

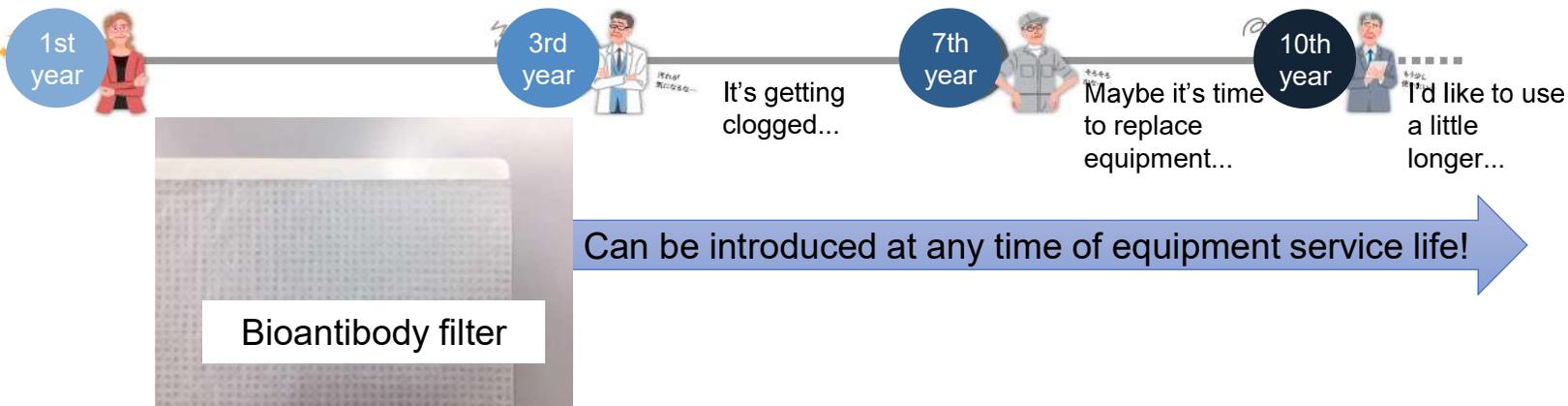


# Bioantibody Filter

## Round flow type

### ■ What is a bioantibody filter?

It quickly suppresses the influenza virus adsorbed on it. It is recommended to customers who are concerned about preventing virus group infection and improving IAQ regardless how old the equipment is.



### ■ 3 major features

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**① Suppresses 99.99% of influenza virus within a minute**  
Operating with bioantibody filter set inside absorption grill, **99.99%** of influenza virus on the filter is suppressed **within a minute.**
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**② Proven effective for various types of influenza virus**  
In addition to **virus types A and B**, which often cause an outbreak, it has been proven effective for virulent **novel/bird influenza virus.**
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**③ Can be used without worry**  
Instead of a physical or chemical technique, natural immune reaction process is reproduced on the filter. Since **no chemical etc. is used**, it can be used safely and securely where children and elderly people are around.

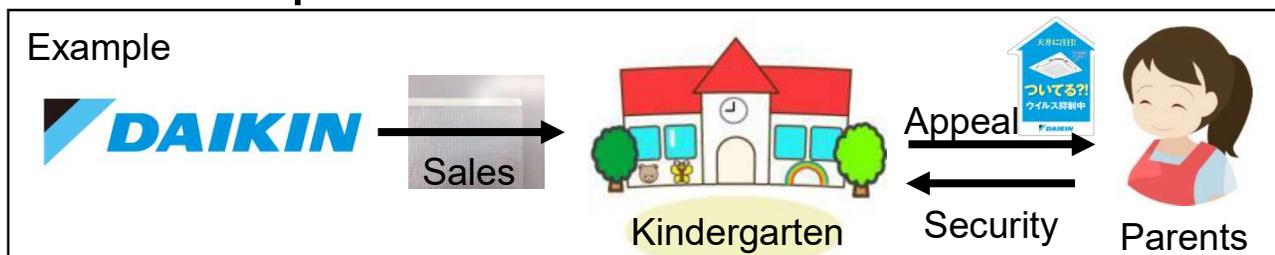
## Advantages of installation

### ① Preventive measure against the flu

**Addition** to ordinary measures such as masks, handwashing, gargling, etc. Just installing the filter in your air conditioner will be another way for measure against the flu.

