



ADVANCED AIR PURIFICATION SYSTEMS

RGF[®]
ENVIRONMENTAL GROUP, INC.

COMPLETE LINEUP WITH ACTIVE PLASMA AND HEPA





COMPANY PROFILE:



- Berdiri sejak tahun 1985, di Palm Beach County, Florida USA.
- Research & Development Company.
 - Technology Company, **BUKAN** Retail Electronic Company.
 - Spesialisasi di teknologi Purifikasi dan Sanitasi utk Udara, Air dan Pangan.
 - Fokus di market vertikal dan industri tertentu.
 - Medical, Militer, Industri Pangan, Sanitasi, Pemerintah, Rumah mewah dll.



THE WHITE HOUSE





DARI HULU KE HILIR: MADE IS USA

INDEPENDENT
INSPECTION



Intertek



America



- Research and Development Lab.
 - Termasuk Testing Lab, RGF dan ASHRAE compliant Test Chambers.
 - Independent tests dari National Accredited Laboratories.
 - 32 patent yang sudah diakui di USA.
- Pabrik, Produksi dan Quality Control di Florida, USA.
 - State of the art machinery.
 - Mendapatkan sertifikasi global.
- Teknologi disempurnakan lebih dari 25 tahun.
 - Product In-Duct pertama di tahun 1998.



RGF's Original HVAC In-duct PHI-Cell® from 1998



RGF IS GLOBAL

Our Partners:
Trane USA
PT Daikin Applied Solutions Indonesia



TRANE [Link](#)



PT. DAIKIN APPLIED SOLUTIONS INDONESIA

RGF[®] PRODUCTS IN OVER 60 COUNTRIES



PATENTS (1/2)



Product Name: REME HALO®
Model #: REME-H
Protected by US Patents: Patent pending



Product Name: BLU QR®
Model #: BLU-QR, BLU-QR2
Protected by US Patents: 9,506,634, D771863, D795,493, D795,494, D774,668, 9,506,634



Product Name: Quick Release Twin Stick Light+
Model #: BQR-TS-24
Protected by US Patents: 9,506,634, D795,493, D795,494, D774,668



Product Name: UPCO-QR™
Model #: UPCO-QR
Protected by US Patents: 9,506,634



Product Name: Guardian Air QR+
Model #: QRP-5, QRP-9, QRP-14
Protected by US Patents: 7,988,923



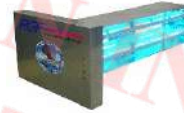
Product Name: Mini Split HVAC Air Purification System
Model #: MINI SPLIT-HVAC-PHI-110, MINI SPLIT-HVAC-PHI-230
Protected by US Patents: 7,988,923



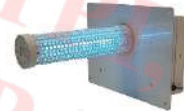
Product Name: PTAC HVAC Air Purification System
Model #: UNV-PTAC
Protected by US Patents: 7,988,923



Product Name: Guardian Air Desktop Air Purifier
Model #: DT-500-GA
Protected by US Patents: 7,988,923



Product Name: CML-Commercial PHI Unit
Model #: CML-25, CML-50, CML-75, CML-100, CML-65, CML-90, CML-115, CML-140, CML-125, CML-150, CML-180, CML-190, CML-215, CML-250
Protected by US Patents: 7,988,923



Product Name: Light Commercial PHI Unit
Model #: LC-14HO-GA-26
Protected by US Patents: 7,988,923



Product Name: Rapid Recovery Unit®
Model #: RRU-16, RRU-DS-16
Protected by US Patents: 7,988,923



Product Name: Turbozone®
Model #: TB-1000-HO-16, TB-7000-HO-16
Protected by US Patents: 7,988,923



Product Name: Mobile Pro Plus Air Purification System
Model #: MBPRO-P-12
Protected by US Patents: 7,988,923





PATENTS (2/2)



Product Name: BOS HOX
Model #: BOS-HOX-16, BOS-HOX-25
Protected by US Patents: 7,988,923



Product Name: BOS II
Model #: BOS-II-16
Protected by US Patents: 7,988,923



Product Name: BOS III
Model #: BOS-III-16
Protected by US Patents: 7,988,923



Product Name: CAPS – Commercial Air Purification System
Model #: CAPS-16, CAPS-25
Protected by US Patents: 7,988,923



Product Name: CAPS Mini – Commercial Air Purification System
Model #: CAPS-MINI-16
Protected by US Patents: 7,988,923



Product Name: IMSB Ice Machine Sanitizer
Model #: IMS-B-GA
Protected by US Patents: 7,988,923



Product Name: PHI Package Unit
Model #: PHI-PKG5-24V, PHI-PKG9-24V, PHI-PKG14-24V
Protected by US Patents: 9,295,746, 7,988,923



Product Name: Fin Saver®
Model #: FS 375, FS 500, FS 625, FS 750, FS 875, FS 1125
Protected by US Patents: 8,999,138, D668738, D668739



Product Name: Pan Saver®
Model #: PS-12
Protected by US Patents: 8,795,590, D720446



Product Name: Food Surface Sanitation Tunnel
Protected by US Patents: 9,506,634



Product Name: Thermo-Oxidizer
Model #: TO-30, TO-60, TO-150
Protected by US Patent: 6,546,883



Product Name: Universal Advanced Bio-reactor
Model #: UAB-20, UAB-40
Protected by US Patents: 8,877,046



Product Name: Pre-Treatment Sewer Discharge System
Model #: SD-I, SD-II, SD-I-XL
Protected by US Patents: 5,120,435



“DOKUMEN MILIK PT. ANINDIAJAH Boleh DISEBARLUKAN ATAU DIUPLOKASIKAN ONLINE” SECARA



COMPANY PROFILE: PT CLARUS TECHNOLOGY INDONESIA

- Didirikan oleh salah satu shareholder dari PT. DAIKIN AIRCONDITIONING INDONESIA.
- Mempunyai pengalaman lebih dari 40 tahun dibidang HVAC dan Building Automation, kami hadir untuk memberikan produk dan jasa dengan kualitas tinggi di area Air Purification System, Building Automation dan Security di sector komersial.
- Partner kami adalah manufaktur yang terdepan di industri mereka masing-masing, dengan produk dan service yang terbaik.
- Metode kerja kami adalah menjadi partner yang dipercaya (Trusted Advisor) dengan solusi yang memberikan ROI yang terbaik bagi klien kami.

“KEBERHASILAN KAMI TERUKUR DARI KEBERHASILAN DARI SETIAP KLIEN KAMI”

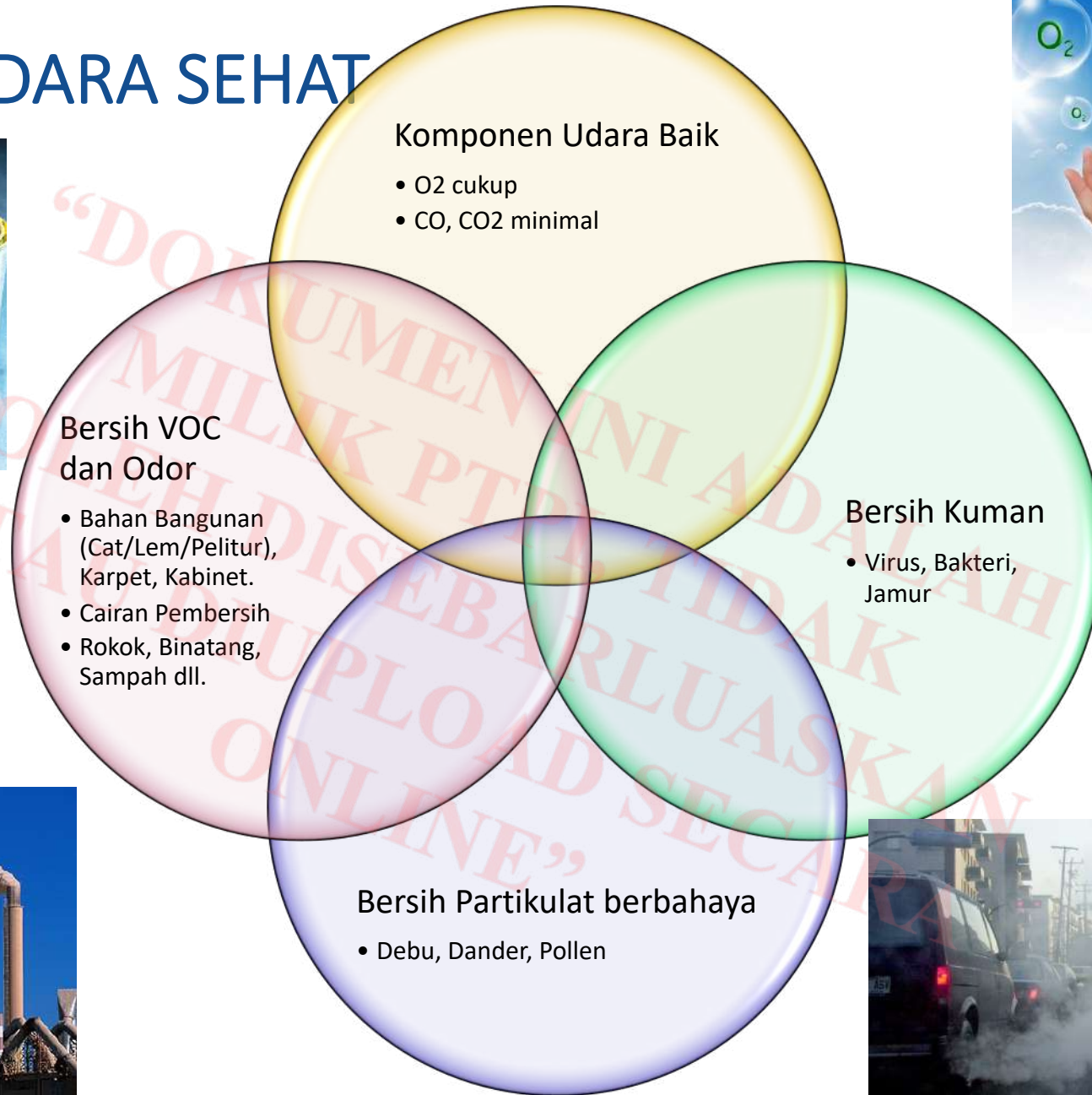
“WE ARE INVESTED IN EACH AND EVERY SUCCESS OF OUR CLIENTS AS MUCH AS IN OUR OWN”



DEFINISI UDARA SEHAT



RGF[®]





SOLUSI RGF



Komponen Udara Baik

- O2 cukup
- CO, CO2 minimal

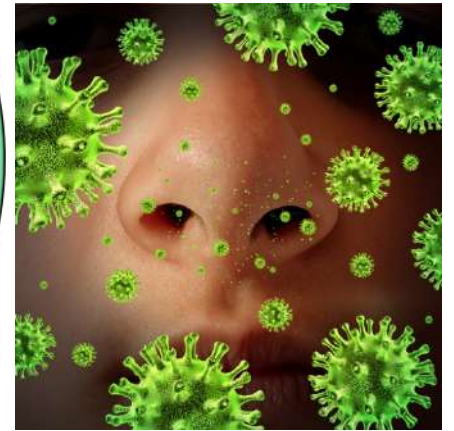
Bersih VOC dan Odor

- Bahan Bangunan (Cat/Lem/Pelitur), Karpas, Kabinet.
- Cairan Pembersih
- Rokok, Binatang, Sampah dll.



