the management of daily chemical products by the Ministry of Environment in the future, to prevent damages from harmful chemicals

## :: Application of deodorants

- Removing odor at toilets
- Removing odor from pets
- Removing odor from food wastes
- Removing odor from sick house syndrome
- Removing odor and smell from other regions