### ② Visualize / publicize measures

For customers' customers (B to B to C) to be able to use the building/facilities with security, **publicize that the facilities are protected against influenza infection for improved facilities value.**



## Customers voices (industry-specific needs)

Industry	Issues / comment
University	<ul style="list-style-type: none"> <li>Preventive measures are more necessary in rooms for students rather than teachers and staff.</li> <li><b>6th-year students come to school to prepare themselves for national examinations during long vacations</b>, one of whose major concerns is to not get infected with the flu.</li> </ul>
Geriatric health services facilities	<ul style="list-style-type: none"> <li>With an outbreak of influenza, since <b>day service is closed and new tenants have to be rejected</b>, the facilities receive serious damage.</li> <li>Bioantibody-equipped air conditioners can be used as a preventive measure for elderly people who can only receive limited medication and vaccine.</li> </ul>
Office	<ul style="list-style-type: none"> <li>Every year, some workers take a sick leave catching the flu. <b>Investing for the filter is not expensive as compared to some workers taking a sick leave as long as a week.</b></li> </ul>
Hospital	<ul style="list-style-type: none"> <li>In-hospital infection at reception or in waiting room need to be prevented.</li> </ul>

## Product numbers, compatible models, dimensions

Product name	Product number	Compatible model	Filter size (mm)	Quantity (filters)	Weight (g)
Bioantibody filter for round flow type	2515801	Round flow, sensing flow	W555×D530×H0.2	1	17.6

## Filter performance

Product name	Airflow reduction rate (%)	Rated airflow speed (m/s)	Initial pressure loss (pa)	Final pressure loss (pa)	Collection efficiency (%)
Round flow	-4%	2.5	21	45	57.5

## Period of use: Approx. 3 months per filter

- In use: Replace once every few months in an ordinary office (depending on use environment).
- In storage: Effectiveness lasts for 1 year when unpacked, and 5 years when packed.

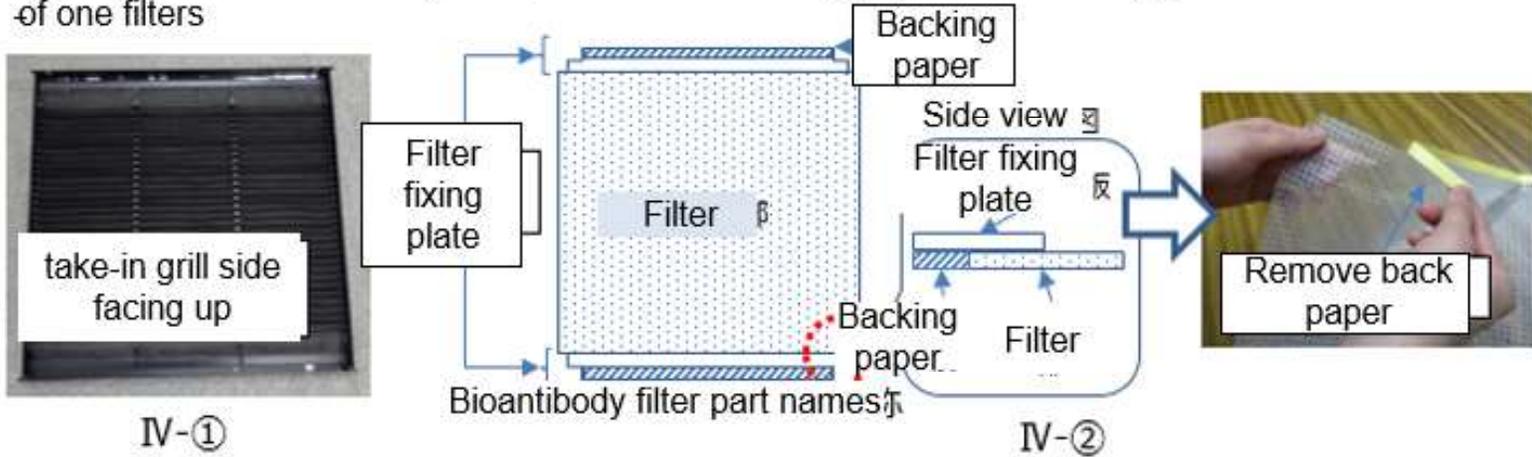
\*Unpacked means the product is exposed to sunlight.

