

SSK
STARS STIRING KOREA INC.

02-518-9311
www.issk.co.kr



Wonderful dream ventilator for enough ventilation and stable indoor temperature

Heat Recover Air Purifier

H R V - Heat Recover Ventilator



Features of Heat Recovery Ventilator

Patent-recognized and new-concept heat recovery ventilator (exhaust waste heat recovery unit)

Efficiency of heat recovery ventilator(HRV) is dependent on how excellent and precise it is in recovering heat. Our heat recovery ventilator consists of Random Matrix Media so it offers incomparable efficiency, and it has simple but sophisticated structure for the durability and reliability. The HRV and its structure are recognized with patents.

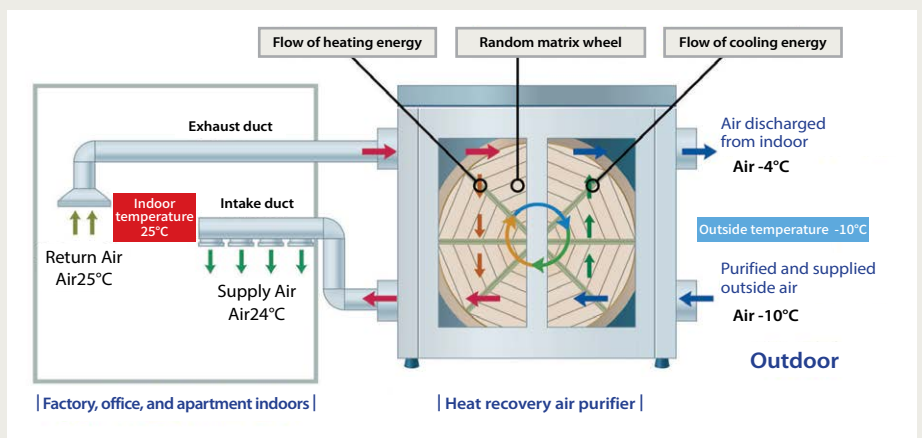
Over 90% heat recovery

This HRV achieves the world's highest wonderful heat(energy) recovery efficiency of 90% with the special heat exchange core of random matrix media to supply fresh outside air. The efficiency has been recognized by a Canadian R&D and testing specialist, ORTECH INTERNATIONAL.

Removal of dust

As well, it effectively removes dust: almost all of pollen (over 10 micron), 95% or more of yellow dust (mostly over 5 micron) and dust, and over 50% of fine dust under 5 micron.

Mechanism of Heat Recovery Ventilator



Stable indoor temperature during ventilation (in summer and winter) | Indoor temperature barely changes due to ventilation because 90% or more of heating energy and 70% or more of cooling energy of indoor air is recovered during the process.

Features of Heat Recovery Ventilator

By-pass function for ventilation (in Spring and Fall) | It has the unique by-pass function to apply outdoor temperature into indoor environment by pressing a button.

Heating and cooling cost saving | Energy cost can be saved up to 40% comparing to general air conditioner because energy is barely lost during the ventilation process.

2-Way ventilation | A general fan only expels air (1-way ventilation), so the air comes in through openings and the ventilation should be less effective given the energy used for the ventilation. HRV has separate exhaust and intake for the 2-way forcible ventilation, resulting in excellent ventilation.

Solution for critical disadvantage of air cleaner | An air cleaner purifies indoor air by regenerating it but it can't remove harmful materials including CO₂, formaldehyde, and radon neither supply fresh air. The HRV removes invisible toxic gas as well as visible cigarette smoke and dust while supplying fresh outside air.

Fresh air supplied by filtering polluted outside air | The dual filter system of pre-filter and random matrix media purifies air so that you can ventilate in polluted urban area with an easy mind.

Stable indoor humidity | It recovers 40% of indoor humidity to facilitate maintenance of it.

Low maintenance cost | It consumes small amount of electricity, and the pre-filter and random matrix media can be reused by cleaning them resulting in low maintenance cost.

Subsidy for agricultural machine | If a mushroom or special crop farm makes purchase of and installs an SD-grade model; it is registered as an agricultural machine, which is subject to the agriculture machine subsidy.



Terms & Definitions

By-pass : To directly intake outside air without the heat exchange core if not required in order to extend the service life of it.

