

Hansae

2023 COMPANY PROFILE



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www.han-sae.com



Hansae's new story

Hansae

Company Profile

company name [주] 한새 / HANSAE / 韓塞

representative Song Se-gil

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home page www.han-sae.com / E-Mail : ssg7302@han-sae.com

Sectors air cleaner, water purifier filter, Manufacture of antiviral products
Year of establishment: August 2009

by product Uses and characteristics	product name	purpose	characteristic
	HEPA filter & deodorization filter	Air purifier, circulator filter	Efficiency 99.99%
	wet carbon block	water purifier filter	High efficiency, long life

Hansae History

2001. Established GL
Chitosan filter development

2002. Daejeong Clean Co., Ltd.
Developed the first photocatalytic
HEPA filter in Korea

2003. Developed natural anion
generating filter
Cold virus sterilization filter
development

2004. Developed air conditioner filter
for vehicle
Developed virus-free hand
sanitizer

2005. Water purifier filter development
Supplied allergen filters to
LG Electronics

2006. Developed HEPA filter for cleaning
Supplied Cheongho Nice filter

2007. Released dog filter
Supply of Korean beef water
purifier filter

2008. Virus zero mask development

2009. Water tissue (muti) product
development, FDA approval
Separation of Hansaero Co., Ltd.

2010. Establishment of the 2nd factory
and expansion of the company-
affiliated research center

2011. Sharp Electronics OEM supply
Acquired ISO 9001/14001
certification

2012. Developed HEPA filter for cleaning
HEPA filter semi-automatic line
extension

2013. Expansion of laboratory 30m³ chamber
Applied for 5 equipment patents
Developed dog filter
Development of functionalized filter
for each gas

2014. Cylindrical HEPA filter development
Parts and materials company certificatio

2015. Geomdan Business Complex Factory
Construction and Relocation

Vehicle air conditioner filter combination
type facility extension

2016. Development of own activated carbon
catalyst technology

2017.

Developed the first air purifier HEPA filter
automation line in the industry
Supplied air purifier filter to Winix
Supplied air purifier deodorizing filter to Kyowon
Developed HEPA filter for secondary cleaning

2018.

Hansae Environmental Technology Research
Center expanded and moved

2019.

Geomdan Industrial Complex 2nd Factory Expansion
Extension of cylindrical hepa line for air purifier
Developed air purifier combination type HEPA
Patent application for deodorizing corrugated filter
cylindrical shape

2020.

30m³ chamber 50m³ chamber construction
completed
Completed vehicle air conditioner filter
reliability evaluation chamber
Development of dual HEPA for newborns
and children

2021.

Development of functional deodorizing
filter by odor cause
Developed extruded carbon (carbon block)
for water treatment
Home Appliance Assembly Line Set Up

2022.

HEPA MEDIA (filter paper) manufacturing &
paper production
Developed all-in-one water (sink water filter)
Developed filter (module) for food processing
Virus sterilization module development and patent
application

Hansae production items

Hansae
Human And Pure Nature



■ HEPA/ULPA filter fabric and paper



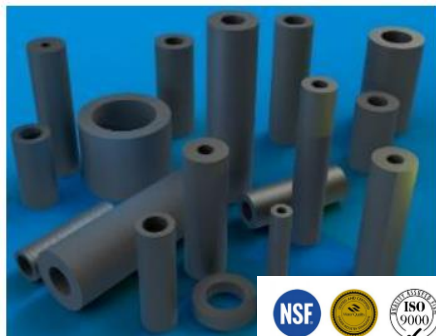
■ Washable HEPA/Wolfa filter



■ Wet wipes / cleaner / bidet kit



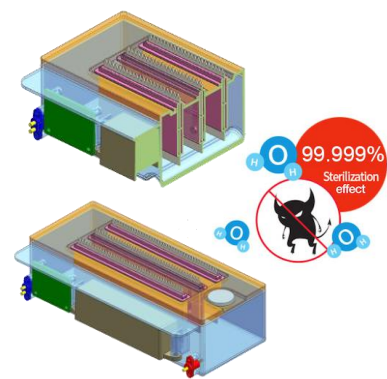
■ High-performance VOCs removal 5 gas deodorization filter



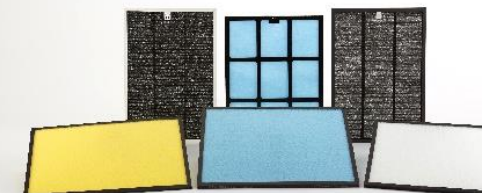
■ Carbon block filter for water treatment



■ Baby vegetable plant cultivation medium



■ Virus removal small air purifier



■ Allergy/Virus Functional Filter

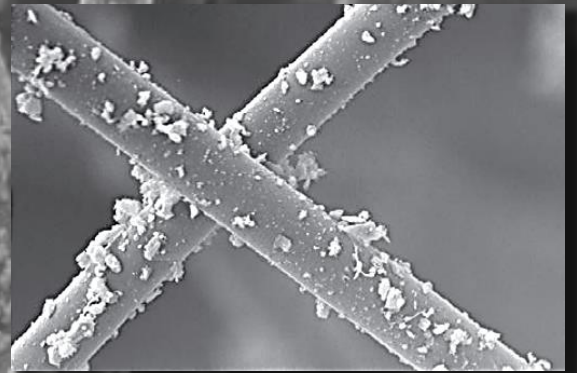
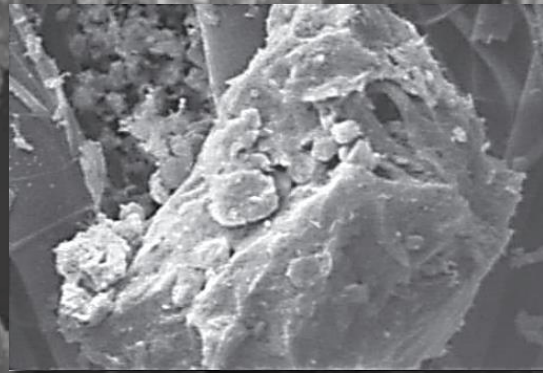
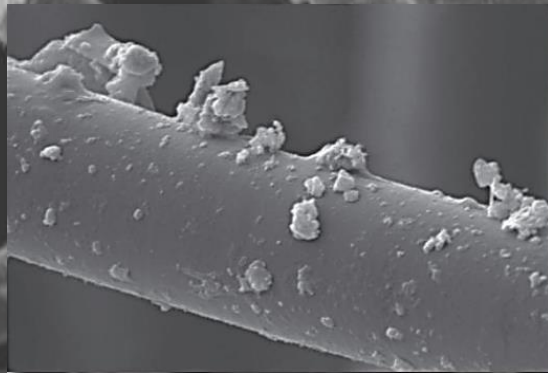
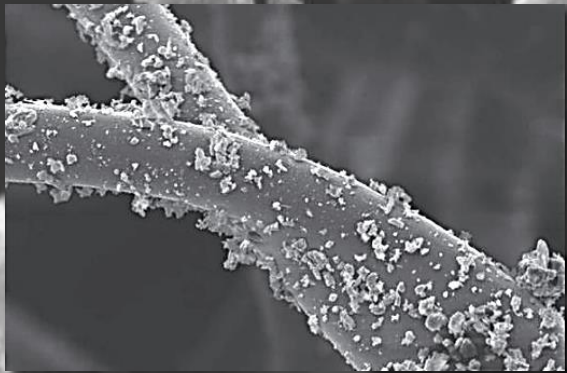


Hansae's product features

Hansae

The **best performance** and differentiation of **filter systems**

The filter system that **Hansae** confidently recommends



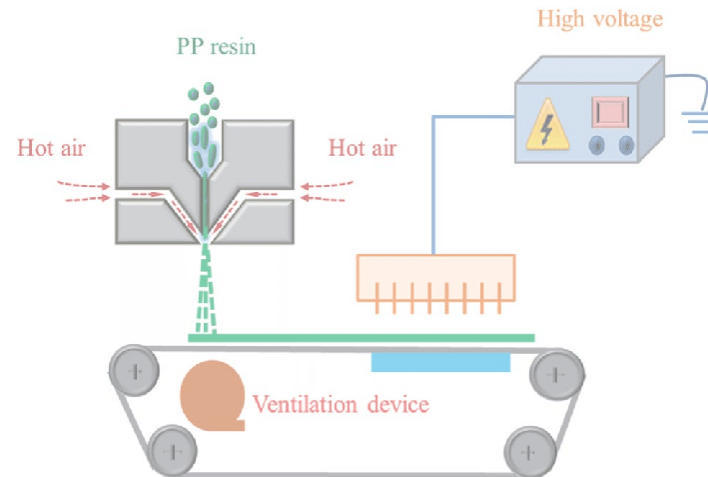
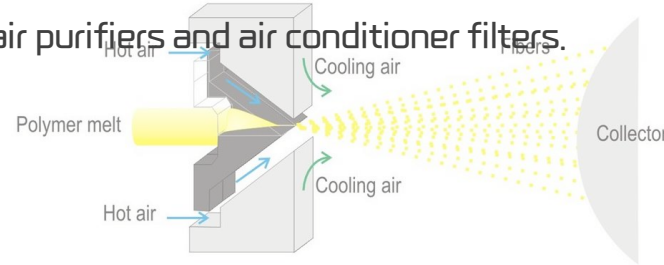
Hansae

■ fabric manufacturing

1) HEPA MEDIA (filter paper) manufacturing & lamination

By applying static electricity to the nonwoven fabric produced by the melt-blown method, it is a fabric with excellent removal efficiency of $0.3\mu\text{m}$ ultra-fine dust.

Used as a raw material for HEPA filters such as household air purifiers and air conditioner filters.



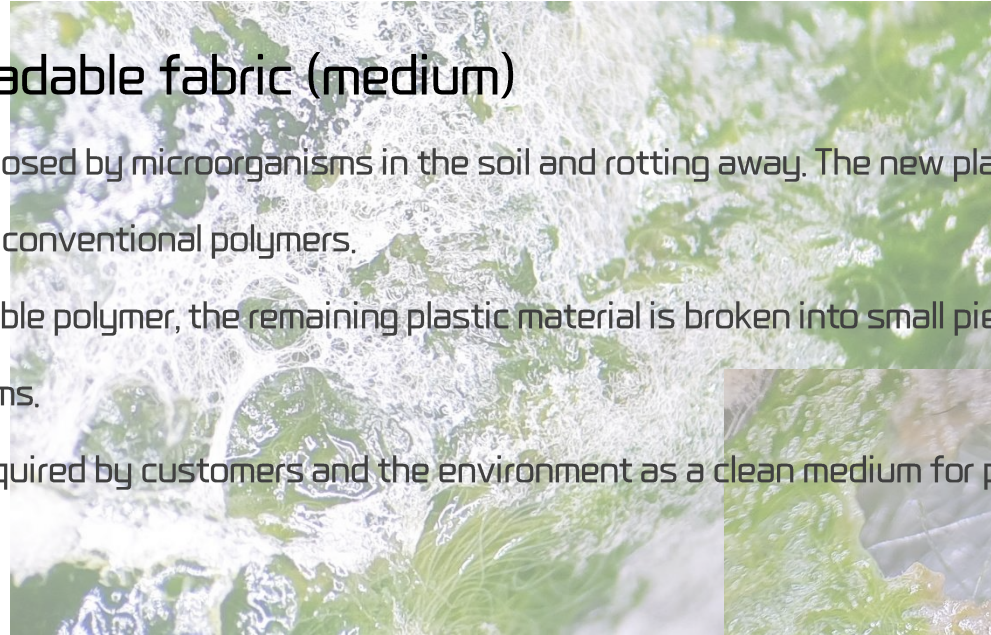
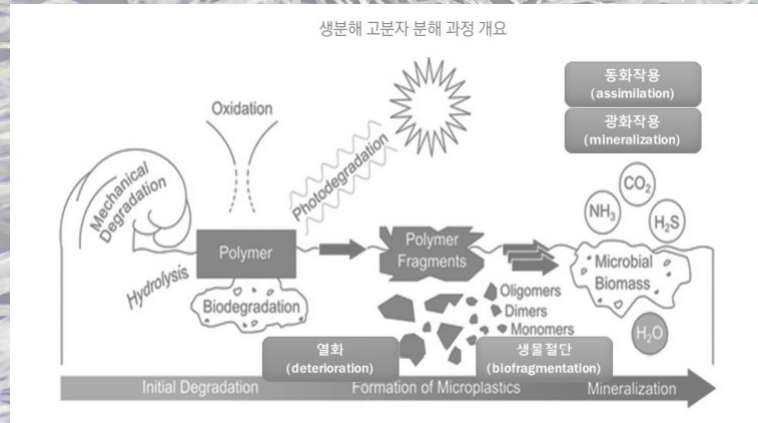
■ fabric manufacturing

2) Manufacturing and processing of biodegradable fabric (medium)

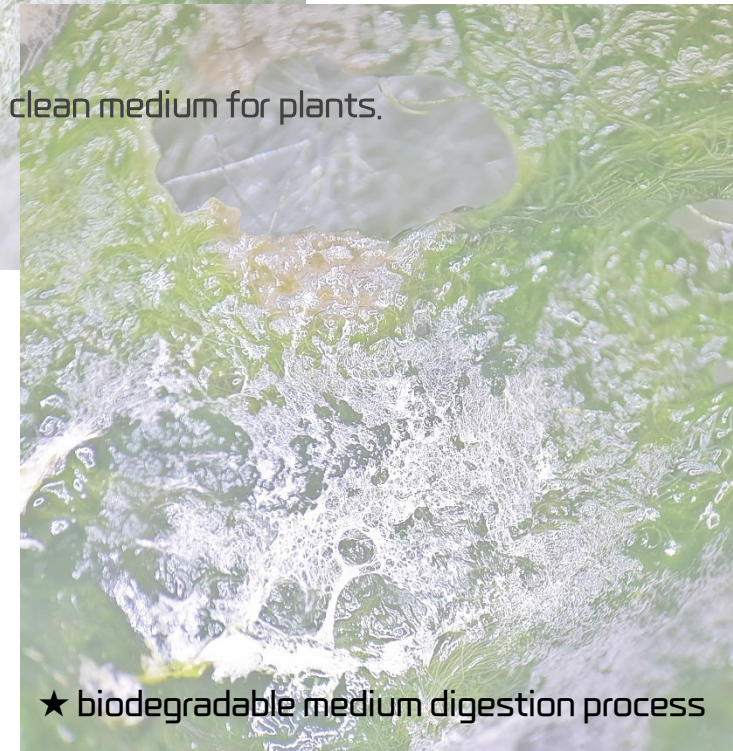
Hansae's biodegradable medium has the property of being decomposed by microorganisms in the soil and rotting away. The new plant medium material developed by Hansae Co., Ltd. contains biodegradable polymers to conventional polymers.

It is a mixed material, and after the bacteria absorb the biodegradable polymer, the remaining plastic material is broken into small pieces. Conventional media and plastics did not decompose in nature, causing pollution problems.

This plant medium from Hansae Co., Ltd. performs the functions required by customers and the environment as a clean medium for plants.



