



Jonathan Saltman

ACA Needle Point Bi Polar Ionization - **Air and Surface Purification System:** Pathogen Neutralization in Aircraft

International Aircraft Cabin Air Conference 2021

16 March, 2021

Airborne and Ground Systems



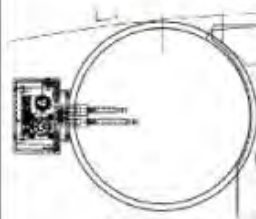
"Cleaning the air we breathe in flight"

ACA technology is designed to purify and sanitize the air and surfaces on-board aircraft

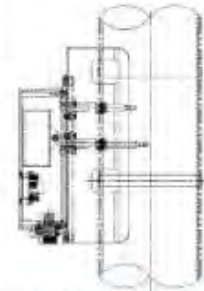
The air and surface purification technology offered by Aviation Clean Air (ACA) is a proactive component that can be added to an existing environmental control system. The ACA component is not a filter system; filtration systems are passive and mostly ineffective as they only collect the allergens and pathogens that find their way back to them, located somewhere in the mechanical area of the aircraft.

When air flows through the ECS ducts and into the cabin and cockpit, the ACA component removes existing odors, mold spores and allergens, proactively and rapidly. It also kills pathogens in the air and on surfaces where they sit throughout the aircraft interior including the cockpit, cabin, galley, lavatories and baggage areas. The ACA Component is effective floor to ceiling and wall to wall wherever the conditioned air reaches.

The component removes new odors caused by fuel emissions, as well as other VOCs generated by cooking, cleaning, stagnant air, cigarette/cigar smoke and many other sources. The ACA Component kills pathogens including, but not limited to, the common cold, flu of all types and variations, Covid 19, MRSA, C. diff, E. coli, M. terrae, pneumonia, and polio. A side benefit is that the system also controls static electricity within the the aircraft interior too. The technology is 100% green and works by duplicating and accelerating nature's cleaning process, with nothing else added, and No Ozone. The benefits are noticeable to crew and passengers in just seconds.



Installed View



Contact us for more information today!

JDavis@aviationcleanair.com

Tel: 248-505-6804

www.aviationcleanair.com

Mechanical Specifications

Dimensions: 7.82"L x 5.27"W x 5.56"
With probes extended
Enclosure: Anodized Aluminum (Sealed)
Electrode Material: Carbon Fiber
Weight: 1.54 pounds (807 grams)
Temp. Range: -65°C / -65°F to +65°C / +155°F

Electrical Specifications

Voltage: 28 VDC (Range 18-32 VDC)
Current: 150 mA
Power: 4.2 Watts
Connection Type: MIL-D-26482, Series 2
Connector: 8 pin - MS-5470-L12-8-P
Pinout: A = 28 VDC, B = DC Common, C = Chassis Ground, D = Dry Contact Status Contact, E = Dry Contact Status (F, G, & H not used)
Status: Continuity between pins D & E when unit is powered and no fault is present. If a fault occurs the Component is not powered, pins D & E will be open.

Testing

The ACA component has been fully tested and meets and/or exceeds requirements of RTCA DO-160.

The ACA component environmental condition and tests are applicable to all airborne vehicles both Fixed Wing and Rotary aircraft platforms.

Application

The ACA component can be installed in pressurized or non-pressurized environments up to 55,000 Ft Alt

SCCs

Certification for numerous aircraft and helicopter, types and models are now available for installation of the ACA systems.

FAA PMA - 2017
Design and Utility Patents with others Pending

ION DISTRIBUTION UNIT

**Covid19
Neutralized**



BiPolar Ionization

- ✓ Kills Covid19
- ✓ Kills Surface Pathogens.
- ✓ Destroys Airborne Pathogens.
- ✓ Sterilizes Mold and Bacteria.
- ✓ Removes Odors.
- ✓ Increases Air Quality.
- ✓ Reduces Static Electricity.
- ✓ Reduces Dust, Pollen and Smoke.
- ✓ Neutralizes Common Industrial Gases.
- ✓ Does Not Produce Ozone.



Part Number **ACA4800GU-1**

The ION DISTRIBUTION UNIT produces up to 2,000,000 Positive and Negative Ions delivered by a powerful 2800 CFM blower motor while maintaining a <12.0 EVP (electron volt potential), producing no ozone while killing up to 99.7% of both airborne and surface pathogens. This low current blower unit operates with 110 volts while consuming only 4.5 amps. The ION DISTRIBUTION UNIT comes with a weather resistant 2 speed switch and a 25 foot grounded power-cord.



