

# HUMICON

## Desiccant Dehumidification

### A Solution for Ventilation & Air-Purification

By the 'Desiccant Dehumidification',  
getting rid of the humidity  
without temperature change

Creating fresh and comfort  
indoor Air quality by  
Desiccant Dehumidification

Innovative Desiccant Humidity  
control as well as ERV  
(Energy Recovery Ventilation)

Complete removal contaminants and  
fine dust. Excellent air purification  
with patented material



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Excellent Product



New Excellent  
Technology



New Excellent  
Product



Green Certification



Excellent Performance  
Certification

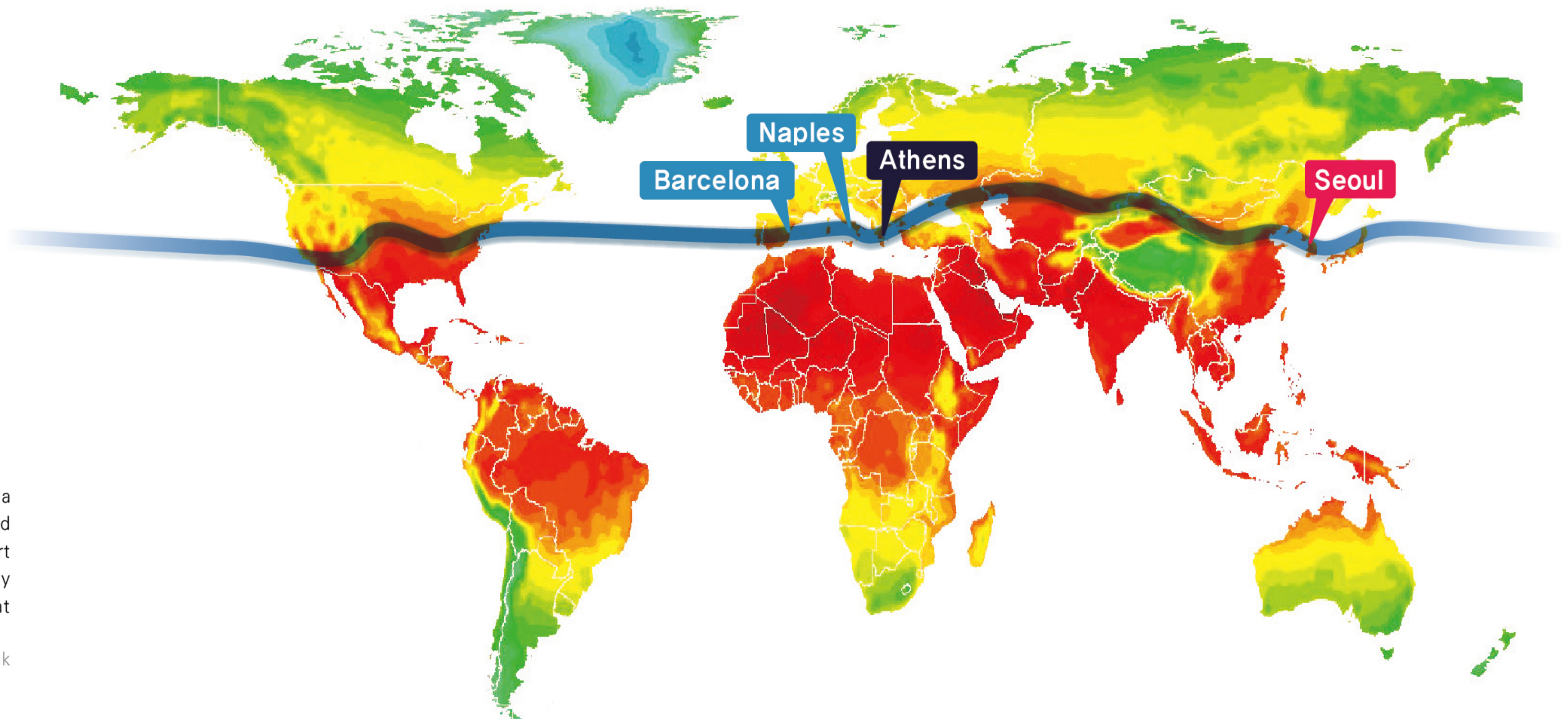


## Comfort or Discomfort, Why?

Humidity is the most significant factor for fresh and comfortable air

Humidity levels below 30% or above 80% indicate a hazardous environment. 40-70% is generally considered comfortable. In fact, the humidity that provides comfort varies with temperature, with the appropriate humidity being around 70% at 15°C, 60% at 18-20°C, 50% at 21-23°C, and 40% at 24°C or higher.

