

Imagination *lives*

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<http://www.samsung.com/global/business/spi>

Version.1

SAMSUNG



SPI

Samsung
Super
Plasma ion

Environment-friendly Samsung Super Plasma ion will provide you the purest air. Stay fresh and healthy with this revolutionary air purifying masterpiece.

SAMSUNG

When Samsung's cutting-edge technology designs the air you breath

Imagination *lives*





Design the pure world with healthy air

Samsung's cutting edge technology has brought you the revolutionary air purifying device. Keep the healthy life of you and your family with the SPI.



You make Samsung one of the world's leading companies.

A brand is created by its customers. That's our novel perspective at Samsung. Business Week and Interbrand ranked the Samsung brand 21st worldwide, giving it the biggest gain in value of any Global 100 brand with a 186% surge. However, the impact of our advertising and marketing, such as our ongoing Olympics partnership, is far outweighed by the voices of our customers. We are fortunate in having excellent customers whose voices have created the Samsung brand. The customer-driven Samsung brand is evolving in partnership with the worldwide community of our Samsung customers.

Best Global Brand*

Rank	Company	Value*
1	Coca-Cola	66.6
2	IBM	59.0
3	Microsoft	59.0
6	Toyota	34.0
21	Samsung Electronics	17.6
24	Apple	13.7
25	Sony	13.5
78	Panasonic	4.2

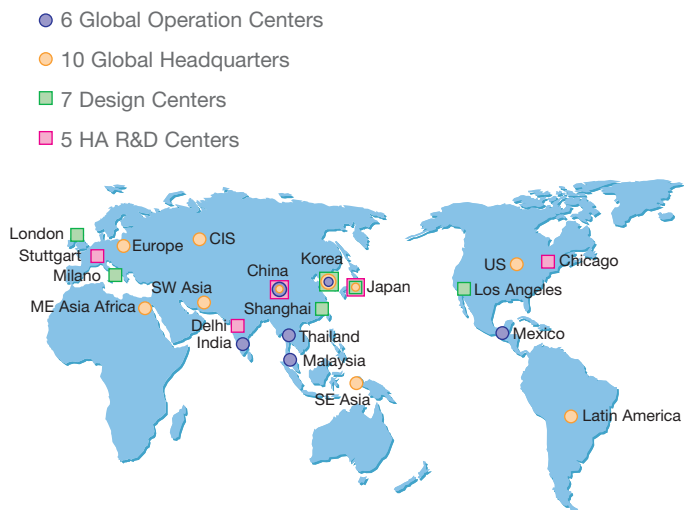
* Brand Value in US \$ Bil

* The Best Global Brands 2008 Report Ranking by Interbrand

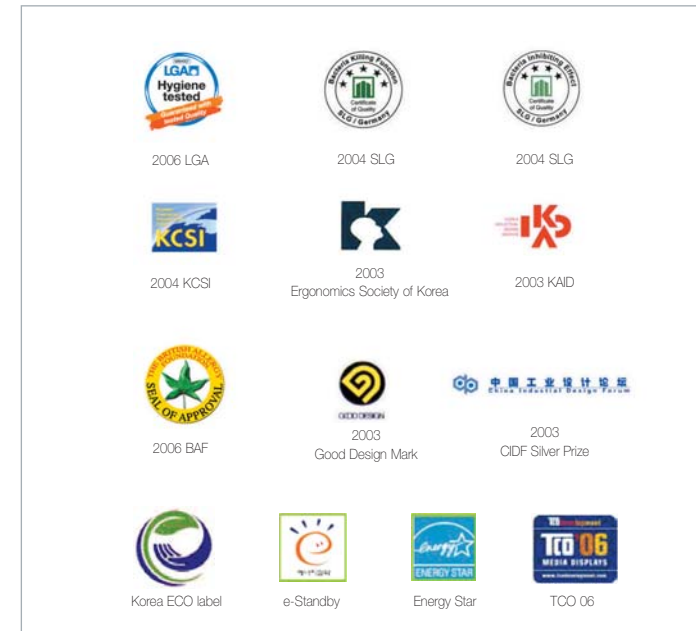
SAMSUNG DIGITAL APPLIANCE HISTORY

- 1972 Entered Refrigerator Market
- 1974 Entered AC & Washing Machine Market
- 1978 Entered Vacuum Cleaner Market
- 1979 Entered Microwave Oven Market
- 1997 Developed World 1st Twin Cooling System for SBS
- 1998 Developed World 1st SBS with Interior Design Options
- 2000 Developed World 1st Digital Washing Machine
- 2003 Developed World 1st Washing Machine with Silver Nano Tech
- 2005 World's 1st 4dr Convertible Refrigerator
- 2008 Introduced the World's Largest FDR in the Market

GLOBAL BUSINESS NETWORK



CERTIFICATION AND AWARDS RECEIVED



Samsung Electronics Home Appliance Product Awards

Technology can contribute to the development of a greener, cleaner world and increase quality of life. This is a philosophy we have held at Samsung for over 30 years.

