



Phenomenal Aire

Cold Plasma Generator Technology
Indian Trail, NC



Phenomenal Aire

Cold Plasma Generator Technology

Indoor Air Quality ... According to the US EPA

Indoor Air is often two to five times more polluted than outside air.

We spend an average of 90% of our time indoors.

Home and building designs are tighter, more energy efficient; reducing air exchange.

Tighter Homes/Buildings lead to higher particle counts which aggravate allergies and make it easier to spread bacteria and viruses.

Phenomenal Aire's Needlepoint Ionization addresses each of these factors.



How it Works

Phenomenal Aire

- Technology – Bi-Polar Needlepoint Ionization
 - An air **ion** is a charged air molecule or Atom
- Ions are present naturally in the air. (Created Constantly by Mother Nature)
- Ions are in greater number in areas such as the mountains and beaches
 - Ions are greater where there is continuous flow of water and are created by friction of the moving water
- Areas with low natural ionization include polluted areas and areas served by air conditioning
- We create Ionization with a **Plasma Field** in the HVAC duct work
- **This field breaks down molecules with an Electron Volt Potential of 12 Or less**
- **This is very Important; the eV of Oxygen is 12.07. With enough energy, anything can be broken down. Through the Needlepoint Ionizations patented circuitry, the plasma field will not break down any molecule with an $eV < 12$. If we were to create a plasma field strong enough to break down molecules with an electron volt potential of higher than 12 Oxygen (O_2) is broken down into O_1 which will create O_3 (Ozone).*