Wireless/wireless remote controller : Controller for wired/wireless control of ventilation system

Pre-filter : To be installed on OA and RA sides in order to filter out large dust and thus protect the heat exchange core

Deodorizing filter : To remove odor, NO_x, and SO_x from the outside air

Dust-collecting filter : To remove fine dust which is not filtered by the pre-filter

Photocatalyst filter : Functional filter to oxidize and decompose harmful materials including volatile organic compound

Electronic damper : To be installed on OA and EA sides to protect the ventilator in a windy condition

External heater : For more pleasant indoor heat environment by preheating taken-in cold air

UV lamp : To intake clean outside air by removing bacteria with the UV



Features of Compact Heat Recovery Ventilator

This product features world's best heat recovery efficiency with global leading patents and high efficiency apparatus certification for exhaust waste heat recovery (first time in Korea). It can be installed at where ventilation is essential such as housing, hospital, office, large shopping mall, religious facilities, and underground facilities (shopping district, assembly point, and storage).

Passive house, apartment, detached house, office, etc.

It promises healthy life by preventing diseases from polluted indoor air and sick building syndrome. Especially, it addresses the ventilation of energy-saving passive house.

School, hospital, religious facilities, and shop (large shopping mall and restaurants)

It helps pleasant and clean environment in a school, library, hospital, religious facilities, and assembly point by double-filtering polluted outside air before taking it in.



SD-250 / 350 / 500



SD-700 / 1000

Compact
SD-250/350/500
SD-700/1000

Industrial site

It kills 2 birds with 1 stone by improving indoor air of work site polluted with toxic gas and scattering dust and saving a lot of energy cost.

Mushroom cultivation facilities, stable, poultry farm, veterinary clinic, and zoo and botanical garden

Ventilation is essential in preventing aspiratory diseases of animals from polluted air and insufficient oxygen and helping health growth. The HRV supplies fresh outside air while maintaining indoor temperature, for the quick and healthy growth and feeding of crops and animals.

Easy maintenance

Difficult maintenance can be a big problem even for a great unit. The HRV can be maintained with minimum cost by cleaning and reusing the heat exchange core(filter)s



HRV (SD) STANDARD SPECIFICATIONS

NO.	MODEL	AIR VOLUME (CMH)	MOTOR (W)	Duct Size[Ø] S.A / E.A	SIZE(mm)			WEIGHT (kg)	Static pressure loss (mmAQ)	MOTOR TYPE	REMARK
					Width	Height	Depth				
1	SD-250	250	170	125	569	587	310	30	10	BLDCMotor	DP-250
2	SD-350	350	234	150	569	587	420	32	15	BLDC Motor	DP-350
3	SD-500	500	286	150	569	587	420	33	20	BLDC Motor	DP-500
4	SD-700	700	471	250	747	747	540	70	25	BLDC Motor	DP-700
5	SD-1000	1000	575	250	747	747	540	72	25	BLDC Motor	DP-1000
6	AP-250	250	222	125	569	587	310	30	10	AC Motor	
7	AP-350	350	270	150	569	587	420	32	15	AC Motor	
8	AP-500	500	300	150	569	587	420	33	20	AC Motor	
9	AP-700	700	543	250/200	747	747	540	70	25	AC Motor	
10	AP-1000	1000	603	250	747	747	540	72	25	AC Motor	

* Specifications above may be subject to change without notice, for the performance improvement.

Compact & Large HRV

Features of Large Heat Recovery Ventilator

Heating and cooling cost saving

Air conditioner operation time can be reduced by 20-30%. It results in far-reduced operation cost.

Reduced air conditioning system cost for new building

It provides recovered ventilation without losing heating and cooling energy(90% recovery for heating and 70% recovery for cooling) so the air conditioning load can be saved by 20-30%. It results in far-reduced air conditioning system cost.

Recovery of investment in short time

It depends on the E.A of AHU conditioning but it is recognized as one of most energy-saving energy equipment. (Recovery in approx. 1-3 years with 30% E.A).

Easy maintenance

Difficult maintenance can be a big problem even for a great unit. The HRV can be maintained with minimum cost by cleaning and reusing the heat exchange core(filer)s



Front view of RP-03



Rear view of RP-03

HRV(RP) STANDARD SPECIFICATIONS

NO.	MODEL	AIR VOLUME (CMH)	MOTOR (W)	SIZE(mm)			WEIGHT (kg)	Static pressure loss (mmAQ)	REMARK
				Width	Height	Depth			
1	RP-02	2,000	200	1,250	1,270	850	250	25	Fan 별도
2	RP-03	3,000	200	1,450	1,470	850	290	25	"
3	RP-05	5,000	200	1,750	1,770	850	370	25	"
4	RP-08	8,000	400	2,050	2,070	850	470	25	"
5	RP-10	10,000	400	2,250	2,270	850	540	25	"
6	RP-13	13,000	400	2,550	2,570	850	630	25	"
7	RP-15	15,000	400	2,750	2,770	850	700	25	"
8	RP-18	18,000	750	3,050	3,070	1,050	840	25	"
9	RP-20	20,000	750	3,250	3,270	1,050	920	25	"
10	RP-26	26,000	400x2	2,550	2,570	2,250	1,330	25	"
11	RP-30	30,000	400x2	2,750	2,770	2,250	1,470	25	"
12	RP-36	36,000	750x2	3,050	3,070	2,450	1,860	25	"
13	RP-40	40,000	750x2	3,250	3,270	2,650	2,020	25	"

* Specifications above may be subject to change without notice, for the performance improvement.