[Source] Hidak

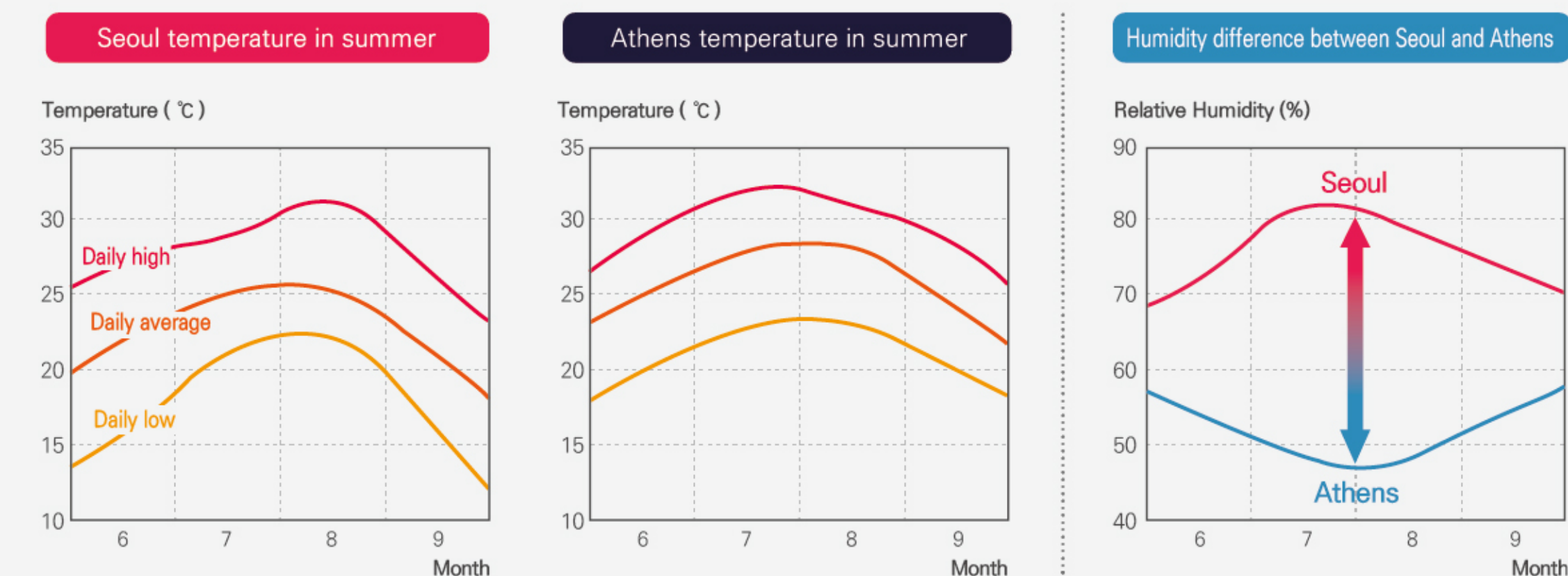


### Temperature? No, IT IS THE HUMIDITY.

What is the difference between Athens, Greece and Seoul, which are at similar latitudes and have similar summer temperatures? It's because of the 30% difference in humidity.

The Mediterranean is known as "heaven on Earth" for two reasons: it is warm and humid.

To make Korea's summers as pleasant as those of the Mediterranean, we must focus on humidity rather than temperature.



### Humidex

Humidity is the primary indicator of your comfortable feeling. As stated in below index, blue color represents the pleasant weather condition, while the red color represents the extremely unpleasant. With the high humidity, even in the low temperature, you can see that the discomfort index rises. On the other side, with the low humidity, even in the high temperature, it indicates the comfortable condition. Therefore, you can keep a comfortable temperature at 28°C or higher by lowering the humidity of the indoor air to 30-40%.

	30%	40%	50%	60%	70%	80%	90%	100%	Humidity (%)
36°C	40	44	47	50	54	57	60	63	
35°C	39	42	45	48	51	54	58	61	
34°C	37	40	43	46	49	52	55	58	
33°C	36	39	41	44	47	50	53	55	
32°C	34	37	40	42	45	48	50	53	
31°C	33	35	38	40	43	45	48	50	
30°C	32	34	36	39	41	43	46	48	
29°C	30	32	35	37	39	41	43	46	
28°C	29	31	33	35	37	39	41	43	
27°C	27	29	31	33	35	37	39	41	
26°C	26	28	30	32	34	35	37	39	
25°C	25	27	28	30	32	34	35	37	
24°C	24	25	27	28	30	32	33	35	