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**International Aero
Engineering**

Cleaning the Air We Breathe in Flight

"Creating the Standard Others Follow"

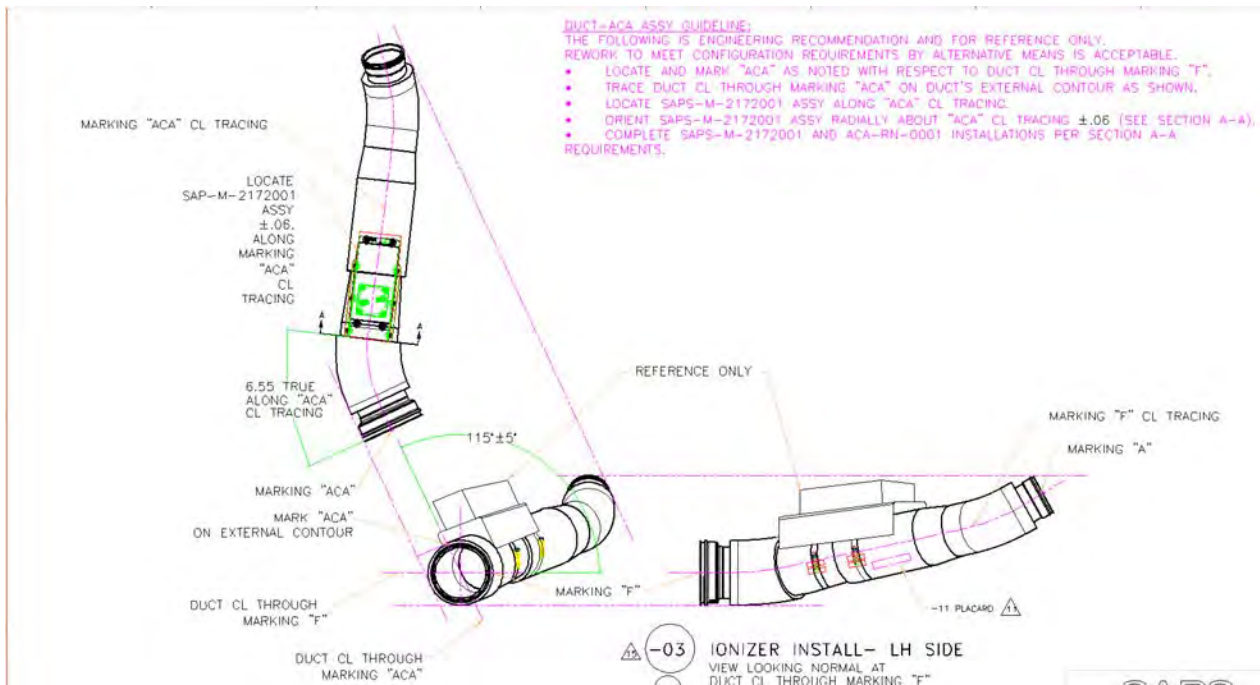