Concept graphic of HRV



Model piping for residential house

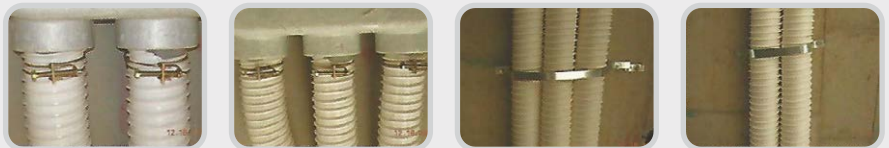
Exhaust of Polluted indoor air
Supply of purified fresh outside air and maintained temperature



Duct installation



Air distributor



Wire band/Saddle



Diffuser

Flexible hose

Duct concept graphic/installation

Duct components



Flexible



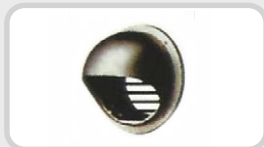
Flexible hose



Spiral



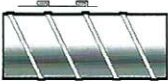
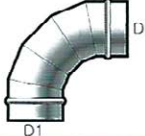

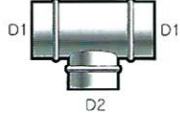

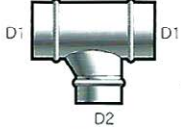
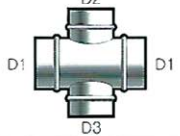



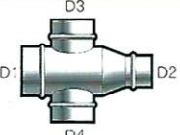
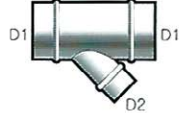

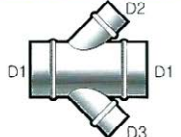
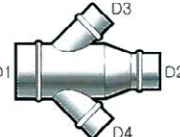
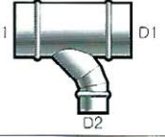

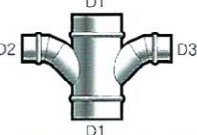
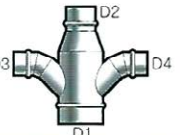









Diffuser



Cap grill



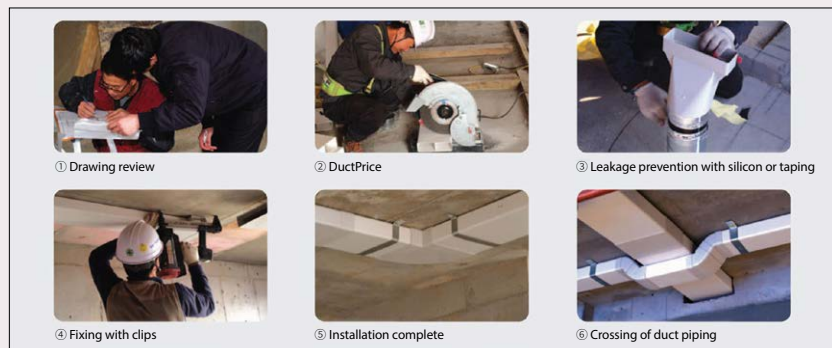
Saddle, band

SPIRAL DUCT 	90° ELBOW 	45° ELBOW 	TEE 
CONICAL TEE 	COMBINATION TEE 	CROSS TEE 	REDUCING TEE 
REDUCING CONICAL TEE 	REDUCING COMBINATION TEE 	REDUCING CROSS TEE 	Y-BRANCH 
REDUCING Y-BRANCH 	CROSS Y-BRANCH 	REDUCING CROSS Y-BRANCH 	Y-T BRANCH 
REDUCING Y-T BRANCH 	CROSS Y-T BRANCH 	REDUCING CROSS Y-T BRANCH 	REDUCER 
TRANSITION 	90° TWIN ELBOW 	45° TWIN ELBOW 	COUPLING 
CAP 	SPIN-IN 	HANGER 	U-BAND 