Bersih Kuman

- Virus, Bakteri, Jamur



Bersih Partikulat berbahaya

- Debu, Dander, Pollen

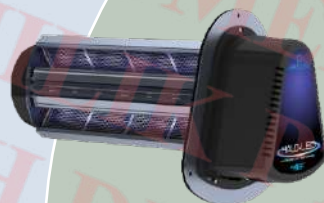




TEKNOLOGI RGF



EFEKTIF PENJERNIHAN KUMAN & VOC



PLASMA



HEPA



MICROCON® ExC7



EFEKTIF PENJERNIHAN DEBU & VOC

PLASMA DAN HEPA SALING COMPLEMENTARY

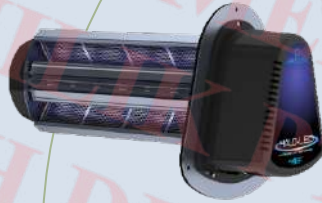
KUMAN ≠ DEBU

DEBU ≠ KUMAN





TEKNOLOGI RGF



EFEKTIF PENJERNIHAN KUMAN & VOC

PLASMA

HEPA



PLASMA DAN HEPA SALING COMPLEMENTARY



EFEKTIF PENJERNIHAN DEBU & VOC

KUMAN ≠ DEBU

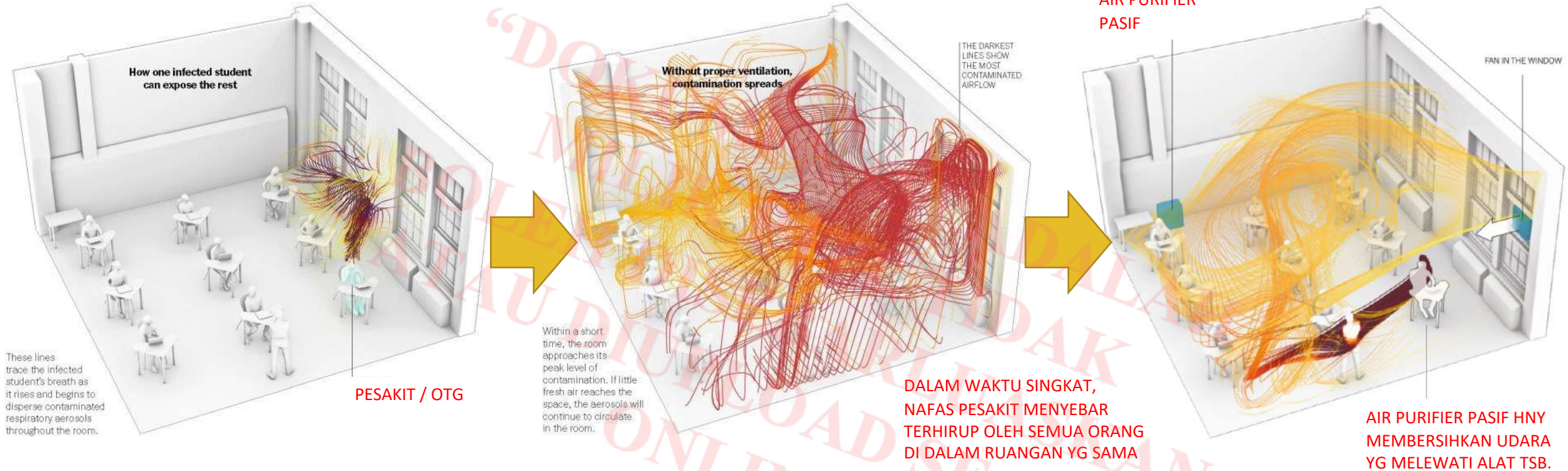
DEBU ≠ KUMAN






PENULARAN LEWAT UDARA

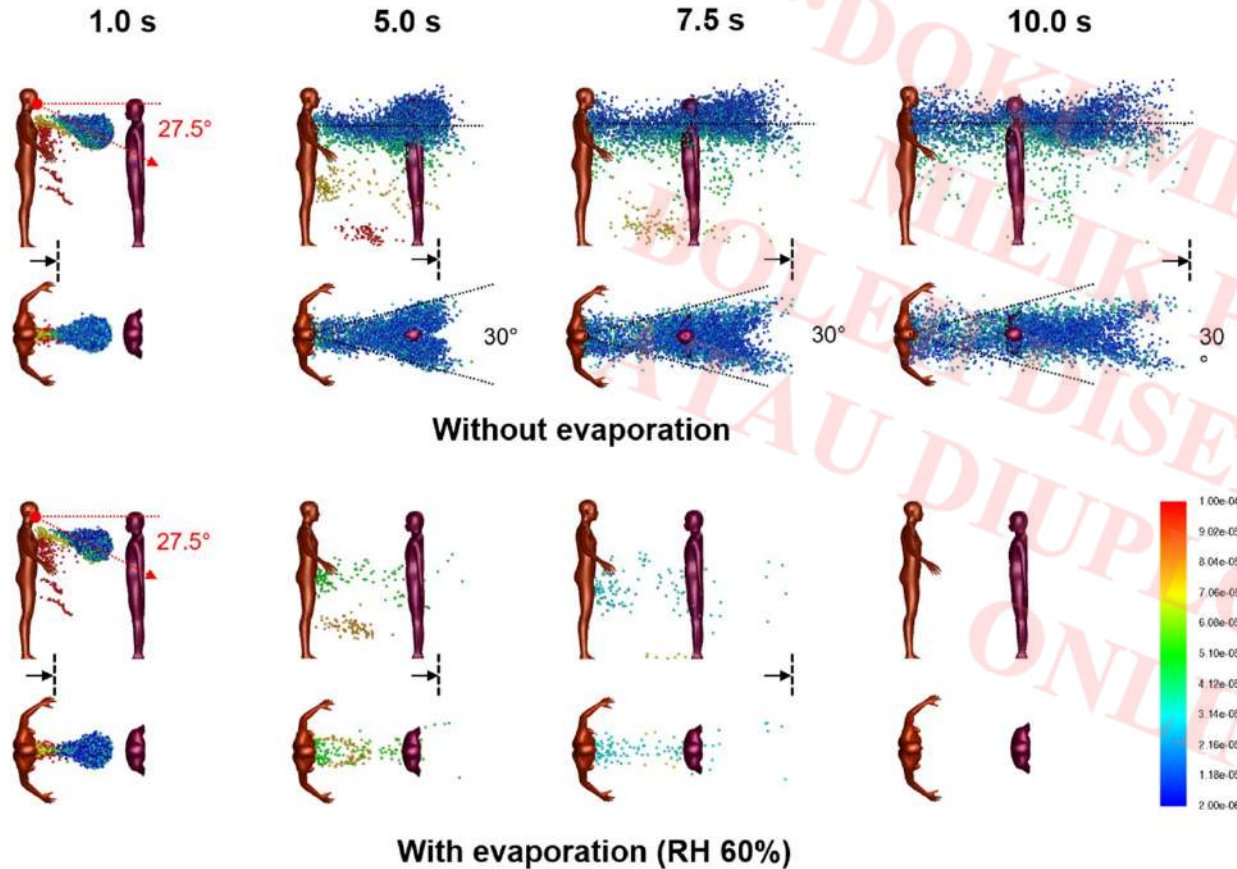
Source: The New York Times ([link](#))



- Studi oleh Prof. Joseph Allen (2021) dari  HARVARD SCHOOL OF PUBLIC HEALTH
- Simulasi pergerakan kuman di udara oleh Pesakit (OTG) di dalam ruangan.
- TIDAK melindungi terhadap penyebaran kuman melalui udara dan permukaan.



PENYEBARAN VIA UDARA LEWAT BATUK

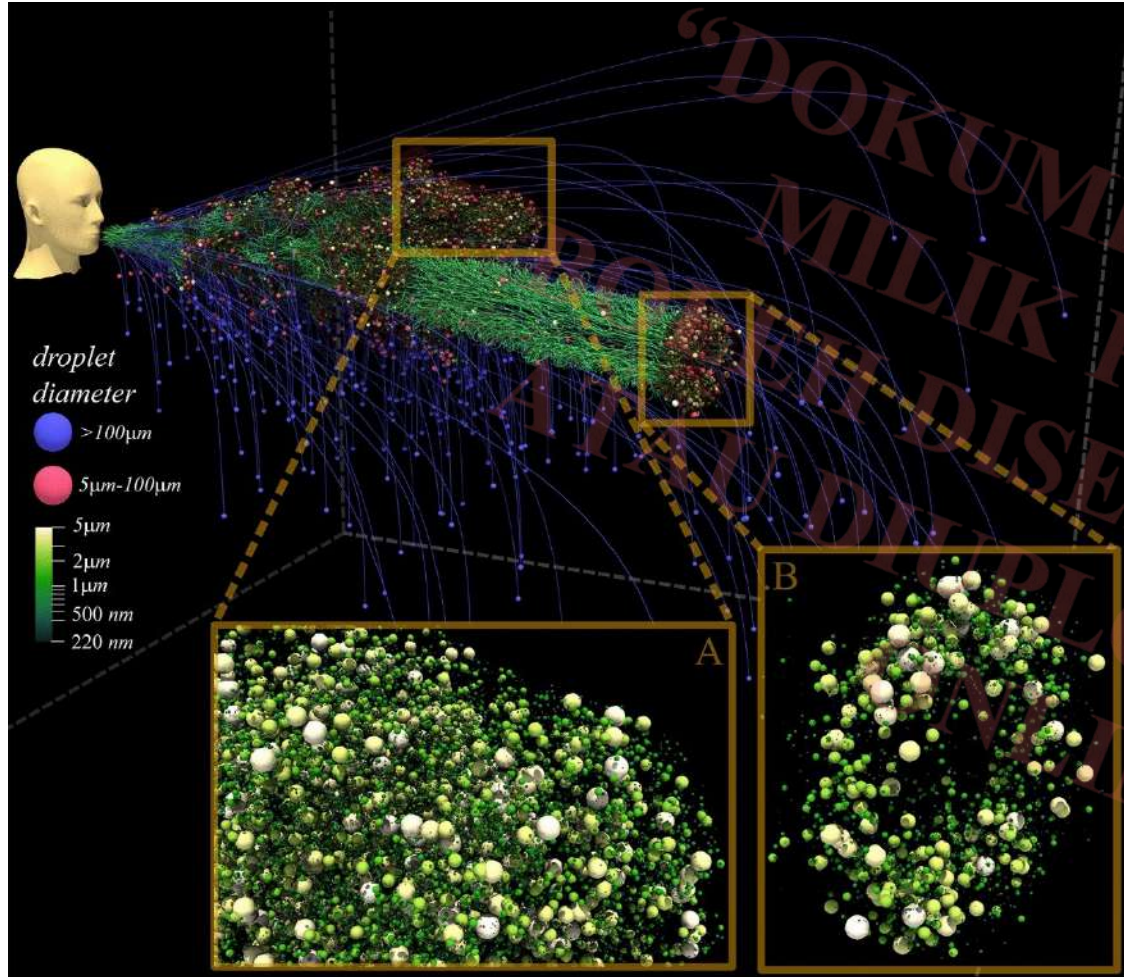


following the cough. The presence of the Listener at 1 m has effectively increased the dispersion range of the droplet plume, with practical consequences. Observe that the head of the Listener is engulfed by the droplet plume when it should not be at that distance (Fig. 1). Also, now since air has to move around the Listener, the lateral dispersion length is now defined by the characteristic width of the Listener (shoulder to shoulder), which by inspection, results in a 30° wedge, instead of the 20° wedge previously obtained for single Cougher case (Fig. 1). Further downstream, the lateral plume angle is horizontal and as before, the droplets further from the center travel faster than those near the center due to entrainment of air in the Listener's wake.

Based on median viral load, an average of 0.55 viral copies is inhaled 1 m away from a single cough. This result could still be amplified through successive coughs at higher viral loads (day-0 or peak) and accumulated over time. Other air sampling studies^{58,59,60} have reported comparable viral counts, accounting for sampling times and flowrates. Droplets deposited on skin and clothes could still lead to secondary transmission modes such as face touching.



BENTUK PENYEBARAN LEWAT BATUK DAN BERSIN



The droplet trajectories are shown in Fig. 3, where two distinct droplet behaviors are observed: (i) near-ballistic motion of large droplets ($D > 100 \mu\text{m}$) and (ii) chaotic motion of smaller droplets²⁷. Even those large droplets that appear far ahead and at the same elevation as the mouth, are in fact falling rapidly. This supports the earlier assertion that the larger ballistic droplets will soon fall down and deposit on surfaces. The spiraling motion of droplets²⁷, most

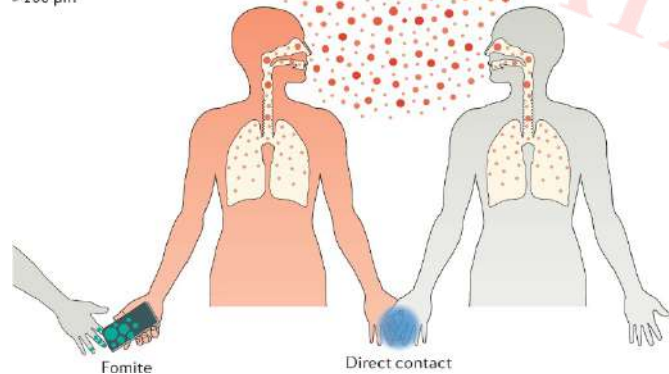
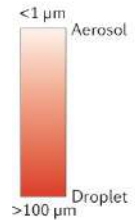
We conclude with the following remarks: (i) While humid ambient conditions can extend the life of droplets²⁷, they result in a smaller non-volatile volume due to enhanced settling. We observe dry ambient conditions to increase by more than four times the number of airborne potentially virus-laden nuclei, as a result of reduced droplet fall-out through rapid evaporation. (ii) Even under nearly identical conditions, coughs/sneezes can vary substantially due to their chaotic nature. The ejected droplets self-sort themselves into larger droplets that quickly fall-out and smaller droplets that fully-evaporate to become droplet nuclei. Smaller droplet nuclei form a cloud that remains airborne for a long time and travels long distances^{17,23,24,25,26,27}. Occasionally, droplets are carried to greater distances by fast-moving,



METODE MATA RANTAI PENULARAN

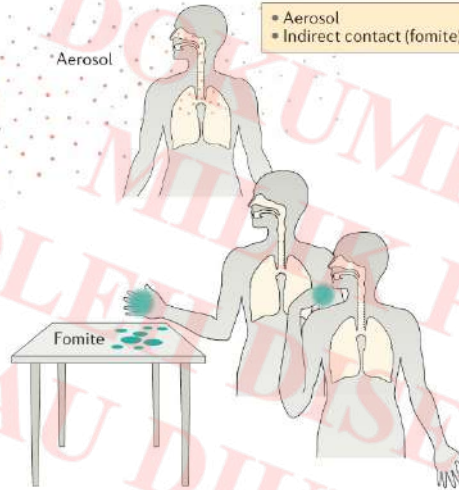
Short-range transmission

- Droplet
- Aerosol
- Direct (physical) contact
- Indirect contact (fomite)



Long-range transmission

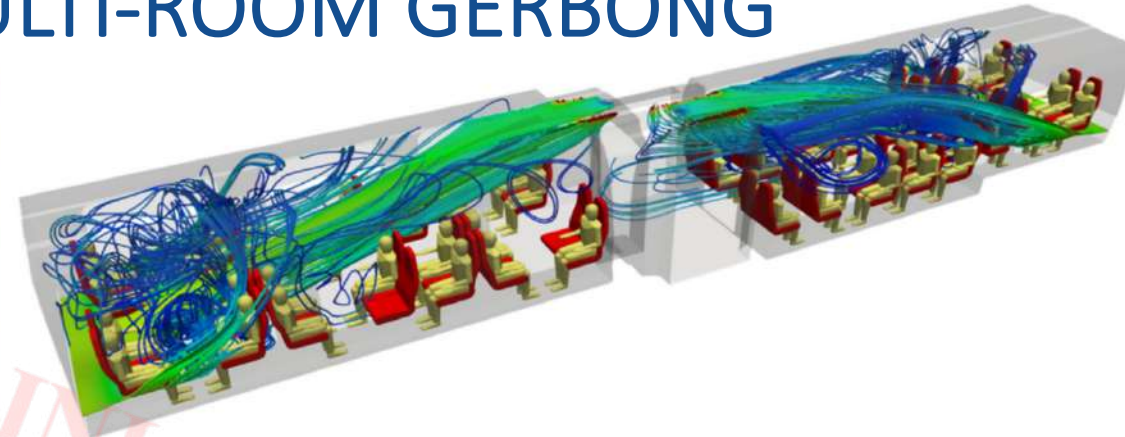
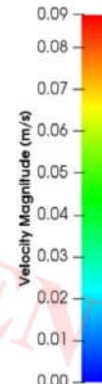
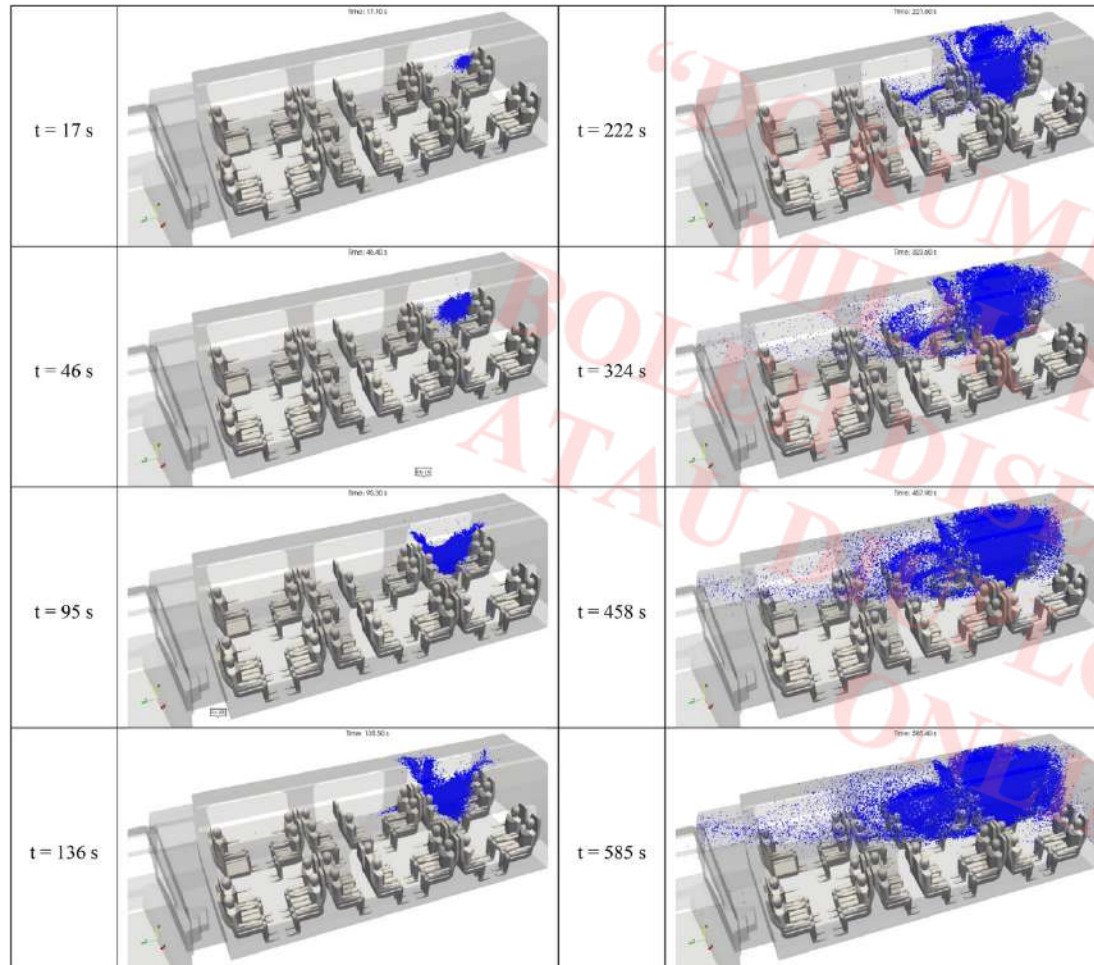
- Aerosol
- Indirect contact (fomite)