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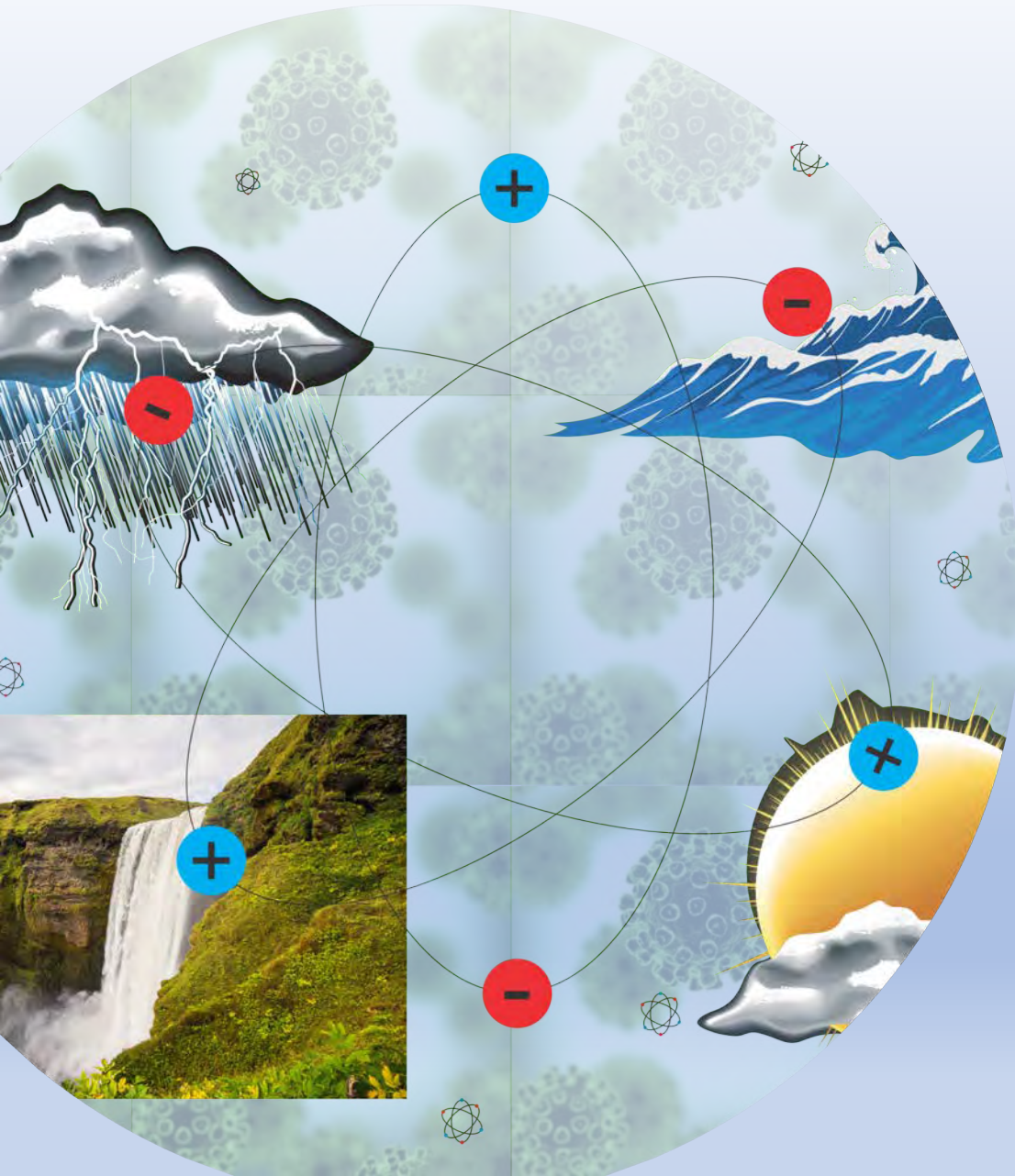
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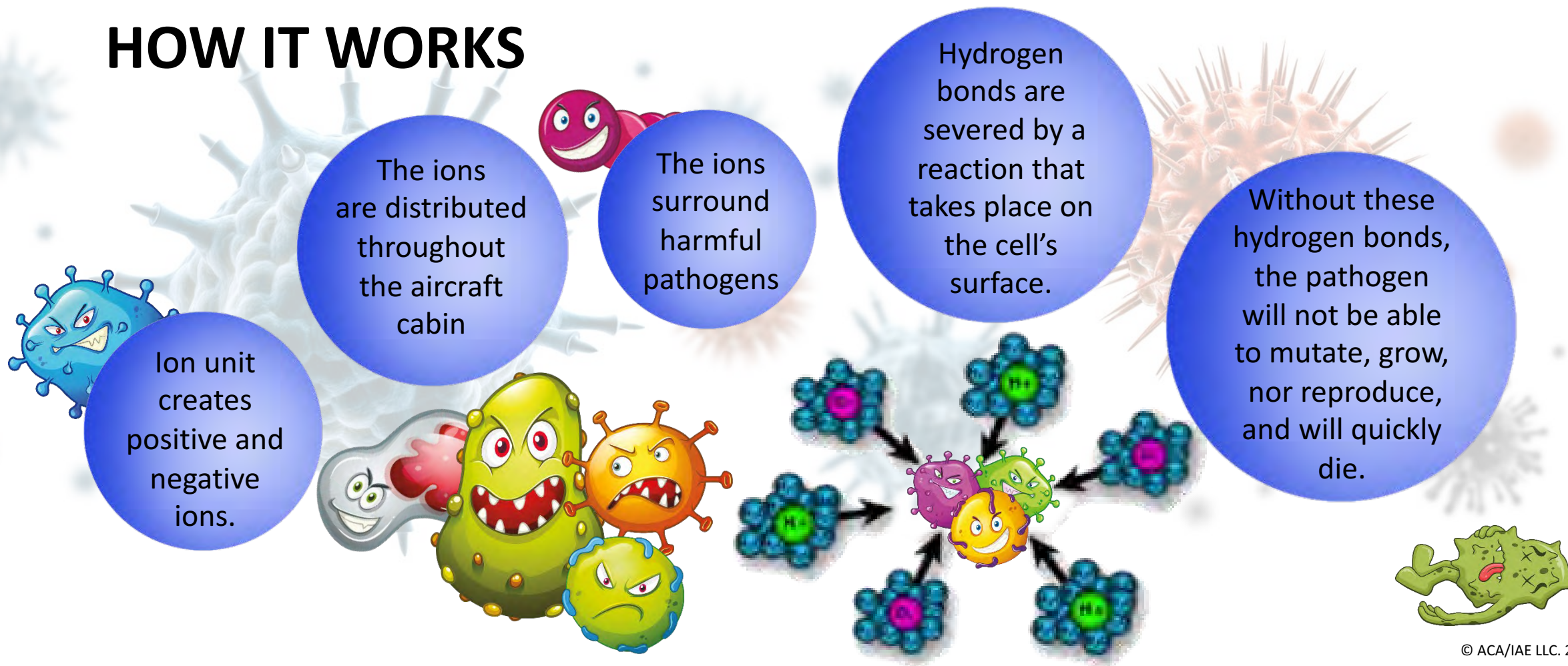
Over 60 STC's issued/in process for the ACA Airborne System installation