Ever since its establishment in 1973, Samsung Electronics has concentrated on developing environmentally friendly products and has converged increasingly sophisticated digital technology with its appliance products to attain a strong technological advantage in improving consumers' quality of living with the ultimate in convenience and style.



To make your life brighter and happier, Samsung works harder for you.

Social Welfare Programs

Children are the future of our society and the SAMSUNG Welfare Foundation, along with SAMSUNG's affiliates, is actively involved in the upbringing of children and in helping people in need become self-sufficient.

Cultural and Arts Programs

SAMSUNG supports artistic and cultural activities around the world in order to promote culture and bring more beauty to our lives. SAMSUNG provides support for artistic and cultural activities around the world.

Academic and Educational Programs

SAMSUNG's academic and educational programs include direct assistance to universities, international exchange programs, support for departments of Korean studies around the world, scholarships and donating supplies to develop schools in third world countries.

Environmental Preservation Programs

Environmental preservation programs exist at every SAMSUNG establishment around the world. SAMSUNG is actively involved in developing environmentally friendly products and related technologies, and is a strong supporter of "green" designs.



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Take a deep breath, SPi is there for you

The world created by Samsung is here. You will see, hear and experience the technologies you can imagine. Cutting edge air purifying device, the outcome of Samsung's endless effort, is waiting for you.



Harmful air contaminants

Biological contaminants

Each year large number of people suffers from allergies, rhinitis, asthma and other respiratory diseases. Airborne biological contaminants such as MRSA, Influenza virus, Corona virus, and other allergens are becoming threats to our healthy life.

OH-radical

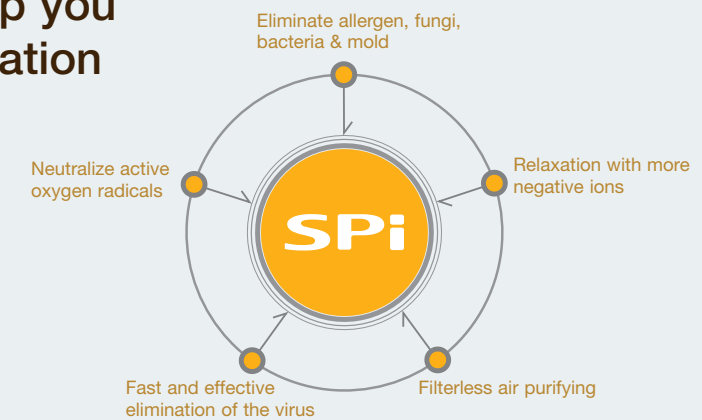
OH-radical is one of the most reactive oxygen species. The oxidation products of OH-radical with VOC (Volatile Organic Compound) contain irritants, which may be responsible for reported eye and airway complaints, potent contact allergens and even asthma.



SPi, the answer to keep you safe from air contamination

The SPi technology helps develop clean indoor air quality by eliminating biological contaminants and by neutralizing the OH - radicals.

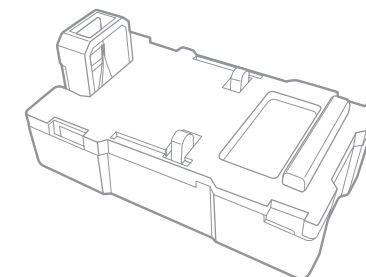
The unique environment-friendly technology of SPi surpasses that of previous air purifiers. While purifiers simply filter the inducted air, SPi emits active hydrogen and oxygen ions into the air inhibiting infection by airborne viruses and destroying airborne bacteria, fungi and allergens for a much cleaner, healthier environment.

