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Innovative
Window screen type air purifying system

ISO NANO
DUST-PROOF
FILTER

ISO
NANO
DUST-PROOF
FILTER

POINT 05



High product reliability

With the SUPER E0 graded eco-friendly material, this product improves reliability. With antibacterial and antifungal functions, it lowers product pollution.

Test Report about Supplier's Declaration of Conformity by KCL

Passed the test of endocrine disruptors including 8 main heavy metals and phthalate

구분	항목명	시험방법	시험결과	기준치	비고
1. 중금속	납	100ppm 이하	100ppm 이하	100ppm 이하	합격
	카드뮴	10ppm 이하	10ppm 이하	10ppm 이하	합격
	수은	10ppm 이하	10ppm 이하	10ppm 이하	합격
	크롬	10ppm 이하	10ppm 이하	10ppm 이하	합격
	비소	10ppm 이하	10ppm 이하	10ppm 이하	합격
	망간	10ppm 이하	10ppm 이하	10ppm 이하	합격
	구리	10ppm 이하	10ppm 이하	10ppm 이하	합격
	코발트	10ppm 이하	10ppm 이하	10ppm 이하	합격
2. 내분비계 장애물질	DEHP	100ppm 이하	100ppm 이하	100ppm 이하	합격
	BBP	100ppm 이하	100ppm 이하	100ppm 이하	합격



Application cases of ISO nano dust-proof filter

Apartment/ office/ shopping district





NEWS

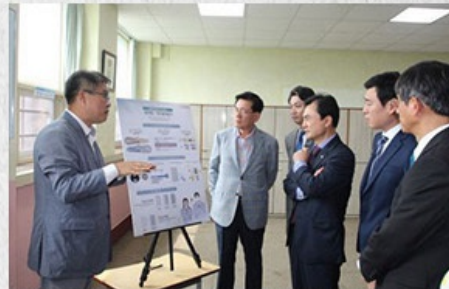
Hanwha L&C donated fine dust reducing screens to Kyunghee middle school.

For the first time as a company producing windows and doors, Hanwha L&C installed 'Meonjjiam' for free in educational institutions for improving children's learning environment.

Hanwha L&C, a total interior solution company (CEO Han Young Ho) conducted an event to donate 'Meonjjiam', fine dust reducing screen to Kyunghee middle school located in Dongdaemungu, Seoul on 30th. For the first time as a company producing windows and doors, Hanwha L&C donated for free 144 sets of fine dust reducing screens for improving children's learning environment to educational institutions.

'Meonjjiam' means 'settling down dusts' and it is a hybrid type 'dust-proof screen' which increases particle collection ratio by attaching numerous Nano Fibers between the screens. Compared with the fine dust blocking of 30% of general screens, 'Meonjjiam' prevents as much as 90% of toxic substances from coming indoors. In particular, the dust-proof screen which is the core technology of Meonjjiam was developed through a joint research with ISO Inc, a venture company specialized in new materials and it captures even fine particulate matters which are more lethal to health. This dust-proof screen is the only one which received the certificate (FITI Testing & Research Institute) and its fine dust capturing ratio is about 87.5%.

This donation event was attended by director Kim Kyung Pil of window business department and executives of Hanwha L&C, school related persons, representative Ahn Kyu Baek of a local district, Yoo Deok Yeol the head of Dongdaemun-gu, and many other representatives of Seoul. Director Kim Kyung Pil of window business department of Hanwha L&C said, "I hope that 'Meonjjiam' would play even a small role in improving students' learning environment. This is not a one-time event, but I will continue to develop fine dust reducing products suitable for school environment by considering opinions of students and teachers.