 **Hansae**

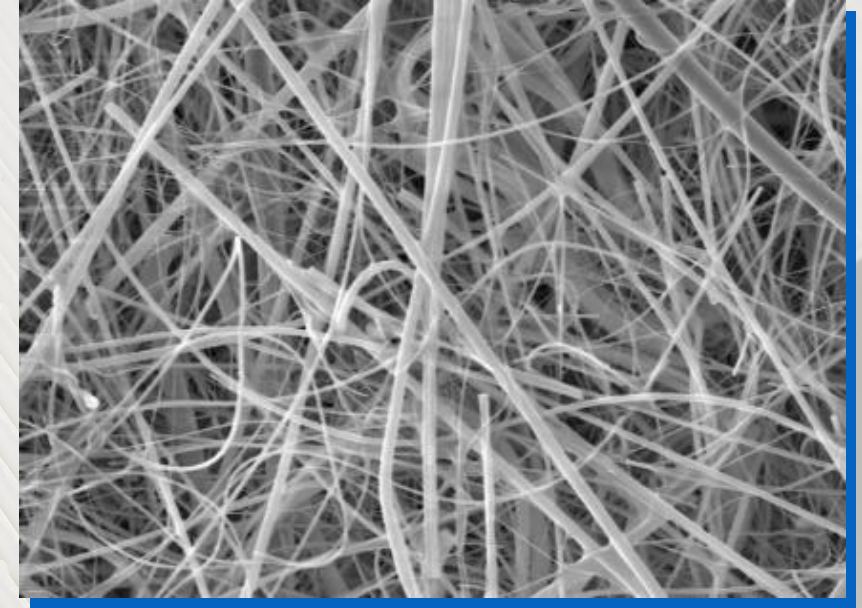
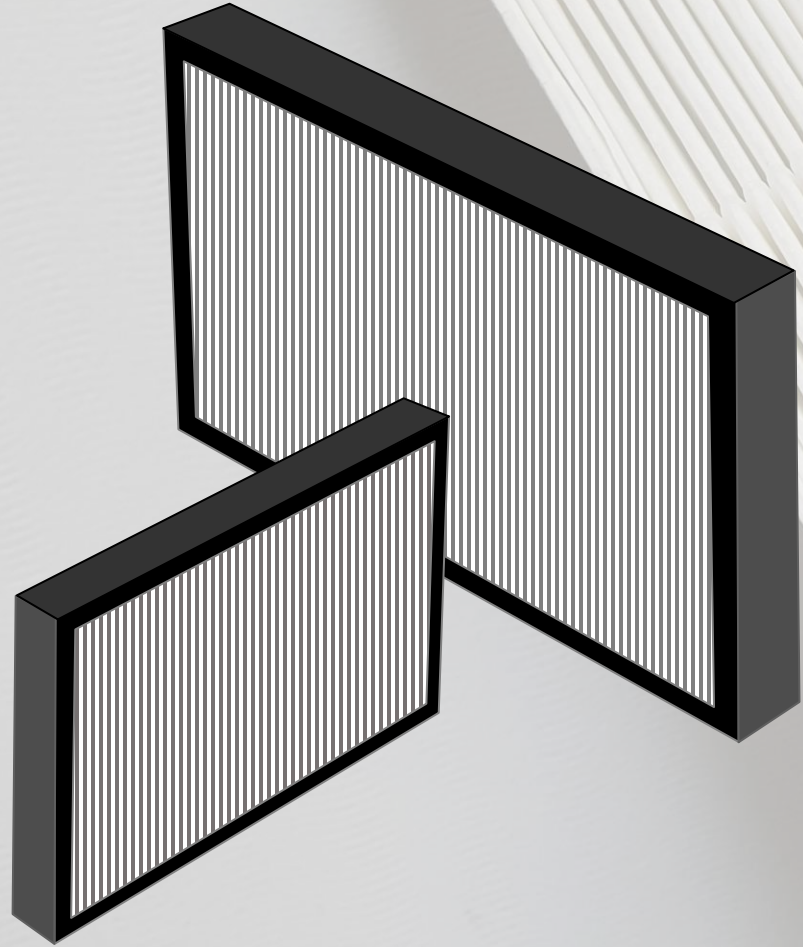


★ biodegradable medium digestion process

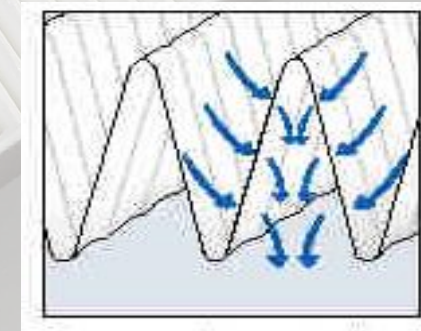
Hansae
Human And Pure Nature

1. Hepa Filter (dust removal filter)

■ PERFECT LINE Series : Standard HEPA Filter



★ High efficiency particulate
air



DUSTLESS HEPA FILTER FOR YOUR LIFE

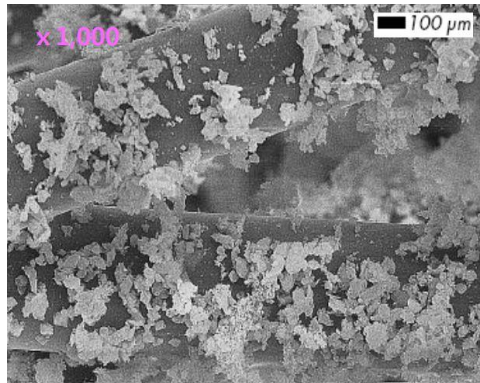
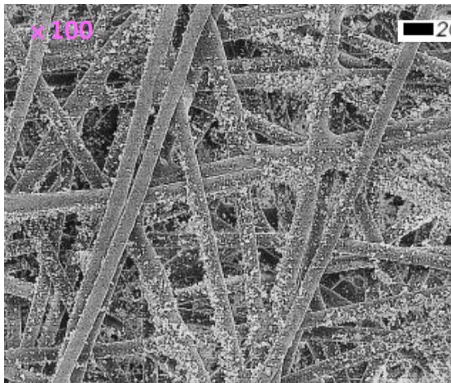
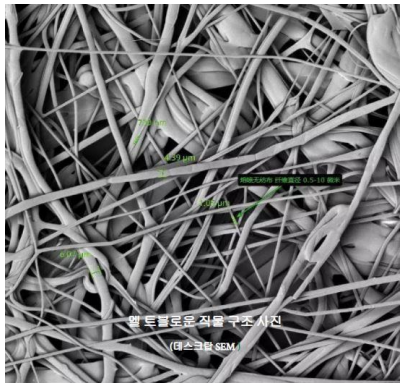
Hansae
Human And Pure Nature

1. Hepa Filter (dust removal filter)

■ PERFECT LINE Series : Standard HEPA Filter



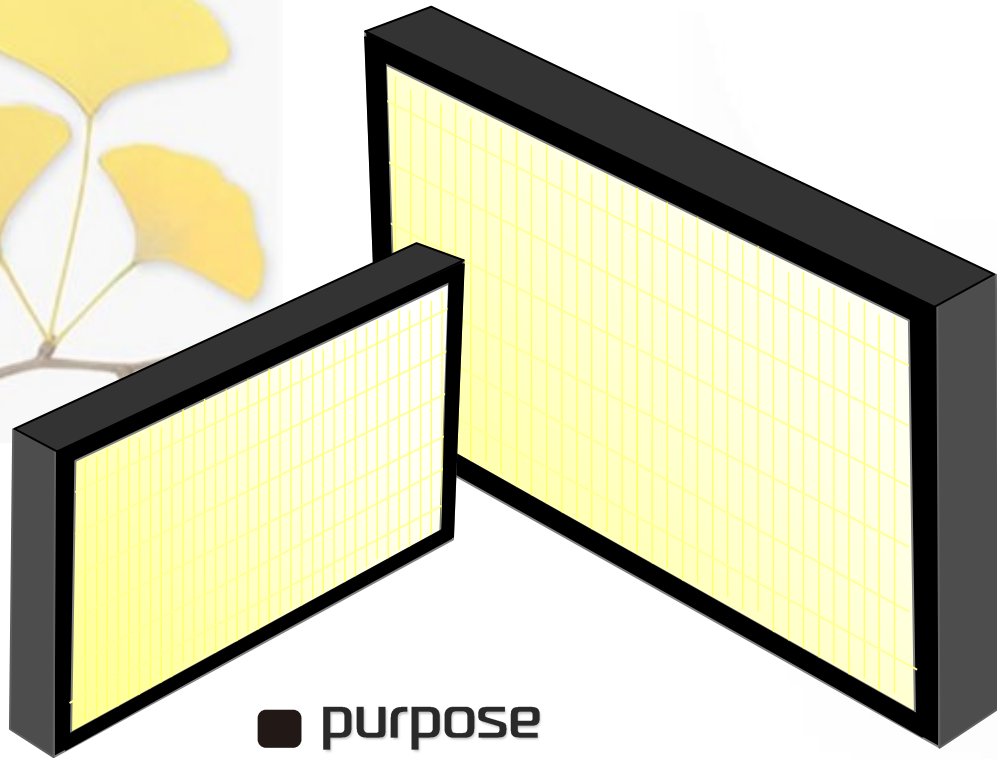
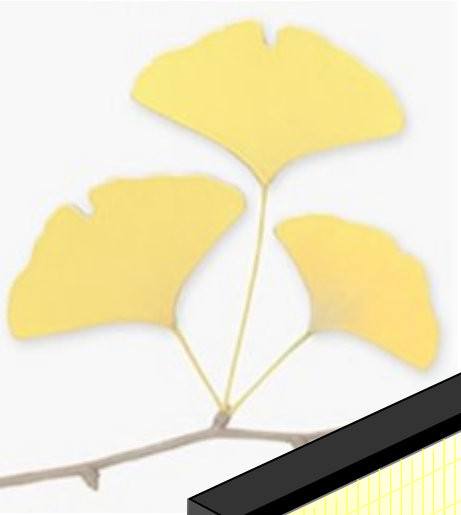
DUSTLESS HEPA FILTER FOR YOUR LIFE



Hansae
Human And Pure Nature

1. Hepa Filter (dust removal filter)

■ PERFECT LINE Series : Gingko – HEPA Filter

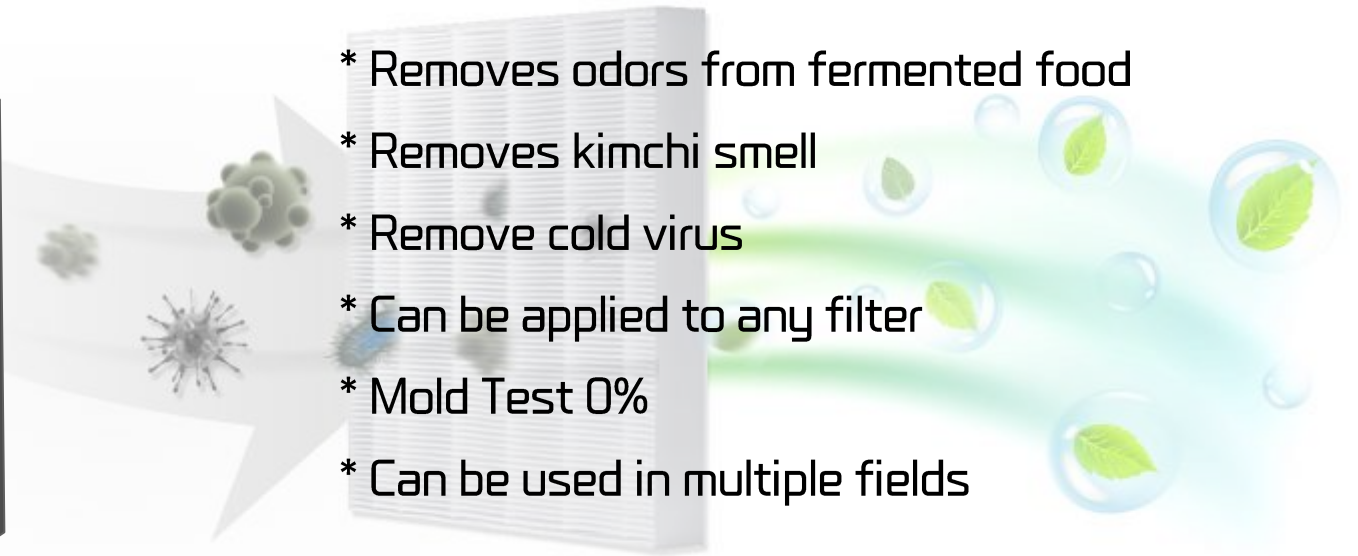


■ purpose

- air cleaner
- Bacteria eradication special equipment
- Kimchi refrigerator and vacuum cleaner applicable

■ Gingko® Filter Features

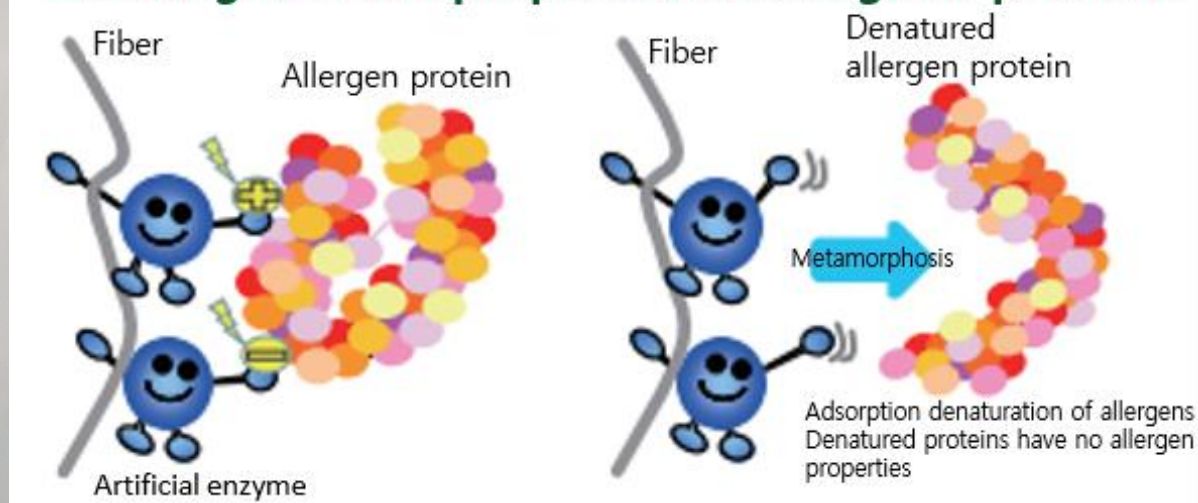
- * Removes odors from fermented food
- * Removes kimchi smell
- * Remove cold virus
- * Can be applied to any filter
- * Mold Test 0%
- * Can be used in multiple fields



1. Hepa Filter (dust removal filter)

■ PERFECT LINE Series : enzyme HEPA Filter

■ Changes in the properties of allergenic proteins



- ① In the tick allergic protein, binding (S-S binding) between sulfur atoms (S) was confirmed.
- ② First of all, allergy catcher fiber adsorbs allergy support
- ③ Next, the allergy catcher cuts the S-S bond using oxygen.
- ④ Proteins with broken S-S bonds are transformed into proteins without allergy support.

※ Anti-allergen enzyme fabric is free from external respiratory diseases and allergens (mites, pollen, bacteria, etc.)

It is a technology that is denatured and destroyed after adsorption when it encounters an anti-allergy filter coated with enzymes.

■ Features of Enzyme Filter

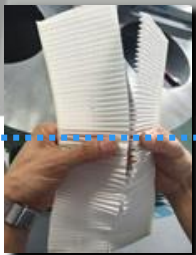
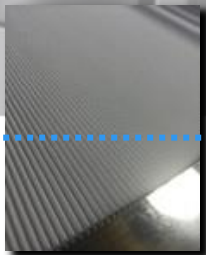
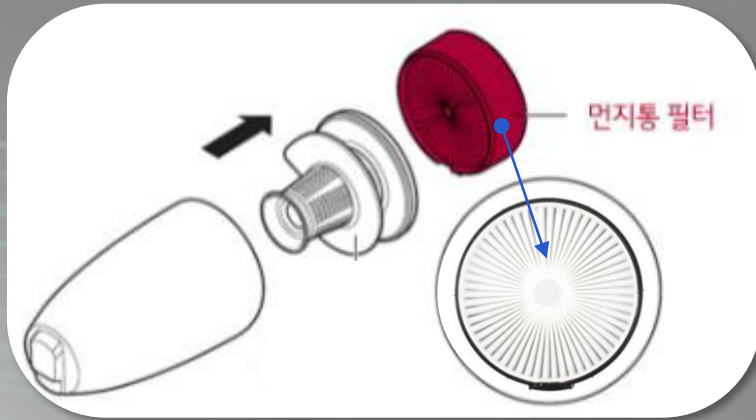
- * Adsorption and decomposition of allergen substances such as mites and pollen
- * Artificial enzyme breaks down protein bonds (S-S bonds)
- * Artificial enzymes are strongly combined with fibers and can be washed
- * Antibacterial and deodorizing properties improve deodorization performance

1. Hepa Filter (dust removal filter)

1) Filter for vacuum cleaner

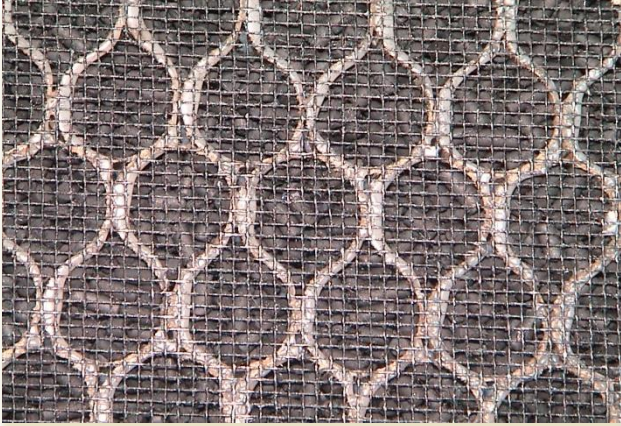
It is a product directly manufactured (produced) by Hansae Co., Ltd.'s manufacturing line, and it is a filter for vacuum cleaner installed in the vacuum cleaner.