The effectiveness of unpacked product lasts for 5 years if repacked in the packing case stored without exposure to direct sunlight.

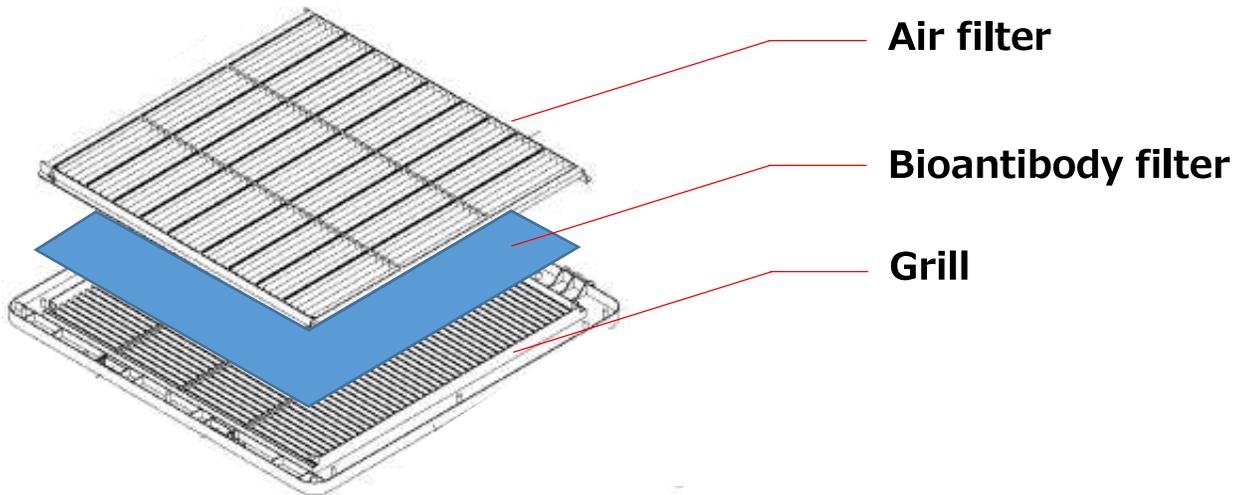
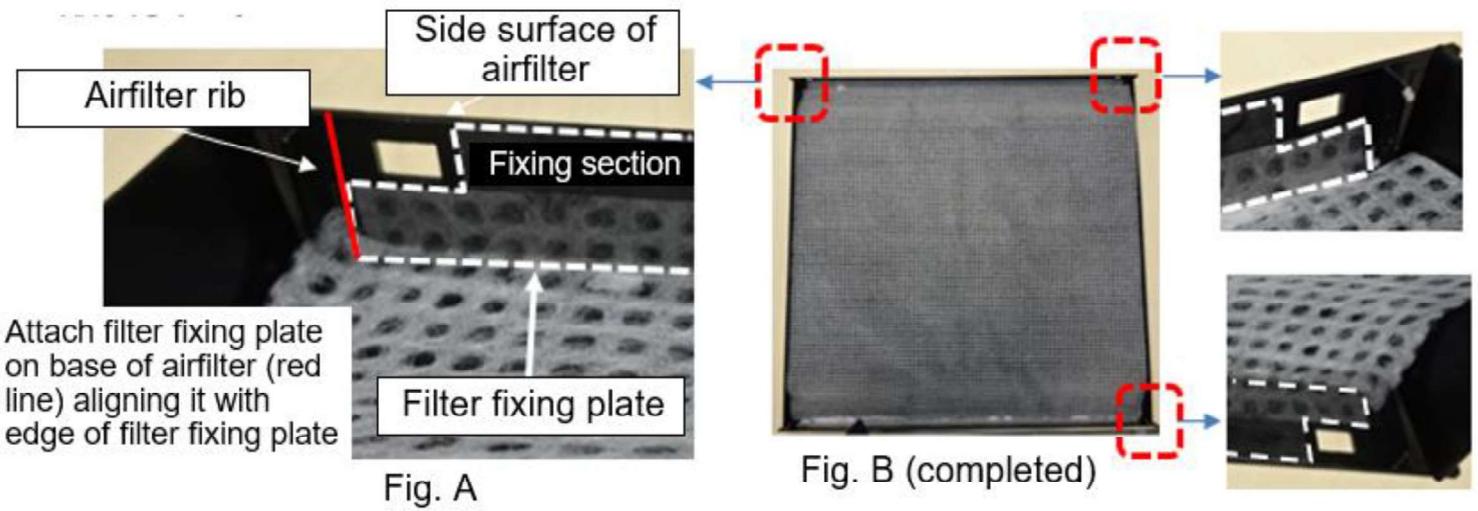
\*In actual use, in which dust and smudge adhere on the filter, we recommend replacement once every 3 months. However, the frequency of replacement may vary depending on the environment where the filter is used.