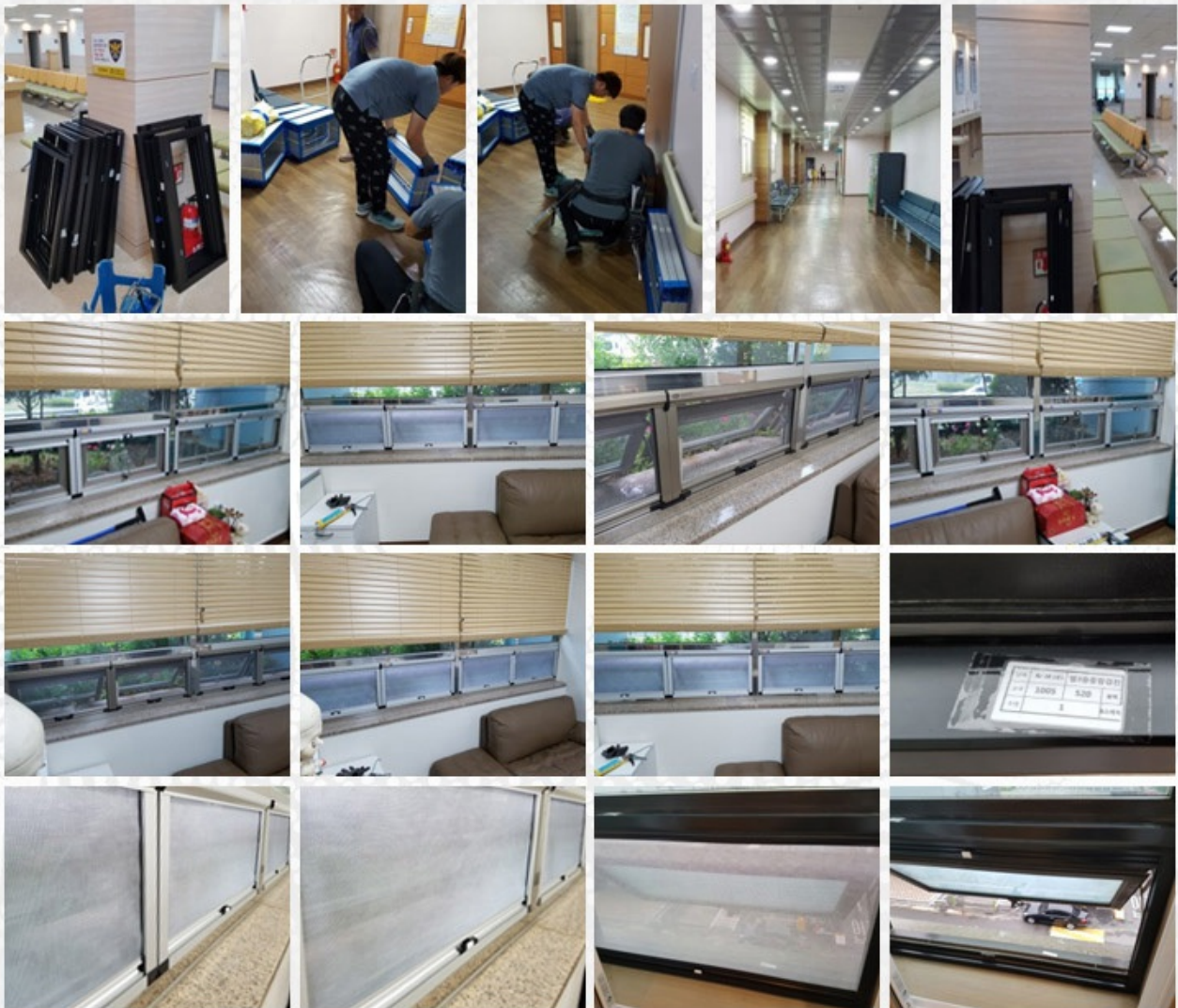


At the donation event of Meonjjiam at Kyunghee middle school, director Kim Kyung Pil is explaining about the product to related persons. (source : Hanwha L&C)



Major participants at the donation event of Meonjjiam at Kyunghee middle school are taking photos. (from the left, director Kim Kyung Pil of Hanwha L&C, Yoo Deok Yeol the head of Dongdaemun-gu, representative An Kyu Taek, vice-principal Nam Kwang Hyun of Kyunghee middle school)

Hospital/ public facilities



‘ ISO nano dust-proof filter ’ exported to the world



ISO NANO DUST-PROOF filter that guarantees safety and excellence through domestic and foreign certificates obtained after strict TESTINGS

Data for verifying functions of the product

Test report - Fine Dust Collection Rate

Two test reports from Fitei showing Fine Dust Collection Rate. The first report shows a result of 87.5% for 'TEST DUS: NORMAL 0-3 MICRON ARIZONA TEST DUST'. The second report shows a result of 98.1%.

Test Report - Pollen Blocking Rate

Test report from Kaken Test Center showing Pollen Blocking Rate with a result of 99.8%.

Test report - Air Permeability

Test report from Fitei showing Air Permeability with a result of 427.6%.

Test report - Rubbing Fastness

Test report from Fitei showing Rubbing Fastness with a result of 4-5.

Test report - Daylight Fastness

Test report from Fitei showing Daylight Fastness with a result of 6.

Test report - Air Permeability

Test report from Fitei showing Air Permeability with a result of 411.9%.

Test report - Formaldehyde Emissivity

Test report from Fitei showing Formaldehyde Emissivity with a result of 0.1 under 1.