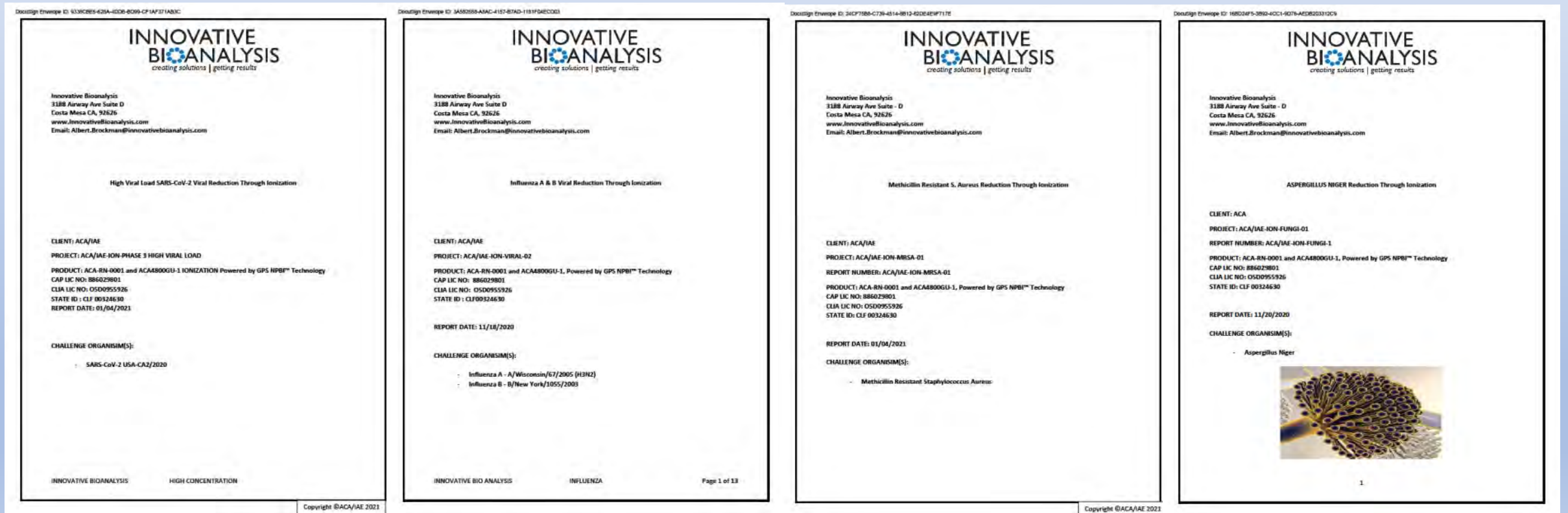


HOW IONS ARE CREATED NATURALLY

HOW IT WORKS



The ACA System has been successfully verified to neutralize all pathogens tested



SARS-Covid 19

Influenza A&B

MRSA

Aspergillus

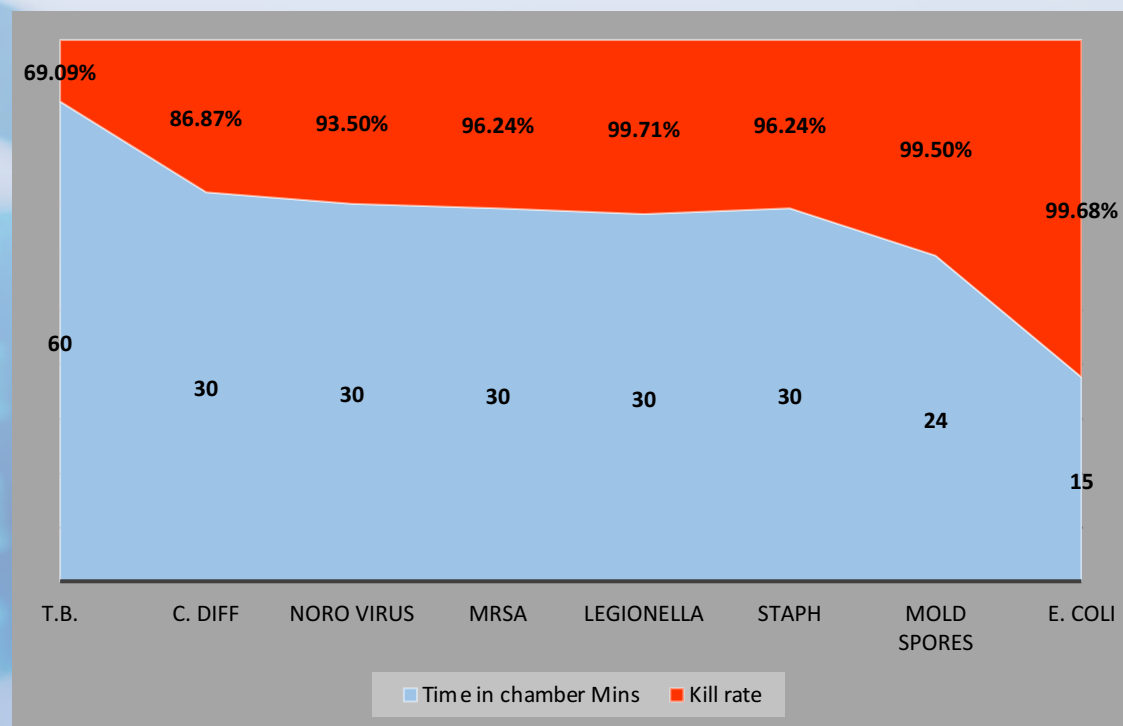


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	Minutes in Chamber	Kill rate
T.B.	60	69.09%
C. diff	30	86.87%
Noro Virus	30	93.50%
MRSA	30	96.24%
Legionella	30	99.71%
Staph	30	96.24%
Mold Spores	24	99.50%
E. coli	15	99.68%



Chemical Compounds Ionization Can Control

CHEMICAL	FORMULA	Electron Volt
Xylene*	C ₈ H ₁₀	7.89
Styrene*	C ₈ H ₈	8.46
Methyl Ethyl Ketone*	C ₃ H ₈ O	9.52
Ammonia*	NH ₃	10.07
Acetaldehyde*	CH ₃ CHO	10.23
Ethyl Alcohol*	C ₂ H ₅ OH	10.48
Formaldehyde*	CH ₂ O	10.88
Oxygen	O ₂	12.07
Corona tubes require >12.07 to break down the dielectric		



NPBI

DIELECTRIC/CORONA
DISCHARGE
TUBE > 12.07eV

* Typical contaminants of concern as contained within ASHRAE 62.1

- Electron Volt Energy greater than 12Ev, creates ozone (O₃)



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WHY ION TECHNOLOGY?

The ACA/IAE system operates under 12.0eV, so our system does NOT produce any Ozone (O₃), or any harmful gases or chemicals. As such, our system is not harmful to the aircraft, the interior, the people on board, or any food on board.





WHY NOT HEPA ALONE?

- HEPA filters are great at removing airborne contaminants and removing contaminants from going through their filters. They are ineffective for surface contaminants and have no effect on static contaminants.
- Our system neutralizes pathogens. Our system keeps particulates from the breathing zone and reduces the particulate count within seconds allowing the HEPA filters to do a more effective job.
- The ACA/IAE system was first STC's on Gulfstream's which have the highest fresh air refresh rate in the industry, and their independent testing has proven that our system neutralizes pathogens in their cabin.