During an acute respiratory virus infection, an infected individual (infector; red) may shed virus in exhaled breath droplets and aerosols, and may also contaminate their immediate bodily surfaces (for example, skin and clothes) or surrounding objects and surfaces (for example, tables) with their respiratory secretions. In general, if a susceptible individual (infectee; grey) is close to the infector, short-range transmission may occur when the infectee breathes in the virus-laden droplets or aerosols released by the infector, during direct (physical) contact with the infector or during physical contact with objects or surfaces contaminated (fomite) by the infector. If the infectee is at a distance from the infector, long-range transmission may occur when the infectee breathes in the virus-laden aerosols released by the infector or during physical contact with a fomite. However, the terminology and the defining features of each mode of respiratory virus transmission, especially regarding redefining the particle size threshold between droplets and aerosols, is under active discussion (see the section Terminology and defining features of modes of transmission).



SIMULASI PENULARAN DI MULTI-ROOM GERBONG



Regarding the fate of the droplets produced by the exhalations of passenger 2, the simulated time period is prolonged by a factor of around 10 in comparison with the cough test cases (passenger 1 or passenger 2). Thus, the transport and dispersion of the droplets is evaluated for much longer durations and distances. One can observe that the micrometric droplets do not stay close to the spreader, but tend to occupy a large part of volume 1 of the rail coach. After about two minutes, the turbulent air flow has both transported and scattered the droplets in between the four passengers closest to the spreader. After about eight minutes, the four passengers next to the first group of passengers on the same side of the carriage are reached by the droplets. While the progression of the droplets occurs principally between and above the passengers seated on the same side as the spreader, some droplets tend to approach the passengers of the seat rows on the other side of the aisle. The droplets are progressively evacuated from the rail coach through the air extraction vents in the roof of compartment 1 of the carriage, or they head towards the extraction vents in the roof of central compartment 2.



HOSPITAL ECOSYSTEM: RESIKO PENULARAN TERTINGGI DI...?





HOSPITAL ECOSYSTEM: POTENSI PENULARAN MASSIVE



Pergerakan dokter, perawat, pekerja, pasien dan pengunjung secara konstan adalah potensi carrier, baik airborne maupun kontak.

- Pergerakan pasien dari ruang kamar ke lift ke ruang operasi dan sebaliknya.
- Pasien yang mengunjungi ruang praktek dokter.
- Perawat yg bergerak di beberapa ruang rawat.

HVAC dengan system sentral membantu penyebaran lebih meluas:

- Ruang tunggu sharing dgn ruang kerja dokter.
- Lift yg membawa udara dari berbagai koridor di bbrp lantai.
- Cafeteria sharing indoor dgn dapur.

**BIAYA HVAC TERISOLASI PER RUANGAN MENJADI SANGAT TINGGI
PEROMBAKAN DI RUMAH SAKIT EXISITING TIDAK MEMUNGKINKAN
DIPERLUKAN AIR TREATMENT SECARA MENYELURUH, MUDAH DAN PRAKTIS**



TEKNOLOGI PHI-CELL®: ACTIVE AIR PURIFICATION

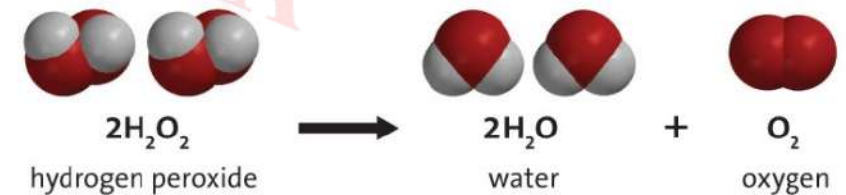


[Link](#)



TEKNOLOGI PHI-CELL[®]: ACTIVE AIR PURIFICATION

- Plasma Hydrogen Peroxides: SENJATA ALAM
 - Alami di udara luar dengan konsentrasi antara 0.01 – 0.03 ppm.
 - Batas safety di 1 ppm menurut CDC.
 - Tercipta dengan sinar matahari yg meng-ionisasi molekul H₂O menjadi H₂O₂.
 - Umur plasma: 5-10 menit dan kembali menjadi H₂O dan O₂ (siklus alam).
 - Aman untuk manusia, binatang dan tumbuhan.
 - Dapat menetralkan virus/bakteri/spora jamur, VOC dan odors secara INSTAN di udara dan permukaan.
- PHI-CELL[®]: membawa kondisi alam ke dalam ruangan
 - Men-ionisasi molekul H₂O di dalam ruangan menjadi H₂O₂, seperti proses alami di atas.
 - Konsentrasi di bawah 0.02 ppm (aman).
- Memutus mata rantai penyebaran dan penularan kuman dari pesakit (termasuk OTG) secara AKTIF (INSTAN dan NONSTOP)
 - Yang sehat selalu terlindungi.
 - Yang sakit selalu terisolasi.



Aktif



Membersihkan baik udara maupun seluruh permukaan benda.

Membersihkan secara INSTAN di seluruh ruangan.

Apabila ada pesakit di dalam ruangan, terisolasi dan tidak bisa menular

Pasif



Membersihkan hanya udara, tidak pada permukaan.

Membersihkan hanya udara yang melewati alat air purifier.

Apabila ada pesakit di dalam ruangan, resiko penularan masih tinggi



PERBANDINGAN PHI-CELL® THD TEKNOLOGI LAIN

FUNGSI	PHI-CELL®	HEPA FILTER	UVC	OZONE	PCO HYDROXIL	NEGATIVE ION BIPOLAR
Menyaring partikel termasuk kuman		✓				
Membunuh virus, bakteri, spora	✓		✓	✓	✓	🤔
Menetralsir VOC	✓				✓	
<u>Perlindungan AKTIF di seluruh area ruangan tanpa re-sirkulasi</u>	✓			✓		🤔
Berbahaya untuk manusia			✗	✗		

- Penggunaan Ozone sebagai Air Purification sudah dilarang di USA ([link 1](#)).
 - Dapat merusak organ tubuh manusia secara permanen.

- HEPA Filter mempunyai keunggulan dalam hal menyaring, tapi tidak menetralsir.

- Penggunaan UVC di dalam ducting tidak efektif
 - Test dengan 36W UV, 1600 CFM 16" x 16" duct dengan kecepatan 1.2 m/s.

Jarak kuman ke UV	Efektifitas	Min exposure	Real exposure
3.3 cm	100%	0.18 detik	0.16 detik
6.6 cm	25%	0.56 detik	0.33 detik
13 cm	6.25%	2.18 detik	0.66 detik

- PCO (Photocatalytic Oxidation) menggunakan ion Hydroxil yang hanya bertahan kurang dari 1 detik ([link 1](#))
 - Tidak efektif untuk membersihkan seluruh ruangan.
 - Teknologi lama dari tahun 1969.

- Negative ION tidak efektif dalam membunuh kuman.
 - Class Action Lawsuit di USA terhadap manufaktur Bipolar Ionizer yang mengklaim bisa membersihkan udara dan membunuh Covid-19 ([link 1](#))



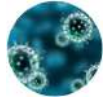


HASIL TEST



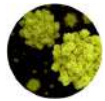
Avian Influenza/Bird Flu – Virus

Tested by Kansas State University
Inactivation Rate 99+%



H1N1/Swine Flu – Virus

Tested by Kansas State University
Inactivation Rate 99+%



Norovirus/Norwalk Virus

Tested by Midwest Research Institute
Inactivation Rate 99+%



Bacillus Globigii – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Bacillus Cereus/B. Cereus – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



C. Diff./Clostridium Difficile – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



E. coli/Pathogenic Escheria Coli – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



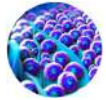
Legionella – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Listeria Monocytogenes – Bacteria

Tested by Kansas State University,
Streis Labs, KAG/Eco Labs
Inactivation Rate 99+%



Methicillin Resistant Staphylococcus Aureus (MRSA) – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Pseudomonas Sp. – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Salmonella – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Staph / Staphylococcus Aureus – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Streptococcus Pneumoniae – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Streptococcus sp/Strep – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Tuberculosis – Bacteria

Tested by Kansas State University
Inactivation Rate 99+%



Mold – Yeast – Bacteria

Tested by California Microbiology Center
Mold: 97-98% reduction
Yeast: 90+% reduction
Bacteria: 99% reduction



Stachybotrys Chartarum – Fungus/mold

Tested by Kansas State University
Inactivation Rate 99+%



Ethylene / C2H4 – VOC

Tests conducted using an ASHRAE compliant HVAC testing system connected to a secondary test chamber
Ethylene level reduced 85+% within 12 hours



Formaldehyde / CH2O – VOC

Tests conducted in a Class II Bio test chamber by Kansas State University
Formaldehyde levels less than 0.05ppm in 4 hours



Chemical Compounds – VOC

Tested by GC/MS Nelap Accredited Independent Lab
Hydrogen Sulfide (Rotten Eggs) – 80% reduction
Methyl Mercaptan (Rotten Cabbage) – 100% reduction
Carbon Disulfide (Vegetable Sulfide) – 30% reduction
Butyl Acetate (Sweet Banana) – 100% reduction
Methyl Metharcylene (Plastic) – 100% reduction



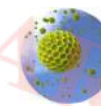
Odors – Perfume, Pet Odors, Cleaning Chemicals

Tested by C&W Engineering (Independent PE Firm)
Cleaning Chemicals – 55% reduction in 24 hours
Pet Odors – 72% reduction in 24 hours
Perfume Odors – 63+% reduction in 24 hours



Smoke Odors

Tested by C&W Engineering (Independent Firm)
Smoke Odors – 70% reduction



Suspended Particle

Tested by Kansas State University,
Performance Analytical Labs
12 hours ISO Class 4 (10,000 – 0.1um)
24 hours ISO Class 3 (1,000 – 0.1um)



Ozone – EMF-Safety Test

Tested by: ETL, TUV to UL standards, CSA, Kansas State University, and other third parties to ensure compliance with federal safety standards.
Tests passed Federal Safety Standards



[link](#)



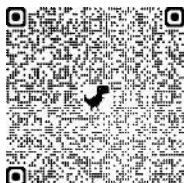


TEST – COVID-19

- Test dijalankan oleh pihak ketiga secara independen di Innovative Bioanalysis Laboratories di Cypress, California, USA.
 - Menggunakan test chamber sebesar 2.5m x 2.5m x 6m untuk simulasi ruangan kantor / rumah.
 - Virus SARS-CoV-2 dipersiapkan di udara maupun di permukaan.
- Menggunakan alat REME-HALO® dijalankan dari awal:
 - Virus dapat dinetralkan sebesar 99.9%, baik di udara maupun di permukaan.
 - Untuk ruang sebesar ini, hanya dalam beberapa menit.
- Test ini diawasi oleh Dr. James Marsden, selaku Executive Director of Science and Technology di RGF.
- Hasil test ini menunjukkan teknologi PHI-Cell® dapat membunuh virus secara instan dan nonstop.
- Press Release:
 - [Link 1](#)
 - [Link 2](#)

INNOVATIVE
BIOANALYSIS

RGF®



RGF®
ENVIRONMENTAL GROUP, INC.
ISO 9001:2015 CERTIFIED COMPANY

RGF® Environmental Group Study: REME HALO® Inactivates SARS-CoV-2 by 99.9%

Proprietary PHI-Cell® Technology Eliminates the Need for Virus Particles
to Travel through HVAC or Air Purification Systems

Port of Palm Beach, Florida (October 26, 2020) – RGF® Environmental Group, Inc., a leading environmental design and manufacturing company, has released the results of a third-party study that reveal REME HALO® efficacy of 99.9% against the SARS-CoV-2 virus, commonly known as the coronavirus 2019 or COVID-19.

Commencing in March 2020, the study was overseen by Dr. James Marsden, Executive Director of Science and Technology at RGF. "The study results show the REME HALO® to be effective in combating the COVID-19 virus and a valuable solution to immediately improve the Indoor Air Quality of residential and commercial spaces and protect occupants against exposure to the SARS-CoV-2 virus." The studies are ongoing.

The independent third-party study focused on the inactivation of SARS-CoV-2 using RGF's proprietary REME HALO® product with PHI-Cell® technology. The testing, performed at the Innovative Bioanalysis Laboratories in Cypress, Calif., looked at neutralizing the virus within the occupied space in the air and on surfaces.

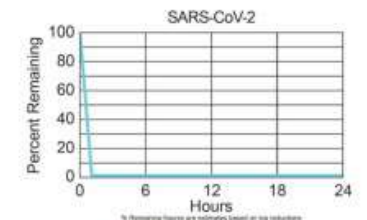
"In our New Normal, the public deserves the confidence of Indoor Air Quality solutions that are backed by science. This study proves the efficacy of one of our flagship products," said Ron Fink, CEO, RGF® Environmental Group, Inc. "From restaurants to schools and places of business, RGF's REME HALO® is a tested and proven solution that provides the peace of mind needed to get America back to work."