It is possible to manufacture a product that satisfies all aspects such as structure, shape, function and performance required by customers.

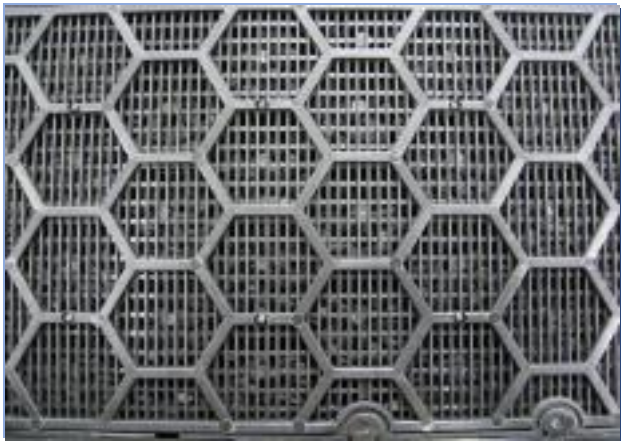


2. Deodorization Filter (Odor and Gas Removal Filter)

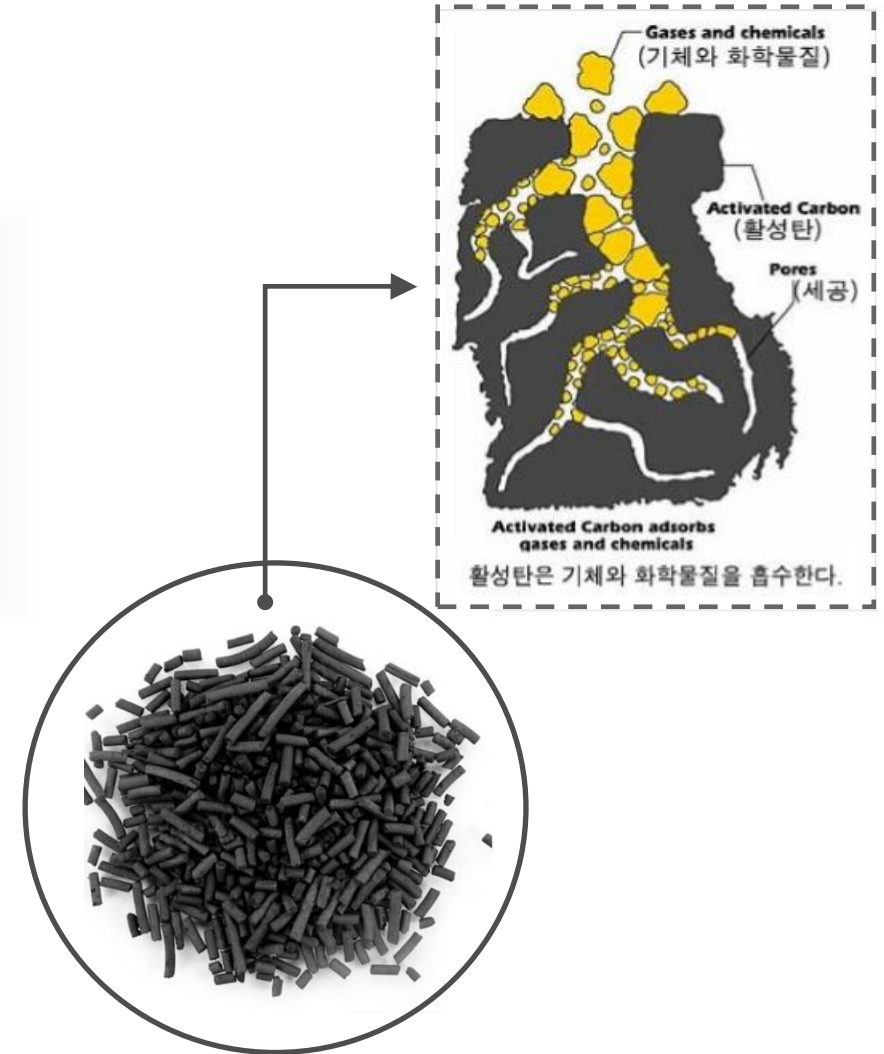
2-1) Honeycomb type deodorizing filter



***Various High Air Flow
Structure***



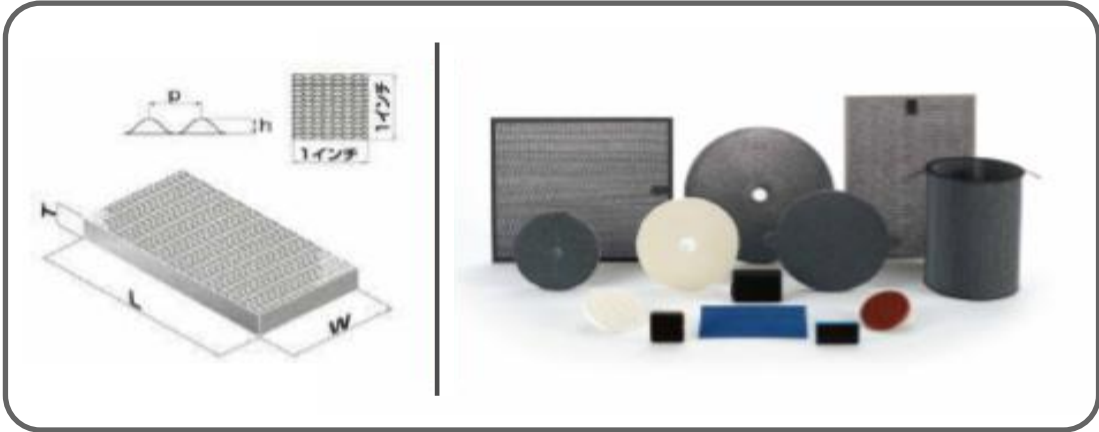
활성탄소의 세공구조



2. Deodorization Filter (Odor and Gas Removal Filter)

2-2) Colgate deodorizing filter

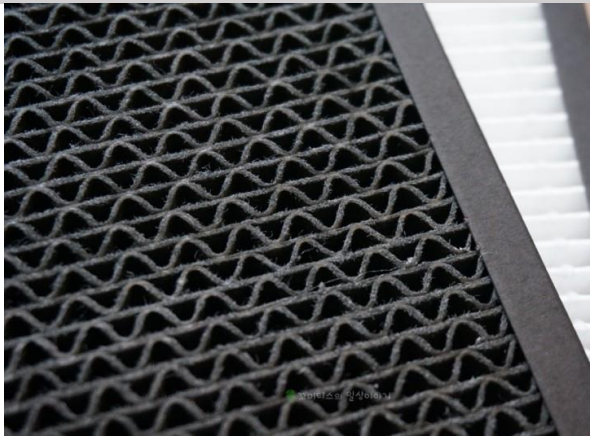
filter size



- Correspondence to dimensions of various shapes

L dimension (length): up to 500mm
W dimension (horizontal): up to 500mm
T dimension (thickness): 5mm or more

Dimensions other than the above
Consultation is available



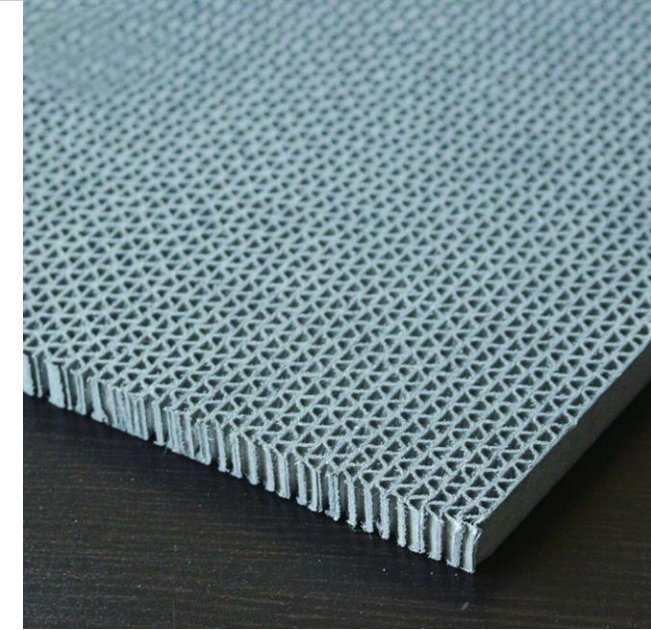
허니컴 셀 Type		
Type	셀사이즈(hXp) 단위:mmA	셀수
A	4.7 X 8.4	33
C	3.1 X 5.9	68
B	2.8 X 5.9	77
F	2.1 X 4.5	134
E	1.4 X 3.3	284
1832	2.0 X 3.2	197
1631	1.8 X 3.1	236
1427	1.7 X 2.7	281
1125	1.2 X 2.5	413

압력 손실				
Type	필터두께	필터통과 풍속 단위:ps		
		0.7m/sec	1.0m/sec	1.5m/sec
A	5mm	1.4	3.0	5.3
B	5mm	2.6	5.6	9.6
F	5mm	4.9	10.3	16.9
A	10mm	1.7	3.6	6.2
B	10mm	3.1	6.6	11.1
F	10mm	6.1	12.3	20.2

2. Deodorization Filter (Odor and Gas Removal Filter)

2-3) High functional deodorizing filter “DA90A-KDE”

- ① Coat the surface of the deodorizing filter with an adsorbent and efficiently contact the adsorbent and odor gas to improve the deodorization rate
- ② Combining several adsorbents to cope with the deodorization of various odorous gases
- ③ Compatible with SPS-KACA002-0132 (2016), which requires high deodorization performance



필터 체적과 탈취 성능

시험 방법 : SPS-KACA002-0132(2016)준수

셀	치수			필터 체적 (cc/장)	통과 풍속 (m/s)	통과 풍량 (m³/min)	제거율					
	L(mm)	W(mm)	T(mm)				HCHO	NH ₃	CH ₃ CHO	CH ₃ COOH	C ₆ H ₆ CH ₃	종합
A	400	250	10	1,000	0.85	5.1	95.3%	90.0%	84.6%	77.5%	64.8%	82.4%
	440	250	10	1,100	0.85	5.6	96.9%	92.0%	88.7%	81.8%	70.0%	85.9%
	480	250	10	1,200	0.85	6.1	97.4%	94.4%	91.8%	82.0%	75.1%	88.1%
	520	250	10	1,300	0.85	6.6	97.9%	95.0%	93.2%	83.3%	77.9%	89.5%
	560	250	10	1,400	0.85	7.1	98.1%	97.5%	93.4%	83.6%	78.6%	90.2%
C	320	250	10	800	0.85	4.1	96.9%	90.0%	91.8%	81.8%	70.9%	86.3%
	360	250	10	900	0.85	4.6	97.1%	91.7%	92.6%	88.0%	77.4%	89.4%
	400	250	10	1,000	0.85	5.1	97.6%	95.0%	95.2%	90.0%	79.4%	91.4%
	440	250	10	1,100	0.85	5.6	98.4%	95.0%	95.0%	90.0%	80.0%	91.7%
	480	250	10	1,200	0.85	6.1	99.0%	95.5%	96.9%	90.9%	84.5%	93.4%

* 위 표에 대해서는 성능 시험 결과는 없습니다. (시험조건: 25°C/50%RH) * 성능 시험 결과에 따라 성능이 크게 변할 수 있습니다. * 성능 시험 결과에 따라 성능이 크게 변할 수 있습니다. * 성능 시험 결과에 따라 성능이 크게 변할 수 있습니다.

풍속과 탈취 성능

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셀	치수			필터 체적 (cc/장)	통과 풍속 (m/s)	통과 풍량 (m³/min)	제거율					
	L(mm)	W(mm)	T(mm)				HCHO	NH ₃	CH ₃ CHO	CH ₃ COOH	C ₆ H ₆ CH ₃	종합
A	400	250	10	1,000	0.85	5.1	95.3%	90.0%	84.6%	77.5%	64.8%	82.4%
	400	250	10	1,000	1.20	7.2	96.9%	90.0%	87.8%	78.6%	74.6%	85.6%
	400	250	10	1,000	1.50	9.0	97.4%	90.0%	88.3%	78.6%	75.9%	86.0%
	400	250	10	1,000	2.00	12.0	97.4%	90.0%	91.4%	83.3%	76.9%	87.8%
	320	250	10	800	0.85	4.1	96.9%	90.0%	91.8%	81.8%	70.9%	86.3%
C	320	250	10	800	1.20	5.8	98.1%	91.2%	92.8%	85.0%	76.1%	88.6%
	320	250	10	800	1.50	7.2	98.7%	92.0%	93.6%	85.5%	78.6%	89.7%
	320	250	10	800	2.00	9.6	99.0%	91.0%	95.0%	81.7%	80.6%	91.0%

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Household Appliances (**Products**) Assembly Line

■ Home appliance assembly line operation

※ Various household appliances can be assembled

Water purifier, cold/hot water device, air purifier, vacuum cleaner, etc.

All products required by customers can be assembled

All household appliances other than the above

Consultation is available.