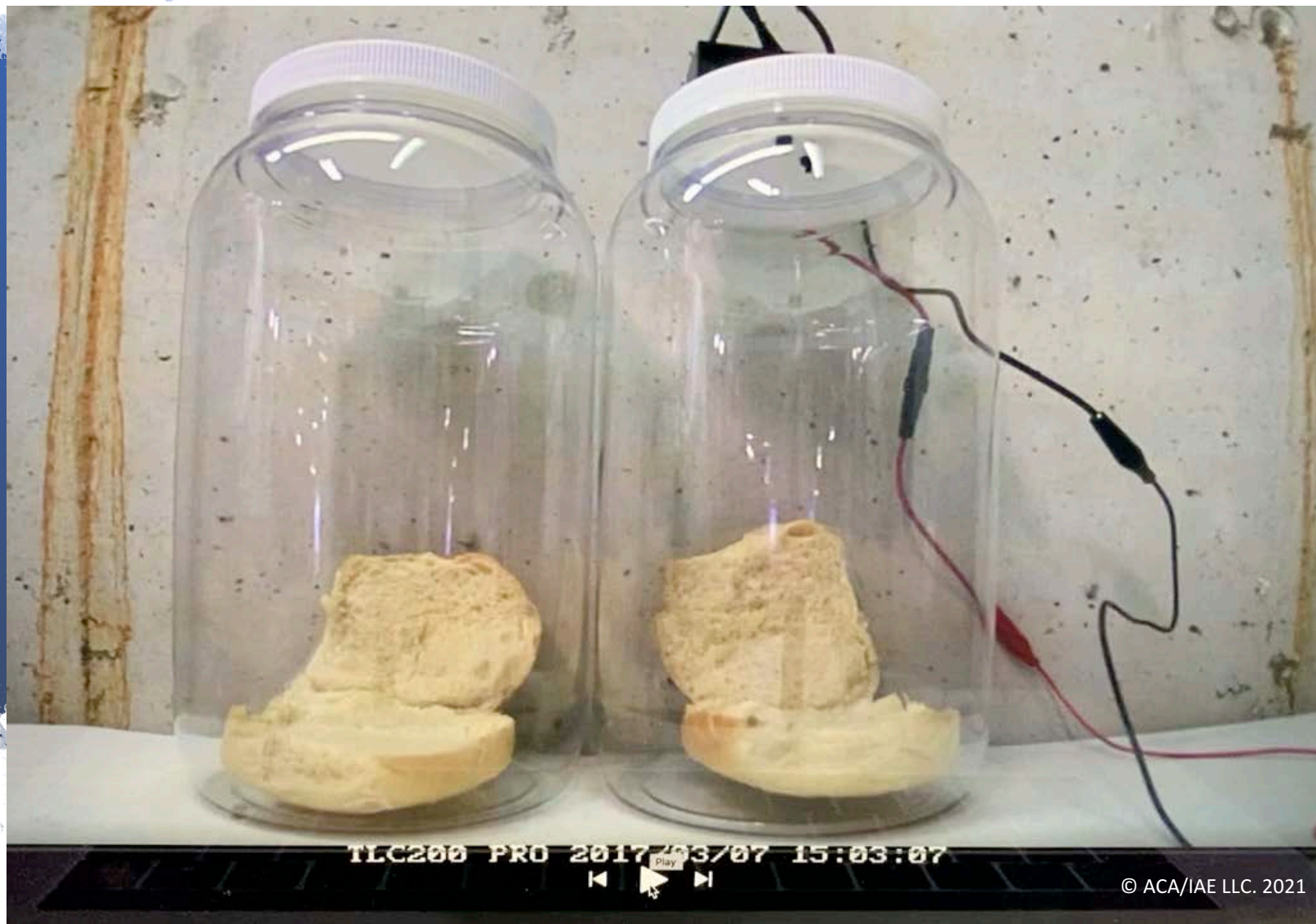


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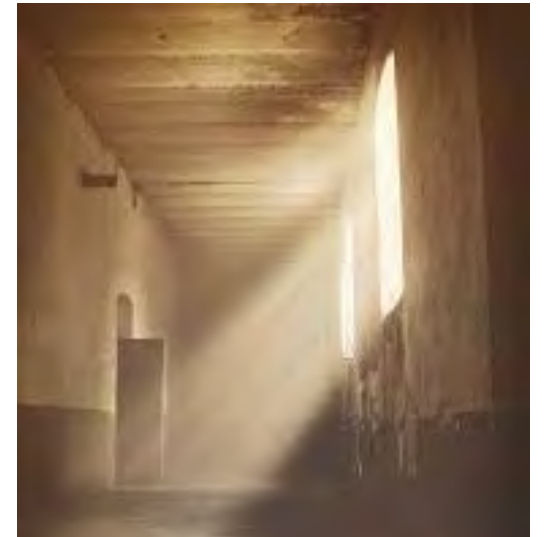
Time Lapse of Bread/Mold Ion Test