The test procedure used the SARS-CoV-2 virus inside a large chamber (4,000 cu. ft.) representing



Figure 1: Dr. James Marsden, Executive Director of Science and Technology

Testing summary: 99.9% inactivation of the SARS-CoV-2 virus



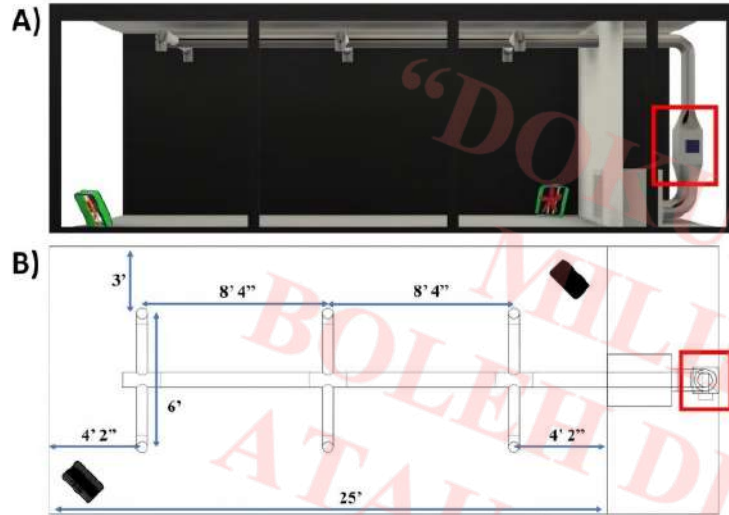
RGF®
ENVIRONMENTAL GROUP, INC.
ISO 9001:2015 CERTIFIED COMPANY

Image 2: Testing Summary: 99.9% Inactivation of the SARS-CoV-2 utilizing REME HALO®.

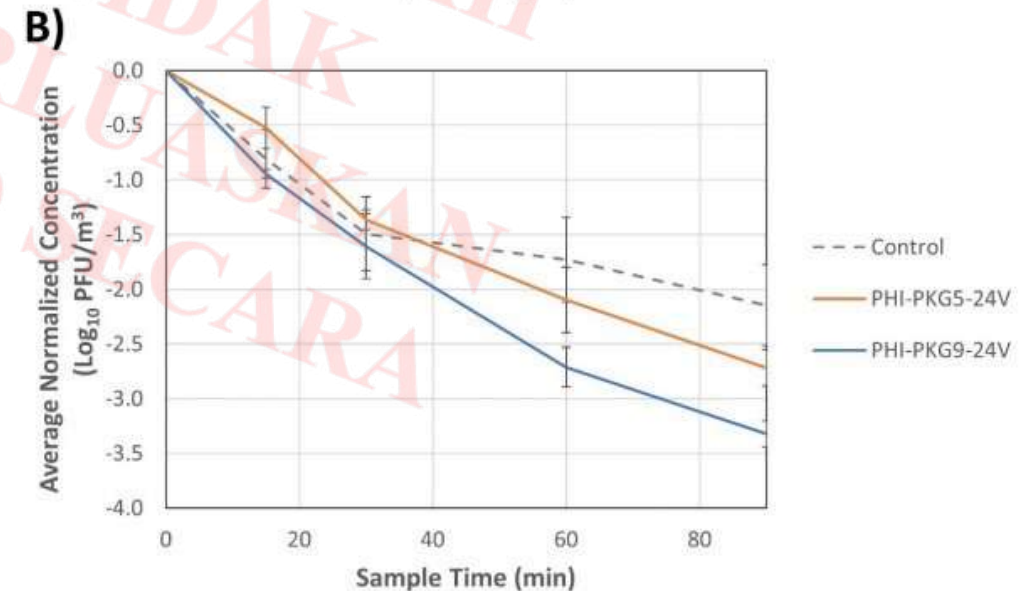
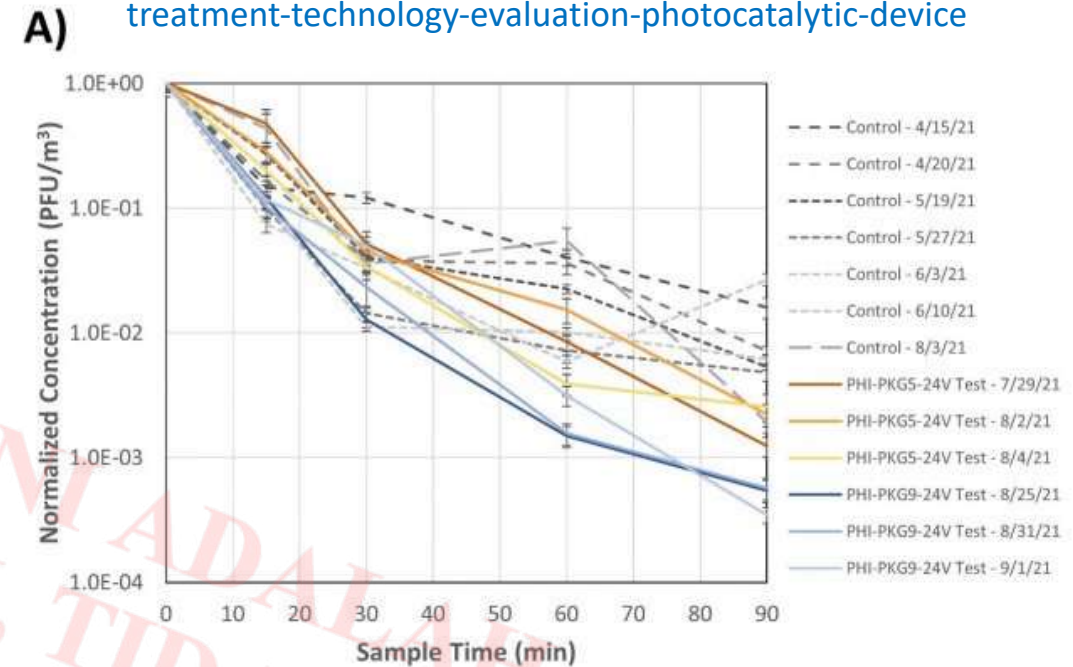


TEST DARI United States Environmental Protection Agency

<https://www.epa.gov/covid19-research/results-aerosol-treatment-technology-evaluation-photocatalytic-device>



- Large test chamber 12' x 10' x 25'
- PHI-PKG5 and PHI-PKG9 were tested in 8" duct distributed via 6 outlets with 10" return, running at 350 CFM.
- Use bacteriophage MS2 virus (more resistant than SARS-CoV-2).
- Ave percent reduction in log₁₀ recoveries ranging from 27% at 15min to 93% at 90min.
- Please note this test was undersized and should have been run at 1000-1200 CFM.





OZONE

- OZONE sebagai Air Purifier tidak di rekomendasikan oleh US EPA ([link](#))
 - Ozone berguna di Stratosphere, berbahaya di permukaan bumi.
 - Inflamasi paru-paru, semakin sensitive thd alergi dan asthma.
 - Merusak sel paru-paru secara permanen ([link](#)).
- Harus di atas batas aman, OZONE baru bisa efektif terhadap kuman dan polutan.
 - Mudah bereaksi menghasilkan senyawa kimiawi lainnya yang berbahaya.
 - Mudah akumulasi sehingga melewati batas safety.
- California Air Resources Board tidak memperbolehkan OZONE generator terhadap manusia dan binatang ([link](#)).
 - Daftar OZONE generator yang berpotensi berbahaya ([link](#)).
- OZONE hanya bisa digunakan sebagai disinfektan.
 - Ruang harus dikosongkan tanpa manusia dan binatang.

• **Aggravate asthma.** When ozone levels are unhealthy, more people with asthma have symptoms that require a doctor's attention or the use of medication. Ozone makes people more sensitive to allergens—the most common triggers for asthma attacks. Also, asthmatics may be more severely affected by reduced lung function and airway inflammation. People with asthma should have an asthma action plan and follow it carefully when ozone levels are unhealthy.

• **Reduce lung function.** This can make it more difficult for you to breathe as deeply and vigorously as you normally would, especially when exercising. You may notice that breathing starts to feel uncomfortable and that you are taking more rapid and shallow breaths than normal.

• **Cause permanent lung damage.** Repeated short-term ozone damage to children's developing lungs may lead to reduced lung function in adulthood. In adults, ozone exposure may accelerate the natural decline in lung function that occurs with age.



Ozone can inflame the lung's lining. These photos show a healthy lung airway (left) and an inflamed lung airway (right). Photos courtesy of PENTAX Medical Company.



UV-C AIR PURIFIER DAN DUCTING

- UV-C tidak efektif dalam membunuh kuman di udara yang bergerak ([link](#)).
 - Virus dan bakteri harus disinarkan di waktu yang cukup lama.
 - Influenza virus: about 6.6 seconds
 - E. Coli: about 6.6 seconds
 - Staphylococcus aureus: about 6.6 seconds
 - Aspergillus mold spores: 8.8 to 33 seconds
 - SARS-CoV: around 60 seconds or more.
 - SARS-CoV-2 (COVID-19 coronavirus): up to 60 seconds
 - Angin yang berhembus di air purifier dan ducting terlalu cepat.
- Tidak bisa membersihkan partikel, polutan dan allergen.
- Memproduksi OZONE.
 - Meningkatkan intensitas UV-C untuk membunuh kuman juga meningkatkan OZONE.
- UV-C efektif untuk sanitasi HEPA filter atau coil dari HVAC.

UConn | UNIVERSITY OF CONNECTICUT

ENVIRONMENTAL HEALTH AND SAFETY

Delivering a suitable UVC dose to target microorganisms requires the consideration and quantification of highly complex interactions between air temperature, velocity, duct surfaces, and lamp performance among other factors (8,9). Simply adding UV to an existing system without consideration of these factors has not been demonstrated to have any benefit (7). The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) reports that UVC system benefits are not easily quantified, are easily lost in poorly maintained systems, and there are no reliable methods for in-situ testing of in-duct system performance to monitor system effectiveness. (7,8,9) In-duct UVC systems are more often used to maintain effectiveness of cooling coils, rather than provide air disinfection.

Additionally, neither the CDC nor the Connecticut Department of Public Health have recommended the use of UVC in ventilation systems for air disinfection in typical spaces such as classrooms, dormitories or office spaces. Instead, they recommend leveraging the systems to maximize dilution ventilation and the introduction of outside air.

Based on current information and public health agency guidance, UConn EHS does not advise in-duct UVC air disinfection systems for general building use. EHS and Facilities Operations will continue to monitor guidance from health agencies on how to effectively utilize ventilation systems to assist in reducing disease transmission.

Special Considerations for Building Occupants

Use of air conditioners, unit ventilators and fans

For spaces with local ventilation control, occupants should adhere to the following best



TIGA TEKNOLOGI PLASMA DARI RGF

REME-LED™



Bebas Merkuri

Bebas Ozon

Lampu UV tahan 2X

REME®

Membersihkan debu/allergen

Ozone Safe



PHI-CELL®

Menetralsir virus, bakteri, mold

Menetralsir VOC's dan Gas Berbahaya

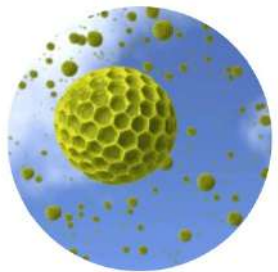
Ozone Safe





FITUR: PEMBERSIH VOC'S DAN GAS BERBAHAYA

- Teknologi REME® dan REME-LED™ dapat membersihkan debu, partikel halus dan allergen di udara.
 - Dengan cara saling merekatkan sehingga partikel menjadi besar, berat dan jatuh ke lantai atau tersaring oleh filter AC.
- Udara menjadi bersih dan membantu pemulihan bagi penderita alergi maupun asthma.
- Hasil test di Kansas State University di mana:
 - Dalam 12 jam, partikel halus 0.1 mikron berkurang menjadi 10,000 ppm (ISO Class 4).
 - Dalam 24 jam, turun menjadi 1,000 ppm (ISO Class 3).
 - ISO Class 4 adalah standard ruang operasi di rumah sakit.



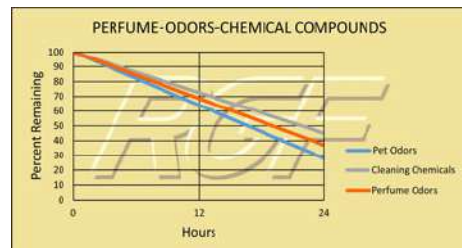
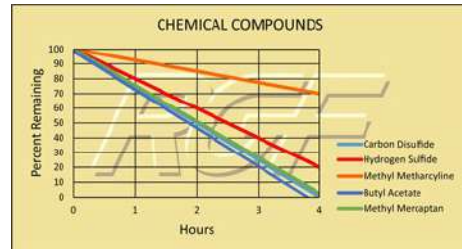
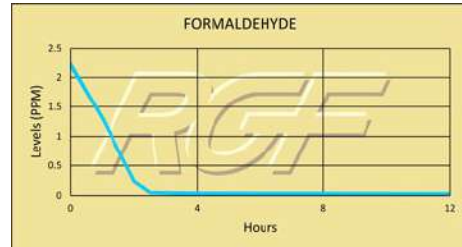
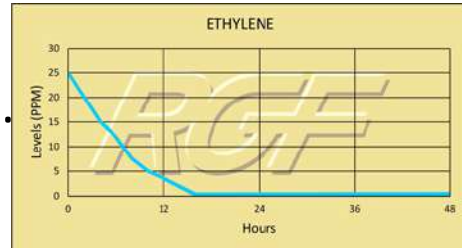
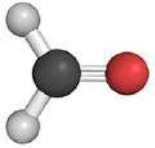
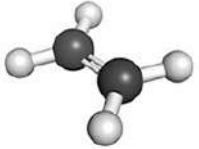
RGF®





FITUR: PEMBERSIH VOC'S DAN GAS BERBAHAYA

- Teknologi PHI-CELL[®], REME[®] dan REME-LED[™] dapat menetralkan VOC (Volatile Organic Compounds) dan gas berbahaya lainnya.
- Test dilakukan di ASHRAE-compliant lab, Kansas State University dan PE Firm.
 - Ethylene berkurang 85% dalam 12 jam.
 - Formaldehyde turun dibawah 0.05 ppm dalam 4 jam.
 - Hydrogen Sulfide (telur busuk) turun 80% dalam 24 jam.
 - Methyl Mercaptan (kubis busuk) turun 100% dalam 24 jam.
 - Carbon Disulfide (sayur) turun 30% dalam 24 jam.
 - Butyl Acetate (pisang manis) turun 100% dalam 24 jam.
 - Methyl Metharcylone (plastik) turun 100% dalam 24 jam.
 - Cleaning chemical (pembersih kimia) turun 55% setelah 24 jam.
 - Bau binatang peliharaan turun 72% dalam 24 jam.
 - Bau parfum turun 63+% dalam 24 jam.
 - Asap rokok turun 70%.