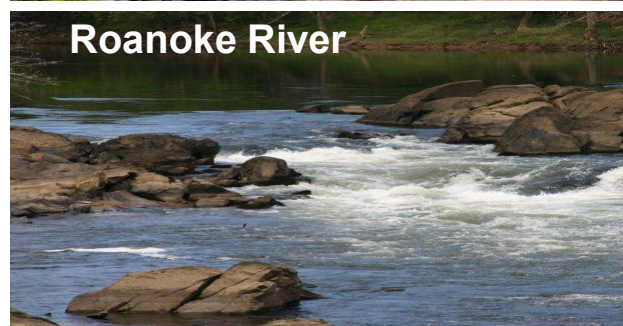
Wrightsville Beach, NC



Highlands, NC

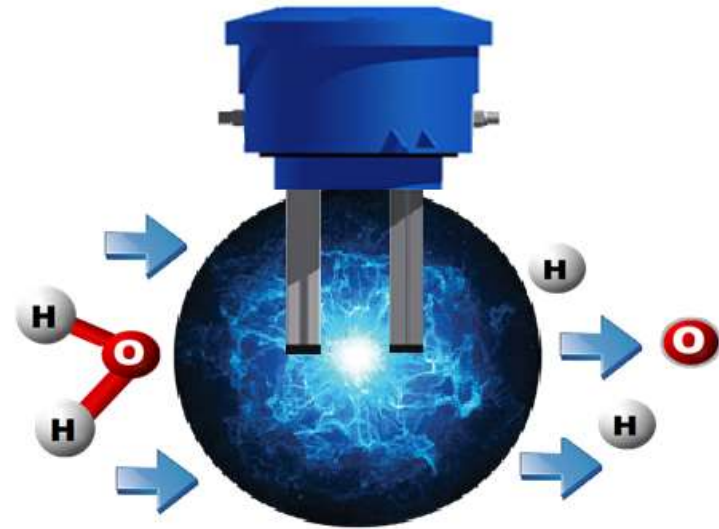


Roanoke River

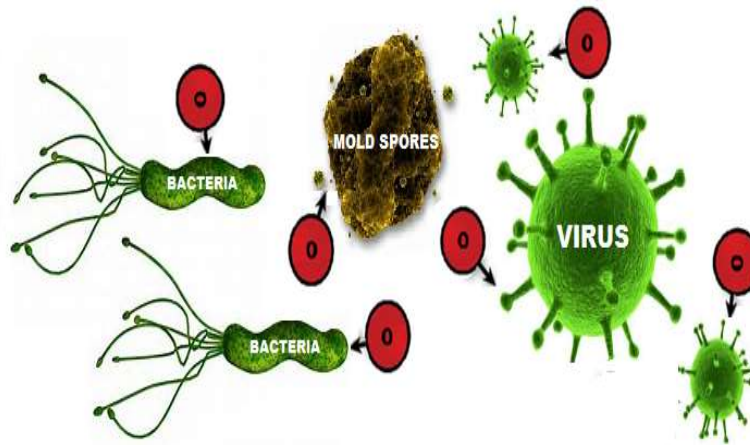


How it Works

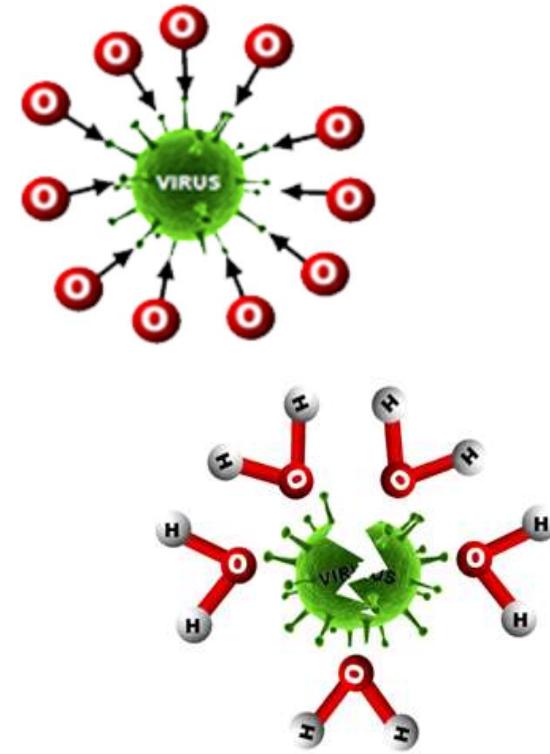
Phenomenal Aire



Needlepoint Ionization creates a Plasma Field. Molecules passing through this field are broken down and charged negatively and positively.



Example – A Water Molecule (H₂O) enters the field. They leave as two hydrogen and one oxygen. These ions travel through the HVAC duct work into the living / workspace. The negative oxygen ions latch onto and rob the hydrogen from the virus, bacteria or mold spore. This is what kills that virus, bacteria or mold.

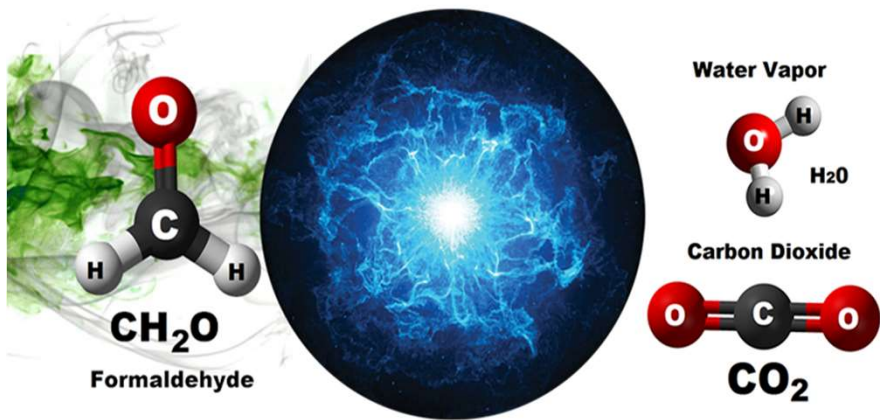


If there is no virus, bacteria or mold to latch onto the Molecules return into safe Atmospheric gasses.

How it Works

Phenomenal Aire

Odors and VOCs enter the Plasma Field and are broken down into simple molecules like Nitrogen, Carbon Dioxide, Hydrogen, H₂O, Water Vapor & Oxygen.



- **Formaldehyde** – pesticides, flooring materials, insulating materials, wood-based materials, coatings, paints
- **Toluene** – pesticides, flooring materials, insulating materials, paints, adhesives
- **Acetaldehyde** – wood-based materials, flooring, HVAC systems
- **Para-dichlorobenzene** – ceiling materials, wood-based materials, pesticides
- **Ethylbenzene** – furniture, paints, adhesives
- **Methyl Chloride** – flooring materials, furniture, HVAC systems, coatings, paints
- **Chloro-ethylene** – flooring materials, coatings, paints, dry-cleaning clothes
- **Carbon tetrachloride** – coatings, paints, industrial cleaners
- **Chloroform** – pesticides, glues
- **Naphthalene** – insulating materials, wall painting, mixed materials
- **Esters and Ketones** – plastics, resins, plasticizers, solvents, perfumes, paints, disinfectants, adhesives

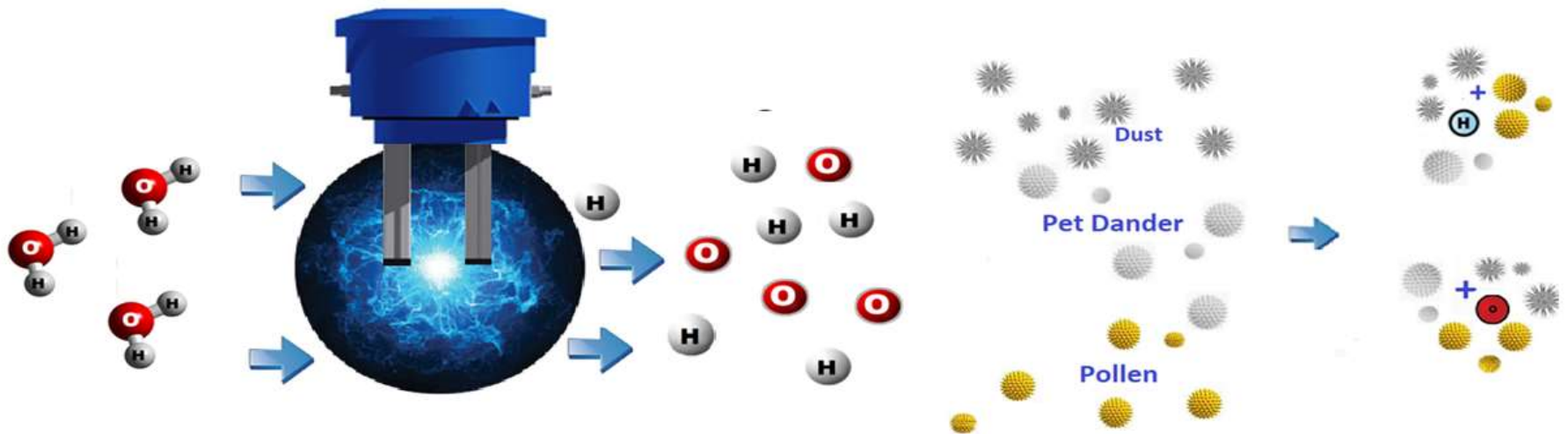
How it Works : Particulate & Allergen Control