Risk of death

Serious risk: stop all physical activities

Discomfort: Restrict physical activities

No discomfort

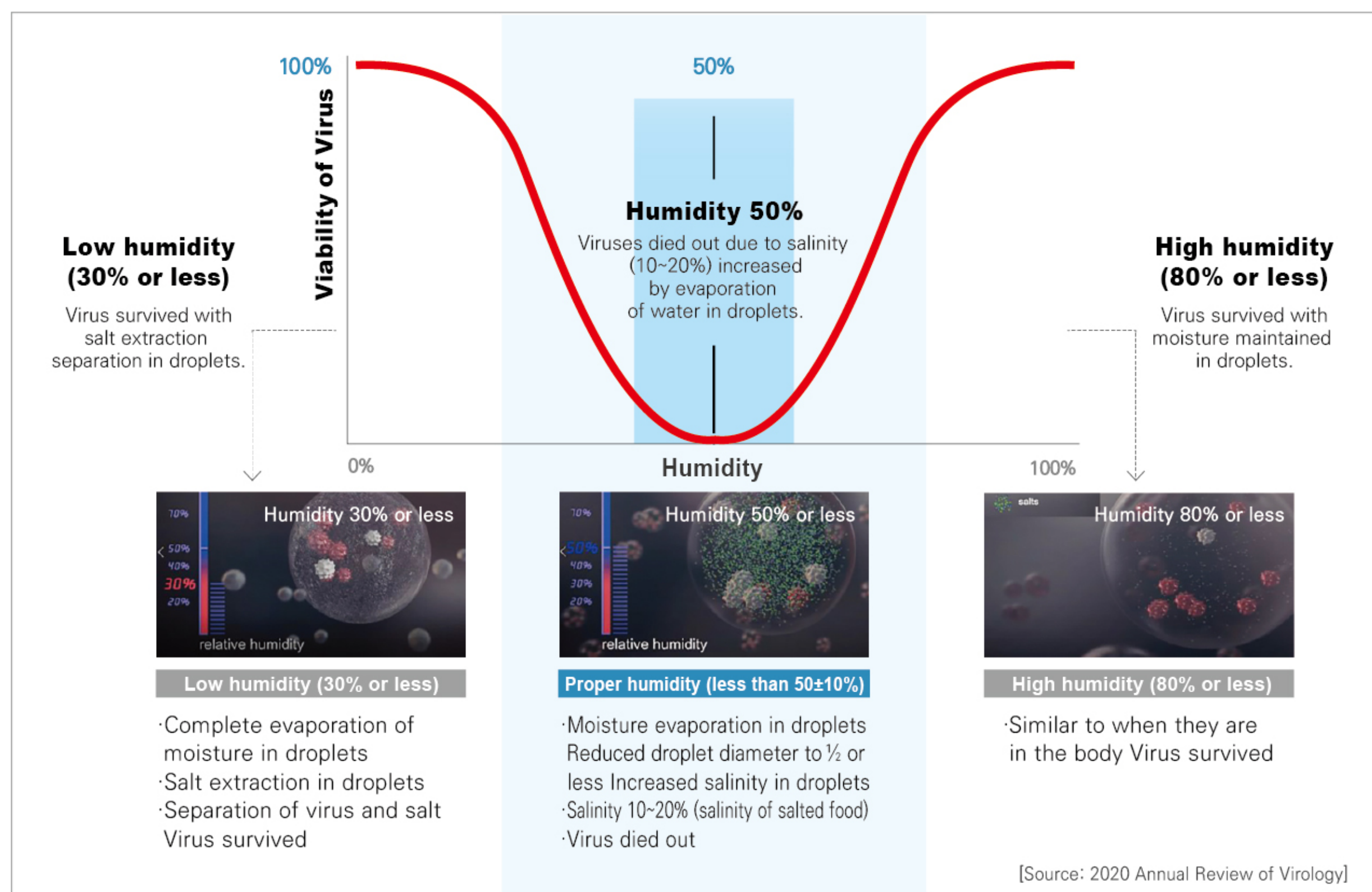


# A solution to prevent the spread of virus and control humidity

**Virus** is heavily affected by **Humidity**.

Relative humidity affects significantly on the airborne spread of the COVID-19 virus through aerosol particles.