PHI-CELL®: CARA KERJA DENGAN REME®



[Link](#)



COLLETON MEDICAL CENTER (PRE-PANDEMIC)

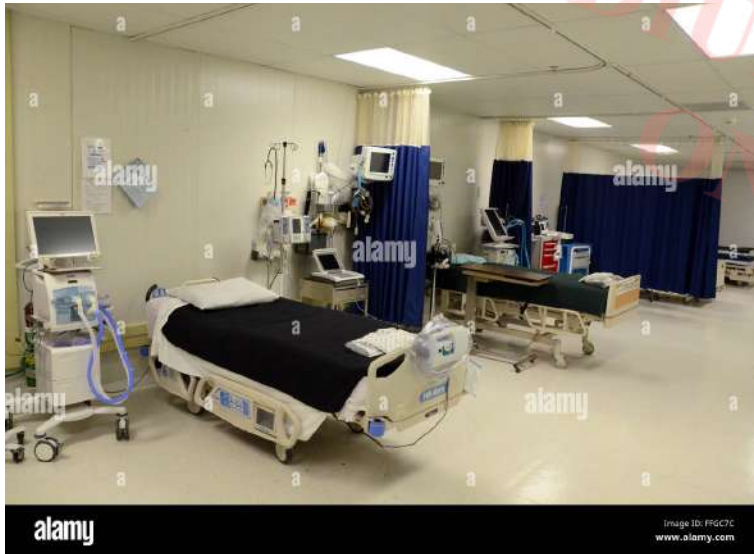


- Problem:
 - Tingkat infeksi MRSA yang tinggi di fasilitas RS.
- Solusi:
 - Install Guardian Air In-Duct system.
 - Tahun 2019 mendapatkan penghargaan dari South Carolina Hospital Association: ZERO HARM AWARDS.
 - 54 bulan tanpa insiden infeksi dalam operasi pergantian tulang lutut.
 - 48 bulan tanpa insiden infeksi dalam operasi pergantian tulang panggul.

<https://colletonmedical.com/about/newsroom/colleton-medical-center-earns-zero-harm-awards>



US MILITARY – CAMP JUSTICE HOSPITAL (PRE-PANDEMIC)



- Problem:
 - Problem dengan jamur dan lumut di fasilitas.
 - Korosi tinggi di HVAC.
 - Tingkat infeksi radang paru-paru yang tinggi.
- Solusi:
 - Instalasi Guardian Air In-Duct units.
 - Test dalam 3 minggu, jamur dan lumut bersih dari HVAC.
 - Eliminasi tingkat infeksi di fasilitas.



AMERICAN CANCER SOCIETY OFFICE BUILDING (PRE-PANDEMIC)



- Problem:
 - Bau ruangan yang mengganggu dan “apek”.
 - Sample jamur dan bakteri yang tinggi saat di ambil di 7 titik lokasi.
- Solusi:
 - Instalasi REME-HALO dan Guardian Air.
 - Penurunan bakteri: 67%.
 - Penurunan jamur: 100%.





INSTALASI DI RUMAH SAKIT

- **Amman, Jordan**
 - Al Khalidi Medical Center
- **China**
 - Beijing Tiantan Pugua Hospital
 - Dalian Skin Disease Hospital
 - Sichuan Huaxi Hospital
 - Shanghai Oriental Liver & Gall Hospital Shanxi Eyes Hospital
 - Dalian Infectious Disease Hospital No. 2 Hangzhou Hospital
 - No. 1 Maoming Guangdong Hospital No. 3 Liaoyang Hospital
- **Panama**
 - Empresa House Against Allergy
 - Vigia Hospital
 - Mother & Child Hospital Jose Domingo De Obaldia Hospital el Vigia
 - Secretaria Nacional de Ciencia, Tecnologia e Innovacion Hospital Materno Infantil
 - Caja de Seguro Social
- **Mexico**
 - Sanatorio Espanol, Torreon, Mexico
- **United States**
 - St. Helena, St. Helena, CA
 - Southwest Texas Medical, San Marcos, TX
 - Southern Maryland Hospital, Clinton, MD
 - Detroit Medical Centre, Detroit, MI
 - Vanguard
 - Trinity Health, Detroit Medical Center, Detroit, MI
 - Central Texas Medical Center, San Marcos, TX
 - Ronald McDonald House, Charleston, SC
 - Baylor Cancer Center, Dallas, TX
 - Colleton Medical Center, Waltersboro, SC
 - Lima Memorial Hospital, Lima, OH
 - County of Allegheny/Office of the Coroner, Pittsburgh, PA
 - John J. Kane Regional Medical Center, Pittsburgh, PA
 - Eden Gardens Assisted Living Facility/Alzheimer's Unit, Aiken, SC
 - Walterboro Community Hospital, Walterboro, SC
 - Belvedere Animal Hospital, WPB, FL
 - St. Mary's Hospital
- **Korea**
 - Korean University Medical Center
 - Hyundai Asian Medical Center



TEST: CARA MENGUKUR EFEKTIFITAS

KUMAN ≠ DEBU
DEBU ≠ KUMAN



GERM FREE

Test Kuman:

Sample diambil dari titik manapun di dalam ruangan, baik dari permukaan maupun dari udara.

Pengambilan sample dijalankan min dua kali:

- Sebelum Air Purifier dinyalakan.
- Setelah Air Purifier dinyalakan dengan jangka waktu yang sudah disepakati.

Perbedaan antara sebelum dan sesudah menunjukkan penurunan koloni kuman.

Alat yang digunakan ATP Meter atau dengan bantuan lab service seperti Saraswanti, Sucofindo, TUV, dsb.



VOC FREE

Test VOC:

Prosedur dapat dijalankan seperti Test Kuman di atas dengan sample udara, tetapi menggunakan alat yang berbeda yang dapat mengecek bermacam tipe gas seperti Formaldehyde, Ozone, Ethylene, dsb.



DUST FREE

Test Partikulat:

Seperti diatas, tetapi menggunakan alat untuk mengukur Particle Matter dengan ukuran tertentu seperti PM 10, PM 2.5 dsb.

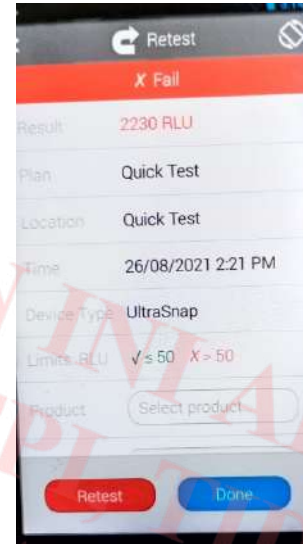
**HANYA RGF YANG DAPAT MEMBERIKAN
PEMBUKTIAN SECARA REAL-TIME DI SEMUA
TITIK DALAM RUANGAN.**



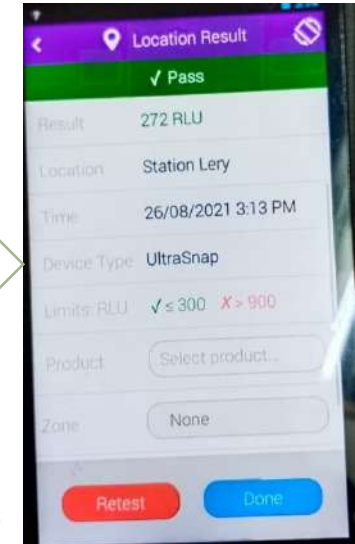
TEST: WISMA BUDI (KUNINGAN, JAKARTA)



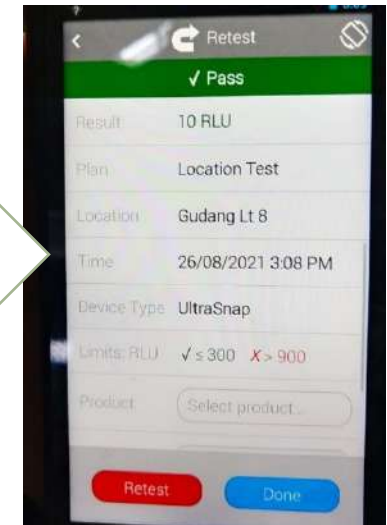
- Lokasi: Wisma Budi
- Menggunakan alat ATP Luminometer, mengukur koloni bakteri di dua titik.
- Test dijalankan dengan mengambil sample sebelum dan 40 menit sesudah QRP-14 dijalankan,



2230 turun 272



504 turun 10





TEST: RS BUDHA TZU CHI (PIK – JAKARTA)

- Lokasi: Tzu Chi Hospital – Pantai Indah Kapuk
 - Ruang: Operating Theater VK di lantai Pandemi
- Metode test:
 - Independent lab: PT Anugerah Analisis Sempurna (Saraswanti Group)
 - Air Purifier digunakan: REME-HALO.
 - Media Sample (Bakteri/Jamur) di paparkan di udara selama **5 menit**.
 - Test 1: sebelum alat dinyalakan.
 - Test 2: 3 hari kemudian setelah alat dinyalakan 24 jam setiap hari.

PT. ANUGRAH ANALISIS SEMPURNA
One Line Laboratory Services

SARASWANTI
Jl. Raya Jakarta Bogor KM. 37, RT 005/04, Cilandak, Depok, Jawa Barat 16412.
Telp.: 021- 29629393-94, Fax.: 021- 29629395. Website: www.aaslaboratory.com, Email: marketing@aaaslaboratory.com.
A Member Of Saraswanti Group.

KAN
Komite Akreditasi Nasional
LP-565-IDN

LAPORAN HASIL PENGUJIAN
Result of Analysis
No: AAS.LHP.XI.2021.2849

<u>Nomer Order</u> (Order Number)	AAS KU.XI.2021.2849	<u>Matrik Sampel</u> (Sample Matrix)	Air Limbah
<u>Nama Pelanggan</u> (Customer Name)	PT CLARUS TECHNOLOGY INDONESIA	<u>Parameter Analisa</u> (Parameter)	Analisa Air Limbah
<u>Alamat</u> (Address)	Tzu Chi Hospital, Jl. Pantai Indah Kapuk Boulevard, RT.6/RW.2, Kaimal Muara, Kec. Penjaringan, Kota Jkt Utara, Daerah Khusus Ibukota Jakarta 14470 Jakarta Utara, DKI Jakarta	<u>Tgl. Penerimaan</u> (Received Date)	02 November 2021

Parameter Uji	HASIL	NAB	Satuan
Formaldehyde	<0,0175	0,3 ³⁾	ppm
Partikel <10 µm (PM 10)	0,42	-	mg/m ³
Ozon (O ₃)	0,051	0,20 ³⁾	ppm
Mikrobiologi			
Bakteri	930	700 ³⁾	cfu/m ³
Jamur	200	1000 ³⁾	cfu/m ³

PM 10 turun
75%

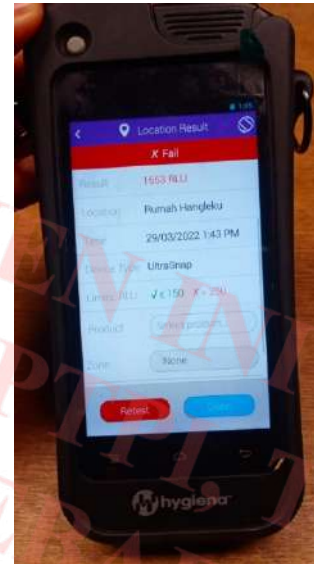
Bakteri/Jamur
turun 99.9%

Parameter Uji	HASIL	NAB	Satuan
Formaldehyde	<0,0175	0,3 ³⁾	ppm
Partikel <10 µm (PM 10)	0,10	-	mg/m ³
Ozon (O ₃)	<0,0491	0,20 ³⁾	ppm
Mikrobiologi			
Bakteri	<1	700 ³⁾	cfu/m ³
Jamur	<1	1000 ³⁾	cfu/m ³

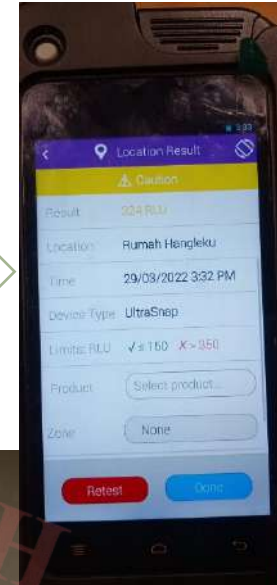


TEST: RUMAH MEWAH DI JAKARTA SELATAN

- Lokasi: Jalan Hang Lekiu, Jakarta Selatan.
- Kondisi masih dalam konstruksi shg debu dan kontaminasi dari pekerja cukup tinggi.
- Alat terpasang: HALO-LED™
- Test dijalankan:
 - Sebelum pukul 1:41pm
 - Sesudah pukul 3:32pm
- Hasil:
 - Koloni bakteri turun dari 1653 RLU ke 324 RLU.
 - Formaldehyde turun dari 172 mg/m³ menjadi 0.
 - PM 2.5 turun dari 124 µg/m³ ke 38 µg/m³.



Bakteri
1653 turun 324



Formaldehyde
172 turun 0

PM 2.5
124 turun 38





TEST: WISMA MILLENIA

LAPORAN TEST INDOOR AIR QUALITY

LOKASI: WISMA MILLENIA, JAKARTA

No: SVC/XXI/XII/012, Tanggal 8 Desember 2021

- Lokasi: Wisma Millenia, Jakarta.
- Metode: ATP Luminometer.
- Alat terpasang: Guardian QRP-14.
- Test dijalankan di beberapa hari seiring dengan instalasi di 9 lantai:
 - Hasil menunjukkan penurunan koloni bakteri secara terus menerus di bawah safety level (< 300RLU).

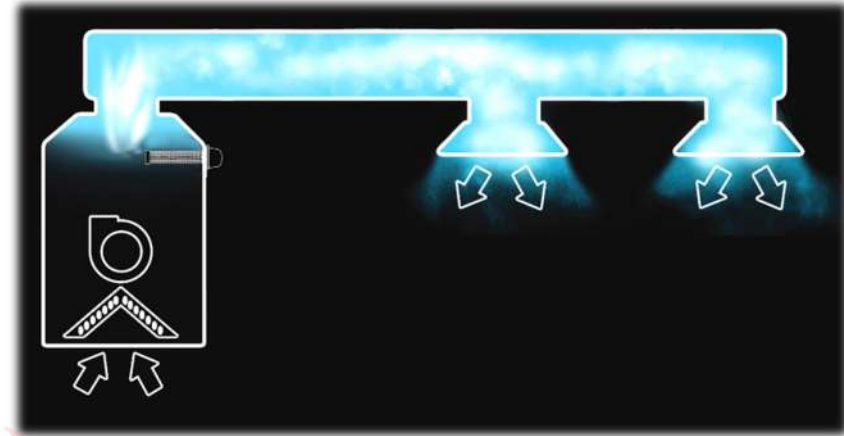
Berikut ini adalah laporan test Air Indoor Quality yang dijalankan di:

- Tempat: Wisma Millenia
- Tanggal: 13 – 27 Oktober 2021, 16 November 2021
- Metode:
 - o ATP Monitor merek Hygiena dengan Ultrasnap untuk test swab bakteri.