고객이 원하는
제품, 성능, 품질
(한새 스러움)

CUSTOMER

Hansae
Human And Pure Nature

Research and Development

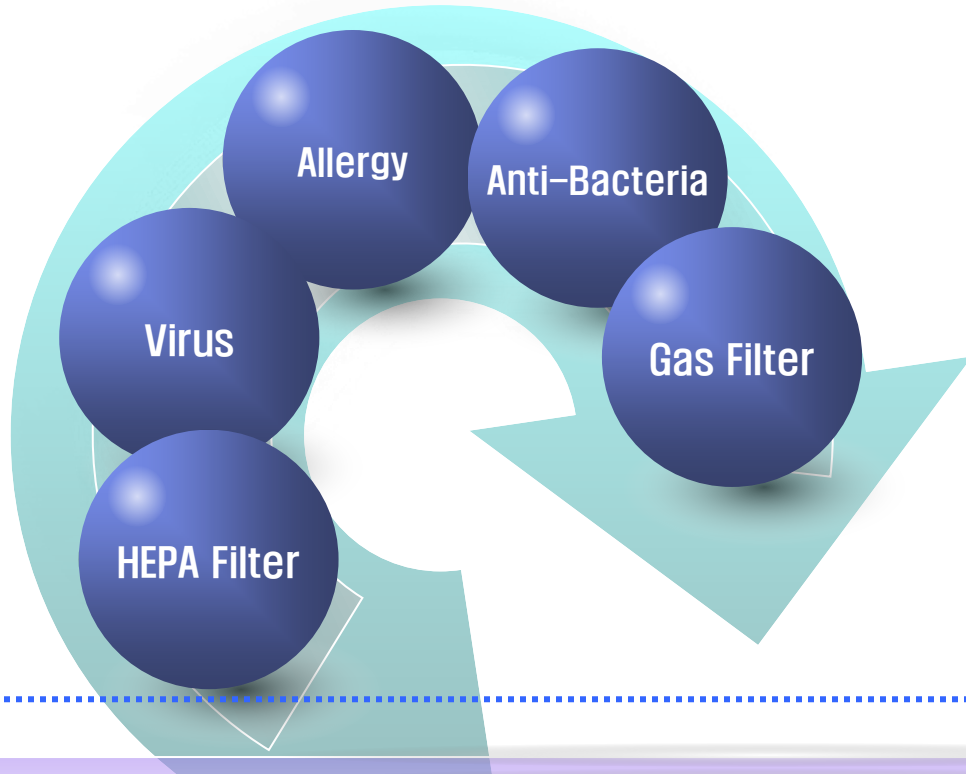
■ Hansae Co., Ltd. – Technology Research Center



Research and Development

Research and Development

■ R&D Process



Client Satisfaction



Filter Test

*Filter Eff. & Pd
Analysis*

*Air Cleaner
Test*

*Air Cleaner
Optimization*

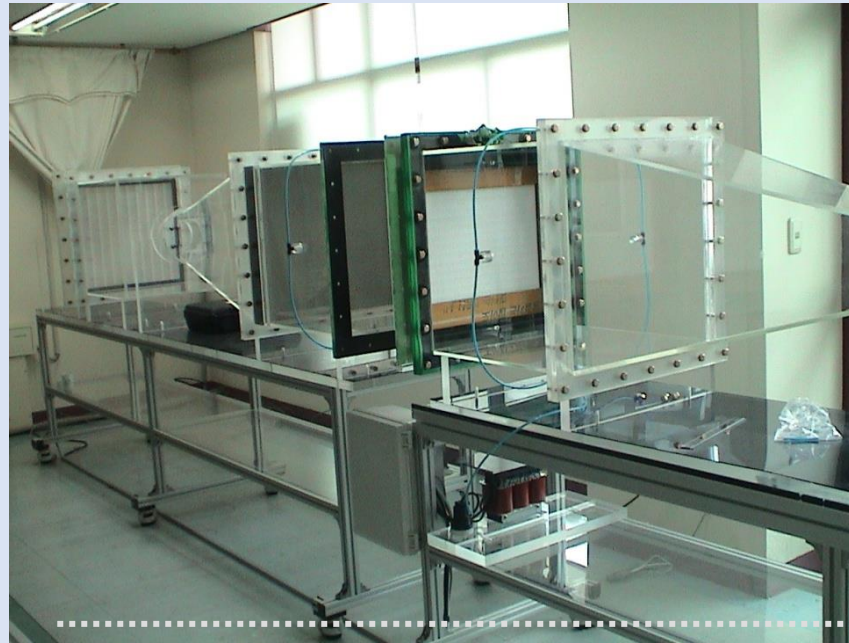
Research and Development

■ Perfect Test Equipment

Developing the most suitable filter that customers want the most



▲ TSI 8130 (Fabric Efficiency Measurement)
Automated Filter Tester



Client Satisfaction

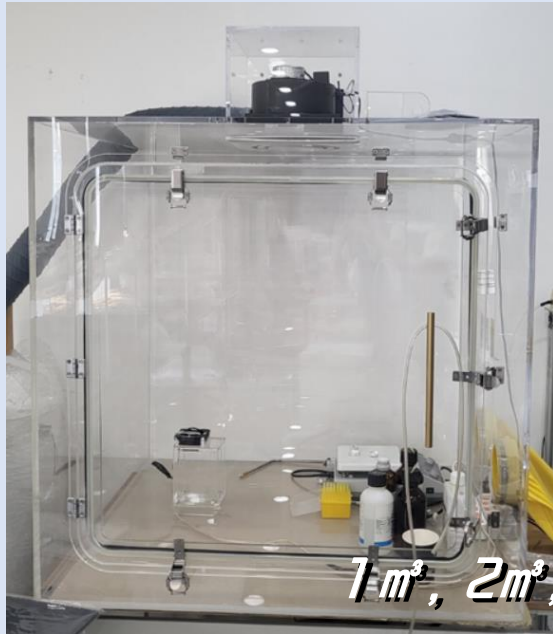
▲ Wind tunnel tester that can measure from filter unit to air purifier set

Research and Development

■ Perfect Test Equipment

Developing the most suitable filter that customers want the most

※ Possession of an air purifier test chamber conforming to the standards of national accredited institutions and product performance evaluation



1m³, 2m³, 4m³ & 8m³ Chamber



30m³ & 50m³ Chamber

▲ Deodorizing Filter Removal Performance Measurement

▲ HEPA Filter Measurement of cleaning efficiency

Research and Development

■ Air Filter Test Equipment

Airflow Meter / Micromanometer - 1



Operating Temperature 0 °C to +50 °C (+32 °F to +122 °F)
Storage Temperature -40 °C to +60 °C (-40 °F to +140 °F)
Operating Relative Humidity
0 % to 90 %, non-condensing
IP Rating IP40
Operating Altitude 2000 m
Storage Altitude 12000 m
EMI, RFI, EMC Meets requirements for EN61326-1
Vibration MIL-PREF-28800F, Class 3
Max Pressure at Each Port
10 PSI
Data Storage 99 readings
Warranty 2 years
Power Four AA batteries
Typical Battery Life 375 hours without backlight, 80 hours with backlight

차압측정기 / Maker : FLUKE / Model : FLUKE922



Airflow Meter / Micromanometer - 2



Specification

- Measure differential and static pressure from -15 to +15 in. H₂O (-3735 to +3735 Pa)
- Calculate and display velocity when using a Pitot tube
- Calculates flow
- Variable time constant
- Statistics
- Data logging with time and date stamp
- Stores 12,700+ samples and 100 test IDs
- Includes LogDat2 downloading software
- Programmable K factors

차압측정기 / Maker : TSI

Model : TSI5825

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Research and Development

■ Air Filter Test Equipment

Particle Counter - 1



파티클카운터

Maker : METONE / Model : 237B



Specification

Size Channels (μm)	237A	2 ch 0.5, 5.0 4 ch 0.5, 0.7, 1.0, 5.0 5 ch 0.5, 0.7, 1.0, 2.0, 5.0 6 ch 0.5, 0.7, 1.0, 2.0, 3.0, 5.0
	237B	2 ch 0.3, 0.5 4 ch 0.3, 0.5, 1.0, 5.0 5 ch 0.3, 0.5, 0.7, 1.0, 5.0 6 ch 0.3, 0.5, 0.7, 1.0, 2.0, 5.0
Flow Rate	0.1 CFM (2.83 LPM)	
Coincidence Limit	2 million/ft ³	
Light Source	Laser diode	
Factory Calibration	Mono-dispersed polystyrene spheres (NIST traceable)	
Display	7-digit red LED	
Output	RS-232C/RS-485 for computer, built-in printer	
Location Labels	250, appear on printout	
Data Storage	500 samples, rotating buffer	
Sample and Hold Times	1 second to 24 hours	
Count Alarms	1 to 9,999,999, counts each channel	
Count Modes	Manual, auto, concentration, beep	
Concentration Mode	1 second samples, 1 to 10 samples averaged, display updated	



Research and Development

■ Air Filter Test Equipment

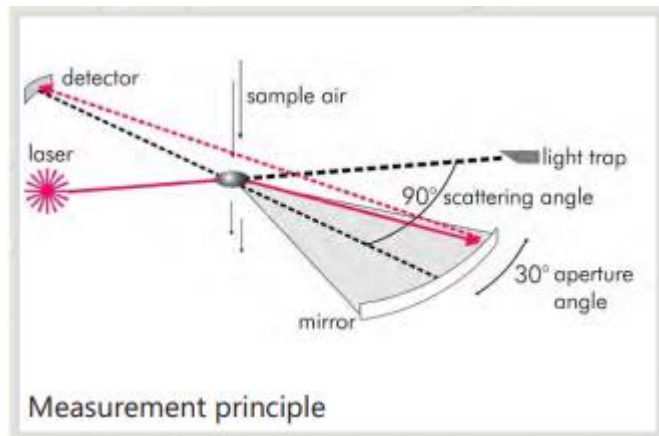
Particle Counter - 2



에어로졸 분광계
(파티클 카운터)

Maker : Grimm

Model : 11-A



- Particle concentration in counts/litre, for all size channels
- Dust mass concentration in $\mu\text{g}/\text{m}^3$, for all size channels
- Dust mass fractions PM10, PM2.5 and PM1, according to US EPA guideline
- Dust mass fractions inhalable, thoracic and alveolic, according to EN 481

Specification

Principle: 90° light scattering and filter-sampling (Dual-Technology)

Particle concentration: 1 to 3,000,000 particles/litre

Dust mass: 0.1 to 100,000 $\mu\text{g}/\text{m}^3$

Reproducibility: 5 % for whole range

Light source: Diode-Laser ($\lambda = 683 \text{ nm}$, $P = 40 \text{ mW}$) max

Measuring range: 0.25 μm to 32 μm in 31 size channels

Volume flow: 1.2 litre/minute, volume controlled

Sampling time: 6 sec (normal), 1, 2, 3 sec (fast mode)

Data storage: intern 80 KByte, with storage card 4 MByte

Storage interval: 1 min to 1h selectable

Interface: RS-232 Interface

Power supply: 110...230 VAC, 50-60Hz,

Battery: 12 VDC (6-8h)

Temperature range: 0 to +40 °C (32 to 104 °F)

Humidity range: relative humidity < 95 % (non condensing)

Dimensions (LxWxH): 24 x 13 x 7 cm

Weight: 2.4 kg (5.3 lb)



Research and Development

■ Air Filter Test Equipment Particle Counter - 3



Portable Aerosol Spectrometer

Benefits

- 31 size channels, equidistant
- Particle size range 0.25–35 μm
- TSP, PM₁₀, PM₄, PM_{2.5}, PM₁, PMcoarse, inhalable, thoracic, respirable
- Counts and Mass
- Built-in filter for gravimetric analysis
- Real-time and portable
- Advanced software

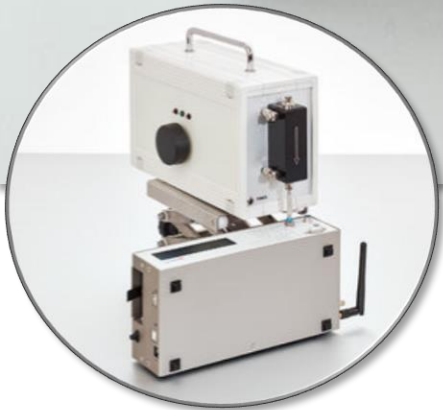
Applications

- Aerosol science
- PM monitoring
- Indoor air quality (IAQ)
- Workplace monitoring
- Process control in industry

- 환경 알고리즘: TSP, PM10, PM4, PM2.5, PM1, PMcoarse | IAQ 알고리즘: pm10, pm2.5, pm1, 흡입식, 흉부, 호흡 가능
- 크기에 대한 입자 수, 크기 이상의 입자 표면, 크기에 대한 입자 질량의 실시간 모니터링
- 입자 수, 입자 표면 및 먼지 질량 분포에 대한 추가 정보
- 등거리 크기 채널 31개, PSL 추적 가능
- 통합 47mm PTFE 필터(GRIMM 이중 기술)
- 다목적 데이터 수집 및 통신 인터페이스(블루투스, USB, 이더넷, RS-232)
- 광학 셀에 레이저 및 검출기를 보호하기 위한 공기 흐름
- 광학 전지의 온도(T) 및 상대 습도(RH)용 내부 센서
- 광학 전지에 분 석된 총 유입 흐름(1.2L/min)
- 최고 품질 표준을 위한 모든 광학 및 공압 부품에 대한 자체 테스트

에어로졸 분광계 (파티클 카운터)

Maker : Grimm / Model : 11-D



Research and Development

■ Air Filter Test Equipment

Industrial Gas Analyzers



Specification

- Simultaneous analysis of multiple compounds from ppb to percent levels
- An array of proprietary gas cells, detectors and optical materials to optimize a system for your specific needs
- Sample cell temperatures to 250° C
- Real-time concentration display in graphic or tabular form
- Up to 12 analog inputs for ancillary measurements such as mass flow, O₂, H, etc.
- Automatic temperature and pressure compensation
- Automated multi-point sampling systems with alarms and communications options
- Reliable, low maintenance design
- AutoQuant Pro software and spectral reference libraries
- MIDAC's patented "porch swing" interferometer
- Portable
- Experienced applications support staff to assist with custom calibrations, rapid implementation and optimal utilization

FT-IR (가스 분석기)

Maker : MIDAC / Model : I1801-E-20



Research and Development

■ Air Filter Test Equipment

Forced Type Oven



hot air dryer

Maker : CORETECH / Model : HQ-FDO260

디지털 열풍 건조기 HQ-FDO Series

모델명	HQ-FDO 84	HQ-FDO 156	HQ-FDO 260
타입	Forced convection type		
온도 범위	Max 250 ℃		
사용 범위	Amb+5 ℃ ~ 200 ℃		
최소 단위	0.1 ℃		
측정 정도	±0.2 ℃ at 120 ℃		
분포도	±1.0 ℃ at 120 ℃		
승온 시간	100 ℃ / 20 min		
조절기	Digital P.I.D Controller		
타이머	99 hr 59 min		
제어 방식	SSR Control		
센서	K(CA) type		
내부 크기	470 x 400 x 450 mm	520 x 500 x 600 mm	620 x 600 x 700 mm
외부 크기	590 x 690 x 765 mm	640 x 790 x 915 mm	740 x 890 x 1,015 mm
용도	84 Liter	156 Liter	260 Liter
선반	2 ea	2 ea	3 ea
히터	1,500 W	1,800 W	2,500 W
송풍 장치	Sirroco fan motor		
내부 재질	Stainless steel		
외부 재질	Steel plate SS41 with Power heating coated		
도어	High temperature Silicon packing door		
투시창	High temperature Safety glass		
안전 장치	Over temperature Protection safety device Electrical leakage breaker Over current fuse		
전원	220V , 50 / 60Hz , 1.8kw	220V , 50 / 60Hz , 2kw	220V , 50 / 60Hz , 2.8kw

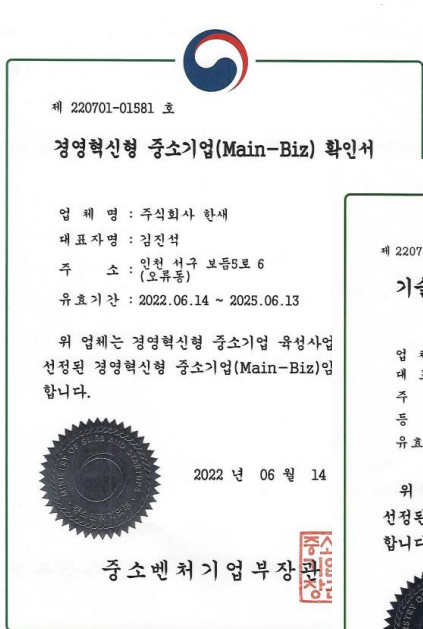
● Other equipment

- Gas loading test equipment
- HEPA filter loading equipment
- Gas automatic generator
- Automotive filter DIN standard measuring equipment



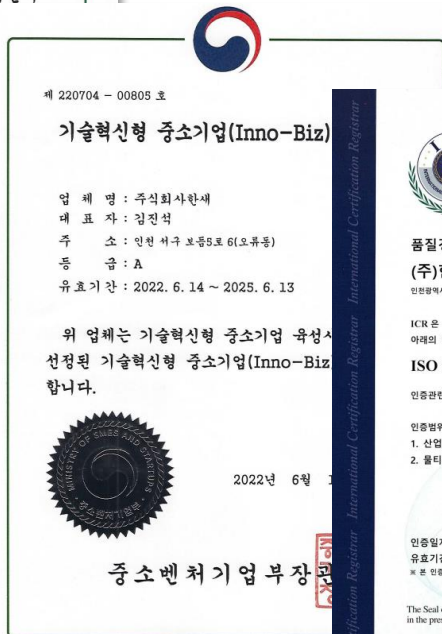
Research and Development

■ Certification



Management
innovation type
Small business
confirmation
(Main Beads)

Technology innovation type
small business confirmation
(Innobiz)



ISO 9001-2015



*Certificate
of Registration*

**품질경영시스템인증서
(주)한새**

인천광역시 서구 보동5로 6 (오류동)

ICR은 상기업체의 품질경영시스템이
아래의 인증규격에 적합함을 인증합니다

ISO 9001:2015

인증관련 규정을 항상 준수한다는 조건으로 등록승인을 부여합니다.