[Source] Leibniz Tropospheric Laboratory (TROPOS), Germany · CSIR National Institute of Physics, New Delhi, India, International Journal 'Aerosol and Air Quality Research'

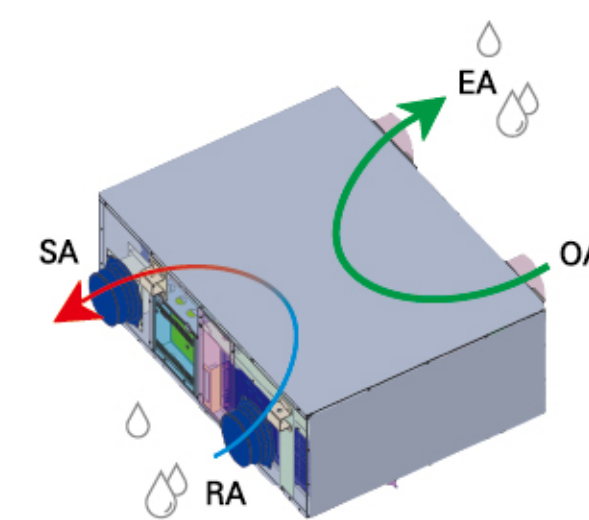


## Officially Certified Technology

- ✓ Maximum moisture absorption performance : 241% (5 times higher than silica gel) – the world's best Desiccant material
- ✓ Reduction of VOCs : ammonia 99.8%, trimethylamine 99.6%, acetic acid 94.0%
- ✓ Antibacterial test : Escherichia coli 99.9%, Staphylococcus aureus 99.9%
- ✓ Antifungal test : mixed strain 0 grade (no mycelial growth)
- ✓ Air Purifying test : Reduction of Particles 99.4%
- ✓ Ozone reduction test : ozone generation 0.0027ppm (5.4% level compared to the standard value of 0.05ppm)
- ✓ Airborne virus reduction rate 98.7%
- ✓ Airborne bacteria reduction rate 99.9%



### Desiccant Dehumidification

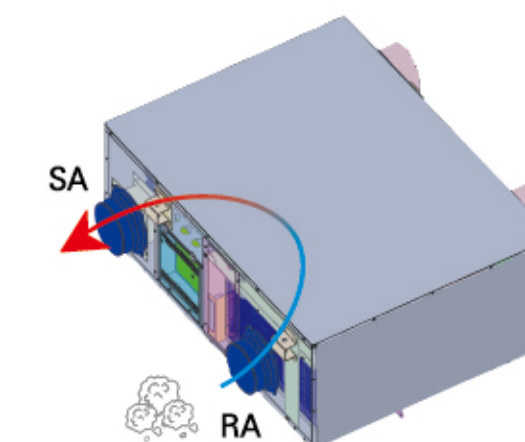


#### Desiccant dehumidification

It draws in humid air from the room, adsorbs the moisture to the filter, and then discharges it to the outside. At this time, it has the effect of lowering the perceived temperature without increasing the temperature.

### Air-Purification

► It draws in the impure air inside and purifies the indoor air with a filter.

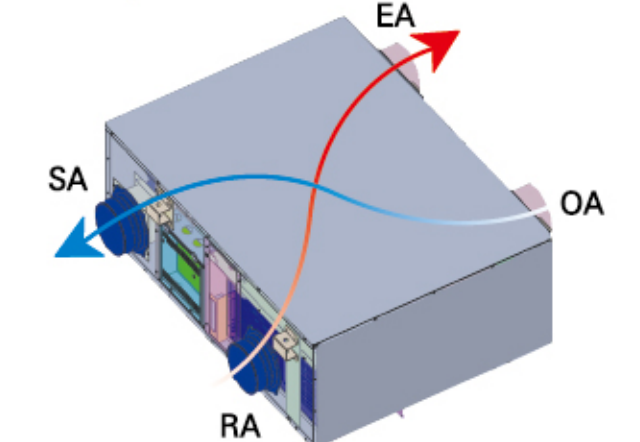


#### Premium air cleaning function

Humicon perfectly removes even a small amount of ozone that can be generated from the dust collection filter applied to the air purifier.

### ERV(Energy Recovery Ventilation)

► It discharges the indoor air to the outside, and purifies the outside air with a filter before drawing in it.



#### Premium ventilation function

When ventilating, it blocks the inflow of moisture contained in the outside air, so you can ventilate with more pleasant air.