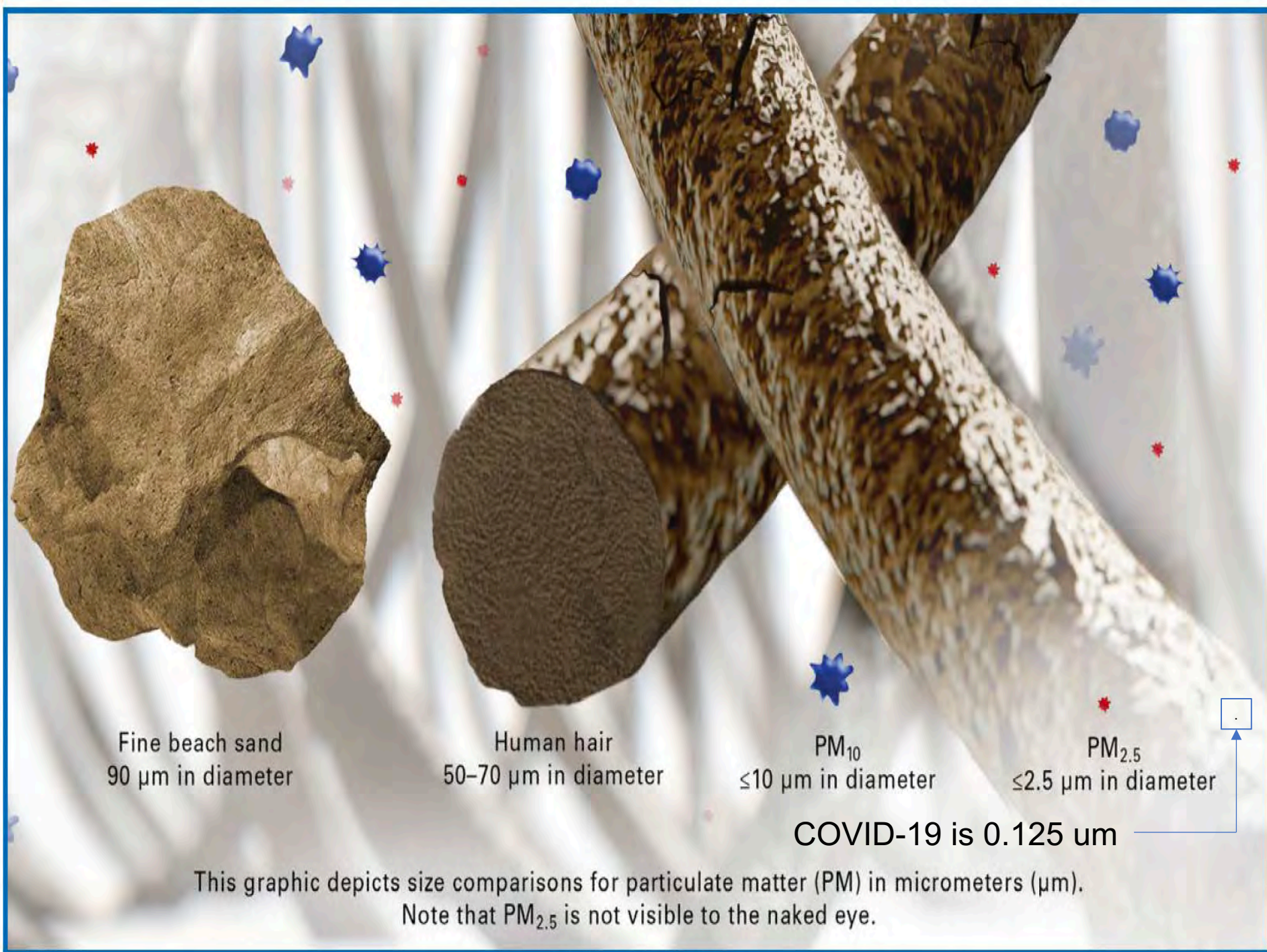


HOW PARTICLES ARE CREATED

- A person sitting or stopped generates about 100,000 particles per cubic ft.
- Sitting down or standing up generates about 2,500,000 particles cubic ft.
- Walking generates about 10,000,000 particles per cubic ft.
- Horseplay generates about 30,000,000 particles per cubic ft.
- Grinding, sweeping, welding adds billions of particles per cubic ft.
- Two surfaces rubbing generate billions of particles per cubic ft.