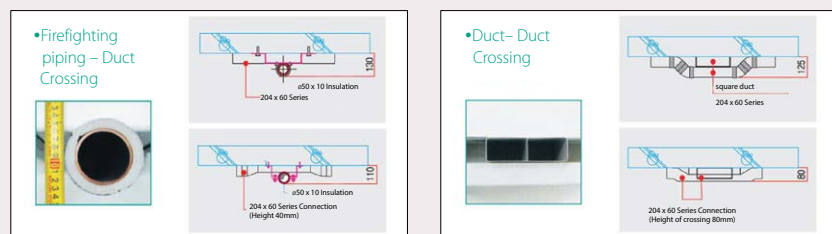
Flat duct system

Easy installation

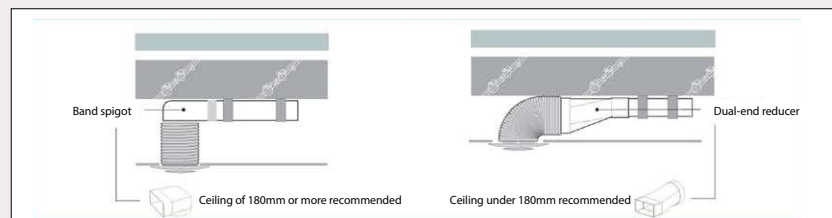
Connect the duct pipe and components according to the design and fix it on the ceiling with clips.



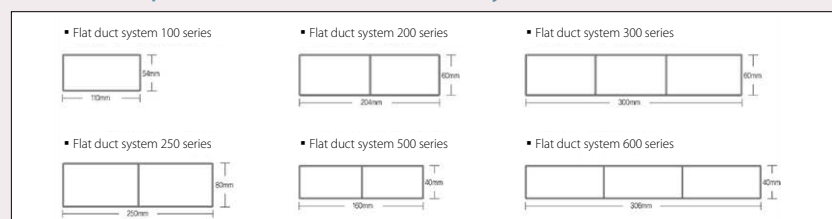
Min. installation space with crossed duct



How to connect duct



Common specifications for flat duct system

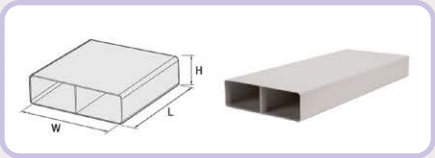


* These specifications are the same with European and Japanese major competitors

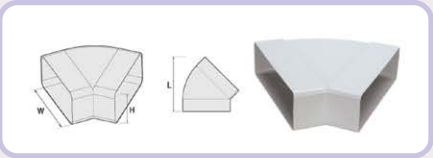
Flat duct system

Flat Duct Pipe & Fitting

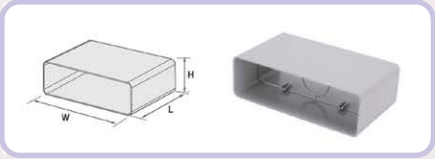
Flat duct pipe



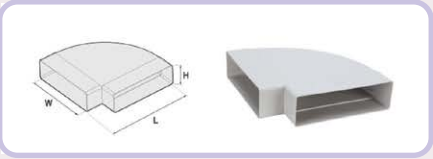
Horizontal 45°bend



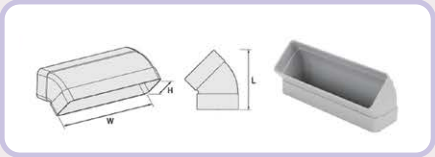
Connector



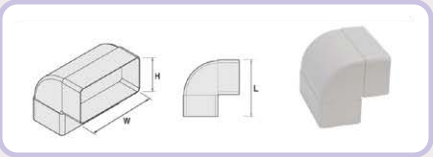
Horizontal 90°bend



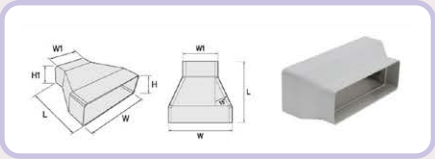
Vertical 45°bend



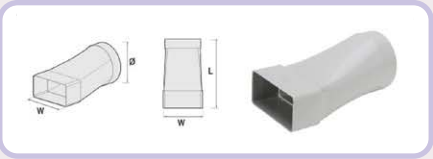
Vertical 90°bend



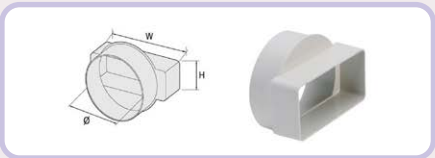
Rectangular reducer



Round to rectangular reducer



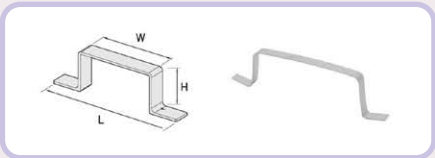
Short round to rectangular adaptor



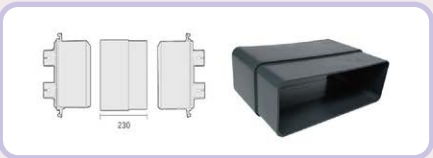
Circular reducer



Metal clip



Sleeve extension socket





Features and Effects of HRV

Sterilization (Optional) | O₃ is generated with the UV lamp and destroys protein structure of virus and bacteria to kill them. 80% of bacteria and 98% of mold can also be removed within 4 days.