## Performance comparison between HUMICON and conventional products

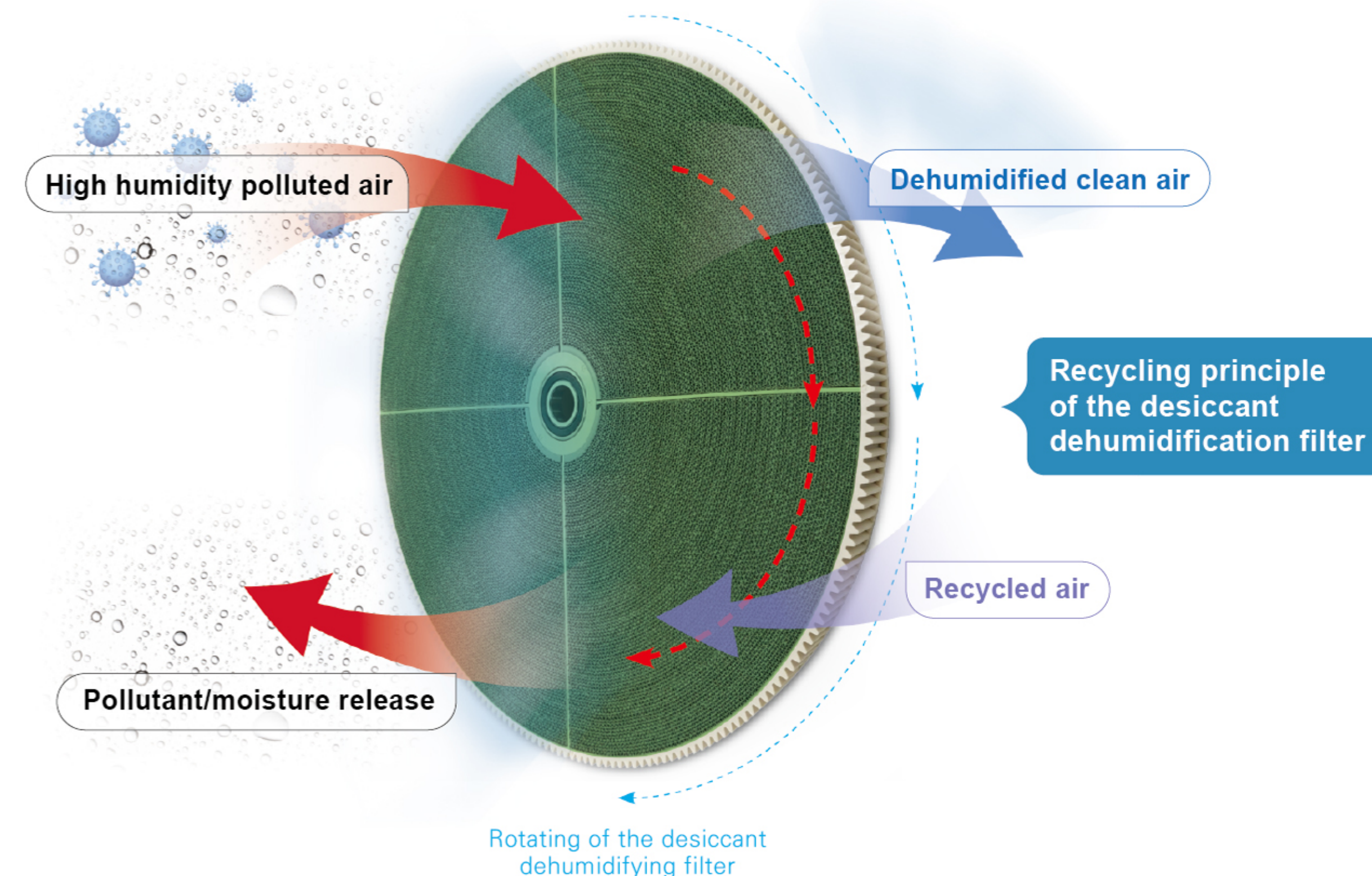
HUMICON has an outstanding advantage in the function compared with dehumidifiers, air purifiers, and clean ventilation products. In particular, mold prevention of the inside of the device and the diffuser and excellent energy efficiency have been proven in certified tests.

	Classification	Existing products	HUMICON
Dehumidification	Dehumidification efficiency (L/kWh)	2~2.5	3.5 or higher
	Discharge temperature	40~50℃ (heater discharge temperature)	Room temperature (no temperature rise)
	Water bottle management	Needed	Not-Needed
	Dehumidifying filter management	Non-renewable, replacement required	Self-renewing, no replacement required
	Room temp. increase	Y	N
	Airborne bacteria reduction	X	O (99.9%)
	Airborne virus reduction	X	O (98.7%)
	Air purifying function	△	O
	Ventilation function	X	O
	Deodorization function	△	O
Airpurification	Fine dust removal	O	O
	Removal of ultra-fine dust	O	O
	Clean filter mgmt.	Replacement needed	Recycling after cleaning the main filter
	Ventilation function	X	O
	Antibacterial, antifungal mgmt.	O	O (99.9%)
	Ozone Suppression of Electrostatic Dust Collection Filter	X	O (ppm 0.0027)
Ventilation	Total heat exchange efficiency (cooling)	45%~55%	65~70%
	Total heat exchange efficiency (heating)	65~70%	70~72%
	Moisture Exchange Efficiency	20%	70%
	Device condensation	Y	N
	Anti-condensation heater heat loss	80%	0% (anti-condensation heater not required)
	Duct (air passage) condensation	Y	N

- ▶ HUMICON can dehumidify below 35% even at 26 °C.
- ▶ Compared to electric dehumidifiers with the same cooling capacity, it has more than 140% dehumidification performance.
- ▶ When circulating indoor air and supplying outside air, antibacterial, antifungal, and deodorizing are possible through the built-in polymer dehumidifying agent.