인증범위

1. 산업용, 가정용필터(성유, 활성탄)의 설계/개발, 생산 및 유통
2. 물티슈, 청소포의 생산 및 유통

인증일자 : 2021년 05월 28일

유효기간 : 2024년 05월 31일

인증서 번호 : 03618

* 본 인증서는 이전 심사일로부터 12개월 이내의 사후 심사를 완료하여야만 인증이 유지 됩니다.

The Seal of ICR Limited was hereto affixed
in the presence of

Signature
President



최초 인증일 : 2010년 06월 08일

인증서 번호 : E172510

* 본 인증서는 이전 심사일로부터 12개월 이내의 사후 심사를 완료하여야만 인증이 유지 됩니다.

The Seal of ICR Limited was hereto affixed
in the presence of

Signature
President



ISO 14001-2015



*Certificate
of Registration*

**환경경영시스템인증서
(주)한새**

인천광역시 서구 보동5로 6 (오류동)

ICR은 상기업체의 환경경영시스템이
아래의 인증규격에 적합함을 인증합니다

ISO 14001:2015

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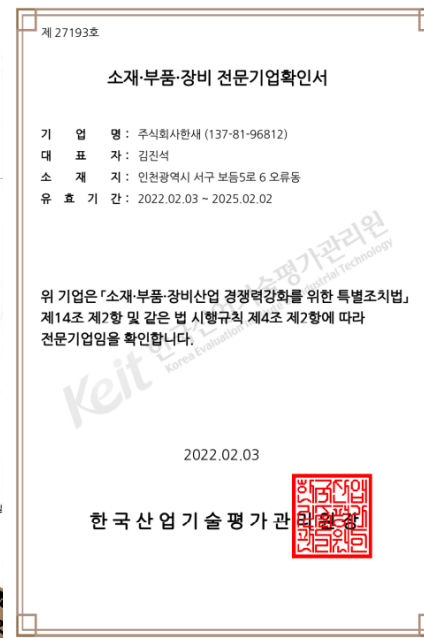
* 본 인증서는 이전 심사일로부터 12개월 이내의 사후 심사를 완료하여야만 인증이 유지 됩니다.

The Seal of ICR Limited was hereto affixed
in the presence of

Signature
President



Confirmation of material parts
equipment specialized



발급번호 제 20220706020005 호

벤처기업확인서

- 기 업 명 : 주식회사한새
- 사업자등록번호 : 137-81-96812
- 대 표 자 : 김진석
- 주 소 : 인천광역시 서구 보동5로 6 (오류동) 주식회사한새
- 확인 유형 : 연구개발유형
- 유효기간 : 2022년 07월 06일 ~ 2025년 07월 05일

위 기업은 「벤처기업육성에 관한 특별조치법」 제25조의 규정에
에 의거 벤처기업임을 확인합니다.

2022년 07월 06일

벤처기업확인기관

벤처기업 해당사유 : 벤처기업법 제2조의2제1항제2호 가목의 요건을 충족하는 벤처기업
(또는 나목의 요건을 충족하는 벤처기업, 또는 다목의 요건을 충족하는 벤처기업)

이 확인서는 「벤처기업법」 제25조의3(벤처기업확인기관의 지정 등에 따라 지정된 벤처기업확인기관(이하 벤처기업확인기관)이 벤처기업확인기관으로서
명칭을 통해 명백히 확인하고 발급한 확인서입니다. (벤처기업확인기관 지정기간 : '20.7.1~'23.6.30)

Venture Business
Confirmation

Hansae
Human And Pure Nature



Research and Development

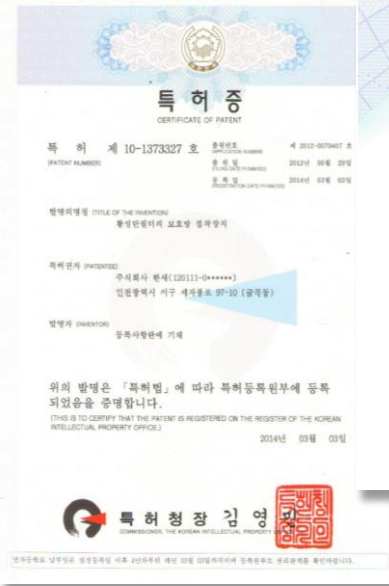
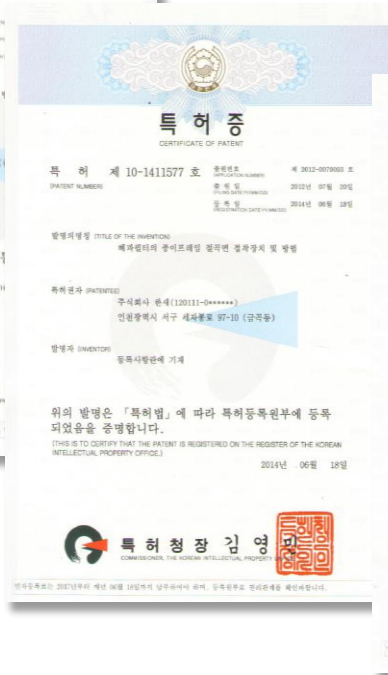
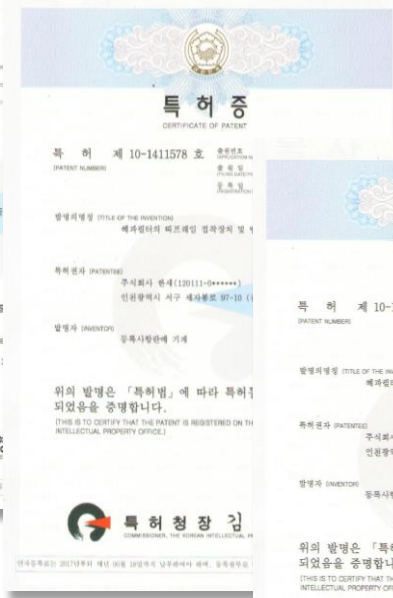
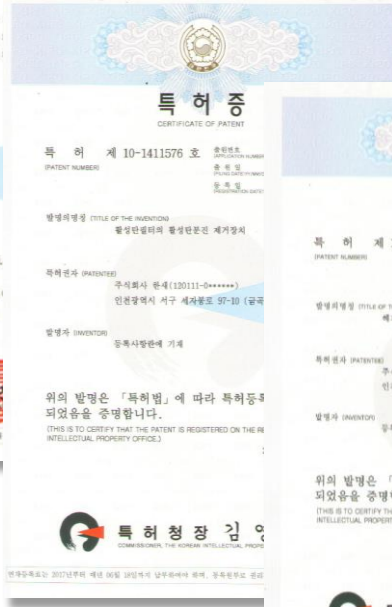
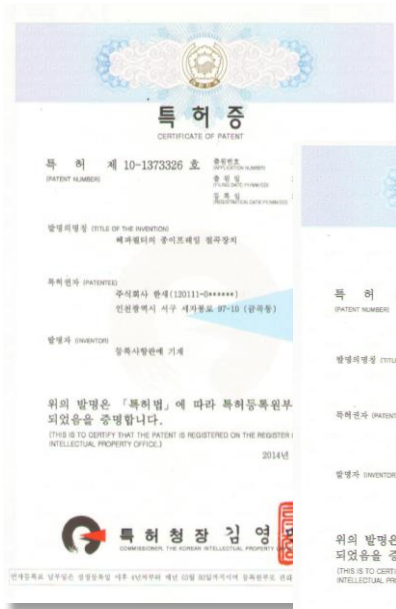
Patent

Frame for air filter, filter for air purification using same, and manufacturing method thereof

HEPA filter paper frame bending device

HEPA filter paper frame bending surface bonding device and method

HEPA filter paper frame bending surface bonding device and method



Activated carbon dust removal device of activated carbon filter

HEPA filter band frame bonding device and method

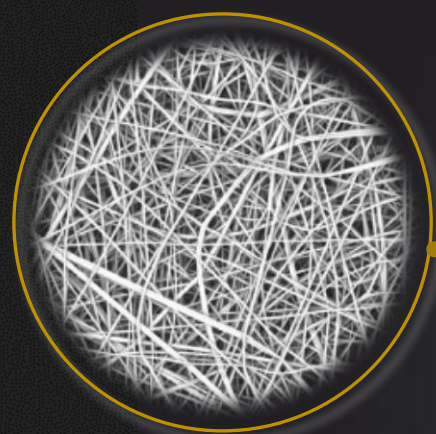
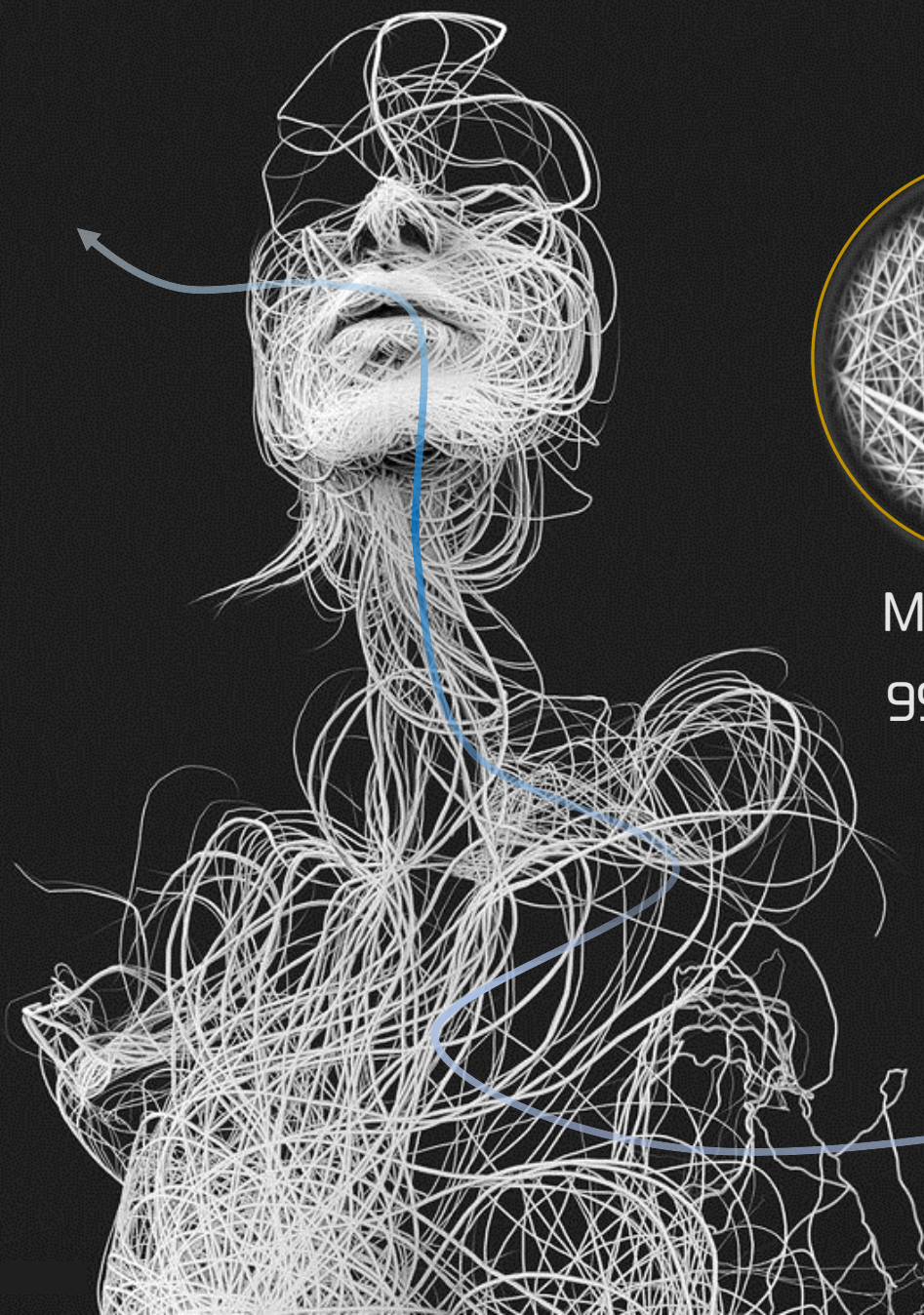
Cleanable fine dust filter module using nanofiber

Introduction of Hansae's functional filter

Hansae

Various High Air Flow Structure

★ HAN-SAE High efficiency particulate air System



Melt-Blown
99.999~ %



Hepa Filter



Deodorization
Filter



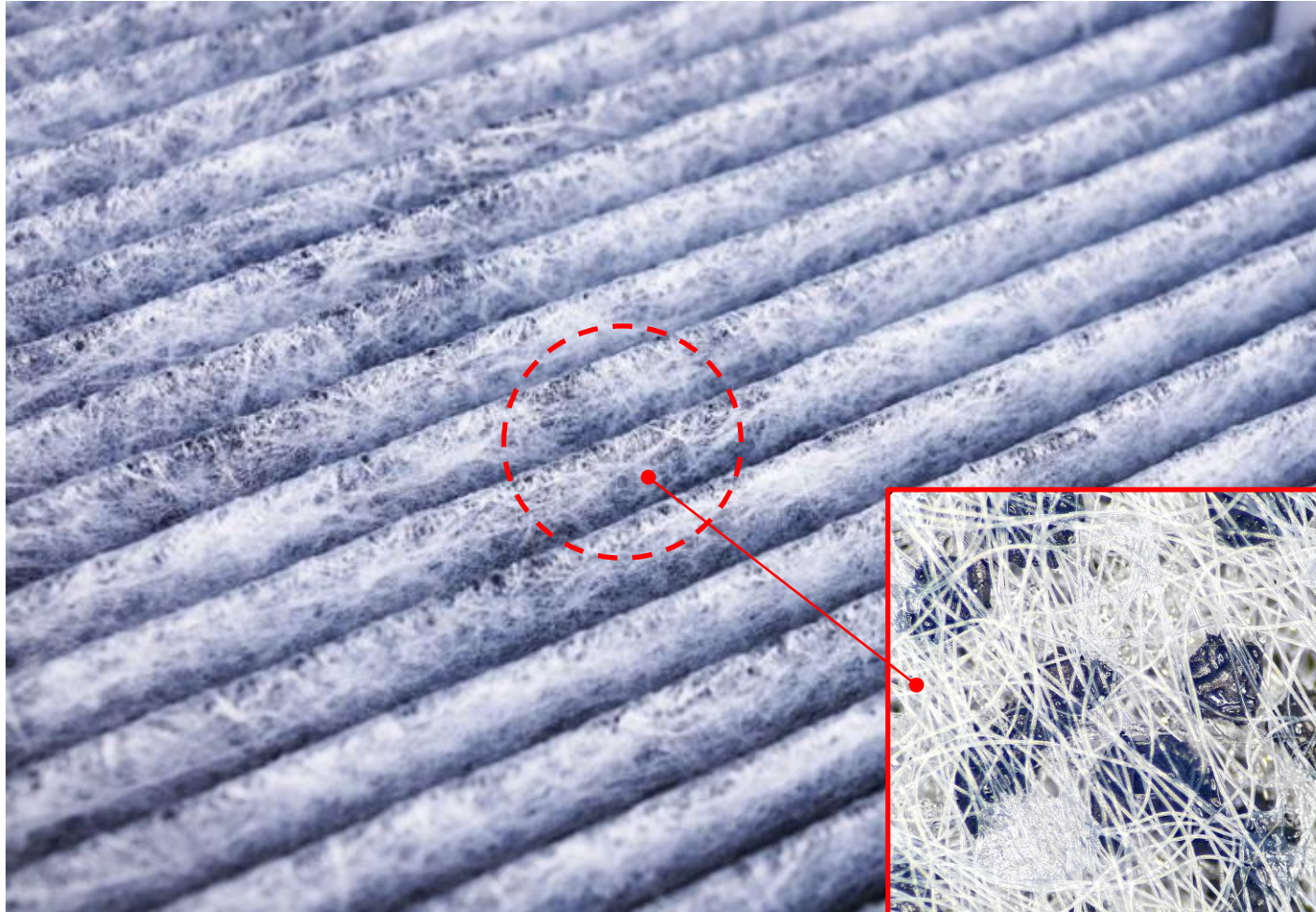
Functional Filtering



Hansae

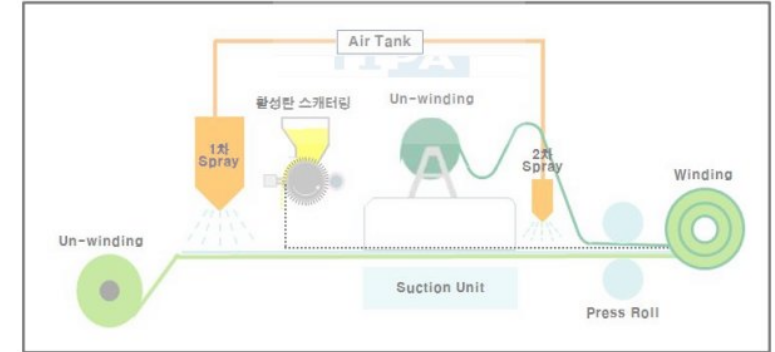
1. Combi Filter (Dust removal + deodorization function in one)