Deodorization (Optional) | O₃ from AHPCO destroys the molecular structure of gas including hydrogen sulfide, mercaptans, and amines that cause odor in order to make them odorless molecules resulting in pleasant environment without odor from mold, food, and pets. 56% of harmful smell and 98% of VOC can also be removed within 4 hours.

Removal of VOC | It effectively removes VOCs that cause the sick house syndrome.

Removal of allergy-causing materials (Optional) | It generates ozone or peroxide in order to effectively remove allergy-causing materials including mold and harmful bacteria.



Classification	Normal filter	Negative ion generator	UV sterilization lamp	UV photocatalyst	AHPCO
Re-movable material	Odor	×	○	△	○
	Bacteria	×	×	○	△
	VOC	×	×	△	△
	Dust	○	×	×	×
Speed	Fast	None	Slow	Slow	Fast
Applicable area	Small	None	Small	Small	Large
	Particles (dust) are filtered out. No sterilization, deodorization, and removal of harmful materials.	Sterilization with healthy negative ion. No deodorization and removal of harmful materials.	Deodorization and removal of harmful materials with mere ozone. Sterilization locally under UV. Performance depends on ambient temperature and wind velocity.	Sterilization with photocatalyst. Deodorization and decomposition of harmful materials. Only passing through air is treated.	UV sterilization; decomposition of harmful materials with advanced oxidation; and improved indoor air through intake duct.

Auto CO₂ operation (Optional) | Indoor CO₂ is measured every 15 minutes to operate or stop if it is over 1,000ppm or under 800ppm, respectively.



CO₂detector

CO ₂ Engine K22	Configuration
Measurement Range	0 to 2000ppm (CO ₂)
Power Supply	4.5 to 12.0 VDC
Communication	I ² C
Operation Temperature	0 to 50°C
Dimensions(H*W*D)	35mm × 60mm × 65mm
Accuracy	±75ppm ±3% of reading

CO₂ Engine K22 is a fast response OEM module that is designed to be integrated into alarm or stationary ventilation equipment, such as burners, Window vent or air handling units.

Applications | Multi-user facilities including library, underground facilities, accommodations, and Internet cafe

Effects and Patents of SSK HRV

HRV Patents

This is an electric heat exchanger, HRV which uses random matrix media including multiple heat-containing fiber materials, and has high heat exchange efficiency between intake and exhaust.

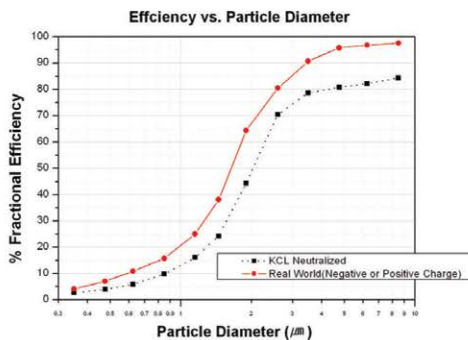
Name of invention	Patentee	Patent No.
Upward discharging	SSK Co., Ltd.	10-1338499
Preheating system on OA side (Radiator)	SSK Co., Ltd.	10-1391990
Material diversification for wheel/core	SSK Co., Ltd.	10-1451830

Technical data

- This invention is different from existing technologies in that the efficiency of random matrix media(hereunder, "Heat Exchange Core") is improved by flowing turbulence through horizontal path instead of heat exchange using directional air flow.
- Mat of the heat exchange core is approx. 90-94% porous.
- The heat exchange core is 40mm-thick.
- Specific gravity of filament is 1.38.
- Conductivity of filament is approx. 0.16 Watt / m°K.
- Specific heat of filament is approx. 1,340 J/Kg°K.
- Rotational speed of heat exchange core is 25-30 RPM.
- The heat exchange core serves as a filter for some particles.
 - Filtering capacity: 95% or more collection of 5µm particles. (Semi-medium filtering capacity)



[Test certificate by FITI Testing & Research Institute]



[filtering capacity of heat exchange core]

Certificate by FITI Testing & Research Institute is on the left while the filtering capacity of heat exchange core is shown with a graph on the right. Black dot line indicates the standard of FITI Testing & Research Institute while the red line indicates the filter capacity of heat exchange core. That is, the graph shows that the filtering capacity is beyond the standard defined by FITI Testing & Research Institute.