## Desiccant dehumidification Filter

The desiccant filter is a recycling filter not a replacement filter, which is comprised of eco-friendly materials that are safe to human. It is a new technology developed by the Korea Institute of Science and Technology (KIST) and patented in the US and Korea.



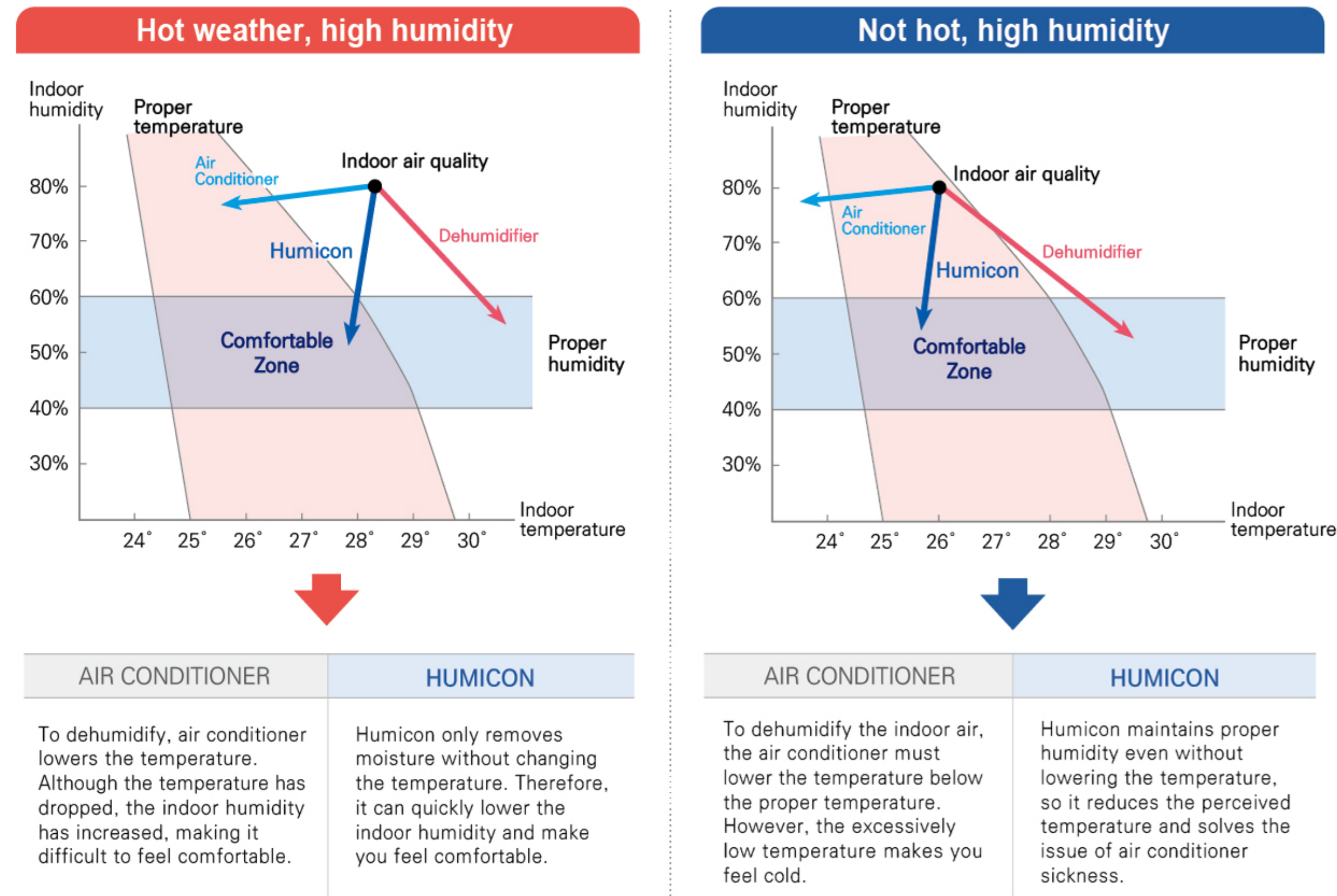
### Excellent desiccant dehumidification filter