Lantai	Area	Description	Result Date	RLU
Lobby	Lift		2021-10-13	30
Lantai 1	Selatan	sebelum terpasang	2021-10-13	560
	Selatan	sesudah terpasang – retest	2021-10-27	3
	Tengah	sebelum terpasang	2021-10-13	450
	Utara	sebelum terpasang	2021-10-13	92
Lantai 2	Utara	sesudah terpasang – retest	2021-10-27	24
	Selatan	sebelum terpasang	2021-10-13	753
	Selatan	sesudah terpasang – retest	2021-10-27	47
	Tengah	sebelum terpasang	2021-10-13	1,012
Lantai 3	Utara	sebelum terpasang	2021-10-13	910
	Utara	sesudah terpasang – retest	2021-10-27	195
	Selatan		2021-10-13	74
	Tengah		2021-10-13	25
Lantai 4	Utara		2021-10-13	15
	Toilet Pria		2021-10-27	98
	Selatan	sesudah terpasang – test 1	2021-10-13	153
	Selatan	sesudah terpasang – retest	2021-11-16	30
Lantai 5	Tengah	sesudah terpasang – test 1	2021-10-13	307
	Tengah	sesudah terpasang – retest	2021-11-16	161
	Utara		2021-10-12	124
	Selatan		2021-10-12	7
Lantai 6	Tengah		2021-10-12	110
	Utara		2021-10-13	13
	Selatan		2021-10-14	29
	Tengah		2021-10-15	18
	Utara		2021-10-16	12



INSTALASI & SERVICE



- Install di plenum / main duct bagian supply.
 - Dihubungkan ke 24V Transformer.
- Perhitungan kapasitas berdasarkan CFM dari indoor unit.
 - CFM indoor unit dikalikan dengan multiplier.
 - Rekomendasi gunakan multiplier 2X untuk kondisi standard.
 - Apabila area high traffic atau fresh air yang tinggi, gunakan multiplier 3X – 4X.
- Maintenance:
 - Pergantian lampu UV setiap 2 tahun atau 4 tahun (tergantung model).
 - Pembersihan catalyst dengan kuas atau cuci dengan air.



ACTIVE PLASMA AIR PURIFIERS

100,000 CFM
250 TR

Maintenance, ganti lampu

- STD: 2 tahun
- LED: 4 tahun

18,000 CFM

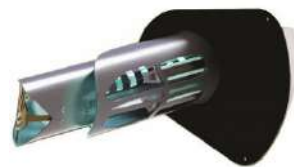
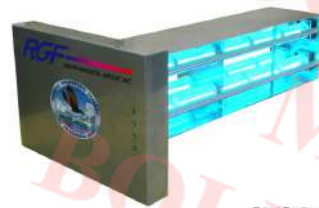
6,500 CFM

Garansi

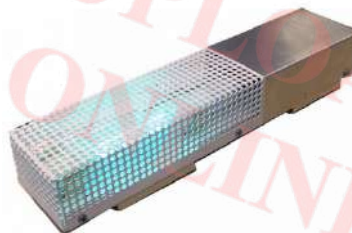
- Ballast: 3 tahun
- Lampu UV: 1 tahun

RGF[®]

IN-DUCT



FLOOR STD CASSETTE ROOFTOP BJLS DUCT



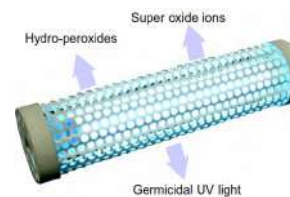
PORTABLE STANDALONE



WALL SPLIT



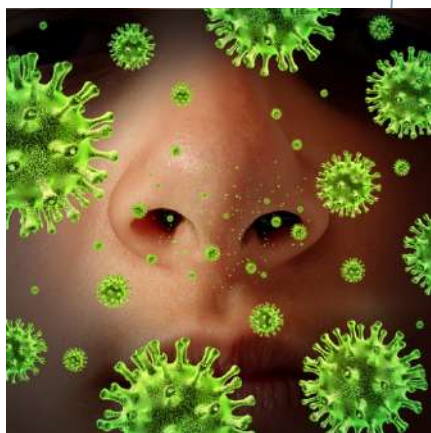
MOBIL BIS KERETA API PESAWAT



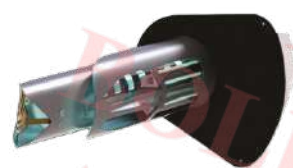
"DOKUMEN MILIK PT RGF ENVIRONMENTAL SYSTEMS BOLEH DISEBARLUKANTAKAN ATAU DIUPLIKASIKAN SECARA ONLINE"



TEKNOLOGI RGF



EFEKTIF PENJERNIHAN KUMAN & VOC



PLASMA



HEPA



MICROCON® ExC7



EFEKTIF PENJERNIHAN DEBU & VOC

PLASMA DAN HEPA SALING COMPLEMENTARY

KUMAN ≠ DEBU

DEBU ≠ KUMAN



HEPA + UVC

UV-C



HEPA



FDA 510(k)
COMPLIANT

FDA 510(k)
COMPLIANT



MICROCON® CD

Accustat™-ST8MSPR





HEPA: STANDALONE VS. BYPASS

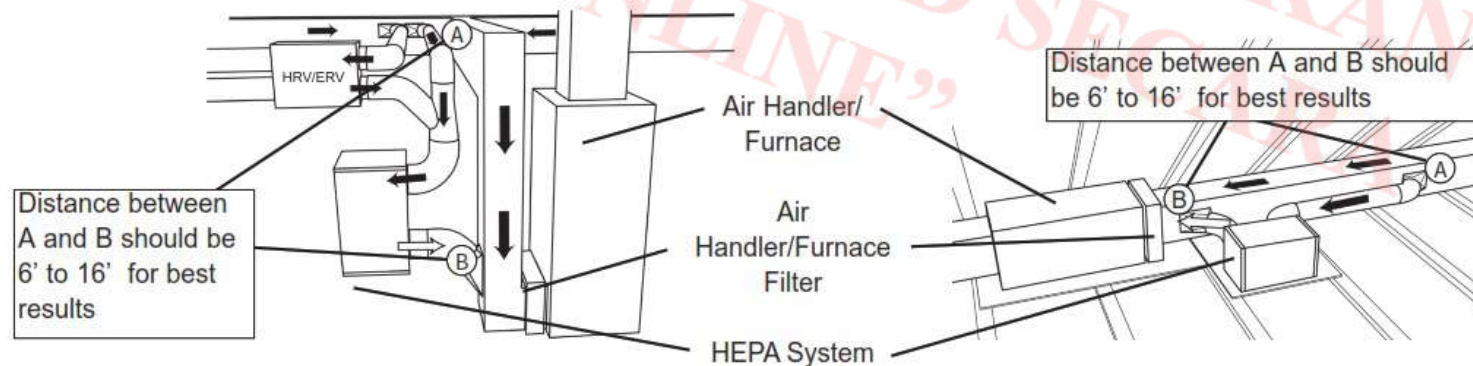
ACH: Air Change per Hour
Waktu yang diperlukan untuk
menjernihkan seluruh volume udara di
dalam ruangan

STANDALONE

- Dapat mencapai ACH yang tinggi.
- Perlu static pressure tinggi (tambah booster fan).
- Single point of failure, apabila booster fan rusak akan mengganggu kinerja HVAC.
- Aplikasi: Rumah Sakit (Operating Room, Isolation Room), Clean Room dsb.

BYPASS

- Tidak dapat mencapai ACH tinggi.
- Motor fan sudah terintegrasi, tidak mengurangi static pressure HVAC.
- HVAC tidak terpengaruh apabila motor fan HEPA rusak, no single point of failure.
- Aplikasi: rumah, kantor, ballroom, restoran, ruang umum, dsb.





HEPA: MICROCON® 350/675

- Bypass / Standalone HEPA Air Filtration System.
 - Built-In Motor Fan, tidak mengurangi static pressure dari HVAC.
- 3-Stage Filtration System:
 - Pre-Filter: membersihkan partikulat yang besar.
 - HEPA (H13) Filter: membersihkan 99.97% partikulat ukuran sampai dengan 0.3 mikron.
 - Activated Carbon Filter membersihkan VOC's dan bau udara lainnya.
 - Optional: VOC canister untuk menghilangkan VOC's dan bau lebih kuat.

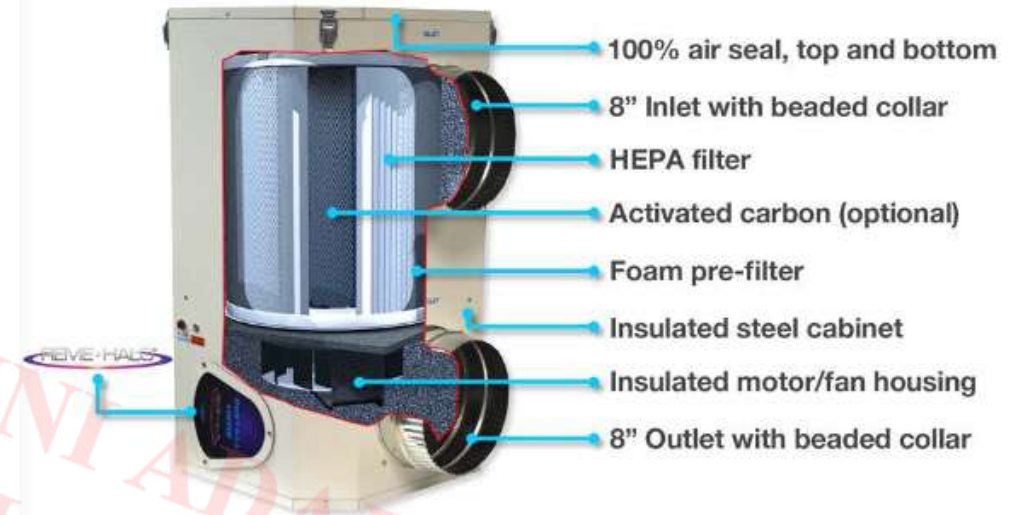


	MICROCON® 350	MICROCON® 675
Dimensi	37cm x 37cm x 70cm	
Motor/Fan	Di test dengan operational non-stop di 50.000+ jam	
Coverage	240 m2	460 m2
Inlet	8" diameter	10" diameter
Outlet	6" diameter	8" diameter
Berat	13.6 kg	15 kg
Air Flow	350 CFM	675 CFM
Electrical	220V, 3.4 amps, 75 watt	220V, 7 amps, 150 watt



HEPA: MICROCON[®] 600

- Bypass / Standalone HEPA Air Filtration System.
 - Built-In Motor Fan, tidak mengurangi static pressure dari HVAC.
- Model MC-600-H (HEPA System)
 - Stage 1: Pre-filter
 - Stage 2: HEPA (H13) filter membersihkan 99.97% partikulat s/d 0.3 mikron.
- Model MC-600-C (Activated Carbon System)
 - Stage 1: Pre-filter
 - Stage 2: Activated Carbon membersihkan VOC dan bau kurang baik.
- Dapat ber-integrasi dengan HALO-LED[™] atau REME-HALO[®].



	Microcon 600
Dimensi	37cm x 37cm x 70cm
Motor/Fan	Di test dengan operational non-stop di 50.000 + jam
Coverage	460 m ²
Inlet	8" diameter
Outlet	8" diameter
Berat	15 kg
Air Flow	600 CFM

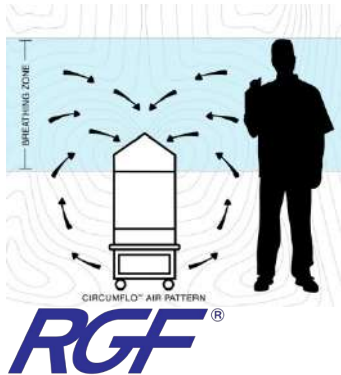


HEPA: MICROCON® MAP 400/800

- HEPA Air Filtration System yang mobile untuk rumah sakit dan fasilitas kesehatan, menggunakan CIRCUMFLOW® perputaran udara.
- Ber-sertifikasi FDA 510(k) Compliant.
- Low noise, dan dapat bekerja standalone atau menciptakan positive/negative pressure room.
- Filtration System:
 - Pre-Filter: membersihkan partikulat yang besar.
 - HEPA Filter: membersihkan 99.97% partikulat ukuran sampai dengan 0.3 mikron.
 - Optional: Activated Carbon.
 - Optional: Lampu UV



FDA 510(k)
COMPLIANT

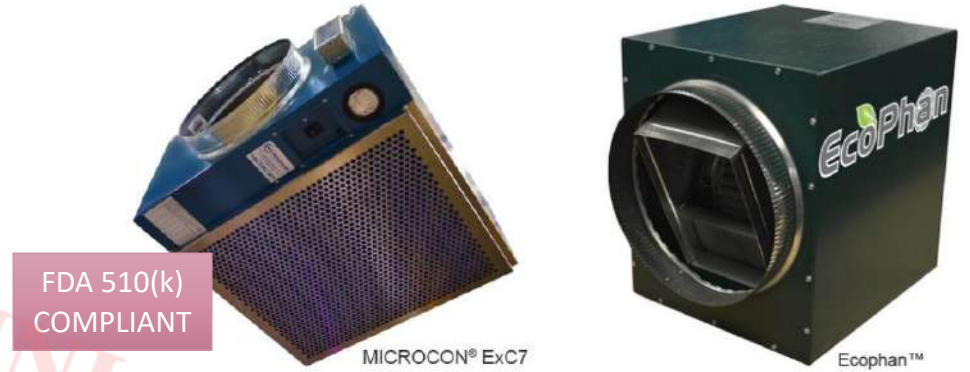


	MAP 400	MAP 800
Dimensi (hxwxh)	100cm x 32cm x 32cm	114cm x 47cm x 47cm
Filtration Rate	12.000 – 14.000 cu ft/hr	24.000 – 48.000 cu ft/hr
Air Flow	200 – 400 CFM	400 – 800 CFM
Noise	<50 dB	<50 dB
Electrical	230V, 500 watt max	230V, 500 watt max



HEPA: MICROCON[®] EXC7 / ECOPHAN[™]

- EXC-7 adalah HEPA Air Filtration module tipe ceiling:
 - Dapat integrasi dengan HVAC system, atau
 - Gabung dengan EcoPhan[™] menjadi standalone.
 - Menciptakan negative / positive / neutral pressure isolation room di rumah sakit dan fasilitas kesehatan lainnya.
- Ber-sertifikasi FDA 510(k) Compliant.
- Low noise, dan dapat bekerja standalone atau menciptakan positive/negative pressure room.
- Filtration System:
 - Pre-Filter: membersihkan partikulat yang besar.
 - HEPA Filter: membersihkan 99.97% partikulat ukuran sampai dengan 0.3 mikron.
 - Optional: Activated Carbon.
 - Optional: Lampu UV



	ExC7	EcoPhan [™]
Motor/Blower	N/A	1/3 HP – High Efficiency Variable Speed
Electricity	230 VAC, 50/60Hz, 1Ph	230 VAC, 50/60Hz, 1Ph
FLA Amps	N/A	230, 4.0A/2.0A@50Hz
Facility Power Interface	N/A	Pre-installed on Blower Module Chassis Breaker / On/Off Switch
CFM – Free Air	N/A	1350+ CFM @ 0.0”WC
CFM – Delivered Air	0 – 850+ CFM @ 0.0”WC	0 – 850+ CFM @ 0.0”WC
Mount Position	Drop Ceiling	Mechanical Space
Hangers	N/A	4 – Eye bolt hardware included
Chassis	16ga Galvanized Steel, Epoxy Painted	16ga Galvanized Steel, Epoxy Painted
Duct Collars	2ea - Intake and Exhaust 12” (10” Optional Adaptor)	2ea - Intake and Exhaust 12” (10” Optional Adaptor)
Berat	19.5kg	19kg
Dimensi (W) x (L) x (H)	349mm x 381mm x 419mm	343mm x 495mm x 413mm
Thermal Protection	N/A	Auto-Reset Thermal Overload
Speed Control	Various Input Options	Various Input Options
dB Sound	Very Low	Very Low



CONTROL: ACCUSTAT™

- Monitor untuk Negative / Positive Pressure Room.
- Akurasi mencapai 0.001" WG, dengan bunyi alarm dan deteksi di screen.
 - Menggunakan sensor yang sangat sensitive dengan tekanan/pressure, bukan berdasarkan sensor airflow yang problem dengan konsistensi.
- Accustat™-ST: dipasang diluar ruang isolasi, menunjukkan tekanan negative/positive.
- Accustat™-BMS: dengan konektifitas ke BMS melalui 4-20 mA analog output.
- Accustat™-PR: konektifitas ke ExC7 dan Ecophan™.
- Accustat™-P2: portable di dalam tas khusus, bertahan s/d 48 jam setelah di charge penuh.