## ■ Bioantibody filter (round flow) installation manual

- ① Place airfilter with take-in grill side facing up  
\* Attach bioantibody filter on take-in grill side of airfilter
- ② Spread 4-folded bioantibody filter, and remove backing paper on filter fixing plate of one filters



- ③ Referencing Fig. 4, attach filter fixing plate aligning it with side of airfilter  
\* Use Fig. B (completed figure) for reference, too
- ④ Remove back paper on the other filter fixing plate, and attach it on side of the other airfilter in the same manner



### Care during use

- The filter is designed to be replaced once in about 2-3 months, but it may vary depending on the environment where it is used. Replacement should take place more frequently if dirtiness is conspicuous  
\* Use with dirty filter may cause degradation in filter performance and cooling/heating capacity
- The attached filter reduces airflow slightly. You may want to select airflow higher than usual using the remote controller

## FAQ

Question	Answer
The filter has darkened. Is it still effective?	It is smudge and dust adherence, and the filter effectiveness is same. If it bothers you, we recommend you replace it with a new one.
Is there a recommended timing to replace filters?	Once every 2-3 months in an ordinary office although it depends on the usage environment. The filter stays effective for a year or longer.
Is it possible to clean a dirty filter?	It is basically non-reusable, but it is possible to clean a dirty filter using a brush etc. The very thin filter need to be handled carefully.
Is there any problem storing an unused filter until the following year?	No. Be sure to store it in a packaging case avoiding it being exposed to sunlight.
Can I cut the filter into a preferred size?	Yes, you can. Be careful when cutting filters for round flow because they have different notches depending on the model.
What specific viruses does the filter suppress?	Evaluation tests have proven filter effectiveness for 3 types of influenza viruses: A, B, and novel (bird).
Is the filter really effective in suppressing influenza viruses?	We do not guarantee effectiveness for the entire space. 99.99% of the viruses adhered on the filter are suppressed.
Is handwashing, gargling, vaccine, or wearing mask more effective?	All of these are extremely effective measures against influenza infection. They being individual-based measures are limited as measures against group infection. The filter is a product that supports customers' health by masking air conditioners, which largely affect IAQ.
Doesn't pressure loss drop?	The initial pressure loss is 21 pa, and the final pressure loss 45 pa. Reference: Lower than Kirei prefilter (24pa, 50pa)
Is the airflow reduced?	The reduction rate is 2-5% in ceiling mounted type, and 11-13% in ceiling-suspended. Reference: Lower than Kirei prefilter (15-22%)
Is it possible to use Kirei prefilter at the same time?	Yes, but only when settings can be made to increase airflow and detailed maintenance is possible because simultaneous use tends to reduce airflow. (Cleaning Kirei prefilter, replacing bioantibody filters, etc.)
Is it alright to distribute the contents of the sales & registration manuals to customers?	It is only possible to distribute fliers to customers. From the viewpoint of the Pharmaceutical Affairs Act and the Act against Unjustifiable Premiums and Misleading Representations, the contents of the sales & registration manuals should be explained verbally.
Why are the virus names clarified on the flier?	Because the Pharmaceutical Affairs Act and the Act against Unjustifiable Premiums and Misleading Representations prohibit providing the names of specific viruses. However, since the effectiveness of the filter has been proven through evaluation testing, explain to customers orally.
Is the effective against corona virus (COVID-19) ?	Currently, we are not verifying coronavirus. *Please do not mention that it is effective or ineffective.
Is there a verification result?	Please do not present the detailed verification results to the customer. Only the leaflet content can be presented.