***There are over 18 Million particles
in 1 cubic ft of air***

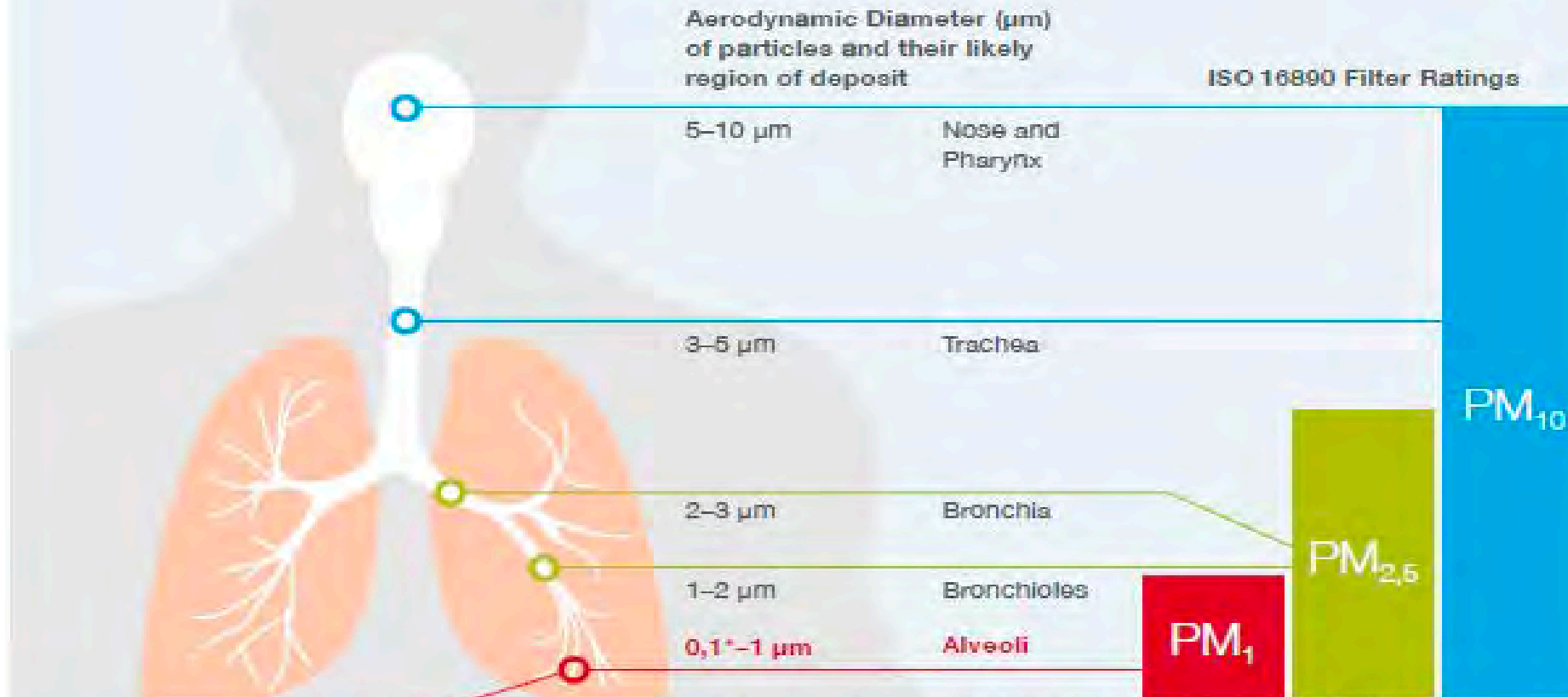




Particle Agglomeration Test



ISO 16890 classifications are based on where particles are deposited in the human lung.



*Efficiency on particles smaller than 0,3 micron is not defined by the ISO

PM₁ – The Smaller the More Dangerous!

A variety of studies are focusing on the health effects of PM1 particles:

CHEMICAL FREE

- There are many risks and side effects of chemicals, some of which are unknown.
- The ACA/IAE system does not use chemicals and will not create any adverse effects to the aircraft or any occupants in the aircraft.
- Ion (both positive and negative) have been widely researched to show there are no harmful effects on people. In fact they have been shown to be beneficial to people in many ways

NO PESTICIDES



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MILITARY CUSTOMERS

- ▶ **Special Air Missions Joint Base Andrews**
- ▶ Ramstein Air Force Base
- ▶ 435th Contingency Response Group
- ▶ Hickam Air Force Base
- ▶ Fleet Logistics Support Squadron JBA
- ▶ 909th AMU
- ▶ USAF 113 WG
- ▶ 932 MXG
- ▶ NORAD
- ▶ US Navy
- ▶ AIRSTA Washington
- ▶ 673 CONS/PKC
- ▶ NAS JRB Fort Worth
- ▶ 86 MXG/AMXS/CCR
- ▶ 718 AMXS/MXAW/909th AMU
- ▶ USAF 113 WG
- ▶ Fleet Logistics Support Squadron 57 (VR-57)
- ▶ Fleet Logistics Support Squadron 51 (VR-51)
- ▶ Fleet Logistics Support Squadron VR-56 Supply
- ▶ M1 Support Services
- ▶ US Government - 89th Airlift Wing
- ▶ US Marines
- ▶ US Air Force
- ▶ US Army
- ▶ March ARB
- ▶ 374th AMXS/MXABS Yokota AB, Japan
- ▶ 718 AMXS/909th AMU KC-135 Kadena Air Base, Japan
- ▶ 15th Operations Group
- ▶ Joint Base Pearl Harbor-Hickam
- ▶ Camp Lemonnier, Republic of Djibouti
- ▶ JBPHH
- ▶ 154 Civil Engineer Squadron
- ▶ 774 EAS/AFE NCOIC
- ▶ 718 AMXS / 909 AMU
- ▶ 435th Security Forces Squadron
- ▶ Eielson Air Force Base



Key Points

- ACA Is the only proactive system available. All other systems are passive.
- ACA Is the only proactive continuous cleansing system available.
- ACA Kills pathogens in the space on surfaces and in the air in moments (not hours or days).
- ACA System is automatic.
- ACA Requires no scheduled maintenance.
- ACA Installs quickly and seamlessly in any ECS system.
- ACA Produces no harmful by products.
- ACA Uses no chemicals. ACA produces no chemicals or harmful by-products.
- ACA Is not a filtration system.
- ACA Is a replication and acceleration of Nature's natural Cleansing process with nothing else added.
- ACA Benefits are noticeable to the occupants in moments if not seconds.



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THANK YOU

Contact: Jonathan Saltman

Email: Sales@AviationCleanAir.com

Phone: (562) 253-5020