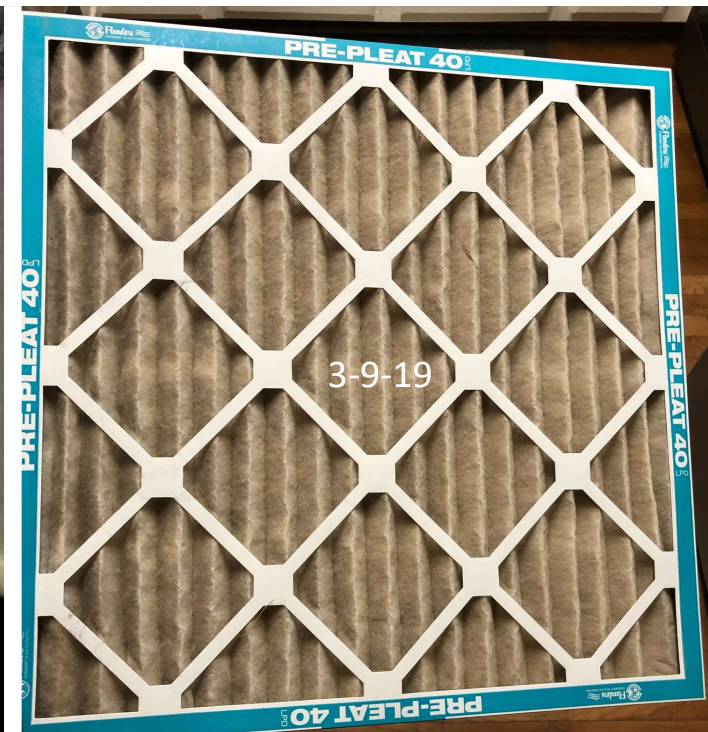
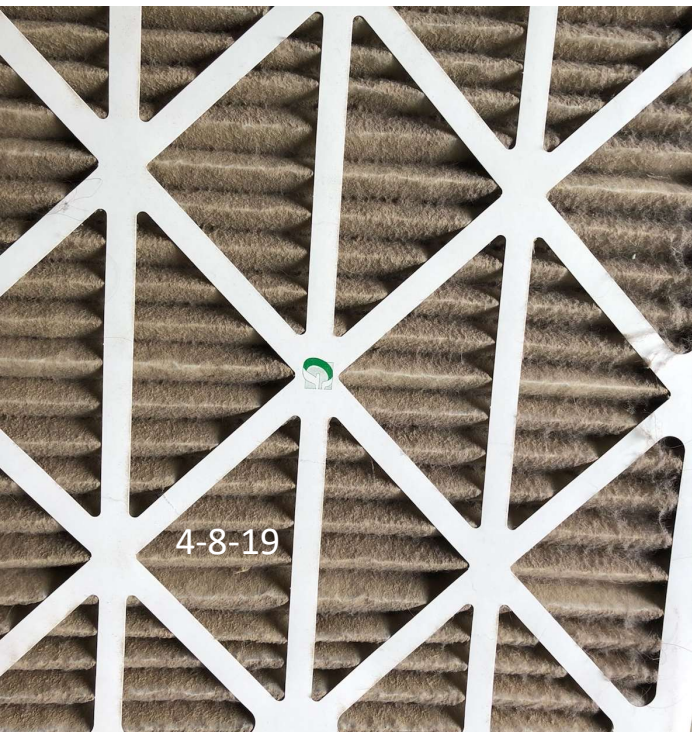
Phenomenal Aire

Water molecules (H_2O) enter the cold plasma field and are broken down into 2 Hydrogen ions and 1 Oxygen ion.

Those positive and negatively charged Ions attract/agglomerate making the particles larger for more effective filtration; therefore, reducing allergy triggers and symptoms.

Reducing allergy triggers for Bronchitis, Asthma, COPD, Emphysema and breathing disorders reduces factors that contribute to Sick Building Syndrome





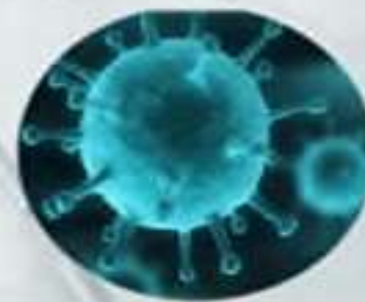
Residential Visual of particulate control

Noro Virus	Reduced by 93.50%
STAPH-	Reduced by 96.24%
E. Coli-	Reduced by 99.68%
TB-	Reduced by 69.01%
MRSA-	Reduced by 96.24%
C. diff-	Reduced by 86.87%
Legionella-	Reduced by 99.71%
Calicivirus	Reduced by 93.50%

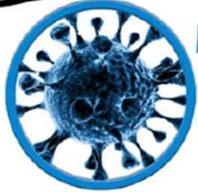


Test Periods 15-60 min

This Took Place In A 10' x 10' x 10'
Room with six air changes per hour



VERIFIED



Phenomenal Aire
Cold Plasma Generator Technology

COVID-19

SARS-CoV-2

99.40% Reduction

Testing Date: 07/22/2020



Release Date: 08/31/2020

CHARLOTTE, NC--- Top Product Innovations Inc., a leading provider in Indoor Air Quality (IAQ) technology announced today that third party ionization testing results validated its technology's ability to effectively deactivate SARS-CoV-2 (COVID-19) surface strain with a 99.40% reduction. The bipolar ionization technology known as a Cold Plasma Generator (CPG) is powered by Needlepoint Clusters™.