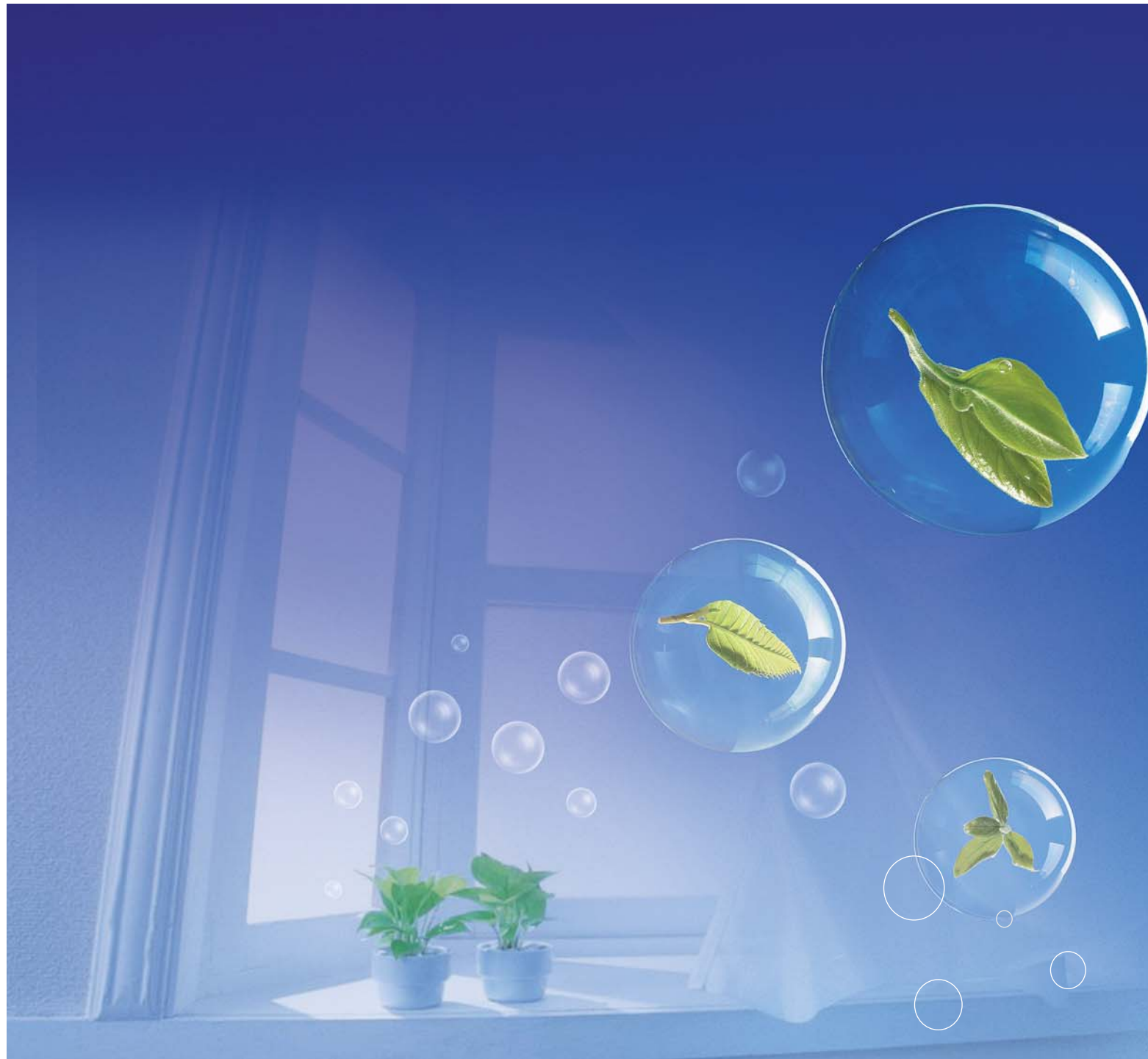


Why is SPi Needed?

SPi protects us from harmful air contaminants

There are seriously harmful air contaminants among the air we breathe. Lots of people are suffering from respiratory related diseases caused by air contaminants. The SPi technology keeps us safe from those air contaminants by elimination and neutralization, providing us with the contaminant-free, clean and healthy air.

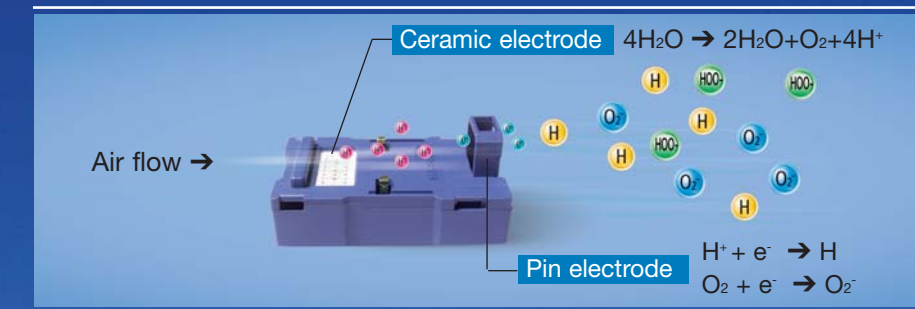




How are H and O₂⁻ Created?

- **Ceramic electrode (+ electrode):** Micro plasma discharger splits water molecules in the air and forms positively charged active hydrogen (H⁺).
- **Pin electrode (- electrode):** High-voltage electric discharger emits electrons which react with H⁺ and O₂ to form active hydrogen (H) and oxygen ion (O₂⁻).
- **Newly generated active hydrogen (H) and the oxygen ions (O₂⁻) forms hydroperoxy radical (HOO⁻).**

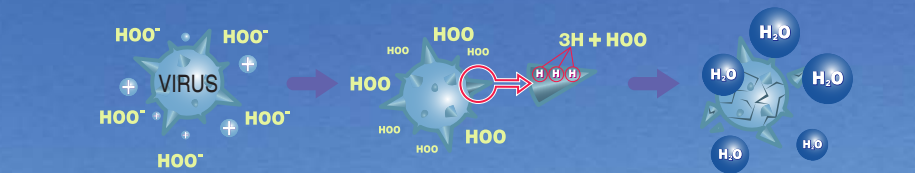
H and O₂⁻ generation



How does SPi eliminate harmful air contaminants?