Supplier Conformity Test Report Card

Supplier Conformity Test Report Card showing various test results in a table format.

Test report - UV Black Rate

Test report from Fitei showing UV Black Rate.

Test report - Visible Light Blocking Rate

Test report from Fitei showing Visible Light Blocking Rate.

Test report - Visible Light Blocking Rate

Test report from Fitei showing Visible Light Blocking Rate with a detailed data table.

Preparations

ISO nano dust-proof filter Windowsill Net roller Cutter Gasket (Wire mold)

01 / Preparing windowsill after removing a window



After removing a gasket(wire mold), prepare the used windowsill as seen in the photo.
 ※ Use of a new gasket(wire mold) is recommended.

ISO nano dust-proof filter sash / 02



- ① Spread ISO nano dust-proof filter on a sash
 ※ Make the shiny surface of hexagon shape to face indoors.
- ② Small-sized sash is properly cut as there are extra parts.

03 / Insert a gasket(wire mold) with a net roller



- ① Use a net roller to insert a gasket(wire mold) in the corner of the sash while leaving extra part of 5cm.
- ② Insert the extra part of 5cm in the opposite direction of the gasket (wire mold) by circling the corner.
- ③ Hold the gasket(wire mold) to ensure that it is on the furrow of the sash and push it with the net roller.
- ④ Be careful about the kind of the net roller and the roller insertion location (see instructions of a net roller)
 ※ Right-handers work clockwise, and left-handers work counterclockwise.



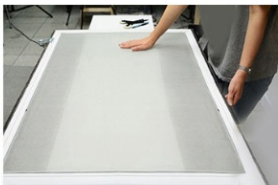
- ⑤ When it circles while being inserted in the window sash, the work is finished.
 Remaining gasket(wire mold) is cut to fit the furrow length.

Completion of inserting gaskets and / or removal of remaining ISO nano dust-proof / 04



Completing the gasket(wire mold) insertion and removing remaining ISO nano dust-proof filter by cutting.
 ※ Be careful to ensure that the surface of the filter is not damaged when cutting.

05 / Completion of exchanging



When installed in the existing windowsill, ISO nano dust-proof filter installation is completed.

Q & A

We will answer to your questions
about ISO nano dust-proof filter.

ISO NANO DUST-PROOF FILTER

Q How is <ISO nano dust-proof filter> is different from general screens?

A <ISO nano dust-proof filter> is a high-functioning dust-proof filter which makes natural ventilation possible and blocks fine dusts/fine particulate matters by as much as 98.1%. Therefore, it has the basic screen function like general screens and tight net screens, prevents fine dusts by 87.5% in the range of fine particulate matters from PM 0.0 to PM3.0, and also has functions such as preventing rainwater inflow,

Q What are the differences of <ISO nano dust-proof filter> from other dust-proof screens on sale in the markets?

A <ISO nano dust-proof filter> is the first dust-proof filter product developed as a window type air purifying system in Korea. It is the only product supplied to Korea's large companies such as LG Hausys, Hanwha L&C, Aluko after passing internal quality standards and approval/verification, and it is being exported to the countries around the world including China.
<ISO nano dust-proof filter> is the one and only product which has durability, safety, and fine particulate matters blocking function which are inimitable by other similar products.

Q Does the installation of <ISO nano dust-proof filter> make the feeling indoors stuffy?

A <ISO nano dust-proof filter> has the air penetration rate of up to 61% compared with existing screens, and wind may be felt less. It does not mean the actual amount of air passing through it decreases, but the strength of wind felt is reduced as the air is distributed while passing the nano web. This product has the basic trait of high-functioning filter and secures the air penetration function of the highest level among domestic products through it's the smooth air ventilation function along with great function of blocking fine dusts.

Q How often is <ISO nano dust-proof filter> needed to be exchanged?

A <ISO nano dust-proof filter> can function for as many as 2 years through regular maintenance such as water cleansing as it does not have consumable filter just for one-time use. The dusts piled up in the filter can be regularly removed through pneumatic sprayer placed at home and it has the function of self-cleansing at the time of raining. After cleansing, its function is restored by more than 95%.

Q Isn't the DIY installation difficult?

A <ISO nano dust-proof filter> is easily installed by anyone through the installation method of the existing screens as it has the similar shape of general screens.



“ISO nano dust-proof filter is the only product supplied after passing internal quality standards of large companies such as **LG Hausys**, **Hanwha L&C** and **Aluko(Dongyang Gangchul)**.”