※ 122 related patent applications, 83 registrations, 8 technology transfers (32 implementation patents)

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|--|--|
| <p>2022 Selected as an excellent government procurement product/ selected as a baby unicorn company</p> <p>2021 Won New Product Certification (NEP) certification from the Ministry of Trade, Industry and Energy</p> <p>2020 Won Excellent Performance Certification from the Ministry of SMEs and Startups</p> <p>Selected as a priority purchase product for excellent inventions recommended by the Korean Intellectual Property Office of the Korea Invention Promotion Association</p> <p>2018 Selected as 'Top 10 Mechanical Technologies of the Year' on Machinery Day</p> <p>Received a commendation from the Minister of Land, Infrastructure and Transport on the Day of Mechanical Equipment</p> | <p>2017 Won Green Technology Certification from the Ministry of Environment for Polymer Moisture Absorption and Desorption Material Technology.</p> <p>New Excellent Technology (NET) from the Ministry of Trade, Industry and Energy</p> <p>2015 International Institute of Refrigeration,</p> <p>2014 Won the Patent Technology Award from the Korean Intellectual Property Office for the Polymer Moisture Absorption and Desorption Material</p> <p>2012 Received Presidential Commendation for Invention Merit on the 47th Invention Day</p> <p>2010 Polymer Moisture Absorption and Desorption Material patented in Korea and the US</p> |
|--|--|



## Desiccant dehumidification vs Air conditioner dehumidification



## HUMICON, Desiccant dehumidification & clean ventilation solution used all year around

Manage indoor air pleasantly and comfortably throughout the four seasons!

**SUMMER**

Reduce the use of air conditioners and employ desiccant cooling to resolve the air-conditioning problem brought on by the significant temperature difference between inside and outside.

Create a conducive environment for good sleep during the rainy season and hot summer nights.

When humidity falls by 5%, the perceived temperature falls by 1°C. Create a breath of fresh air by using desiccant dehumidification.

**WINTER**

Solve condensation problems caused by differences in indoor and outdoor humidity by managing proper humidity.

With a 98.7% reduction in airborne viruses, you can create an environment where viruses cannot live indoors.

If you're worried about heat loss when ventilating in the cold winter, Humicon is the best solution.

**SPRING & AUTUMN**

Must maintain proper humidity to reduce house dust, mites and mold, which are the causes of allergies and rhinitis.

Due to a lack of ventilation, odor accumulates throughout the house. Utilize Humicon's powerful deodorization function to solve the problem.

When you are afraid to ventilate due to external fine dust, you can now ventilate without concern.

### Dehumidification method by device

	HUMICON	AIR CONDITIONER	DEHUMIDIFIER
Principle of operation	Humidity based	Temperature based	Temperature based
Temperature	Slightly decreased	Decreased	Increased
Humidity	Decreased	Slightly decreased	Decreased
How to get rid of moisture	Discharged to the outside	Discharged to the outside	Internal storage(Bucket)

#### ► HUMICON's dehumidification principle



HUMICON captivates moisture from the air and adsorbs it to the desiccant filter regardless of temperature. The moisture that has been absorbed is slightly heated and discharged to the outside. You can quickly achieve the proper humidity and get a cooling effect that reduces the perceived temperature by controlling only the humidity.

#### ► Air conditioner's dehumidification principle



The principle of air conditioner dehumidification is to remove moisture by causing condensation by cooling air as it passes through a cold cooling plate. However, once the air conditioner reaches the specified temperature (e.g. 26°C), the humidity cannot be lowered any further. The only way to reduce humidity is to reduce the temperature.

#### Intuitive room control UX



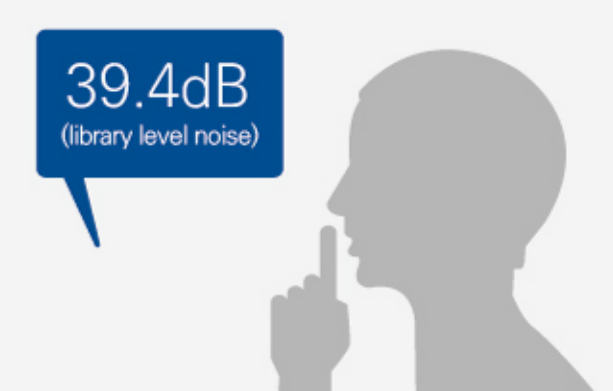
**Easy to check your indoor air quality.**  
The HUMICON controller is designed so that users of all ages can easily recognize and control real-time air quality.