## ■ Superior technology!

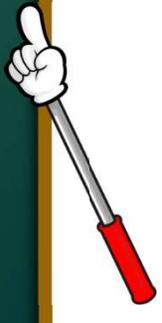
Various technologies are aggregated through joint development

Daikin is responsible for the bioantibody filter development concept, testing the effectiveness of prototype filters, and developing optimal material.

**Antibodies are extremely expensive**  
GHEN Corporation's chicken egg production technology enables us to use low-price chicken egg antibody (IgY = immune globulin Y).



**Immune reaction only takes place where moisture is present**  
The filter material, with nano-size holes, takes sufficient moisture from the air to cause immune reaction. Toyobo has the patent.



## ■ 7 joint developers

Waseda Univ., NIID, TOYOBO, GHEN Corp., LSL, PFI, DAIKIN



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株式会社ゲンコーポレーション

## ■ Evaluation test

### Evaluation results of antiviral effectiveness

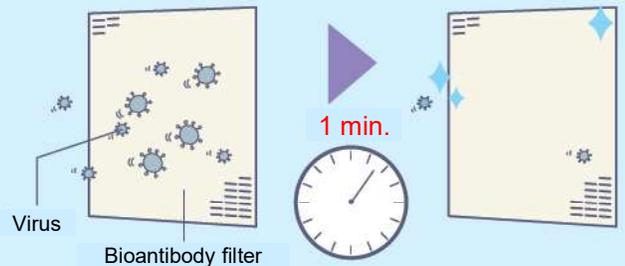
#### Captures and suppresses

<b>Results</b>	99.99% of 3 specific viruses were found to lose their infectiousness within a minute when they come in contact with the bioantibody.
<b>Method</b>	1. Mix the bioantibody with virus solution of 3 different concentrations. 2. Collect the virus solution after certain time and measure the antigenicity of the virus using the ELISA method.

Testing institute: Waseda University Faculty of Science and Engineering, GHEN Corporation

When the virus comes in contact with the bioantibody...

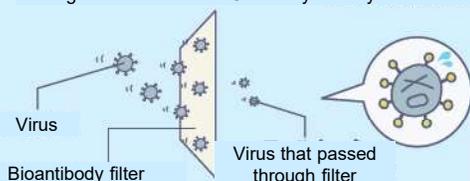
99.99% will lose their infectiousness



### Evaluation results of antiviral effectiveness suppresses even through-passing virus

<b>Results</b>	99.99% of 3 particular viruses were found to lose their proliferation potential when they come in contact with the bioantibody.
<b>Method</b>	1. Spray the virus solution on the bioantibody filter for 3 minutes. 2. Collect the virus that passed through the filter in the solution, dilute by 10 times, and inoculate and subculture the diluted solution on the chorioallantois of chicken egg. 3. Check for virus presence in the chorioallantois liquid of chicken egg using the hemagglutination method.

Testing institute: Waseda University Faculty of Science and Engineering, GHEN Corporation

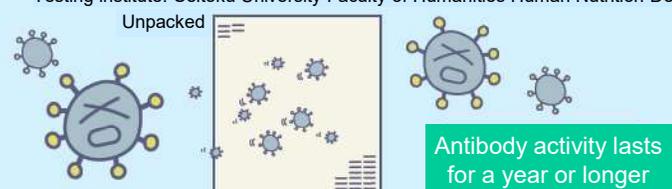


99.99% will lose their proliferation potential

### Proving bioantibody is effective for a year

<b>Results</b>	With bioantibody filter unpacked, antibody activity was found to last for a year or longer.
<b>Method</b>	1. Store unpacked bioantibody filter under room temperature without exposure to light. 2. Measure reactivity against viral antigen once every month using the ELISA method.

Testing institute: Seitoku University Faculty of Humanities Human Nutrition Dept.



## Reference

### **10 items to prevent infection measures in the field**

- 1. Wear a mask**
- 2. Wash your hands frequently**
- 3. Gargle frequently**
- 4. Ventilate frequently**
- 5. Washing work clothes and gloves**
- 6. Daily body temperature measurement**
- 7. Health management**
- 8. Sterilization of tools**
- 9. Sterilization of service car**
- 10. Consult before going to the infection site**