■ PERFECT LINE Series : Standard Combi Filter



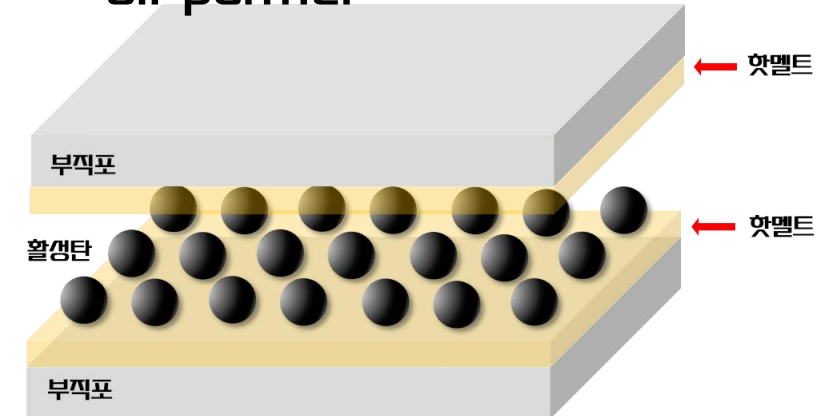
Dustless & Deodorization = Hansae Combi

○ 개발공정 : 1차 핫멜트 분사 → 활성탄 스퀘터링 → 2차 핫멜트 분사
→ 합지가공 → 여재절곡 → 필터 완제품



<개발 핫멜트 분사시스템을 응용한 유해가스 제거용 필터 제조 공정 >

▼ Combi filter structure for air purifier



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1. Combi Filter (Dust removal + deodorization function in one)

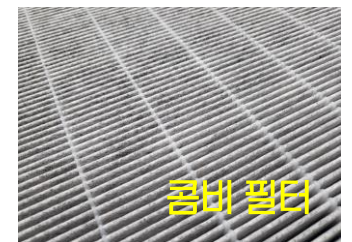
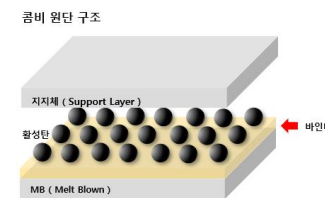
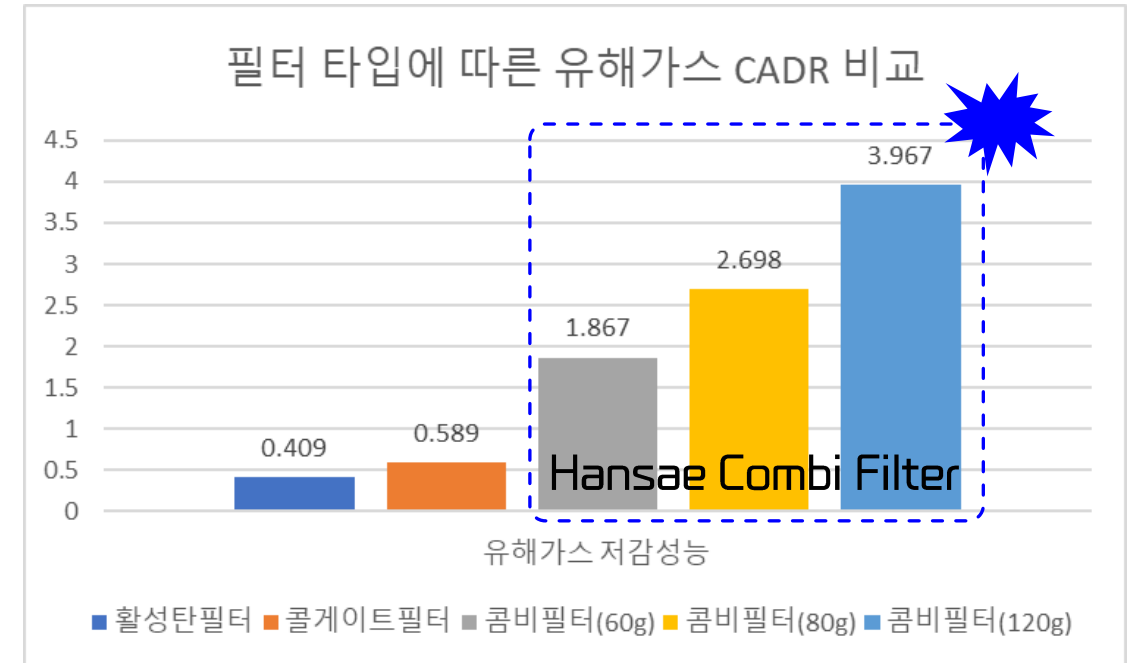
1) Combi Filter (콤비 필터) 성능 평가

1) Hepa Media's activated carbon grafted 'combi filter'

- ① More filtration area can be secured due to the combined form of HEPA filter and deodorization filter
- ② To respond to "toxic gas reduction performance" and "differentiation in performance", which are mandatory items for certification newly added to SPS-KACA022-0132 (2021)
- ③ It is possible to maintain the performance of the 5 major gases of the existing type and maintain the cleaning performance
- ④ Handles various activated carbon weights to meet customer needs

- Securing and maintaining the performance of the existing 5 major gases
- Excellent performance in the new three gas CADRs
- Excellent clean area CADR performance

타입	시험항목	유해가스 제거성능 (5대 가스 효율)	유해가스 저감성능 (3대 가스 CADR)	청정화성능
활성탄 필터		72.2%	0.409	4.08
콜게이트 필터		81.5%	0.589	4.37
콤비필터 (60g/m)		77.0%	1.867	4.20
콤비필터 (80g/m)		85.3%	2.698	3.98

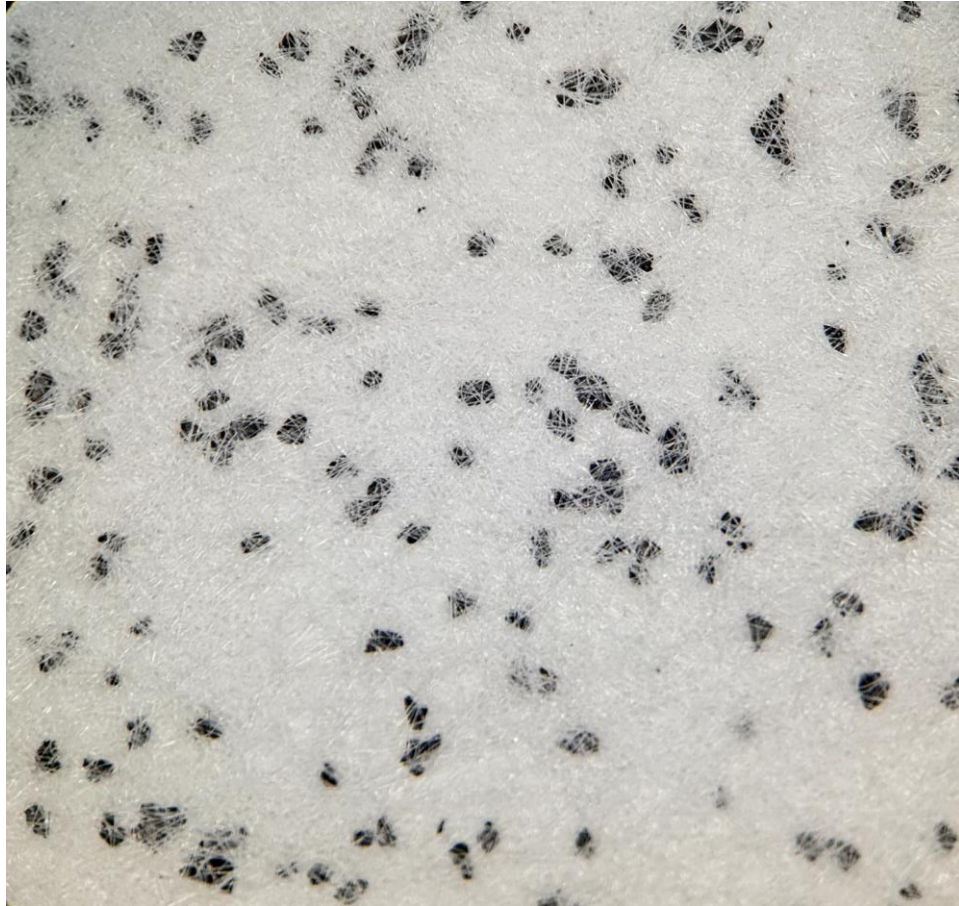


1) Combi Filter (Dust removal + deodorization function in one)

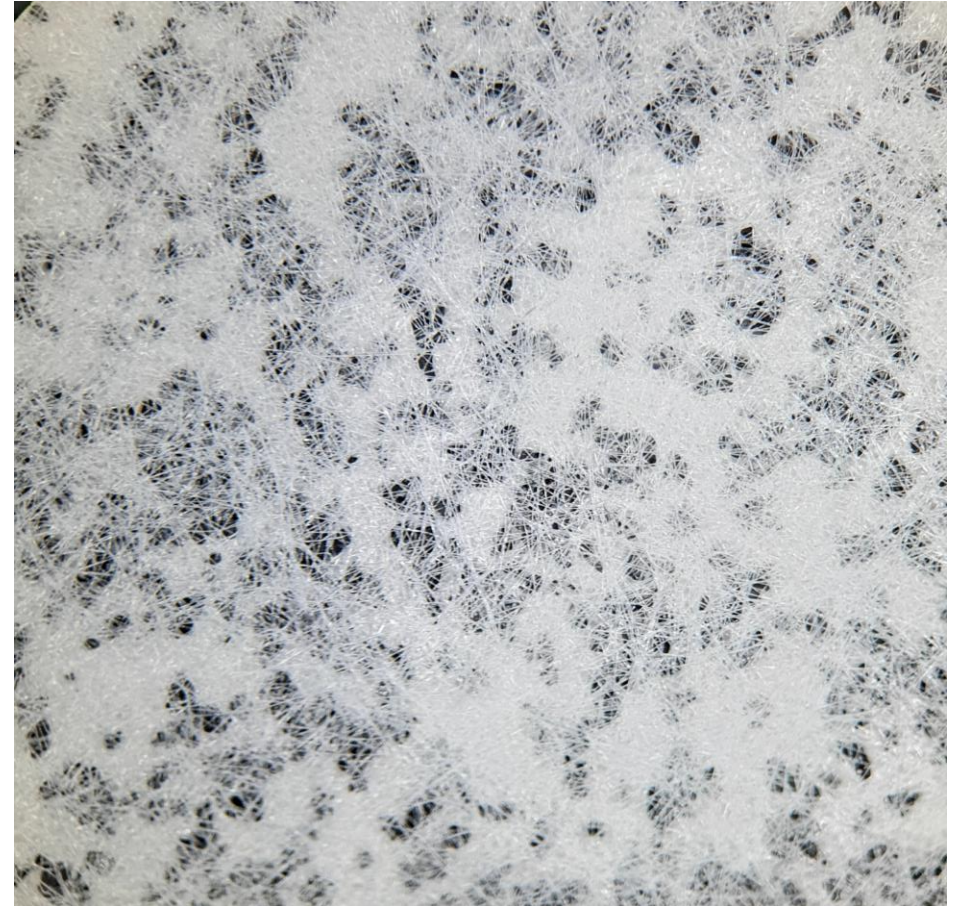
Hansae Co., Ltd.
Introduction of functional filters

■ Applicable deodorizing performance (deodorization CADR) by weight of activated carbon that meets customer requirements and target performance

▼ Activated carbon weight 30g



▼ Activated carbon weight 60g



2. Copper Antibacterial Functional Filter

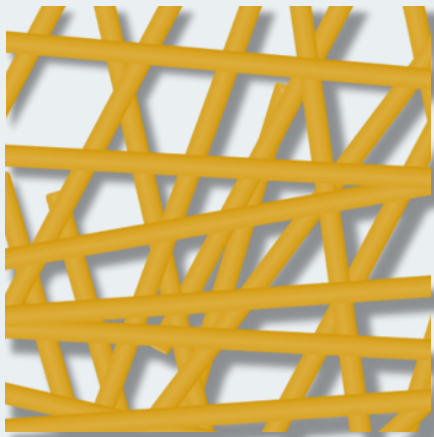


#Antiviral_Mechanisms

Copper Antimicrobial Filter

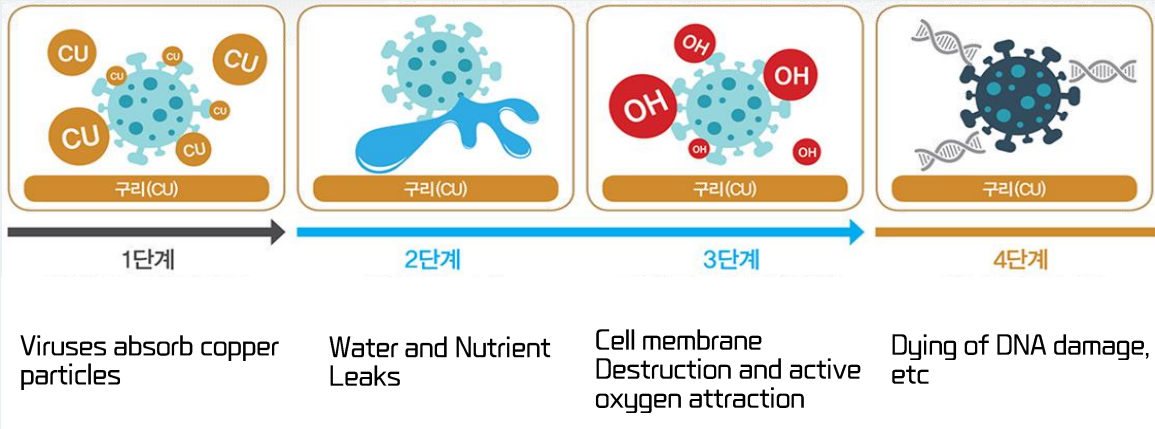
Filter combining 13 grade HEPA with copper fiber

Antivirus, sterilization, deodorization, ultra-fine dust removal filter



“ i CU⁺, fresh air ”