Active hydrogen atom and oxygen ion form Hydroperoxy radicals (HOO⁻) which surround the positively charged biological contaminants, and then react with three hydrogen elements of its protein structure, forming water vapor. Also, the active hydrogen (H) combines with OH-radical to form a water vapor, neutralizing harmful OH-radical.

Eliminating biological contaminants



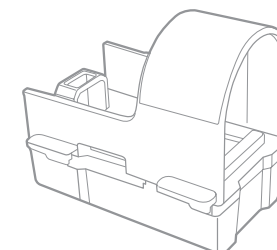
Neutralizing OH-radical



How Does SPi Work?

Effective sterilization

The SPi device generates active hydrogen and oxygen ions which eliminate biological contaminants and active oxygen . The process of eliminating the harmful substances is completely harmless to human body and SPi improves the air quality.





Effectiveness of the SPi

Health Effects from Biological Contaminants

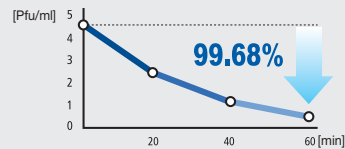
The SPi is certified from many academic research organizations for its effective elimination of the biological contaminants and OH-radical. SPi provides the healthy and clean environments by removing viruses, fungi and allergens from the air you breathe everyday.



Inactivation of biological contaminants

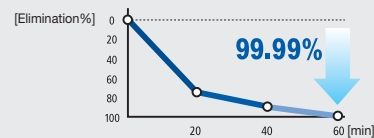
INFLUENZA VIRUS

Airborne Influenza Virus, which is the most common virus, was eliminated up to 99.6% by the SPi device.



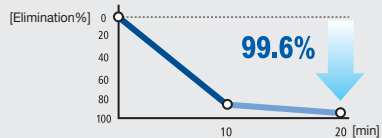
MRSA

Methicillin-Resistant Staphylococcus Aureus, which is tough to eliminate even with the antibiotics, was eliminated 99.99% with the SPi device.



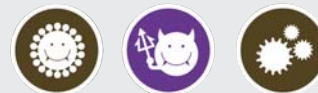
CORONA VIRUS

Corona Virus, which is equally serious as SARS, was eliminated by SPi up to 99.6% within 20 minutes.



ALLERGEN

Efficiently eliminates the allergens such as the mites, dust and animal hair which cause rhinitis, asthma, fever and rash etc.



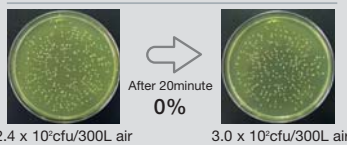
SUPERIOR PERFORMANCE

BACTERIA TEST RESULT (STAPHYLOCOCCUS AUREUS)

SPi

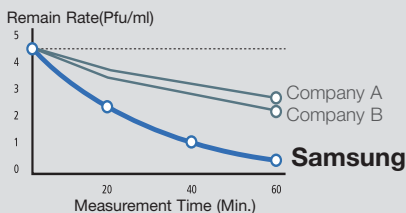


Conventional



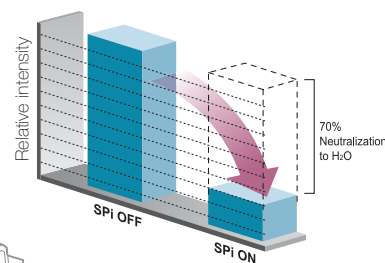
- Chamber size : 900(W)x500(D)x600(H)
- Air Suction rate : 300 Liter air/3 mins
- Tested by Samsung

VIRUS TEST RESULT (INFLUENZA)



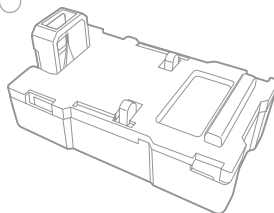
- Department of Biotechnology in Yonsei University
- Temperature : 25°C
- Relative Humidity : 51~60%,
- Chamber size : 1m³

Neutralization of active oxygen radical



OH-radical can cause aging and skin diseases. Hiroshima University's test verified that the active oxygen concentration level decreased significantly by the SPi-generated active oxygen hydrogen atom (H) which reacts with the active oxygen (OH-radical) to form a water molecule.