#### More efficiency, less electricity



**40% savings on annual expense**  
Because an air conditioner and a dehumidifier must be used in tandem to achieve the desired temperature and humidity, electricity bills are high. With Humicon, you can save money on your electricity bill.

#### HUMICON without noise



**Dehumidification and ventilation without noise**  
When measuring the noise of the HCR-350E Model, it is very quiet at 39.4dB. Less than 40dB means quiet residential or library level noise.



## Why you need HUMICON in your house



- Point 1** With ceiling-type installation, make not only the air in the house, but also the space in the house pleasant.
- Point 2** No ducts and diffusers where mold lives! Stay healthy with dehumidifying and anti-fungal performance.
- Point 3** Stop placing dehumidifiers and air purifiers in each room.
- Point 4** Stop worrying about the cold wind from the air conditioner. Keep all rooms comfortable with proper humidity endured by desiccant cooling .
- Point 5** Integrated operation of air conditioner, dehumidifier, air purifier, and ventilation system into one, even reducing electricity bills.

### Convenient SMART Funtion

- ✓ HUMICON is a TOTAL SOLUTION that can comprehensively provide desiccant dehumidification, air purification, and ventilation functions along with humidity control.
- ✓ HUMICON can measure air conditions such as indoor humidity, temperature, carbon dioxide, fine dust, and ultrafine dust in detail, and prioritize them to control the indoor air in the desired direction.
- ✓ HUMICON maintains the best indoor air quality by automatically diagnosing the current condition and operating without the user having to manually set it.



## Product information

Choose the proper HUMICON model that is best suited to the indoor space.  
With HUMICON, you can create a pleasant and healthy indoor environment.

Model name	Use Area (㎡)	Air volume (CMH)			Total heat exchange efficiency (%)		Dehumidification amount (L/day)	Dehumidification efficiency (L/kWh)	Power(W)		Power source	External dimensions (mm)			W.T (kg)	Filter method
		High	Med.	Low	Cooling	Heating			Dehumidification	Ventilation		W	L	H		
HCR-250E	60	300	250	200	70	73	42	3.3	530	100	1/220/60	750	900	300	60	Filtered
HCR-350E	100	400	350	300	71	72	64	3.5	752	120	1/220/60	750	1000	350	70	Electronic
HCR-500E	160	600	500	400	66	71	87	3.6	1024	200	1/220/60	900	1170	430	90	Electronic
HCR-800E	260	900	800	600	65	71	127	3.4	1553	288	1/220/60	1040	1380	500	120	Electronic
HCR-1200E	380	1400	1200	900	65	72	194	3.5	2290	441	1/220/60	1043	1433	550	140	Filtered

## Keep the same temperature, and let HUMICON control the proper humidity with the most efficient Desiccant Dehumidification & Clean Ventilation Solution.

- To reduce the survival rate of airborne viruses by maintaining proper humidity as well as ventilation



| Restaurant, Cafe



| Study Room, Study Cafe



| Fitness centers, indoor sports facilities

- Seasons sensitive to temperature changes,  
Health management by proper humidity management without temperature change



| Day Care Center, Kindergarten, School



| Postpartum care centers, hospitals



| Nursing facilities, day and night care centers

- If it needs to preserve moisture-sensitive products,



| Museums, performances and exhibition facilities

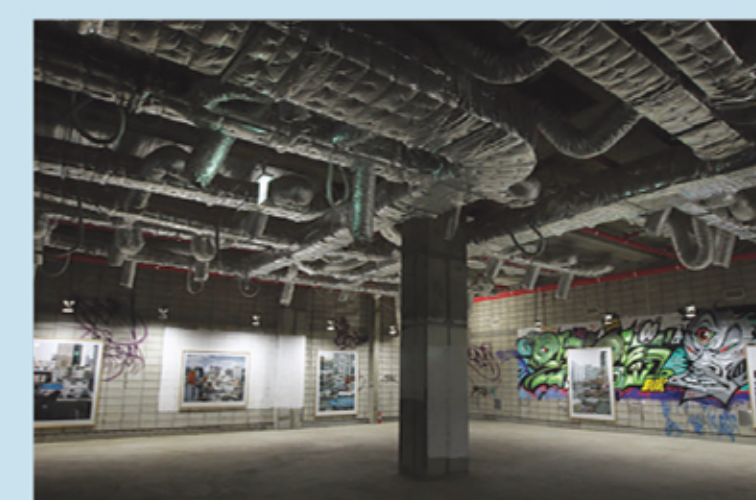


| Archives, server rooms



| Product warehouses, distribution warehouses

- If you worry about the absence of an appropriate humidity control solution,



| Underground space humidity control



| Alternatives for the air conditioner less-use campaign in public institutions



| Prevention of condensation in winter