Clear air to meet again with copper antibacterial filter



3. ASGARD Filter (Antiviral functional filter)

Hansae
Human And Pure Nature

■ PROTECT LINE Series : Silver Nonwoven Filter

※ COVID-19 virus reduced by more than 99.99%



Silver & Nonwoven = Hansae ASGARD

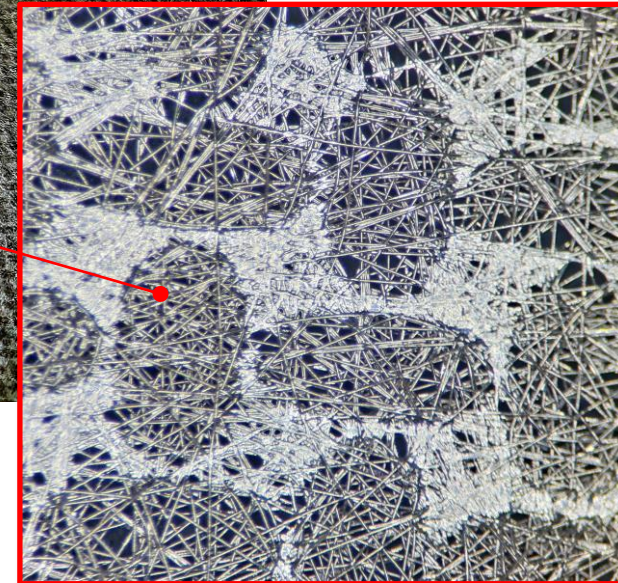
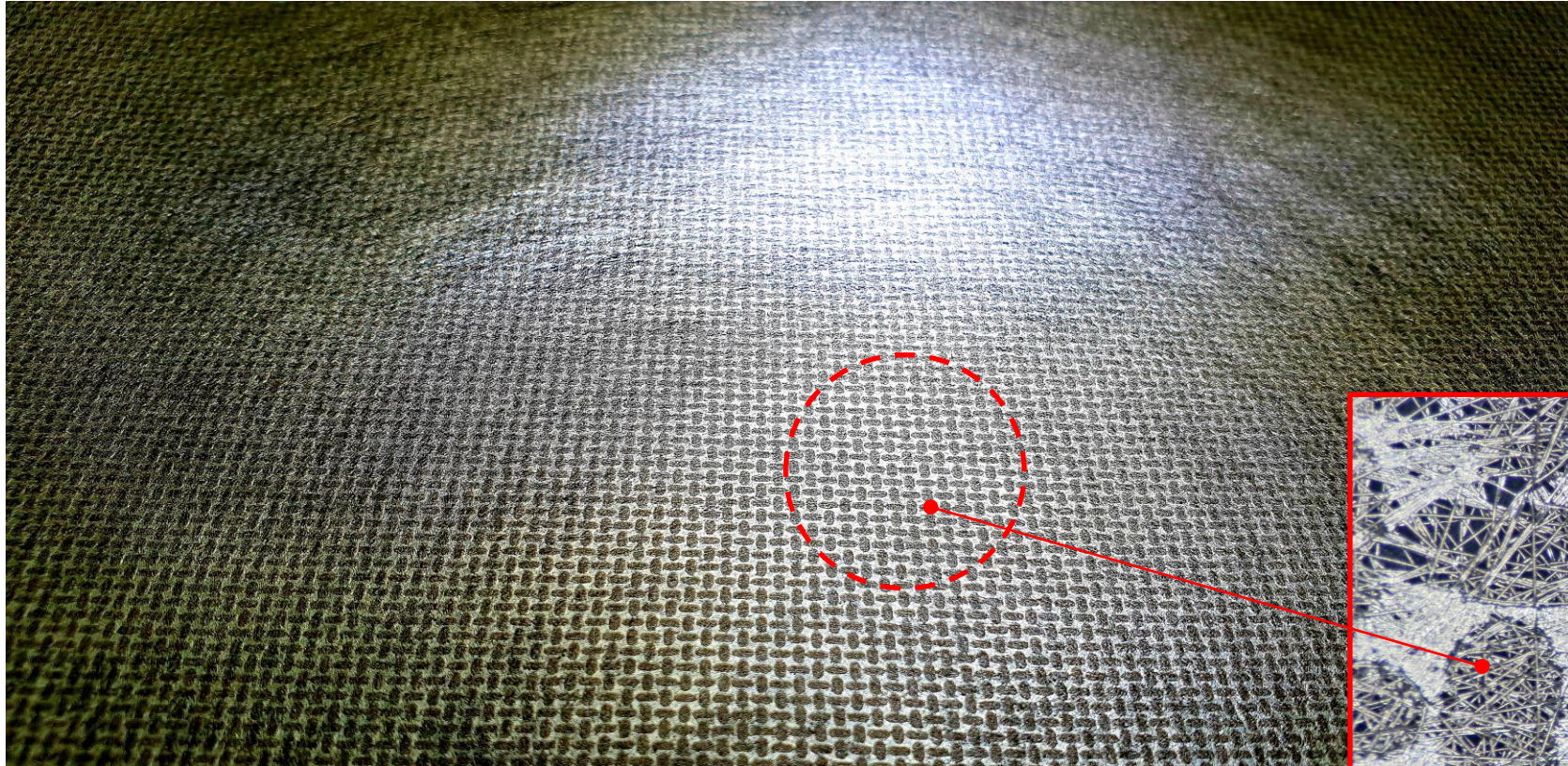


Realization of anti-virus with “pure silver”
+ “non-woven fabric”

3. ASGARD Filter (Antiviral functional filter)

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Human And Pure Nature

■ PROTECT LINE Series : Silver Nonwoven Filter

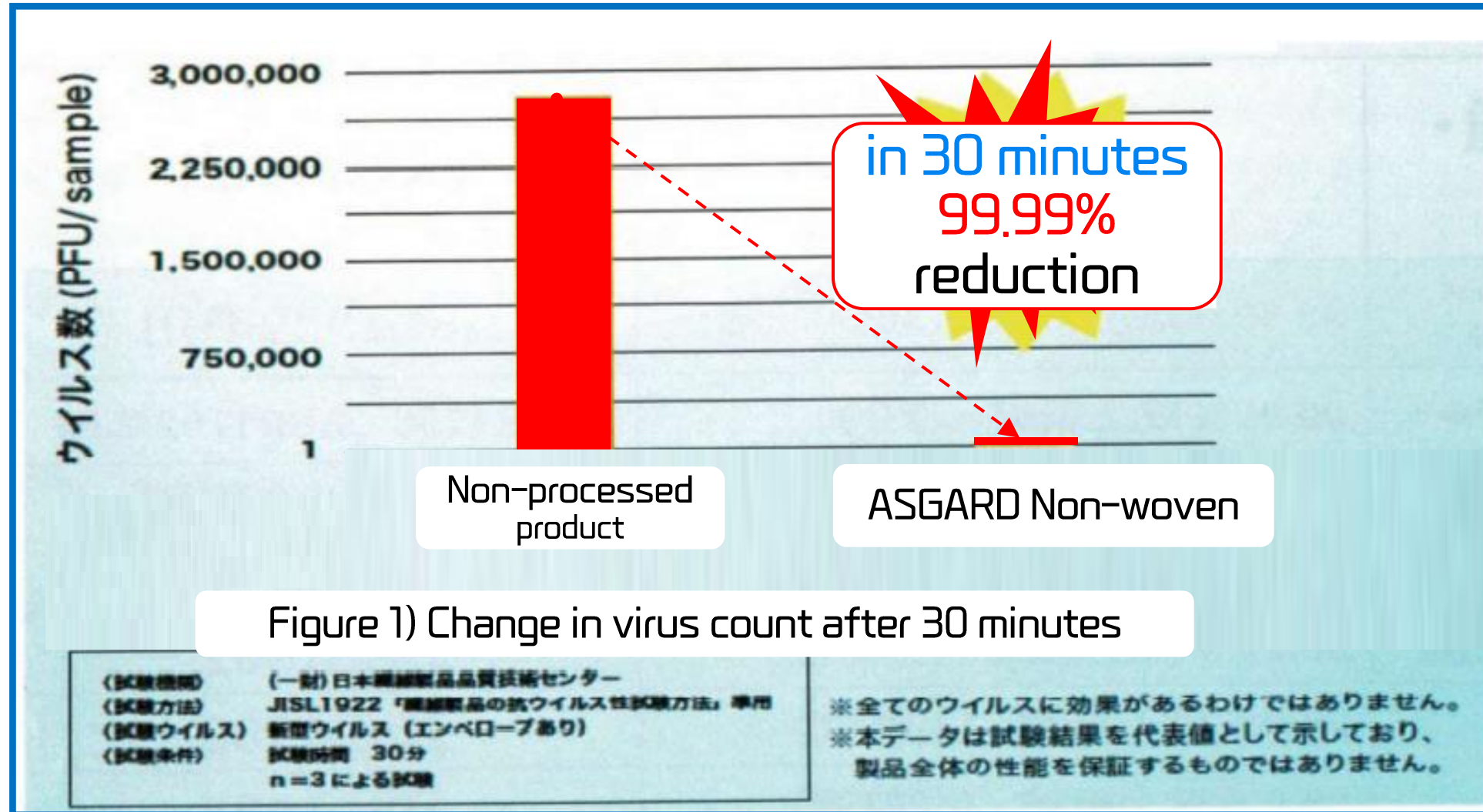


Silver & Nonwoven = Hansae ASGARD

Hansae
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3. ASGARD Filter (Antiviral functional filter)

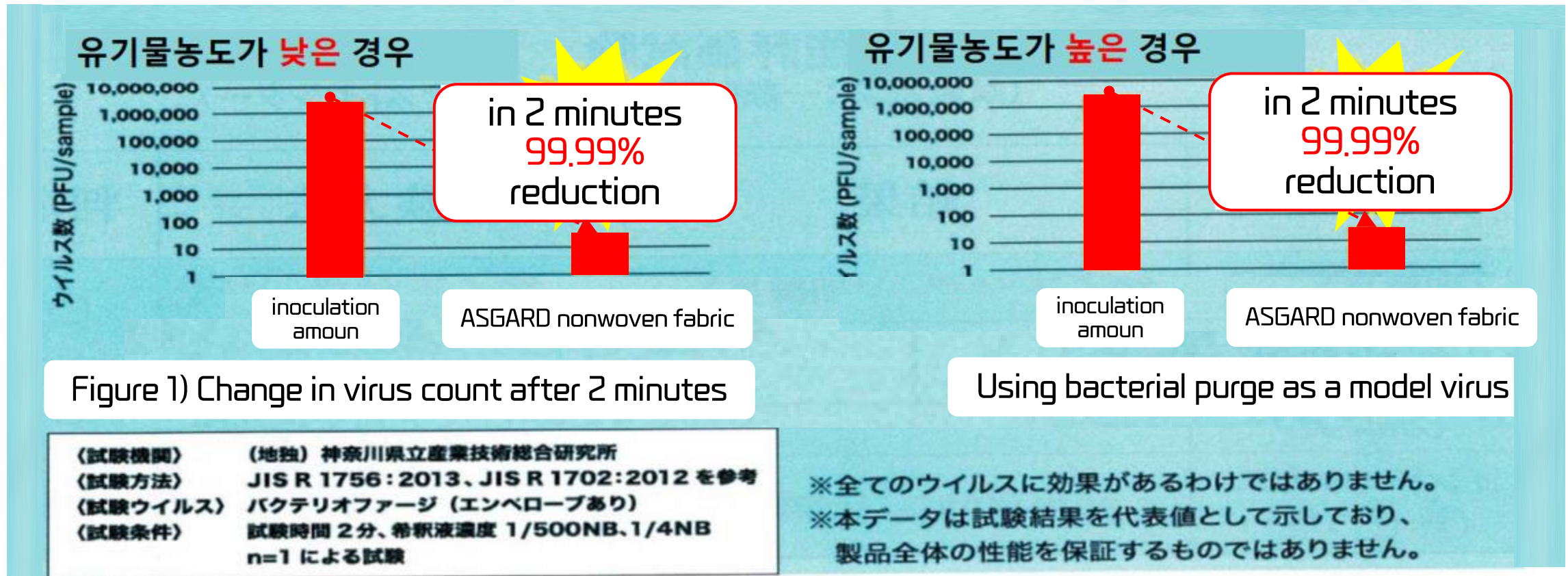
1) ASGARD Nonwoven antibacterial / antiviral test result (COVID-19: SARS-CoV-2 Omicron)



3. ASGARD Filter (Antiviral functional filter)

2) ASGARD Non-woven antibacterial/antiviral test result (influenza A replacement virus test completed)

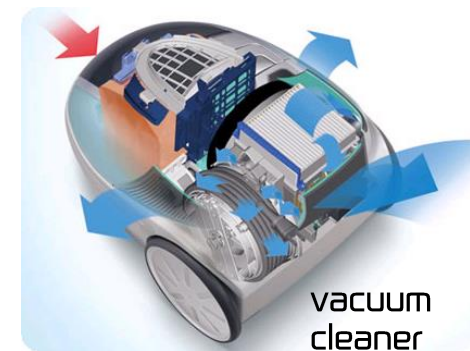
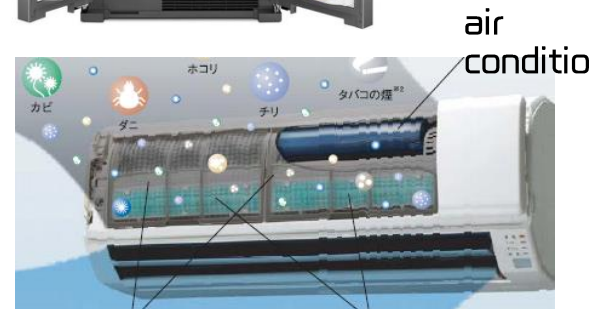
▼ Antiviral performance test result (Influenza A replacement virus: Bacterial purgeΦ6)



3. ASGARD Filter (Antiviral functional filter)

Hansae
Human And Pure Nature

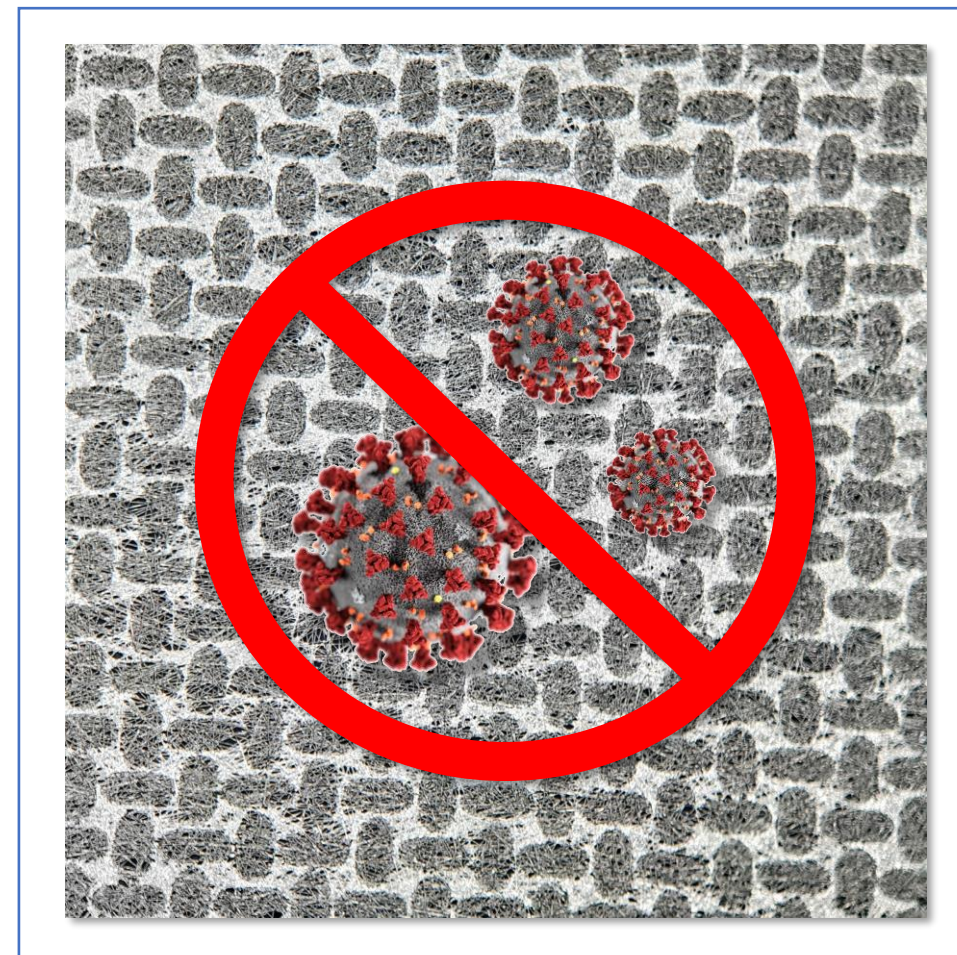
3) ASGARD Nonwoven application example



3) Antiviral functional filter (ASGARD)