- Hiroshima University
- Temperature : 24°C
- Relative Humidity : 50%
- Measurement Method : LIF(Laser Induced Fluorescence)





Certifications

Effectiveness certified by specialized research centers

Substance	Effectiveness	Certified by
Influenza virus type A	99.7% Elimination	Kitasato Environmental Science Center
	99.6% Elimination	Yonsei University
Corona virus (Strain of SARS-Corona Virus)	99.6% Elimination	Kitasato Medical Center
Penicillium	98.4 % Elimination	Kitasato Environmental Science Center
Aspergillus	96.4 % Elimination	
Cladosporium	98.9 % Elimination	
Staphylococcus aureus	99.96 % Elimination	
Micrococcus	99.86 % Elimination	
MRSA ¹⁾ (Antibiotic resistant nosocomial pathogen)	99.99% Elimination	Korea Consuming Science Research Center
Mold Staphylococcus aureus/E. coli	99.9% Elimination	
Allergen (Dust Mite, Cat/Dog Allergen)	Effectiveness certified	Acquired BAF ²⁾ (U.K) Seal 
	Effectiveness certified	RTI ³⁾ Test (U.S.A)
Indoor contaminants	over 90% Elimination	Shanghai Ji-Kong Assessment Center for safety and health
Animal toxicity test	Non-toxic	Seoul Toxicology Laboratory
Active hydrogen atom	Active hydrogen formation verified	Hiroshima University
OH-radical	Active oxygen neutralized	

1) MRSA : Methicillin-resistant Staphylococcus aureus (antibiotic resistant nosocomial pathogen)

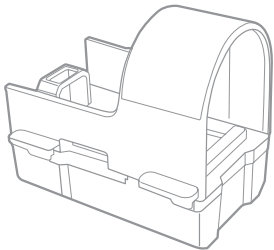
2) BAF : British Allergy Foundation (certification institute)

3) RTI : Research Triangle Institute (allergy research institute,USA)

Certified Effectiveness of the SPi

Tested and proved from academic research organizations

SPi device has demonstrated that SPi technology can inactivate and eliminate the biological contaminants and OH-radical along with the collaboration of academic research organizations around the world. The result shows that SPi device is effective and harmless to humans.

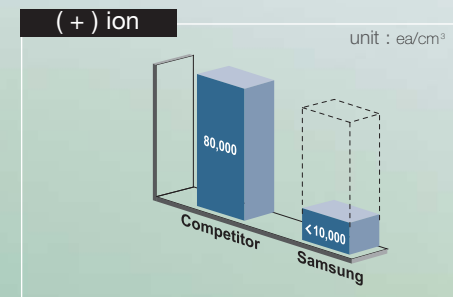




Free from harmful positive ion

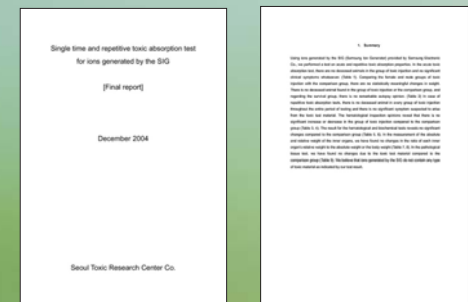
Positive ions cause discomfort and symptoms such as headaches and nausea and make breathing more difficult. SPi rarely generates harmful positive ions, which make you free from the potentially harmful positive ions.

- Measurement distance : 1m
- Concentration level : (ea/cm³)



Free from toxic

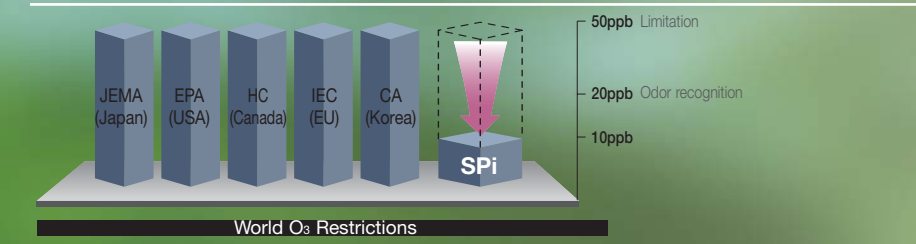
Seoul Toxicology Laboratory has tested the SPi technology to prove its safety to human body. There were no signs of toxic symptoms observed at the animal test and no side effects of the ionizer, particularly on respiratory organs.



* Tested and certified by Seoul Toxicology Laboratory

Free from ozone

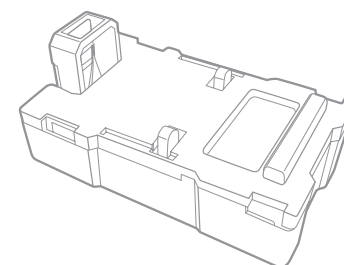
Samsung's ozone regulation is much stricter than that of many organizations around the world. Samsung controls the ozone emission level less than 10ppb. You will be free from the ozone smell.



Safe Technology to Human Body

People-oriented technology, especially for your body

The mechanism of the SPi device shows how safe it is to human body. Samsung's Green Management policy has also established the eco-friendly system which is based on SPi device. Put all the worries behind with the SPi device which is as safe as it is effective.





