

A horizontal splash of clear blue water with many bubbles, set against a white background.

# Clean the air onboard

Ventilation / Antibacterial / Antiviral / Isolation

## Antivirus Products

# Total Solution Provider What DAIKIN offers

Daikin develops business with 3 pillars of "Air Conditioning," "Chemicals," and "Filter". To meet the various needs with different cultures and perspective in each region that makes people and place healthy and comfortable, Daikin is developing a wide variety of products and services in the global market. We, Daikin MR Engineering, who is in charge of the "Marine Business" offers a wide range of marine engineering and services that utilize Daikin's latest technology.



## Air Conditioning Business

A wide selection of air conditioning products and solutions are offered worldwide to provide customers with the precise answer to all their air conditioning needs.

### Improving Air Quality

## Chemicals Business

Fluorine compounds with distinctive characteristics such as fluoropolymers, fluoroelastomers, and fluorocarbon gas are developed to support society in a variety of fields.

## Filter Business

The filter business integrates Daikin technological expertise in air conditioning and chemicals to support air pollution control measures and hygiene management in the pharmaceutical and food industries.

### DAIKIN Global Expansion

Daikin has expanded its business with air conditioning, fluorochemicals, and filters as its pillars. To help advance the health and comfort of people and space, we develop an array of products and services for the global market to fully meet the diversity of needs arising from national and regional differences in culture and values.

### Sales Breakdown by Division (consolidated)

<b>Air Conditioning &amp; Refrigerator Business</b>	<b>90%</b>
Air conditioner / Refrigerator / Air purifier	
<b>Chemical Business</b>	<b>8%</b>
Fluorine chemical products	
<b>Filters/Oil Hydraulics/Defense Systems/ Electronics Business</b>	<b>2%</b>
Hydraulic machinery / Hydraulic equipment / Home oxygen therapy equipment	



(FY2018: April 1, 2018 through March 31, 2019)

## Oil Hydraulics Business

By applying energy-saving technologies cultivated in air conditioning, Daikin supports development for life and industry such as in the use of oil hydraulic pumps.

## Defense System Business

The high precision process technologies developed in the defense-related products support workplaces with high demands including those of medical facilities.

## Electronics Business

Leveraging its extensive knowledge of monozukuri, Daikin helps companies strengthen their competitiveness with IT solutions.

The world contains an infinite number of spaces. Daikin believes that the air in each of them should be ideally suited to the environment they support. Thus, we make it possible to manage the air – to control its temperature, humidity, flow and cleanliness. Exciting new research promises the ability to modulate sensory elements, such as light and smell. We will continue to identify opportunities and seek solutions as we strive to make world's spaces happier and more comfortable. At Daikin, we discover something new every day.



# For your cruise and crew work environment on board

## Safe and Comfortable Air

"Safe and Comfortable Air" on board is considered as an important factor after the COVID-19 pandemic. We, Daikin MR Engineering, coordinate various types of product developed by Daikin group companies to help customers resolve thorny issues related to air comfort and quality. As a company that provides solutions with air, we will continue to bring comfortable air and confidence to customers around the world while pursuing the new possibilities of air.

### ALL FRESH AIR CONDITIONER

Air conditioning by fresh air all the time.



### CLEAN UNITS



#### Negative Pressure Exhaust / Air Purifier Unit

- Negative pressure can be easily applied to the room, reducing the risk of secondary infection.

#### Folding Negative Pressure Booth

- Create a closed space with curtains to isolate infected people inside.
- When not in use, the curtain can be folded and stored.

### Streamer & HEPA Filter AIR PURIFIER



#### Streamer Air Purifier

- 99% suppression of airborne viruses, adherent viruses, airborne molds, and adherent bacteria.
  - Disinfect the dust collection filter and humidification filter with a streamer. Suppresses bacteria in humidifying water.
- \*NOTE: This is not a demonstration experiment of the actual use space, and is an effect of a closed test space of 25m<sup>3</sup> (17minutes for airborne virus and airborne fungi, 5 hours for adherent virus and adherent bacteria).

#### Commercial Air Purifier

- Easy installation and effective to approx. 97m<sup>2</sup>.
- Effective to large space with maximum 88m<sup>3</sup> with one unit.

#### Indoor Circulation Type Air Purifier

- Built-in high-performance HEPA filter reduces the risk of cleaning infection.