Independent testing conducted by Innovative Bioanalysis, (BSL-3 Laboratory), **utilized a testing chamber 37 times greater** than cited in previously published tests. The testing environment was increased in size to better emulate environmental conditions of heating ventilation and air conditioning systems (HVAC) that are found in both residential and commercial applications. The results for the 60-minute test verified that 99.9% of the virus was inactivated at 60 minutes, 99.4% at 45 minutes, and 82.3% at 30 minutes.

EFFICACY TESTING

Viral media with a known concentration was applied via aerosol to the materials in 3 locations throughout the containment unit and exposed to bipolar ionization for a period of 15 minutes, 30 minutes, 45 Minutes, and 1 hour. Swabs were taken of all material and cultured by the same means as the original viral titration performed on the BEI Resources provided SARS-CoV-2 USA-WA1/2020 viral culture. The viral media was exposed to a consistent flow of ion density. The test objective was to obtain 15.0×10^3 ions /cc. Ion densities were measured every 5 seconds and the averaged ion density delivered was 15.1×10^3 ions /cc.

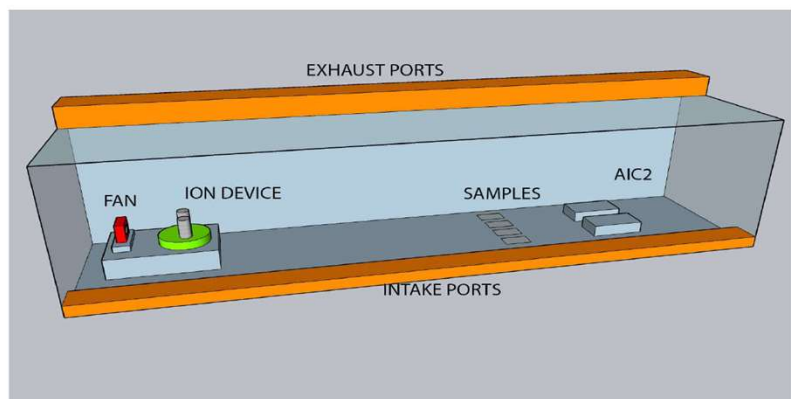


Figure 1: Test Chamber Design

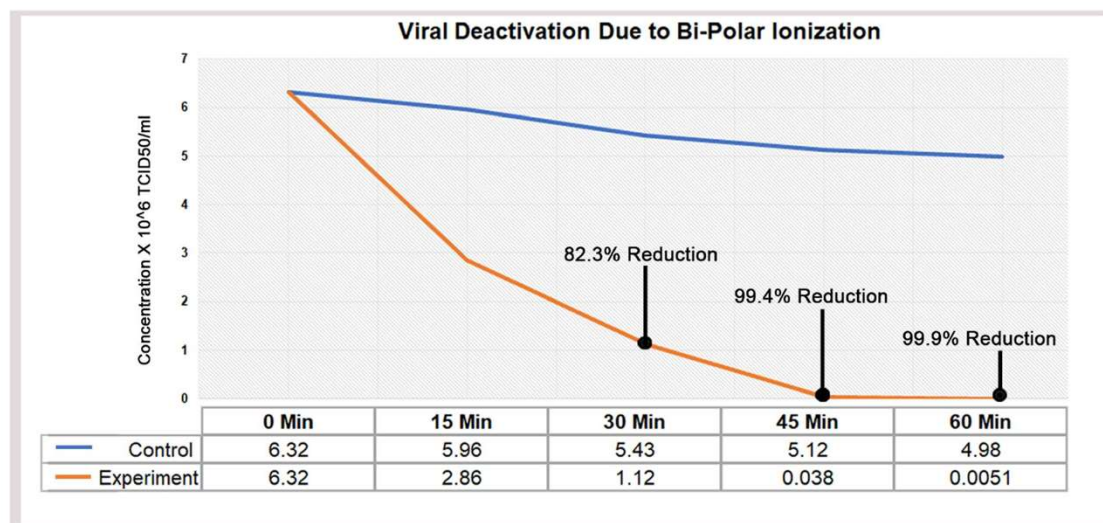
EXPERIMENTAL DESIGN

CONTROL SUMMARY

VIRAL TITRATION DETERMINED BY TCID₅₀ ASSAY PROTOCOL

INNOCULATION OF THE TEST CARRIERS

EFFICACY TESTING

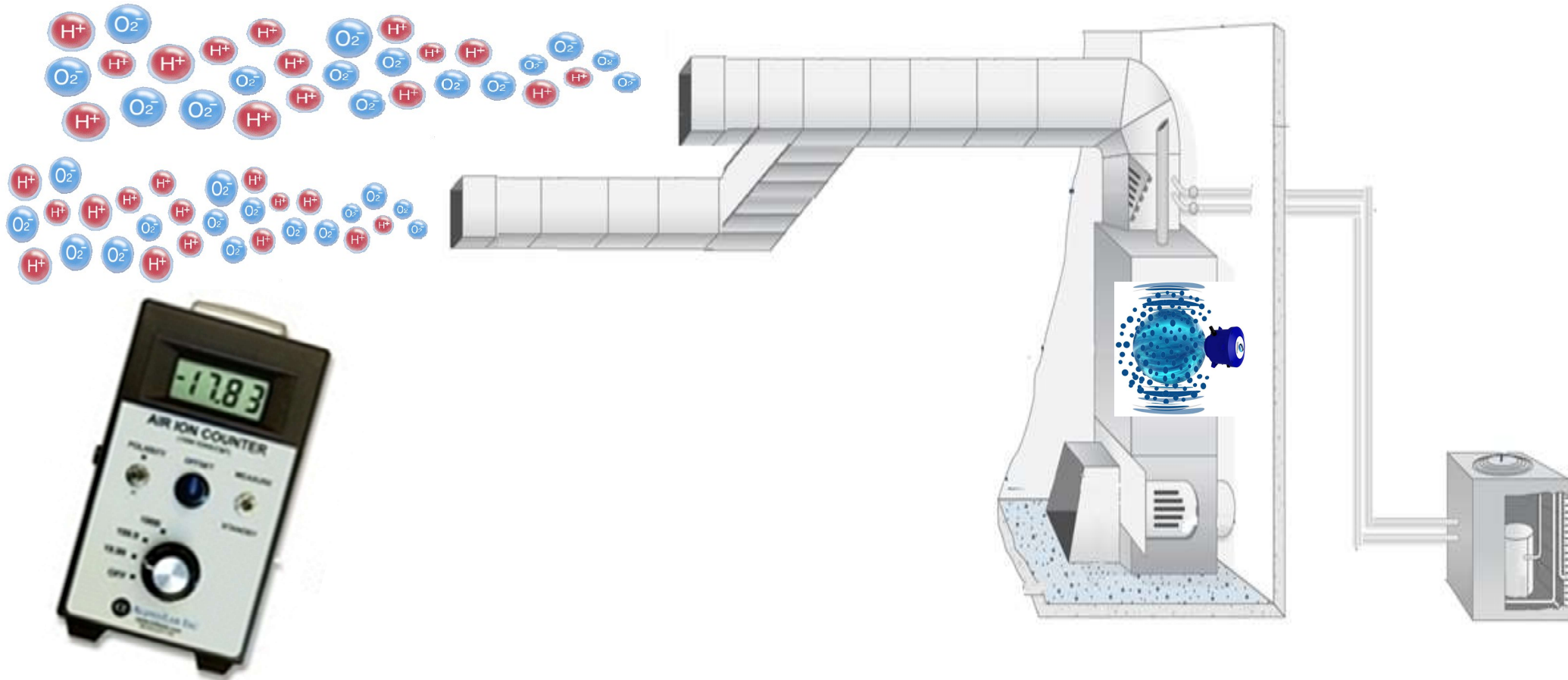


Log Reduction at 15min: 0.34 30min: 0.75 45min: 2.22 60min: 3.1

Figure 2: SARS-CoV-2 (COVID-19) 99.4% Reduction Testing Date 07/23/2020

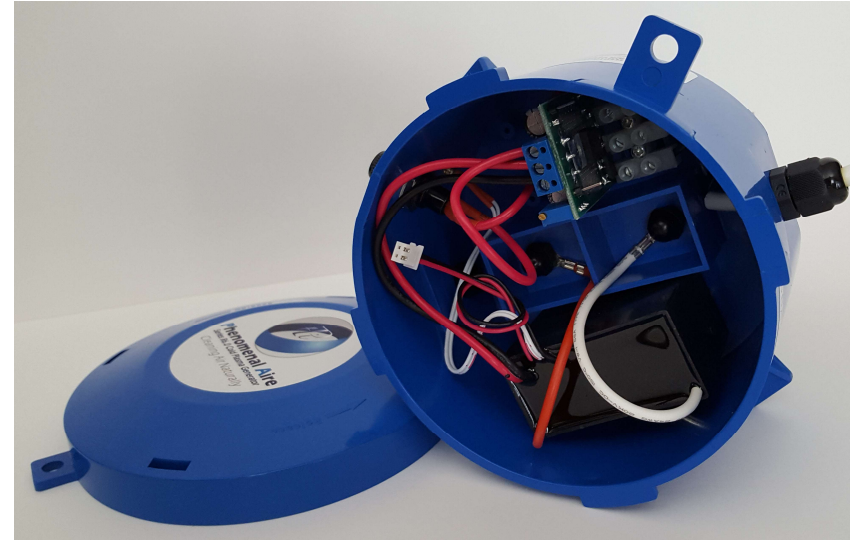
How do we know the amount of Ionization we are getting?