World Recognized Technology

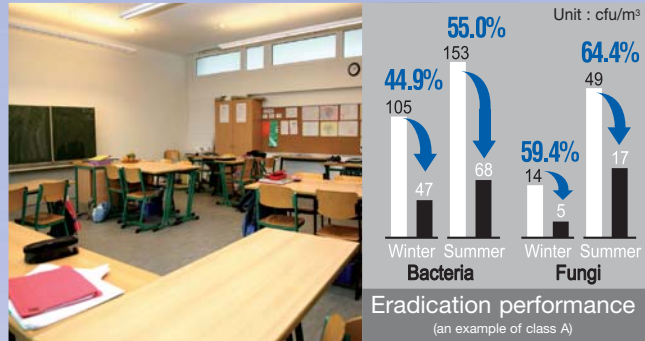
World best technological breakthrough in air purification

The most advanced environmental technology eliminates viruses and the other air contaminants.
SPi will keep you and your family healthy by inactivating those substances which threaten you.



Educational facilities verification

Tested by Hanyang University Environmental and Industrial Medicine Laboratory

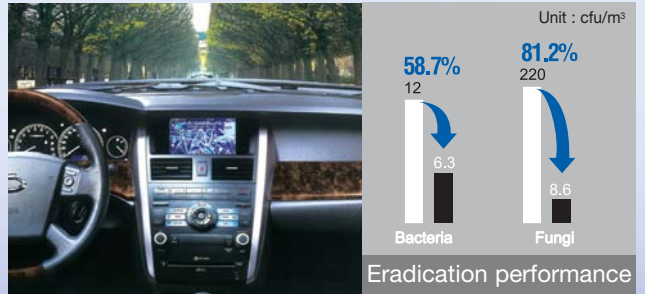


		Bacteria				Fungi			
Item	Classroom	A	B	C	D	A	B	C	D
Room Space (m ²)		48	48	50	48	48	48	50	48
Number of installed SPi		2		1		2		1	
Winter	SPi Off (cfu/m ³)	105	91	107	41	14	20	10	17
	SPi On (cfu/m ³)	47	40	61	28	5	6	5	12
	Elimination Rate(%)	44.9	50.4	42.9	30.4	59.4	49.2	44.8	31.6
Summer	SPi Off (cfu/m ³)	153	82	127	60.8	49	96	45	31
	SPi On (cfu/m ³)	68	43	61	30	17	56	23	20
	Elimination Rate(%)	55.0	50.8	47.1	48.1	64.3	52.0	49.6	42.7

- Date measurement : Winter(December, 2007), Summer(May~July, 2008)
- Place of measurement : Seoul Special School
- Measurement instrument : BioCulture (Impaction sampling method)
- Measurement Method : Measured when off, and 3 hours after on

Car verification

Tested by Hanyang University and EHN



Measurement method

SPi performs superbly in airtight environments such as cars, airplanes, and elevators. Test result for the automobile indoor air showed the 81% of fungi and 58% of bacteria elimination. This fascinating test result brought agreement in supplying and installing the SPi module to a well-known European HVAC manufacturers.

- Test vehicle : 2008 SM7
- Conditions : Vent Mode, Blower (2/7)
- Air Sampler : Middle of the front seat
- Test time : Twice daily (SPi ON: 30min/ SPi OFF: 30min)

World-known bacterial eradication performance



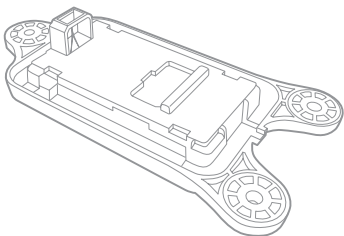
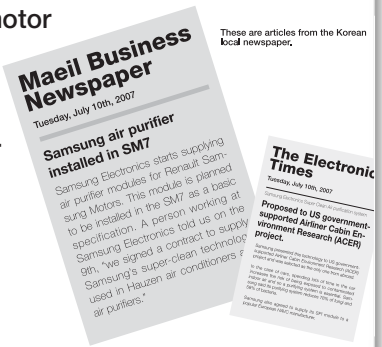
SPi was installed in Renault Samsung motor

SPi is installed in high-end Renault Samsung automobiles to reduce toxins in its closed space.



SPi was chosen as a part of the “Airliner cabin environment research project”

ACER (Airliner Cabin Environment Research) is funded by the US government to find a way to reduce contamination in airplane cabins. Samsung's SPi technology was the only one to be chosen from abroad and this suggests how safe SPi is.