Installation in Korea



Sejong Art Center



Lotte Castle Empire



Dormitory, Kyung Hee University



Samil Church



Hwaseong Factory, KIA Motors



POSCO



Mushroom farm



Daelim Industry
(Korea's first boiler-less apartment)

Record in Korea

Education facilities

University of Seoul, Seoul National University, Medical School of Seoul National University, Yonsei University, Soongsil University, Chung-Ang University, Kyungpook National University, Ehwa Womans University, Kyung Hee University, Kaywon University of Art and Design, Kwangwoon University, Dankook University, Pusan University, Catholic University of Daegu, Hansung University, Kangnam University, Yeungnam University, Kangwon National University, Busan Institute of Science and Technology, Kyungsung University, Gyeongsang National University, Woosong University, Kyung-in Women's University, Yeungjin College, Kemyung University, Korea Military Academy, Republic of Korea Naval Academy, Republic of Korea Air-Force Adademy, St. Peter's School, Dormitory of Kyung Hee University, Kyung Hee Girls High School, Daewon Girls High School, Jeomchon Middle School, etc.

Medical facilities

Drama Obstetrics & Gynecology Clinic, Drama Postnatal Care Center, Seoul National University Hospital, Kyungpook National University Hospital, Chonbuk National University Hospital, Soon Chun Hyang University Hospital, Kwangwon National University Hospital, Konyang University Hospital, Chosun University Hospital, St. Vincent Hospital, Busan Baek Hospital, Pyeongtaek Hospital, Hanil Hospital, Myongji St. Mary's Hospital, Gwangju Veterans Hospital, Gwangju Central Hospital, Daegu Patima Hospital, Pohang Semyeong Chirstan Hospital, Daegu Oriental Medicine Hospital, Daegu Kwak Hospital, Seosan Central Hospital, Gimcheon Cheil Hospital, Medipark Obstetrics & Gynecology Clinic, Mother's Hand Postnatal Care Center, Saimdang Postnatal Care Center, Hansarang Postnatal Care Center, Veterinary School of Chungnam National University Hospital, Woorideul Hospital, Blood Donation House(Myeongdong, Shinchon, Nowon), Seongnam Female Welfare Center, Seoul National University Veterinary Hospital, Bundang Seniors Welfare

Center, Rainbow Sanatorium, Deoksan Sanatorium, Pyeongtaek Agricultural Co-operative Funeral Hall, Seoul Funeral Hall, Chaewon Natural Healing Hospital, etc.

Public office & Financial institutions

Sejong Art Center, Supreme Prosecutor's Office, Bank of Korea(Headquarters), Anyang City Hall, Ansan City Hall, Euiwang City Hall, Hanam City Hall, Gwacheon City Hall, Osan City Hall, Paju City Hall, Bucheon City Hall, Yeongdeungpogu Office, Yeonggigun Office, Buyeogun Office, Munkyeong City Hall, Waterworks Headquarters Daegu Metropolitan City, Asan Police Station, Deoksukung Art Center, Korea Broadcasting System(KBS), Kyungpook Provincial Assembly, KEPCO, Gwangju Design Center, Post Office(Nonsan, Cheongju, and Cheonan), Paju Mt. Dora Peace Park, Kyungju Independence Mokwol Memorial Hall, Safety Experience Center, Road Transport Center, Euijeongbu LetsRun, Foreign Exchange Bank(Bundang, Seongsudong, Garakdong, Masan, and Sinsadong branches), KIST Information Research Center, Incheon Water Quality Research Center, etc.

Office buildings

Korea Institute of Science and Technology, KT Gwanghwamoon Building, Onse Telecom, Posteel Building Co., Ltd., POSCO Research Center, KEPCO NF, Gapeul Building, Yooseong KT, Federation of Korea Trade Unions, SK Securities, LG Investment & Securities, Samsung C&T, Hyundai Development Company, Lotte Engineering & Construction, Ssangyong Engineering & Construction, Seohee Engineering & Construction, Samjeong Engineering & Construction, Ink Tech, Baesangmyeon Juga Building, Hyeseong Industry Co., Ltd., KIA Osan Human Resources Development Institute, Toyota Nonhyeon Office, Geo Design, Keumgseong Architecture, Cheonil Architecture, Yoowon Equipment, KL-NET Headquarters, Samsung Electronics New Tower, Samsung Innoflex, Joongang Valuation & Evaluation, Robotis, Rapid Action Packaging AP, etc.