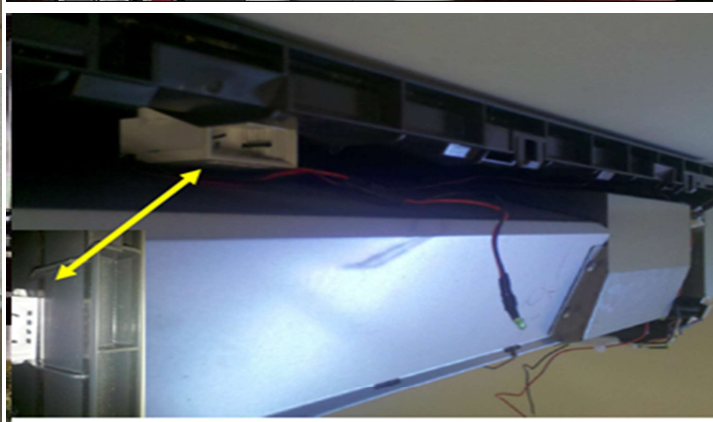
- Using the AIC2M allows you to see what amount of ions Come out of each register.



Phenomenal Aire Overview of Features & Benefits

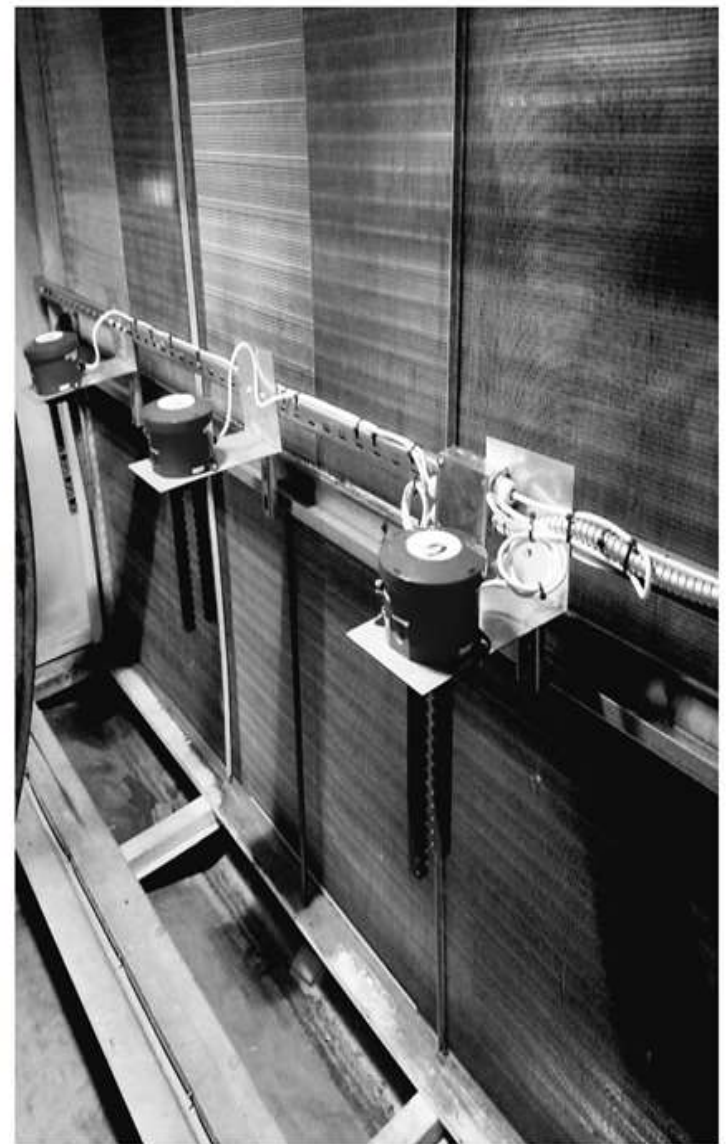
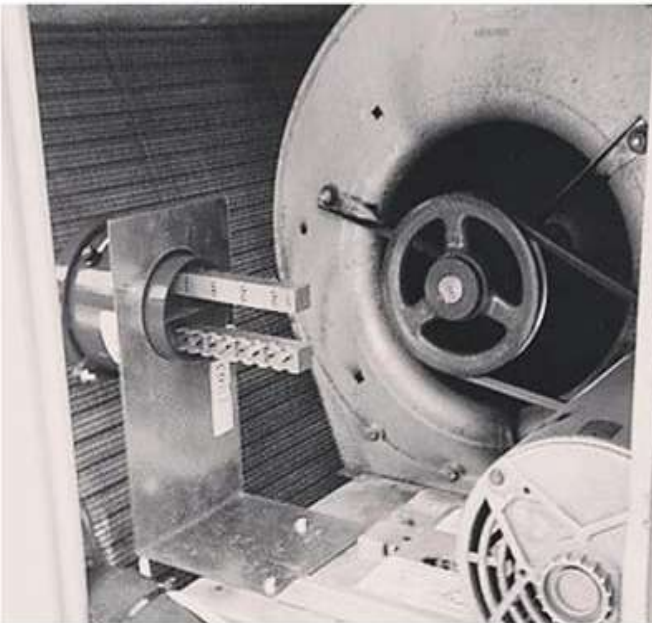
- No Annual replacement Parts
- Produces positive and negative ions at the Air Handler and into the environment
- Agglomerates particles in the air making them larger for more effective filtration (*Mitigates Allergies*)
- Breaks down VOC' s, smoke & odors (*including DSS – Dirty Sock Syndrome*)
- Disables viruses and kills mold, bacteria & fungus in the dust and living space (*Meets UL-867 – No detectable ozone*)
- Meets ASHRAE 62.1 for commercial reduction of Make Up Air.