Hansae Co., Ltd.
Introduction of functional filters

▼ HANSAE ASGARD Sample



Hansae
Human And Pure Nature

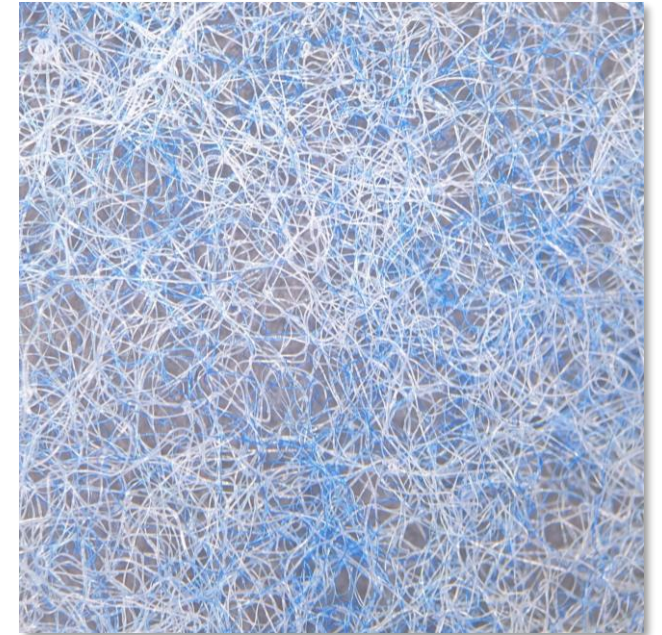
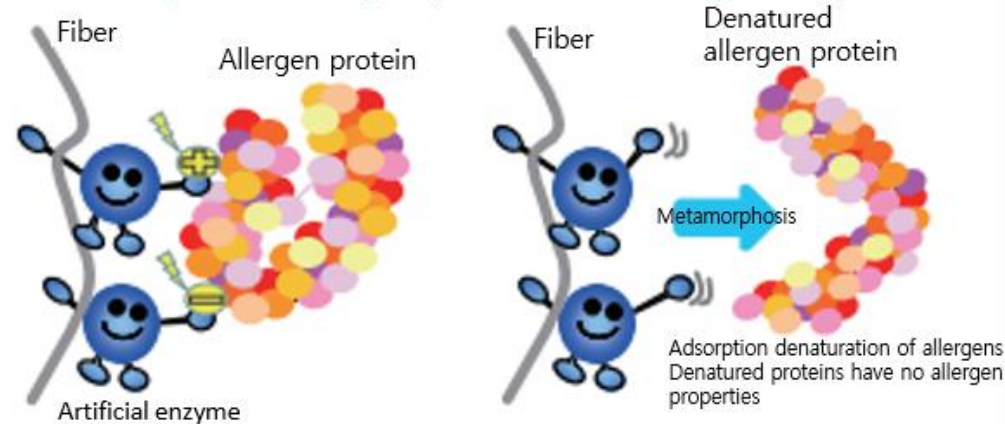
4. Anti-allergic / anti-viral functional filter (allergic catcher)

1) allergic catcher 「Aller Catcher」

Characteristics

- Remove animal, plant, mold allergy support
- Active enzymes adsorb and degrade allergens
- Material: Phthalocyanine (artificial enzyme)
- Antibacterial and deodorizing functions
- Modified proteins are not allergic
- Allergy adsorption: 10,000 animals/1g

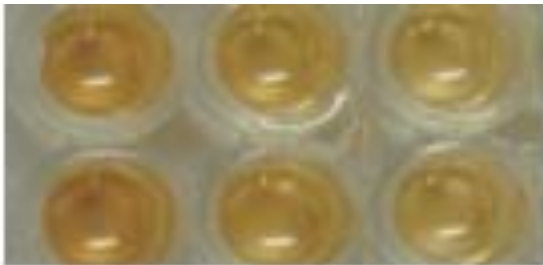
Changes in the properties of allergenic proteins



Allergen adsorption test (ELISA method)

The allergen in the aqueous solution was adsorbed with an allergen fiber, and the allergen remaining in the aqueous solution was measured by ELISA method. (ELISA method measures the amount of allergen in the concentration of color)

[General fiber]



Target substance: Tick allergen (Der II)

[Allergic Catcher Fiber]



Allergens are adsorbed and the color fades

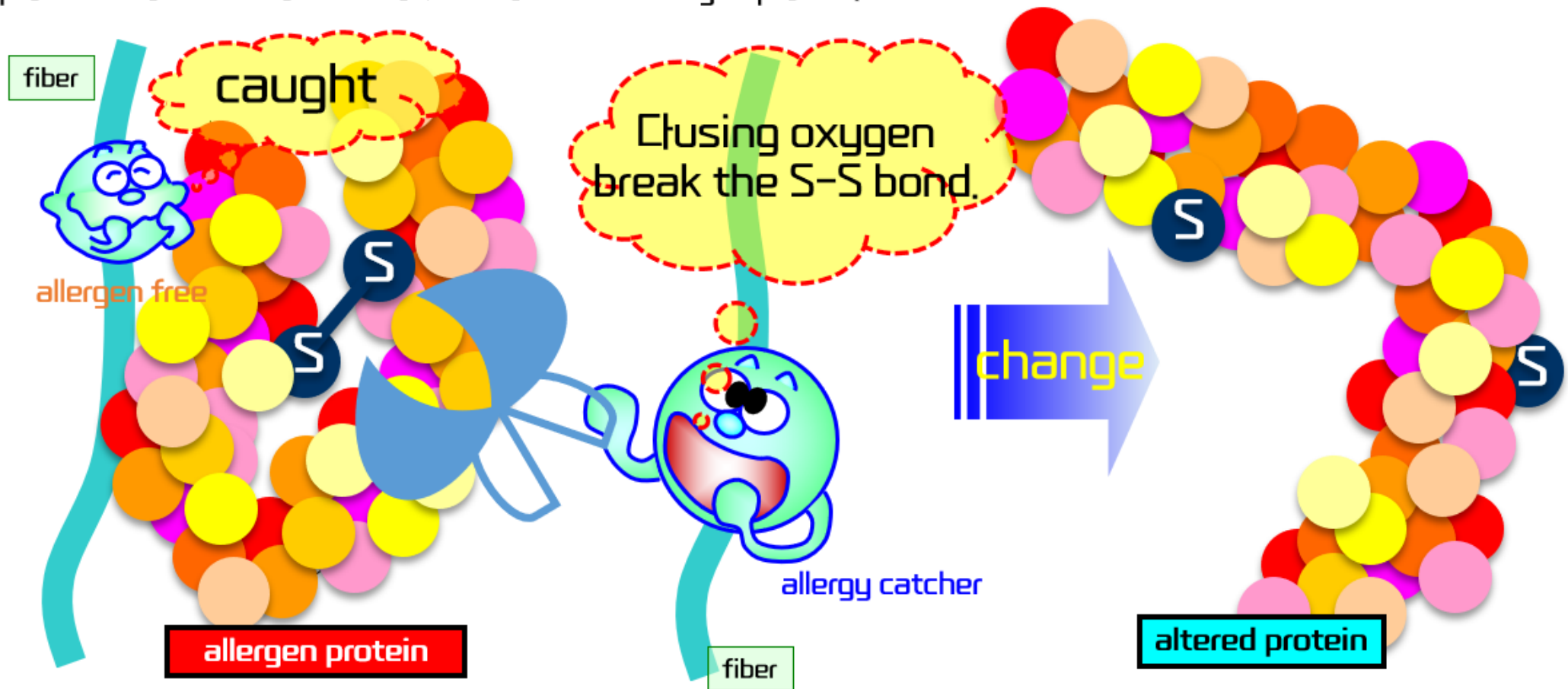
ALLERGY



4. Anti-allergic / anti-viral functional filter (allergic catcher)

2) allergic catcher 「Mechanism of allergy catcher」 Changes in properties of allergen proteins

- ① In the tick allergen protein, the bond between sulfur atoms (S) (S-S bond) has been confirmed.
- ② First, the allergen catcher fibers adsorb allergens.
- ③ Next, using oxygen, the allergen catcher cuts the S-S bond.
- ④ The protein whose S-S bond is broken is lost as an allergen protein.



4. Anti-allergic / anti-viral functional filter (allergic catcher)

Hansae Co., Ltd.
Introduction of functional filters

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진드기



고양이 표피



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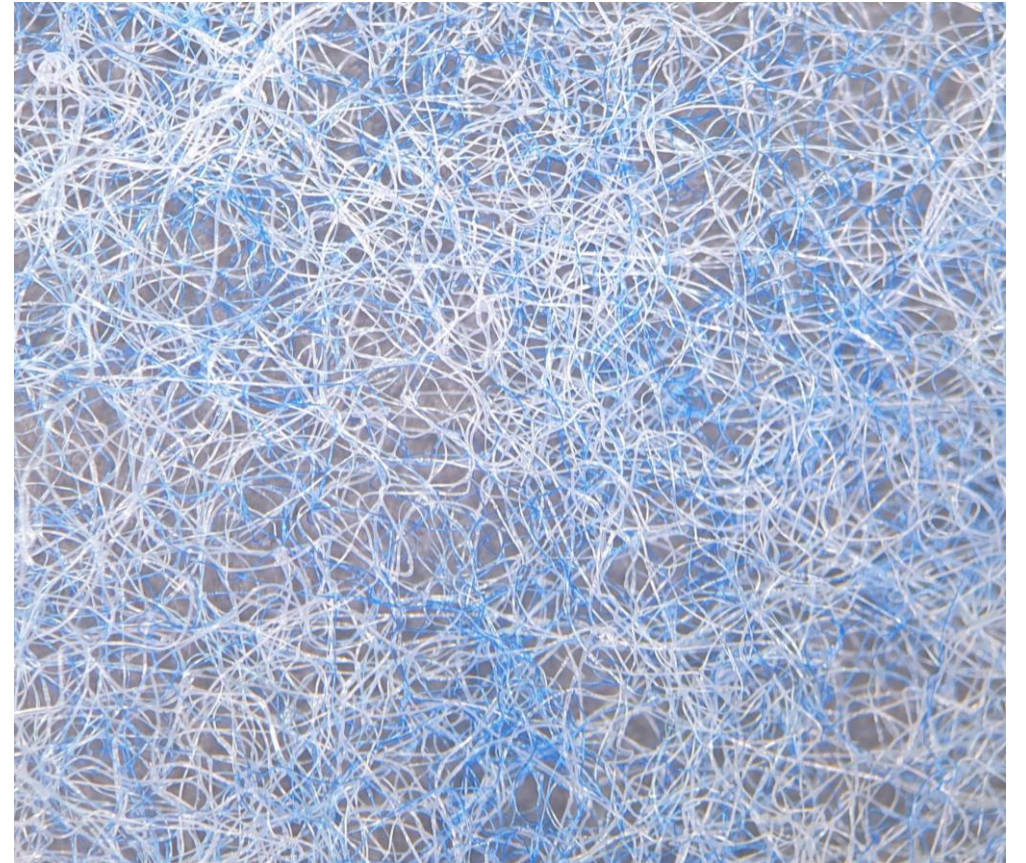
바퀴벌레



생쥐



벼룩



5. Other Functional Filters

- (1) Electrostatic nonwoven filter
- (2) Ammonia removal functional filter
- (3) Yellow Dust Protection Filter
- (4) Deodorization Reinforcement Filter

01

Assistance to the Performance of the Dust Efficiency of the HEPA Filter through the Dust Collection Function

Assistance of HEPA Filter Dust Collection Capability through Fine Dust Removal Function

02

Can be combined with functional materials

Combination of various functional materials and combined dust collection + functional effects

03

Electrostatic Nonwoven Performance Specification Table

종류	Basis Weight (g/m ²)	Efficiency (%)	Pressure Drop (Pa)	Remark
HS80P-G35	35	60 ↑	1.7 ↓	Non Flame-retardant - 축전 방지 - TSI 8130 - 유량 : 32L/PM - 입자 크기 : 0.3μm - 사용 입자 : NaCl
HS90P-G45	55	80 ↑	2.5 ↓	
HS70-G50	50	70 ↑	3.0 ↓	
HS80-G70	80	80 ↑	4.0 ↓	
HS90-G90	90	90 ↑	5.0 ↓	
HS95P-G120	120	95 ↑	6.0 ↓	
HS99P-G170	170	99 ↑	8.0 ↓	
HS99.5P-G210	210	99.5 ↑	12.0 ↓	

01

Ammonia gas removal

Ammonia removal, which is responsible for odor generation, such as toilets, kitchens, etc

02

Hazardous gas removal

Can serve as a synergistic filter with ammonia single gas

구분 (제품명/용도)	규격	측정 구분	용량 중량	Ammonia		Acetaldehyde		Acetic Acid		Formaldehyde		Toluene		Total Efficiency
				초기 30분후	효율 30분후	초기 30분후	효율 30분후	초기 30분후	효율 30분후	초기 30분후	효율 30분후			
1	알코시어 제거 필터판* 알코시어 부직포	264*384*10T	분할 측정	200g	13.4 -	100.0% -	11.9 3.0	82.4% 63	12.9% 1.3	12.8 -	90.1% -	100 100.0%	93.1%	
2	알코시어 부직포	264*384*10T	측정	5g	15.0 -	100.0% -	- -	- -	- -	1 -	- -	- -	100.0%	
3	기존 활성탄 필터 (5대/가스)	264*384*10T	측정	200g	10.8 1.4	87.0% 3.0	11.3 3.0	71.3% 0.4	11.3 1.2	11.0 -	86.1% -	100 100.0%	89.2%	

01

Removal of harmful gases from yellow dust

Removing harmful NOx, SOx from the inside of yellow dust

02

Dust removal of more than 10 μm

Removing various harmful dust and harmful substances from the human body

01

Hazardous gases can be removed

Deodorizing effect by processing activated carbon on nonwoven filter

02

Deodorization Synergies

Synergy of deodorization efficiency due to deodorization functionality

유해가스 제거율(5대 가스 기준)

정청화 능력(m³/min)

5. Other Functional Filters

(5) Antimicrobial Functional Filter (6) Odor enhancement filter

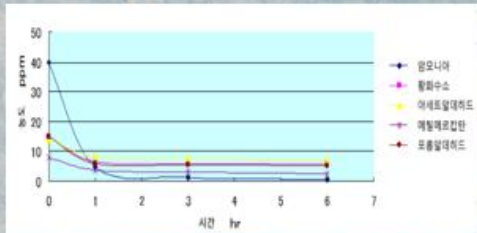
01 Antibacterial/antiviral functions
 Added performance of antibacterial/antivirus via ZnP and Cu ions
 Retention of Antibacterial Accredited Test Report
 Staphylococcus aureus 2 and E. coli 99.9% killed

01. 항균도 (KS K 0693 : 2016) : 세균수/mL, 정균감소율 %

		BLANK	#1
균주 1	접종직후 균수	2.3 x 10 ⁴	-
	18 시간 후 균수	8.7 x 10 ⁶	< 10
	정균감소율	-	99.9
균주 2	접종직후 균수	1.8 x 10 ⁴	-
	18 시간 후 균수	2.2 x 10 ⁷	< 10
	정균감소율	-	99.9
균주 3	접종직후 균수	2.2 x 10 ⁴	-
	18 시간 후 균수	1.2 x 10 ⁷	< 10
	정균감소율	-	99.9

02 Conformity determination of emission conformity test criteria
 Completion of issuance of a safety standard compliance report certificate

01 Odor removal function
 Smell from life (sweat smell, pet smell, cigarettes, elimination of gas, which is a cause of urine, exhaust, etc.)



Odor removal test (Japan Food Analysis Center)

(7) Pet Care Filter

01 Preprocessing function
 Pet hair / Large dust / Blocks inflow into the pre-filter and air purifier through primary removal

02 Odor removal function
 It has the ability to remove methyl mercaptan/ammonia, etc., which is the cause of pet odor (defecation, saliva odor, etc.)

(8) Pre Filter



- **Basic specification**
 - Material : PET(Polyester)
 - Form : Non-woven Fabric
 - Operating temperature: 80°C or lower
 - Surface speed (wind speed): 1.0 m/s (Recommended specification)
- **Purpose**
 - For pretreatment of air purifiers, air conditioners, clean rooms, etc
- **Functional processing**
 - Zinco, antiallergen, nanosilver, catechin, chitosan, antiviral noneral, mosquito repellent, etc

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Beautiful people make it for people and the environment

Thank you so much

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