Accustat™-ST/BMS/PR



Accustat™-P2 Portable



HEPA: MICROCON[®] CD & PD

- HEPA Filtration System untuk menyaring pollutant dan gas yang berkontaminasi di udara.
 - Microcon[®] CD: tipe ceiling.
 - Microcon[®] PD: tipe portable.
- Filtration System:
 - Pre-Filter: membersihkan partikulat yang besar.
 - HEPA Filter: membersihkan 99.97% partikulat ukuran sampai dengan 0.3 mikron.
 - Dual Activated Carbon Filter Cell.
 - Lampu UV



MICROCON[®] CD

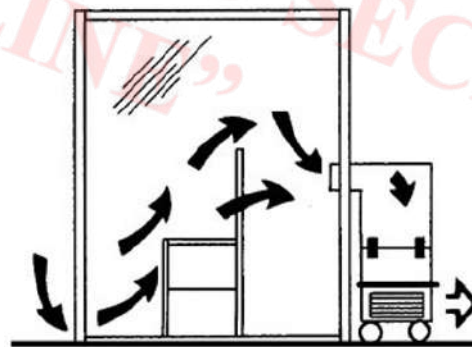


MICROCON[®] PD



ISOPORT™

- Ruang isolasi yang dapat di customize.
- Penggunaan di fasilitas kesehatan:
 - Sputum induction.
 - Administration of Aerosolized Medications.
 - Pentamidine Treatments.
- Penggunaan di Clean Room:
 - Electronics Manufacturing.
 - Artifact Conservation and Collection Care.
 - Pharmaceutical Compounding.
 - Hazmat Handling.
 - Food Preparation.
- Dapat di integrasikan dengan:
 - Microcon® HEPA Filtration System.
 - HALO-LED™ atau REME-HALO®





UV: BLU-QR®

- Lampu UV untuk Coil.
- Mudah dipasang tanpa alat bantu, dengan berbagai macam mounting kit: magnetic, mechanical, self-adhesive dsb.
- Pergantian lampu dengan cepat dan mudah.
- Manfaat:
 - Mengurangi populasi Virus/Bakteri/Jamur dan bau ruangan.
 - Meningkatkan kualitas udara ruangan (indoor air quality).
- Tersedia:
 - Single lamp (1 tahun / 2 tahun).
 - Twin lamp (berikut power supply).





PROJECTS: THE WHITE HOUSE





PROJECTS: AIRPORT



São Paulo International Airport (GRU)



Jorge Chávez International Airport (LIM)



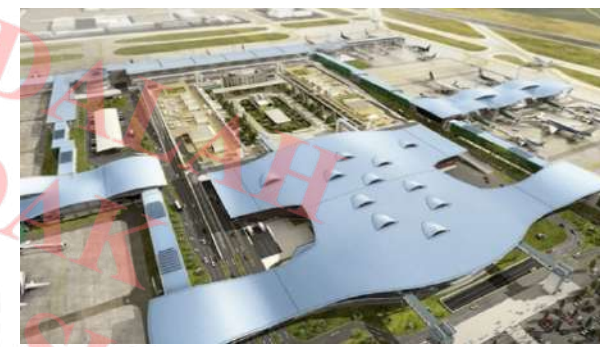
Congohas Airport (CGH)



Salvador International Airport (SSA)



Arnold Palmer Regional Airport



Comodoro Arturo Merino Benítez International Airport (SCL)



Dalian International Airport



Tianjin Binhai Airport



Hangzhou International Airport



PROJECTS: HOSPITALS & HEALTHCARE



US Military – Camp Justice Hospital



Johns Hopkins Hospital



Albert Einstein Hospital, Sao Paulo, Brazil.



Mayo Clinic Hospital



Korea University Medical Center



Colleton Medical Center



PROJECTS: FOOD & BEVERAGES



Shake Shack 180 locations



MacDonald's ([link](#))



TGI Fridays Franchise ([link](#))



Chipotle Mexican Grill Franchise ([link](#))



Newport Restaurant Group ([link](#))



PROJECTS: GEDUNG PERKANTORAN



Four Fisher Brothers' Class A Office Buildings in New York ([link](#))

Llyods of London ([link](#))



UBER Headquarter - Brazil



Siemens Building



The Kraft Heinz Office ([link](#))



Bayer Office ([link](#))



Google Tower ([link](#))



Johnson & Johnson



Microsoft Building



Nestle Office ([link](#))



Merck Office ([link](#))



PROJECTS: TRANSPORTASI



Capital Metro Austin, Texas ([link](#))



Disney Cruise Line



Capital District Transportation Authority, New York ([link](#))



Hongkong Subway



Jacksonville Transportation Authority, Florida ([link](#))



PROJECTS: HOSPITALITY



ITC Grand Bharat Hotel, Bengaluru



ITC Windsor Hotel, Bengaluru



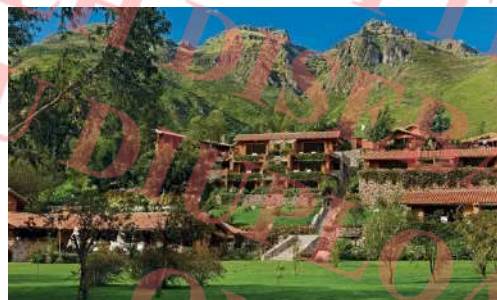
ITC Maratha Hotel, Mumbai



The Legendale Hotel – Beijing, China



Miraflores Park, Belmont Hotel, Lima



Rio Sagrado, A Belmond Hotel, Sacred Valley



Monasterio, Belmont Hotel, Cusco



Madison Beach Hotel, Curio Collection by Hilton



PROJECTS: SEKOLAH



Paris Central Public School, Paris, Canada



Brier Park Public School, Brantford, Canada



The Els Center of Excellence



Gulf Stream School, Florida



Gulf Stream School, Florida



Palm Day Beach Academy, Florida



PROJECT: LAINNYA



Shenyang International Convention and Exhibition Center



Casino Sun Monticello ([link](#))



Sea World Australia



Zara Retail Stores, Panama City



Asolo Repertory Theatre ([link](#))



Sun Life Stadium – Miami Florida



PROJECTS: INDONESIA



Wisma Millenia



Wisma Budi



Sahid Sudirman Center



Sequis Tower



Wisma 46



GBI – PRJ CK7



Gedung Bank Indonesia



RSUD Tangerang





IN-DUCT: HALO-LED™

- Tipe: IN-DUCT.
- Teknologi: REME-LED™
- Kombinasi fitur yang terbaik.
 - Bebas Merkuri dan Bebas Ozone.
 - Menetralkan kuman.
 - Menetralkan VOC's.
 - Membersihkan debu dan allergen.
- Catalyst bisa dicuci bersih.
- Auto Self-Cleaning Ionizer.
- LED UV cell yang 2x tahan lebih lama.



Model #	HALO-LED™
Teknologi	REME-LED™
Pergantian UV Cell	4 tahun
Power Supply	120/208/240 VAC 50/60 Hz
Voltase	24 VAC/DC
Ampere	0.7 A
Watt	17 W
Tons of Refrigerant	2.5 – 16.25
Air Flow	250 – 6,500 CFM
Tipe	In-Duct
Material	Aluminum / polymers
Dimensi	28cm probe / 16.5cm x 19.5cm plate
Berat	2.7 kg
Kadar Hydrogen Peroxides	<0.02 PPM





IN-DUCT: REME-HALO®

- Tipe: IN-DUCT.
- Teknologi: REME®
- Catalyst dengan Zinc untuk meningkatkan daya bunuh terhadap kuman.
- Fitur:
 - Menetralkan kuman.
 - Menetralkan VOC's.
 - Membersihkan debu dan allergen.
- Mudah dibuka untuk pergantian UV Cell.



SAFE OZONE LEVEL



GERM FREE

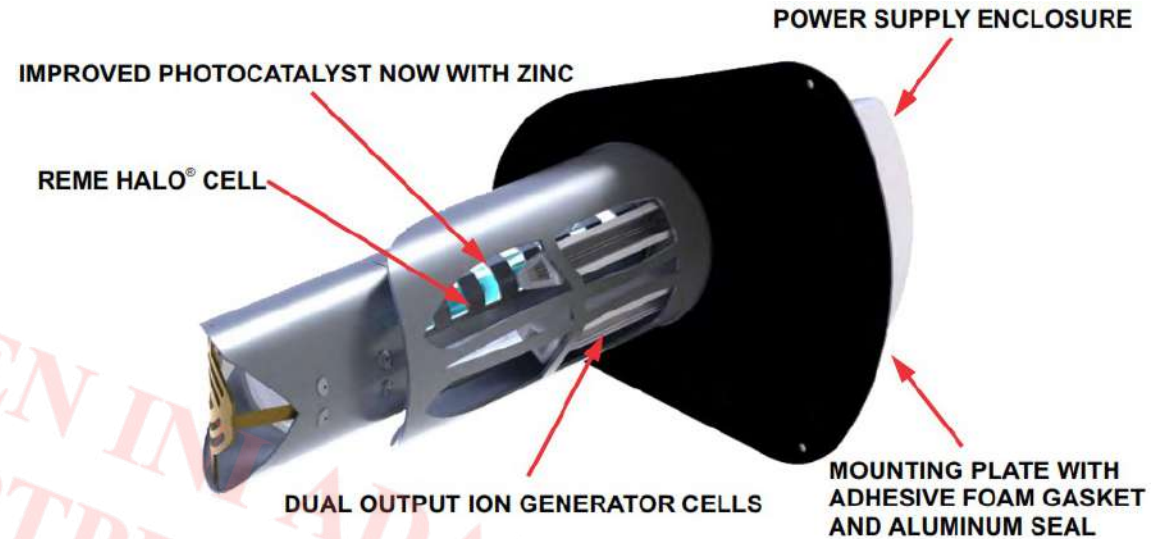


VOC FREE



DUST FREE

RGF®



Model #	REME-H
Teknologi	REME®
Pergantian UV Cell	2 tahun
Power Supply	120/208/240 VAC 50/60 Hz
Voltase	24 VAC
Amps	0.7 A
Watts	17 W
Tons of Refrigerant	2.5 – 16.25
Air Flow	1,000 – 6,500 CFM
Tipe	In Duct
Material	Aluminum / polymers
Dimensi	16.5 x 18.8 x 35.1 cm
Berat	2.7 kg
Kadar Hydrogen Peroxides	<0.02 PPM



IN-DUCT: GUARDIAN AIR QR+

- Tipe: IN-DUCT.
- Teknologi: PHI-CELL®
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Mudah dibuka untuk pergantian UV Cell.



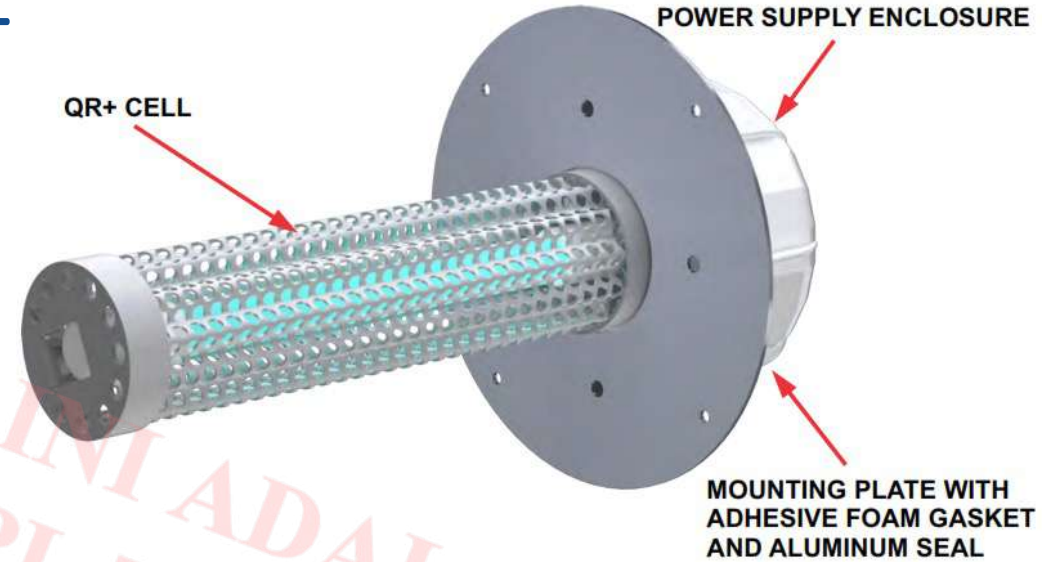
SAFE OZONE LEVEL



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ITEM #	QRP-5	QRP-9	QRP-14
Air Flow	300 – 1,200 CFM	1,000 – 6,500 CFM	10,000 – 18,000 CFM
Dimensi	13cm Probe / 14cm Dia. Plate	23cm" Probe / 14cm Dia. Plate	36cm Probe / 14cm Dia. Plate
Listrik	0.47 Amps, 11 Watts	0.6 Amps, 14 Watts	0.7 Amps, 17 Watts
Berat	1.4 kg	1.4 kg	1.8 kg
Teknologi	PHI-CELL®		
Pergantian UV Cell	2 tahun		
Voltase	24 VAC		
Tons of Refrigerant	3 to 20 tons		
Air Flow	300 – 18,000 CFM		
Tipe	In-Duct		
Material	Aluminum / polymers		
Kadar Hydrogen Peroxides	<0.02 PPM		



IN-DUCT: COMMERCIAL PHI

- Tipe: IN-DUCT.
- Teknologi: PHI-CELL®
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Aplikasi: kapasitas besar s/d 250 TR:
 - Airport, Shopping Mall, Terminal, dsb.