Phenomenal Aire

Commercial Installs



Needlepoint Ionization vs photocatalytic oxidation



VS



- Needlepoint Ionization – No replacement bulbs = Low cost of ownership
- Ozone and/or other reactive oxygen species (ROS) have come under scrutiny as a source of respiratory irritation. While all products with electricity run to it produce some ozone, many IAQ products produce large amounts of ozone. According to UL, Phenomenal Aire's needlepoint ionization produces less than 4 parts per billion. UL 867 identifies tested products that produce under 5 PPB as zero ozone emissions. Phenomenal Aire is UL 867. Some MFG's say they conform to UL 867, but have not passed UL 867.
- Phenomenal Aire produces a minimum of 140 million positive and 140 million negative naturally produced ions at the unit. Most PCO advertise ion production between 1 and 2 ½ million ions at the unit.
- Needlepoint's higher quantity of ionization increases agglomeration of Allergens/dust to be taken out of the air far more effectively than PCO. An MRV 8 filter functions as a MRV 14 Filter.

Full Comparison Chart

TPI Phenomenal Aire	Adv. Photocatalytic
Does unit operate without creating detectable ozone	✗
Does unit operate without creating reactive oxides	✗
Does unit operate free of titanium dioxide	✗
Does unit operate without creating chemical ions	✗
Does unit meet UL867 standards	✗
Does unit operate without expensive glass bulbs	✗
Can unit operate without replacement of glass bulbs	✗
How often do glass bulbs require replacement	1-2 yrs.
What is the approximate cost of replacing glass bulbs	\$200+
Does unit kill bacteria, viruses, mold, fungus	✓
Is unit effective at cleaning air it cannot "see"	✓
Does unit eliminate odor without detectable ozone	✗
Does unit neutralize allergens	✓
Does unit aid conventional particle filtration	✓
Does unit neutralize VOCs without detectable ozone	✗
Can unit be mounted in air supply	✓
Can unit be mounted in return air	✓
Can unit operated from 24 VAC	✗
Can unit eliminate Dirty Sock Syndrome (DSS)	✗
Can unit be mounted in a ductless split	✓
How does unit kill bacteria, viruses, mold, fungus	Natural ions +/- Chemical ions

TPI Phenomenal Aire	Adv. Photocatalytic
✓	✗
✓	✗
✓	✗
✓	✗
✓	✗
✓	✗
✓	✗
NA	1-2 yrs.
NA	\$200+
✓	✓
✓	✓
✓	✗
✓	✓
✓	✓
✓	✗
✓	✓
✓	✓
✓	✗
✓	✗
✓	✓
Natural ions +/-	Chemical ions

Phenomenal Aire

Cold Plasma Generator Technology

Saving Energy Safely

* Phenomenal Aire meets ASHRAE 62.1

The IAQ spread sheet provides criteria for the allowable indoor levels of particulate and VOC's and the validation to reduce makeup air from 30% OA to as low as 10% or in Schools from 15 CFM to as low as 5 CFM/Student. The limiting factor for OA % is typically Carbon Dioxide CO₂.

* **Phenomenal Aire Passed UL-867-2007** (*less than 4 PPB*) Phenomenal Aire doesn't break down molecules greater than 12 Electron volts.

* **OSHA's** allowable Ozone level is 50 ppb.
A photocopier is 30-40 ppb



Generating Savings, Safely: OA Reduction

- Atlanta Area Schools (120,000ft²)
- Typical First Cost Savings = \$300,000 to \$400,000 or \$2.50 sq/ft
- or \$2.50/ft²
- Typical Annual Energy Savings = \$48,000 or \$.40 sq/ft
- Phenomenal Aire Adds **VALUE** Not Cost!