ISO NANO DUST-PROOF FILTER is a technology-intensive, high-functional, and high-tech product based on three original patented technologies for nano dust-proof filter



[Patent no. 10-1668395]



[Patent no. 10-1884365]



[Patent no. 10-1126066]

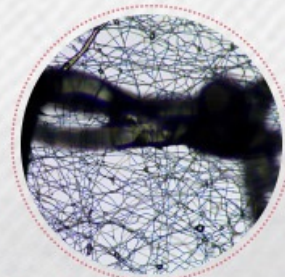
Q What is **ISO NANO DUST-PROOF FILTER?**

A &

This world's 1st & best **window-type air cleaning system** was developed with the combination of Pre-Filter that supports natural air flow and ventilation and medium-filter that **can block 98.1%** of yellow dust, pollen, **fine dust**, and even **ultra-fine dust** with **PM2.5**



40 x enlarged photo by microscope



100 x enlarged photo by microscope



ISO nano dust-proof filter is

easily installed in houses, schools, public facilities, and industrial fields in place of existing screens, and has an excellent filtering function which instantly blocs external pollutants after installation.



Fine dust which is a category 1 carcinogen designated by WHO (World Health Organization) is as dangerous as smoking two packs of cigarettes (40 cigarettes), say experts regarding the danger of fine dusts.

Korea's fine dusts is twice the level of major cities of OECD countries, and Korea came in 173 among 180 countries in terms of air quality according to a 2016 survey. OECD pointed out the serious air pollution problem and predicted that Korea would have the highest early death rate among OECD member states if Korea fails to properly respond to it.

Comparison of fine dust sizes

Particle Size	Example
Less than 2.5 μm	fine particulate matter
10 μm	fine dust, yellow dust
50~70 μm	hair

Category 1 carcinogen
fine particulate matter of PM 2.5

Particle size of less than 2.5 μm , one thirtieth of a hair, As it can infiltrate not only into respiratory organs, but also into skin, causing hear diseases and respiratory diseases.

Indoor air 57%

Indoor pollution caused by fine dusts is 2~5 times that of outside

The number of premature deaths because of fine dusts

3,200,000	23,000
(2010, World)	(2010, Korea)

Among toxic substances which come into our body, 57% accounts for indoor air.

In our daily life, the time we spend in houses or work places is more than 90%. The indoor where windows are closed when fine dusts and toxic substances which come indoors stay has 2~5 times more pollutants compared with outside.

In our body which breathes more than 11,000 liters per day, toxic substances accumulate.

Air purifier alone cannot improve the air quality.
Air ventilation is absolutely needed.

ISO nano dust-proof filter which makes natural ventilation possible is the only alternative for improving indoor air quality.

The moment you close a window,
the indoor place is full of harmful air.

ISO nano dust-proof filter protects the indoor air

The importance of ventilation

'ISO nano dust-proof filter' makes natural ventilation and air ventilation possible.
It not only prevents fine dusts and pollutants of the outside from coming indoors,
but also completely purifies indoor air polluted by carbon dioxide,
combustion air from cooking, radon, and other daily dusts accumulated indoors.

video

Characteristics of ISO nano dust-proof filter

POINT 01



YELLOW DUST, POLLEN, FINE DUST, ULTRA FINE PARTICLE BLOCK

(UNIFORM DUST COLLECTION EFFICIENCY IN ALL AREAS)

With the dual collection effect (physical & electrostatic collection) our product brings about higher dust collection efficiency than our competitors, And shows even collection efficiency in all areas.

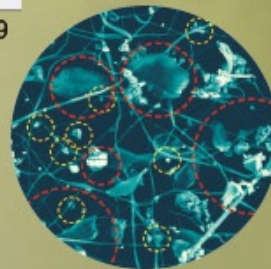


Collection Efficiency (%)

NOMINAL 0-3 MICRON ARIZONA TEST DUST	PM 2.5 Average particle size of dusts	Pollen Lycopodium Spore (APPIE Standard Powder)	A2 FINE TEST DUST (ISO 12103-1)
87.5%	98.1%	99.8%	90.1%

Test method : ASHRAE STANDARD 52.1, Gravimetric Method / HG/T 20698-2009
KAKEN test method for pollen

- Test conditions :
- Ⓐ Test wind velocity 1.0 m/s.
 - Ⓑ Final pressure drop 76mmAq.
 - Ⓒ Test dust (4 types)
 - NOMINAL 0-3 MICRON ARIZONA TEST DUST
 - Average PM2.5 particles - Lycopodium Spore
 - ISO 12103-1, A2 ULTRAFINE TEST DUST



-  Dust captured by electrostatic collection mechanism
-  Dust captured by physical collection mechanism

POINT 02



Natural ventilation and natural air flow

(implementation of high ventilation and high collection rate)

With the optimal multi-layer nano-web structure and electrostatic effect, this product has a higher collection rate than other competitive insect nets and 61% air permeability ($700\text{cm}^3/\text{cm}^2/\text{s}$) compared to them.