Neighborhood living institutions

Hyundai Department Store(Cheonho-dong), Jongno Cheongha Building, Iksan

HRV Installation/ Record in Korea

Passive Installation in Korea



House at Haenghyeon-ri, Gapyeong-gun, Gyeonggi-do (2.8L)



House at Sudong-myeon, Namyangju-si, Gyeonggi-do (3.0L)



House at Pangyo-dong, Bundang-gu, Gyeonggi-do (2.6L)



Roi House Passive Promotional Center (1.4L)



House at Munpal-dong, Paju-si, Gyeonggi-do (2.9L)



House at Hwalcho-dong, Hwaseong-si, Gyeonggi-do (2.7L)



House at Samdong-myeon, Namhae-gun, Gyeongnam (2.7L)



Zero Energy House (Yooljeon-ri, Nae-myeon, Hongcheon-gun)

CGV, Yeouido Baptist Church, Samil Church, Gyeyang Church, Saemunan Church, Underwood Memorial Hall, Pyeonggang Cheil Church, Gwacheon Church, Jeonju Gymnasium, Bucheon Sports Complex, Chungju CC, and Jeju Raon CC, Pyeongchon Sports Center, Busan Seomyeon Neoforce, Daegu Palace Wedding Hall, Gwangju Wedding Hall, Girin Distribution, Natural Whole Food, Hainan (Chinese restaurant), Foodsia Restaurant, Cheongsol Academy, Gyeongseong Academy, Mido Foreign Laugnage Academy, Expressway Corporation (Buyeo, Osu, Jinju, and Gongju Rest Areas), Chungmuro Xii, Gyeongju Cheongun Landfill, Ilksan St. Clara Congregation Convent, Yangyang Monastery, Gapyeong Catholic Church, JJ Golf & Fitness Center, Songchu Amusement Park, Jangsimri Training Center, Yongsan Youth Swimming Pool, Academy Lounge, etc.

Housing

Hongcheon Zero Energy House, Yongin Roi House (Passive Experience Center 1.5L certified), Daelim Apartment (Korea's first boiler-less apartment), Company housing of KOSPO, Company housing of Donghae Thermal Power Plant, Yeouido Lotte Castle (Empire, Ivy), Passive house (Paju, Hoengseong, Yangpyeong, Cheolwon, Gangreung, Geoje, Inje, and Namhae), Yeouido Shinhan River Tower, Yeouido Daewoo Triumph World, Hannamdong Hyundai Hiperion, Ilsan Lakepolis, Kyungju Residential & Commercial Complex, Apgujeong Hyundai Apartment, Olympic Athlete's Village Apartment, Dongbuechondong LG Village, Samsongdong Decovill, Dogokdong Daelim Apartment, Daechidong Seongyoung Apartment, Cheongdamdong Yeseong Villa, Foreign embassy in Hannamdong, etc.

Industrial(factory) facilities

POSCO, Daewoo Shipbuilding & Marine Engineering, KIA Motors (Hwaseong and Gwangju factories), Hyundai Motors (Asan MOBIS, Ulsan Cultural Center), Bupyeong factory of Daewoo Motors, Samsung Electronics (Gwangju and Suwon factories), Cymer Korea, Nongshim Dalseong/Anseong factories, Gumi LG Siltron, SKC Cheonan factory, Daelim Industry (Yeocheon Industrial Complex, Suncheon factory, and Jeonju factory), Dongyang Magic Hwaseong factory, Jeongeup Rapid Action

Packaging AP (Paper factory), Sseratech, Youngchang Instrument, Hankuk Electric Glass, Hyosung Diamond, Jevisco, KDK (Pyeongtaek factory), M4M research center, Paju LED factory, LG Housis (Cheongju), Anseong Bonded Cold Storage, Gaeseong Industrial Complex, Convergence Technology Center of Seoul National University, YG1 Bupyeong factory, etc.

Hotels & Accommodations

Hotel Shilla Jeju, Hotel Canas Jeju, Hotel Soseol, Haneul Hyanggi, Hotel Ramada Plaza Jeju, Hotel Park Daegu, Hotel Park Gumi, Hotel Caslon Secho, Hotel Femme Yeoksam, Hotel Gildong, Suwon Joatel, Busan Joatel, Cheongwon Joatel, Hotel Nineth Secho, etc.

Agricultural facilities

Gwangneung Arboretum, Yongwoongyuni Laboratory, Rural Development Administration, Jeonnam Naju Development Administration, Hwasoon Rural Development Office, Youngnam Agricultural Research Center, Topyeong Nongsan, Jeongdo Agricultural Association, Cheongsanwon, Cheonggyewon, Hwaseong Agricultural Association, Pyeongjongjang, Buyeo Dasan Farm, Cheongdo Mushroom, Neulpureun Agricultural Association, Gapyeong Mt. Myeongji Saesongi Association, Gwangju Memilmaru, Gwangju Youggil Farm (pigsty), Sangchon Farm, Cat Farm of Suncheon University, Suncheon Paru Plant Laboratory, Sejong Low-temperature Warehouse, Lucky Mushroom in Nikada of Japan, etc.