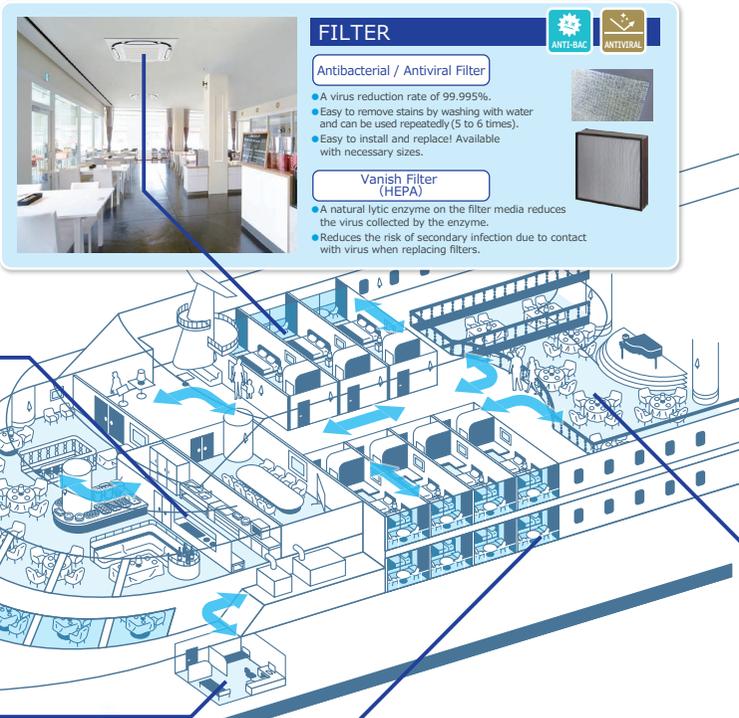
### FILTER

#### Antibacterial / Antiviral Filter

- A virus reduction rate of 99.995%.
- Easy to remove stains by washing with water and can be used repeatedly (5 to 6 times).
- Easy to install and replace! Available with necessary sizes.

#### Vanish Filter (HEPA)

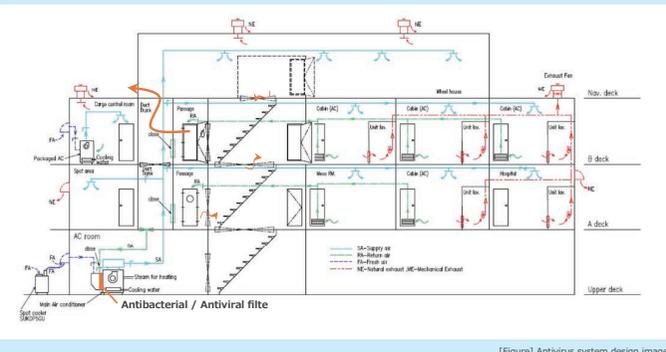
- A natural lytic enzyme on the filter media reduces the virus collected by the enzyme.
- Reduces the risk of secondary infection due to contact with virus when replacing filters.



### Antivirus System Design and Installation

Providing support for the design and construction of air conditioning and ventilation systems with optimal antivirus measures tailored to customer needs (both for general commercial ships and passenger ships).

※For details, please contact us for another references.



### Streamer STERILIZATION UNIT



#### Ceiling Mounted Cassette Type

- Less space and installation work in combination with air conditioner unit.
- Independent operation of sterilization unit is possible with ventilation mode.

#### Duct Connection

- Connectable to the heat exchangers.
- Connectable to products other than Daikin.

#### E.g. Duct Connection Type Air Conditioner

The sterilization unit can be operated independently even in the season when the air conditioner is not operated.

Category	Product	Main Features and Effects	Collection Efficiency (Average)	Virus Reduction Rate (※2)	Maintenance	Remarks
 All Fresh Air Conditioner	Water-cooled Packaged Air Conditioner	Air conditioning by taking in only the fresh air. Reduce the amount of circulation and reduce the risk of infection.	—	—	Air filter: Washable	3 to 8 HP
	Air-cooled Spot Air Conditioner		—	—		1 to 5 HP 20 HP
 Streamer	Sterilization Unit	Saving space and construction by incorporating Daikin indoor unit. Duct connection type makes it possible to connect to products other than Daikin.	— (※1)	99.9%	—	—
	Air Purifier	Additional installation is possible if there is installation space and power supply. The collection efficiency and reduction rate are relatively high.	Over 99.97% (@0.3µm)	99%以上 (5hrs.)	Pre-filter: Washable Dust filter: Replace after 10 years use Refer the equipment standard manual for others	—
 Filter	Vanish Filter (HEPA)	The collection efficiency and reduction rate are relatively high. Supports lytic enzyme on a general HEPA filter.	Over 99.97% (@0.3µm)	99.926% 6.86⇒2.3 (24hrs.)	Non-washable Filter replacement required	Initial:249Pa Final:498Pa (※3)
	Antibacterial / Antiviral Filter	Low pressure loss enables retrofitting to existing air conditioners. Washable environmentally and economically friendly design.	Appx.46% (※2)	99.995% (2hrs.)	Washable (5,6 times)	Initial:24Pa Final:50Pa (※3)
 Clean Units	Negative Pressure Exhaust / Air purifier unit	Space to isolate infected people can be easily secured. Additional installation is possible if there is installation space (and power supply).	Over 99.97% (@0.3µm)	99.926% (24hrs.) (※4)	Non-washable Filter replacement required	—
	Folding Negative Pressure Booth					



**Antivirus System Design and Installation**

**Engineering**

**We propose a dedicated air conditioning system that incorporates antivirus measures according to the needs of each ship.**

(※1) Varies depending on the product (※2) At the time of filter collection  
 (※3) At the rated air volume (※4) Measurement result as an example  
 Detailed specifications of all products are not described in this table.  
 Please contact us for details.

Contact

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Promotion of "Safe and Comfortable" voyage with qualified Daikin air.

**Get an original sticker!**

For ships with antibacterial & antiviral, antifungal, deodorant, and air cleaning measures with Daikin products.

An original sticker offered by Daikin MR Engineering helps to identify antivirus measures have been taken with the Daikin Group products to create safe and comfortable air for the passengers on board. The sticker is removal and attachable to the various parts of the ships.



[Size : 800×800mm]