POINT 03



Excellent product durability

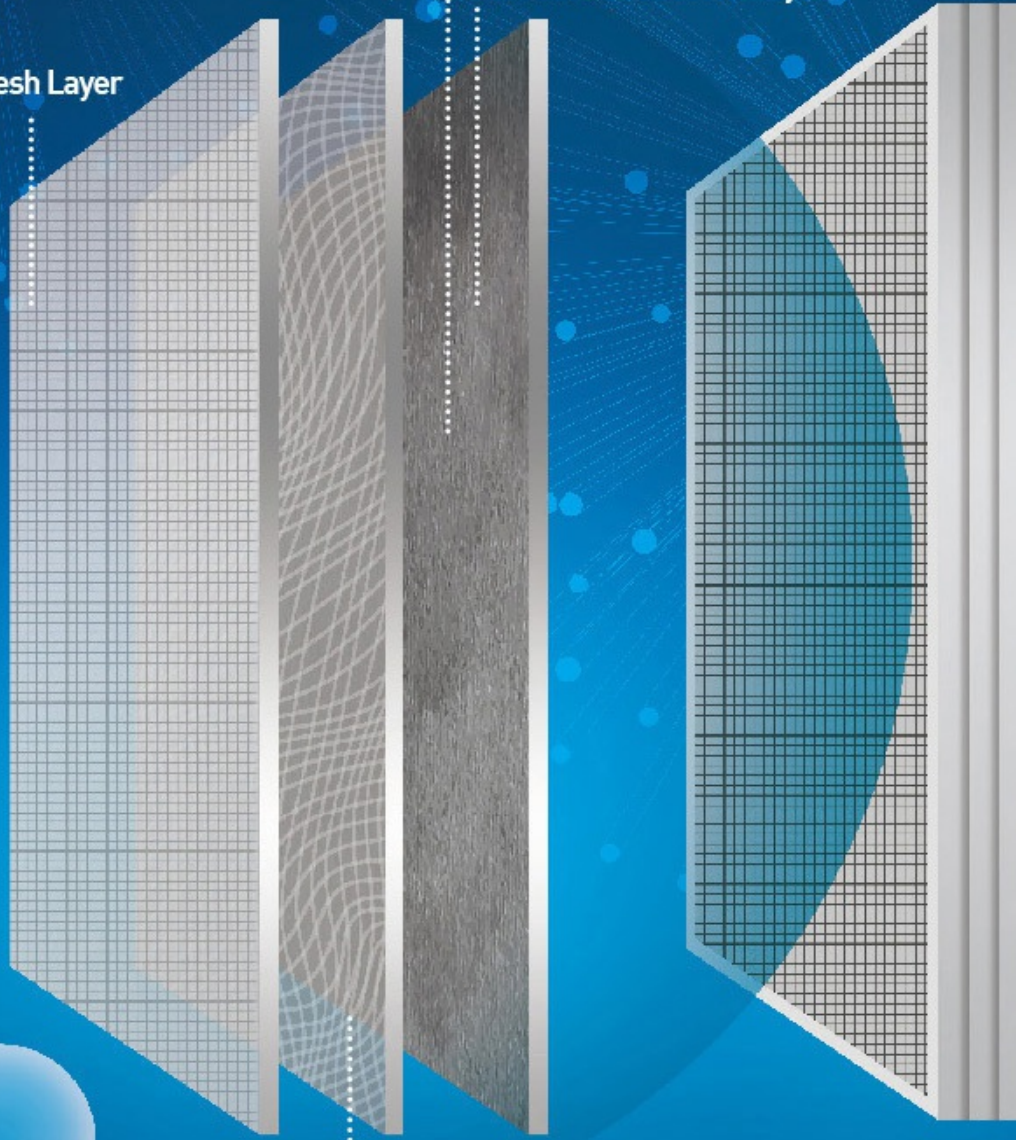
With the multi-layered structure and advanced technology, this product guarantees more than one year of use and secures enough durability not to damage nano fiber in water washing.

Shield Mesh Layer

Bridge Fiber Layer

Collector (Base Mesh Layer)

Nano Fiber Layer



POINT 04



UV ray block
Rainwater block

Natural cleaning with rainwater
Simple cleaning with a sprayer