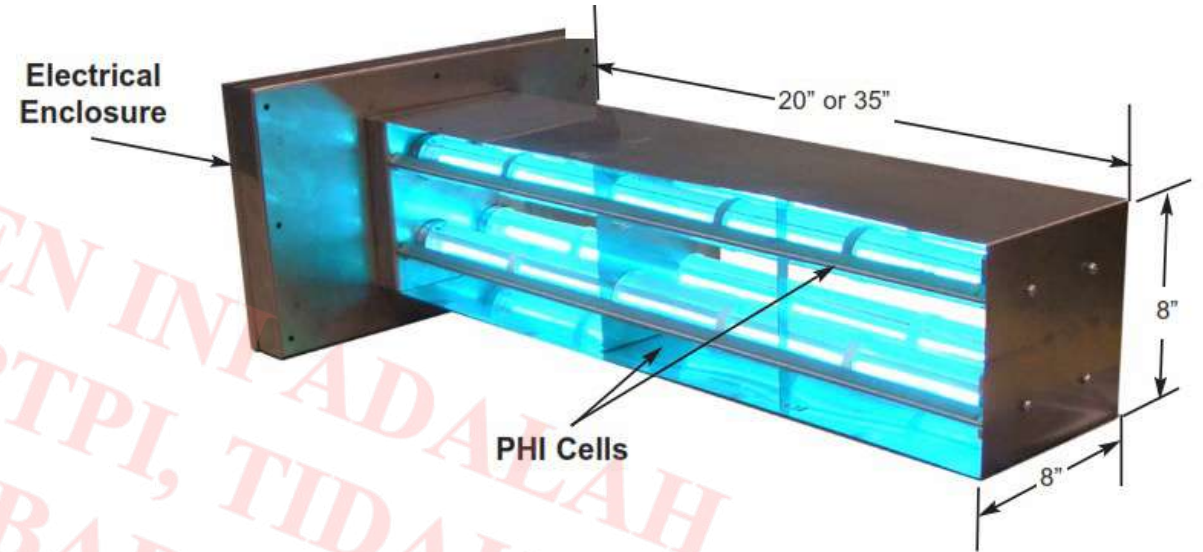
SAFE OZONE LEVEL



GERM FREE



VOC FREE



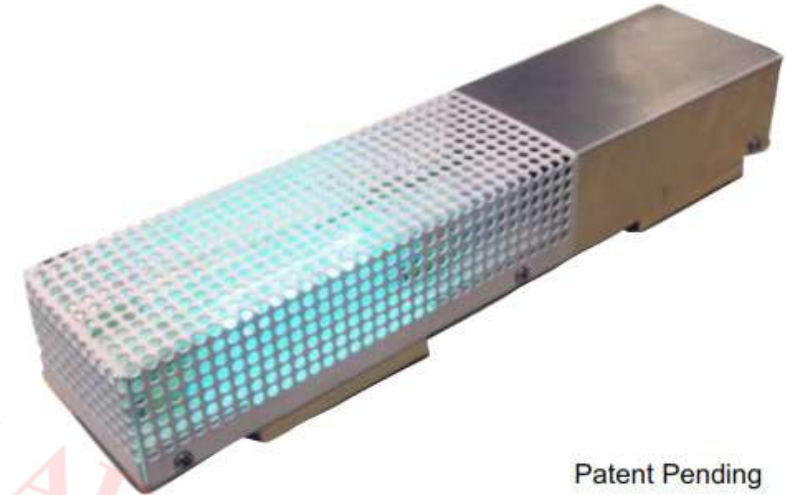
Commercial 35 – Housing is 35" L	# of 35" cells	# of 14" cells	CFM Coverage	Tons of Refrigerant
CML-150	2	1	59,770	150
CML-180	2	2	69,500	180
CML-190	3	0	75,060	190
CML-215	3	1	84,790	215
CML-250	4	0	100,080	250

Model #	CML-**
Voltase	100-277 VAC, 50/60 Hz
Pergantian UV Cell	2 tahun
Tipe	In-Duct
Material	Stainless steel / Polymers
Controls	Indicator lights



PACKAGE UNIT

- Tipe: PACKAGE.
- Teknologi: PHI-CELL®
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Instalasi dengan mudah tanpa alat pembantu.
- Aplikasi:
 - Floor Standing / Package
 - Rooftops
 - Cassette
 - Ducting dari aluminium



Item #	PHI-PKG5-24V	PHI-PKG9-24V	PHI-PKG14-24V
Air Flow	250* to 1,200 CFM	1,200 to 3,000 CFM	3,000 to 8,000 CFM
Tons of Refrigerant	s/d 3.5 TR	3.5 - 7.5 TR	7.5 - 20 TR
Dimensi (W) x (L) x (D)	5.8cm x 27cm x 4.5cm	5.8cm x 35cm x 4.5cm	5.8cm x 47cm x 4.5cm
Berat	0.5 kg	0.5 kg	1 kg
*Install unit in conjunction with an HVAC system utilizing a minimum air volume of 250 cfm.			
Teknologi	PHI-CELL®		
Pergantian UV Cell	2 tahun		
Voltase	24 VAC		
Ampere	0.48 A		
Watts	11 W		
Tipe	Package: Air handler cabinet / dengan kaki magnet		
Material	Aluminum		
Kadar Hydrogen Peroxides	<0.02 PPM		



PACKAGE UNIT: PTAC

- Tipe: PACKAGE.
- Teknologi: PHI-CELL®
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Maintenance rendah, hanya mengganti UV cell.
- Ideal untuk:
 - Lift.
 - Cassette (< 2pk)
 - Ceiling Concealed (<2pk)



SAFE OZONE
LEVEL



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VOC FREE



Model	PTAC
Teknologi	PHI-CELL®
Dimensi	20.4cm (W) x 7.6cm (H) x 7.6cm (D)
Pergantian UV Cell	2 tahun
Listrik	220 VAC
Power	9 watts
Air Flow	250 – 500 CFM
Berat	0.4 kg



MINI-SPLIT

- Tipe: Modul untuk Split Wall Mount.
- Teknologi: PHI-CELL®
- Fitur:
 - Menetralkan kuman.
 - Menetralkan VOC's.
- Integrasi dengan copper/silver ionic germicidal electrostatic filter.



SAFE OZONE
LEVEL



GERM FREE



VOC FREE



Model	MINI-SPLIT
Teknologi	PHI-CELL®
Dimensi	77cm (W) x 6.5cm (D) x 3.2cm (H)
Pergantian UV Cell	2 tahun
Power	9 watts
Air Flow	200 – 2000 CFM
Berat	1.4 kg



PORTABLE: REME-ION™

- Tipe: PORTABLE.
- Teknologi: REME-LED™
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Power options: listrik 220V, power bank(*) dan car lighter adapter(*).
- Advanced catalyst dan washable filter.
- Aplikasi:
 - Ruang kantor, rumah, apartment
 - Mobil dan di bawa ke tempat umum lainnya.



OZONE FREE



GERM FREE



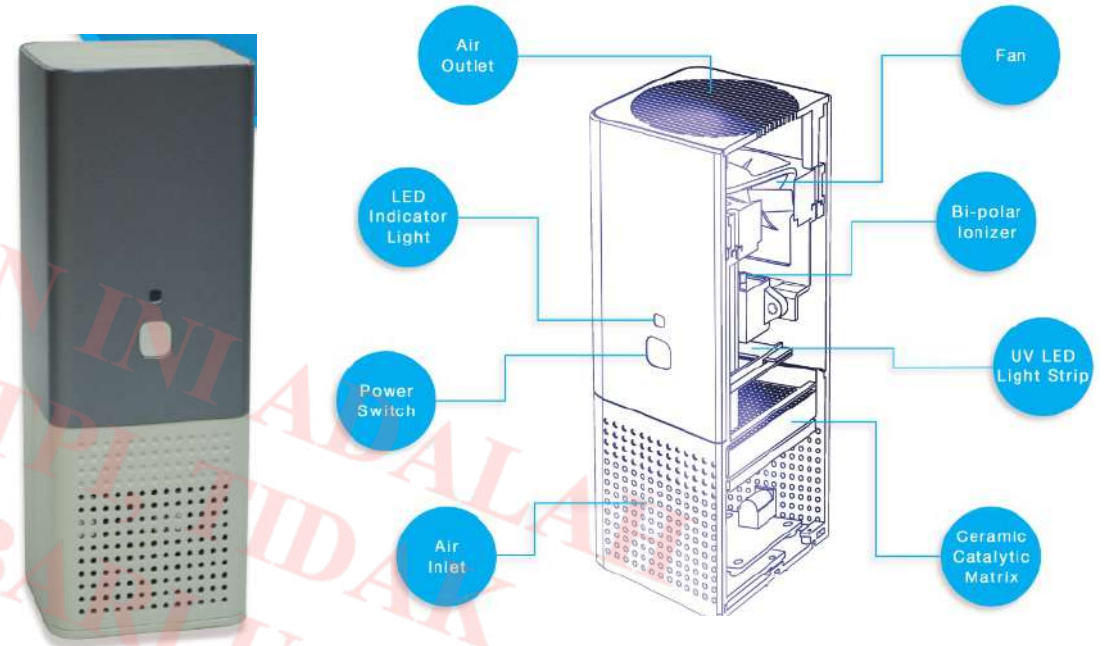
VOC FREE



DUST FREE

RGF®

(*) Tidak termasuk dalam paket



Model	REME-ION™
Teknologi	REME-LED™ with Bi-polar
Dimensi	7cm x 7cm x 16cm
Listrik	12 VDC 0.4 A
Power	5 watts
Coverage	20 m2
Berat	0.4 kg



PORTABLE: AIR SHIELD MODEL NX



SAFE OZONE
LEVEL



GERM FREE



VOC FREE

- Tipe:
 - Portable, Ceiling Mount, Wall Mount.
- Teknologi: PHI-Cell®.
- Coverage: 50 m2.
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Aplikasi:
 - Ruang kantor, kelas, rumah, toilet
 - Conference Room
 - Restoran
 - Bis



Model #	Air Shield NX
Teknologi	PHI-Cell®
Pergantian UV Cell	2 tahun
Power Supply	240 VAC
Watt	47 watt
Coverage	50 m2
Noise	< 66dB
Dimensi	28 x 23.5 x 9 cm
Berat	2.3 kg
Kadar Hydrogen Peroxides	<0.02 PPM



PORTABLE: AIR SHIELD MODEL TS



- Tipe: Portable.
- Teknologi: PHI-Cell® + HEPA/Pre-Filter/Carbon + Bi-Polar.
- Coverage: 50 m2.
- Fitur:
 - Menetralkan kuman.
 - Menetralkan VOC's.
 - Membersihkan debu.
 - Wi-Fi, Sleep Mode, Timer, Child Lock.
 - 3 Fan Speed.
- Indikator:
 - Temperature.
 - Humidity.
 - PM 2.5.



SAFE OZONE LEVEL



GERM FREE



VOC FREE



DUST FREE

RGF®

Model #	Air Shield TS
Teknologi	PHI-Cell®
Pergantian UV Cell	2 tahun
Power Supply	240 VAC
Watt	85 Watt
Coverage	50 m2
Particulate CADR	380 m3/h
Formaldehyde CADR	65 m3/h
Noise	< 66dB
Dimensi	42.5 x 22 x 64 cm
Berat	8.8 kg
Kadar Hydrogen Peroxides	<0.02 PPM



STANDALONE: HALO-ROVE™

- Tipe: STANDALONE.
- Teknologi: PHI-CELL®
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Maintenance rendah, hanya mengganti UV cell.
- Ideal untuk:
 - Ruang kantor, kelas, rumah
 - Conference Room
 - Restoran
 - Bis



SAFE OZONE
LEVEL



GERM FREE



VOC FREE



Model	HALO-ROVE™
Teknologi	PHI-CELL®
Dimensi	46cm (W) x 16cm (H) x 16cm (D)
Pergantian UV Cell	2 tahun
Listrik	12 VDC
Power	12 watts
Coverage	100 m2
Berat	2.3 kg



STANDALONE: AVID AIR®

- Tipe: STANDALONE.
- Teknologi: PHI-CELL®
- Fitur:
 - Menetralsir kuman.
 - Menetralsir VOC's.
- Di pasang masuk ke dinding atau plafon (flush mount).
- Aplikasi:
 - Toilet
 - Lift



SAFE OZONE LEVEL



GERM FREE



VOC FREE



Model	AVID AIR®
Teknologi	PHI-CELL®
Dimensi	13.3cm x 7cm x 40cm
Pergantian UV Cell	2 tahun
Listrik	12 VDC 0.4 A
Power	11 watts
Air Flow	9 CFM
Coverage	75 m2
Berat	0.4 kg



STANDALONE: RAPID RECOVERY UNIT®

- Tipe: STANDALONE.
- PHI-Cell® Plasma Generator.
- Digunakan untuk:
 - Sanitasi ruangan dari virus/bakteri.
 - Sanitasi ruangan dari problem dengan mold/jamur.
 - Menghilangkan bau yang tidak sedap (bau rokok, bau busuk, masakan, cat, binatang, pembuangan sampah, dsb).
 - Menghilangkan VOC's.
- Optional: Duct Sanitation Kit (selang flexible).
- Aplikasi:
 - Hotel, apartemen, gym/fitness center, restaurant, bis, pesawat terbang, kantor, sekolah, kapal laut, dsb.



SAFE OZONE
LEVEL



GERM FREE



VOC FREE

Spec	RRU
Teknologi	PHI-Cell®
Pergantian UV Cell	10,000 jam
Voltase	220V
Air Flow	88 CFM
Tipe	Standalone
Material	Stainless Steel
Dimensi	66cm x 33cm x 38cm
Berat	5.5 kg
Control	On/Off Light, 12-hour timer, Hour meter



BI-POLAR IONIZER: CLEAR-SKY-DM

- Tipe: In-Duct
- Teknologi: Bi-Polar Ionization.
- Magnetic, mudah dipasang.
- Membersihkan:
 - Partikulat/debu.
 - Alergen.
 - Asap.
 - Mengurangi bakteri/virus/jamur yang berada dalam partikulat.



SAFE OZONE
LEVEL



DUST FREE



Spec	RRU
Teknologi	Bi-Polar Ionization
Listrik	24 VAC
Tipe	In-Duct
Kapasitas indoor	Sampai dengan 8 HP
Dimensi	17.8 x 8.9 x 7.7 cm
Berat	2.2 kg