Examples of Application

Place where imagination lives

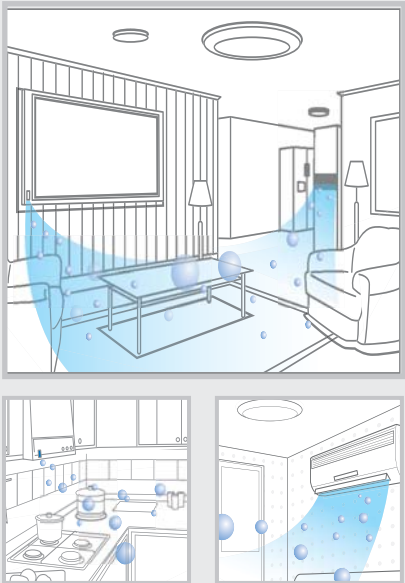
A space free from bacteria, mold and other contaminants, SPi creates healthier breathing environment.
Place where imagination lives, you will experience the pure world with healthy air designed by Samsung.





SPI in Living spaces

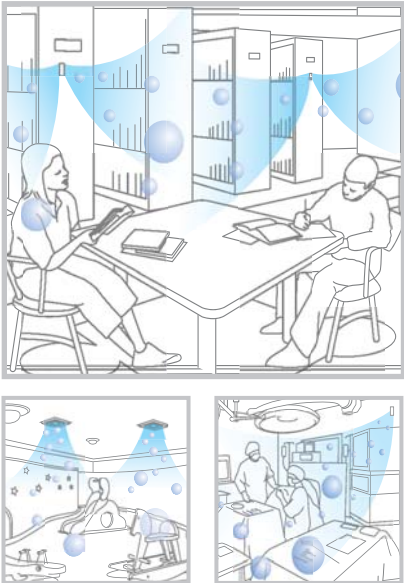
- Bathroom
- Bedroom
- Kitchen
- Stove hood
- Air conditioner
- Air cleaner
- Computer
- TV
- Hair dryer
- Water purifier



People you love and care the most, spend their time mostly indoor. Nowadays it is known that indoor air carries more air contaminants. SPI will keep your family healthy, by protecting them from airborne bacteria and viruses in airtight areas, active oxygen emitted from building materials, and molds that grow everywhere.

SPI in Public spaces

- School
- Auditorium
- Fitness club
- Theater
- Hospital
- Restaurant
- Hotel room
- Department store
- Museum
- Airport lounge
- Aquarium



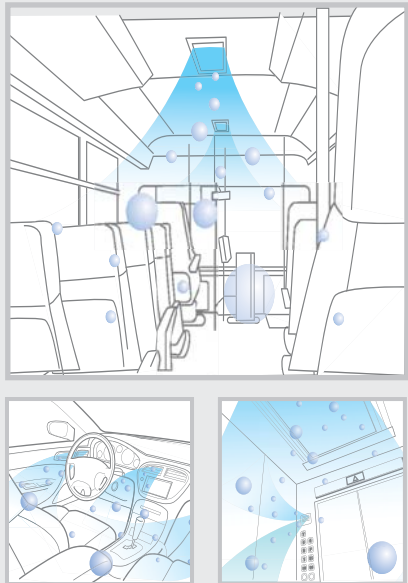
The air in public places is more prone to be contaminated due to the amount of people that pass through the areas. SPI ensures that you will always breathe the clean air by eliminating the toxins in the air around you.





SPI in Transportations

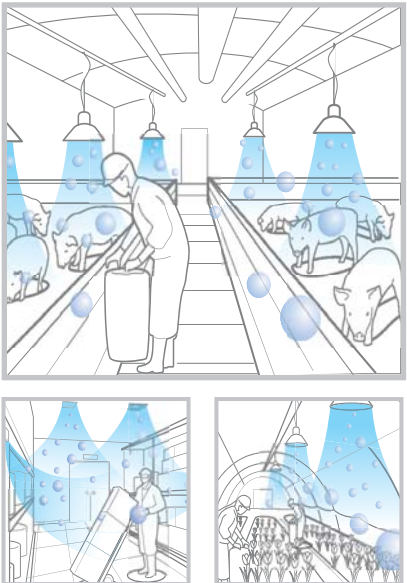
- Automobile
- Business vehicle
- Cable car
- Ambulance
- Subway
- Train
- Air plane
- Cruise
- Yacht
- Bus
- Container
- Elevator



Traveling for a long time in airtight areas such as airplanes, automobiles, and express vehicles is not safe for either passengers or the drivers. SPI will provide you with a comfortable and healthy indoor environment.

SPI in Agriculture facilities

- Poultry farm
- Swinery
- Greenhouse
- Flower garden
- Mushroom farm
- Food storage warehouse
- Organic farming facilities



There are many damp and dark areas in agricultural and marine facilities. Damp and dark places are the most ideal ones for bacteria and the viruses to grow. Installing SPI in places such as animal stalls, storehouses, and greenhouses will ensure that these places become more clean and safe.





World Wide Patents and Certifications

SPI is a unique and effective technology that is certified from all around the world. Patents granted from many countries and the certifications obtained from academic research centers prove superb technology of SPI.

Patent

SPI technology was granted with a patent for generation of active hydrogen (H) from all over the world. 29 patents were granted in Korea alone and 42 worldwide, from counties and continents including China (13), U.S (12), Japan (10) and Europe (7).