Military bases

Yongsan Eighth US Army (DPW, S-7047A, FED, etc.), Office the Air Force Chief of Staff, Naval base in Jinhae, 1st Headquarters, Gyeryongdae, Headquarters of Naval Fleet 3, Defense Acquisition Program Administration Building, Ammunition, Front-line GP/GOP, Print Base, Korea Military Academy, Corps CCC, etc.

Others

Kazakhstan, Taiwan, Russia, Japan, China, etc.



Relevant Regulations

Indoor ventilation is a legal obligation and guideline for your health.

Ministry of Land, Infrastructure and Transport (Rules for equipment criteria of building - No.487 of Order of Ministry of Land, Infrastructure and Transport)

Article 11 (Ventilation equipment criteria for apartment building and multi-user facilities)

1. According to Article 87, Clause 2, Order, any newly-built or remodeled housing or building subject to any of followings(hereunder, "New Apartment Building") will install natural or mechanical ventilation equipment for 0.7 cycle or more ventilation.

- ① Apartment building with 100 or more households (excluding dormitories)
- ② Building with 100 or more households, which is built as the same building with facilities other than housing

2. When installing a natural ventilation equipment for a new apartment building, it will be subject to evaluation of local construction committee if it meets the requirement of Clause 1(Architecture Act).

Ministry of Environment (Enforcement ordinance of Indoor Air Control Act for Multi-user Facilities)

Article 2 (Applications)

1. Indoor Air Control Act for Multi-user Facilities (Hereunder, "Act")

- ① All underground stations
- ② Underground shopping area with the architectural area of 2,000m² or more (including 2 or more combined underground shopping areas with the architectural area of 2,000m² or more)
- ③ Waiting room of passenger terminals with the architectural area of 2,000m² or more
- ④ Passenger terminals of airports with the architectural area of 1,500m² or more
- ⑤ Waiting room of port with the architectural area of 5,000m² or more
- ⑥ Library, museum, and art center with the architectural area of 3,000m² or more
- ⑦ Theaters according to Article 2, Provision 10, Movie and Video Promotional Act (only indoor theaters are included)
- ⑧ Hotel business according to Article 3, Clause 1, Provision 2, B, Tourism Promotional Act and rest condominium with 100 or more rooms according to B of the same
- ⑨ Academies with the architectural area of 1,000m² or more according to Article 2, Provision 1, Act on Establishment, Operation of Academy, and Private Lesson
- ⑩ Exhibition facilities according to Article 2, Provision 4, Exhibition Industry Development Act (only indoor facilities are included)
- ⑪ Internet computer game equipment providing businesses with the architectural area of 500m² or more according to Provision 2 and 7, Game Industry Promotional Act

Former part of Article 3. "Owner and occupant or" will be "Owner and occupant or manager."

Article 4. (Interim measures to maintain indoor air quality)

According to revised Article 2, Provision 1, any owner and occupant or manager of theater, hotel business and rest condominium business facilities, academy, exhibition facilities, and Internet game equipment provision business will maintain the indoor air quality within 3 months of the effective date of it following the Article 5 of the same.

Ministry of Education and Science Technology - Enforcement Ordinance of School Health Act (No.866, Order of Ministry of Education & Human Resources Development)

A. Ventilation control

Ventilation window will be frequently open or mechanical ventilation equipment will be frequently operated in order to keep ventilation per person over 21.6m³. B. B.

B. Structure and installation criteria for ventilation equipment (if required))

- ① Any ventilation equipment will have enough capacity to introduce outside air and discharge indoor air in order to meet the school building air quality criterion.
- ② Capacity of ventilation equipment of school building will be enough to meet the ventilation control criterion.
- ③ Outside air will be evenly introduced into a school building in order for even circulation of indoor air.

New Technology Award, Patents & Certificates

Relevant Regulation New Technology Award, Patents & Certificates

Patents

Korea Invention Patent No.10-1338499
 Korea Invention Patent No.10-1391990
 Korea Invention Patent No.10-1451830

Certificates

Certificate of high-efficiency energy apparatus No.735
 Certificate of high-efficiency energy apparatus No.736
 Certificate of Research Institute No. 2016111150
 Certificate of Family Company of Incheon University No. 2016-1167
 Certificate of ISO9001_ISO14001



New technology award

Minister Award of Land, Infrastructure and Transport on 13th Day of New Construction Technology
 9th Korea Great Patent Grand Prize for First Half, 2015