* Based on data from May, 2008

Certifications

SPI technology was certified from many academic research centers around the world for its ability to eliminate all different kinds of air contaminants and viruses.

Certifications



Elimination of Allergens
Acquired BAF (U.K) Seal



Elimination of Influenza virus
Kitasato Environmental Science Center



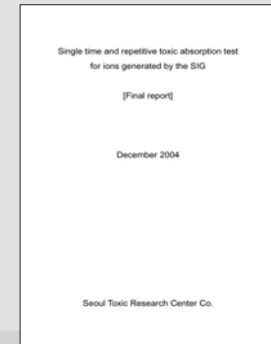
Elimination of Corona virus
Kitasato Medical Center



Elimination of Mold, S. aureus/E. coli
Korea Consuming Science Research Center



Elimination of MRSA
Kitasato Environmental Science Center



Animal toxicity test
Seoul Toxicology Laboratory



Elimination of Indoor contaminants
Shanghai Ji-Kong Assessment Center for safety and health



Elimination of S. aureus
Kitasato Environmental Science Center



Active hydrogen atom (OH-radical)
Hiroshima University

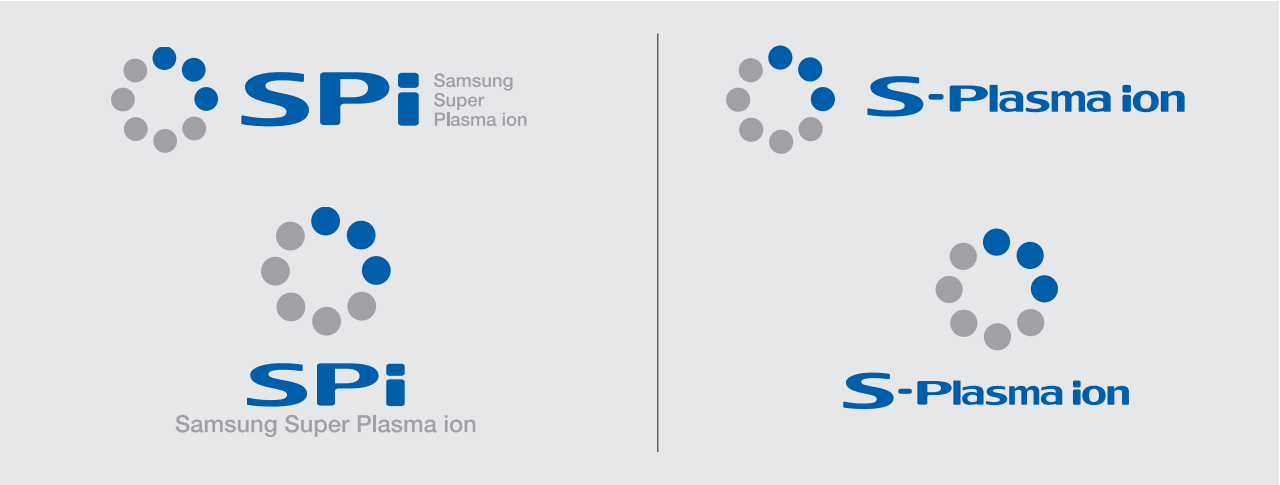


Specification






The more the better. You can find SPI devices practically anywhere Various types of the SPI devices will be available from anywhere to anything.

Application Regulation for SPi(Samsung Super Plasma ion) C.I

SPi 's technology originates from the Micro Plasma Technology, in which the oxygen ion (O₂⁻)bonds with the active hydrogen (H) to form the hydroperoxy radical (HOO⁻). The logo symbolizes the hydroperoxy radical in the air as a circle shape, which also stands for elimination of harmful airborne substances, neutralization of active oxygen, and purification of air.



Specification

Item		For normal use				For automobiles
Model		SMD-HON01	SMD-HAN01	SMD-HAC01	SMD-HBN01	SMD-CAN01
Image						
Dimensions WxLxD	Cap included (mm)	44x70x64	-	36x60x54	-	-
	Cap not included (mm)	44x70x19	36x60x17	36x60x17	56x60x12	67x128x18
Power requirement	Voltage (V)	DC12	DC11.5	DC11.5	DC11.5	DC13.5
	Current (A)	0.15 ↓	0.15 ↓	0.15 ↓	0.15 ↓	0.15 ↓
Output voltage	+ electrode (kV)	+3.4 ±0.17	+2.95 ±0.15	+2.95 ±0.15	+2.95 ±0.15	+2.95 ±0.15
	- electrode (kV)	-4.0 ±0.50	-4.0 ±0.50	-4.0 ±0.50	-4.0 ±1.00	-3.0 ±0.50
Wire length (mm)		900±30	500±20 250±10	500±20	500±20	593±30
Weight (g)		96	52	60	65	95

Memo