Commercial Installs



Clemson, SC



N Charleston, SC



Charleston, SC



Myrtle Beach, SC



Lynchburg, VA



UNIVERSITY OF
GEORGIA

Athens, GA



Old Town, VA &
San Antonio, TX



Columbia, SC



Charlotte, NC



Gastonia, NC



Charlotte, NC



Roanoke, VA

Commercial Installs



Greenville, SC



Charleston, SC



Columbia, SC



Providence RI



Charlotte, Tryon, NC &
Spartanburg, SC



Anderson, SC



Spartanburg, SC



Shelby, NC



Goldsboro, NC



Fort Benning, GA



Providence, RI

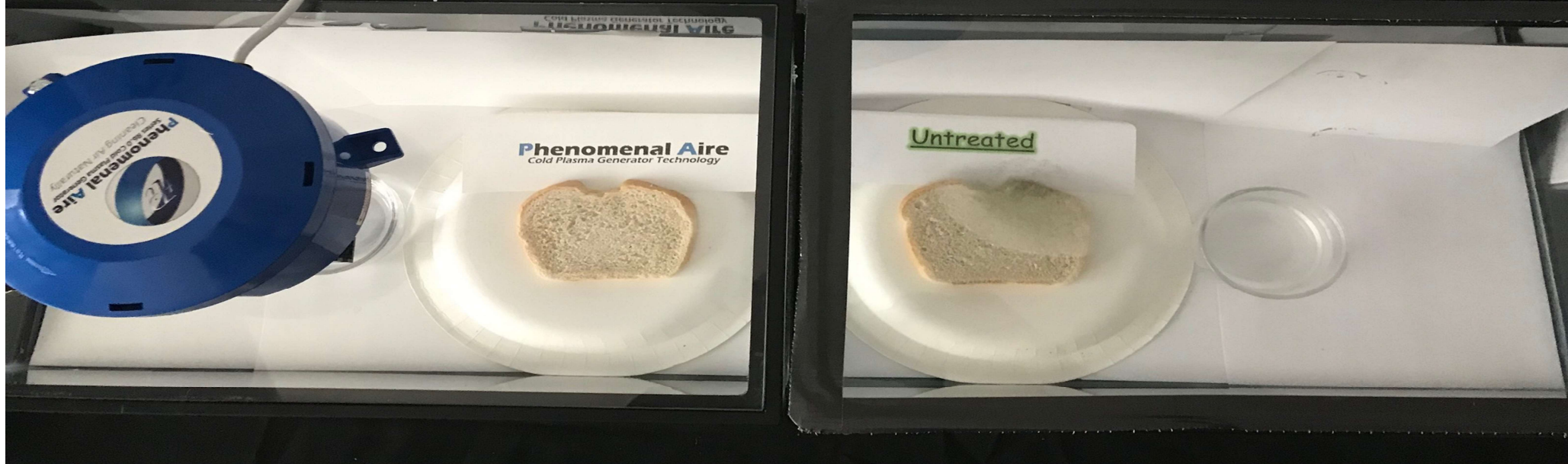


Columbia, SC

Phenomenal

Cold Plasma Generator Technology
Cleaning Air Naturally

<https://vimeo.com/318023129/f97bf376f4>





Phenomenal Aire

Residential Product Selection Guide



Series C-Flex 18"



Series D3.2



Series C-Flex 36"



Series D2.4-1 (set of 2)



Series R-6

Home Size	Series CPG	Sq.ft (Per HVAC System)
Small / Condo	Series D3.2	1,600 and below
	Series C-Flex 18"	1,200 and below
Medium	Series C-Flex 36"	1,200 - 2,400
	Series D2.4-1 (Set of 2)	1,600 - 2,400
Large	Series R-6	2,400 and above

Installation Guides

Click or Scan



Click or Scan

Installation Guides

How it Works Video

Click or Scan



Click or Scan

How it Works Video

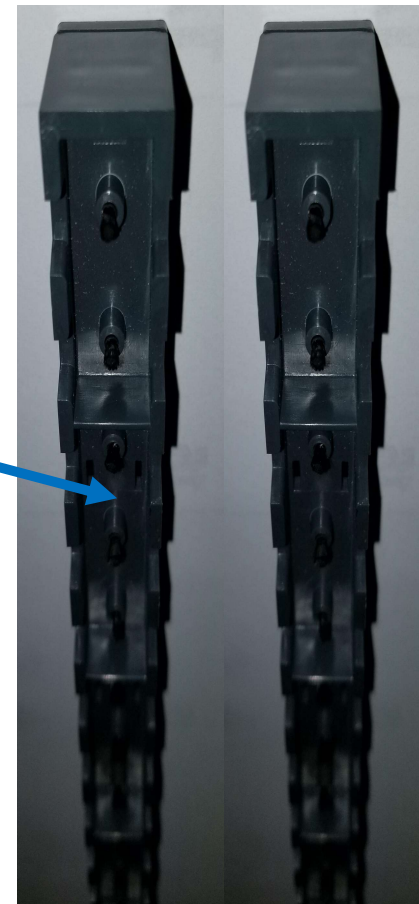


Cleans Air
SAFELY



Essential
to Healthy Living

Phenomenal Aire 6" Stingers



Voltage, Installation and Warranty

- R-6 is 24VAC
- C-Flex (18" & 36" Tape) 110-240VAC
- D-1.2 Series (MINI SPLIT/PTAC) 115 or 208VAC
- D-2.4-2 (Pair) 24VAC
- Testing: Ion Counters & Each product has a Green LED Light to show it is on
- Installation: Return vs Supply
- Return – Return does more for Coil Cleaning. Some ionization catches on the Coil. If there is a prefilter at the Air Handler or Furnace then a transition is needed or R-6 needs to be in the Supply. **Do Not install R-6 in front of a filter.**
- Supply – Supply side allows for more ionization in the living / work space.
- 1 year warranty – **Registration brings it to a 3 year warranty**
 - Life expectancy of the stingers: 10-12 years
- Maintenance
 - If R-6 Cycles on and off with the fan = no maintenance.
 - Running 24/7, Then once a year use soft brush or compressed air on the stingers if there is any dust build up.
 - Either way of wiring does NOT change the warranty.



Phenomenal Aire Website - Residential Portals

For specifications, IOM's, marketing and additional information, we have a dedicated Trane portal on Phenomenal Aire's website for your convenience.

RESIDENTIAL WEBSITE

www.topproductinnovations.com

1. Click on the Partner Portal ...
2. Click on the Residential Partner ...
3. Password is ... TPIresPartner1

Including the Following:

Supporting Technical Documents
Series C Documentation
Series D Documentation
Product Warranty Information
Presentations
Service Bulletins
IAQ & ASHRAE Tools
Engineering Specifications
Master Spec

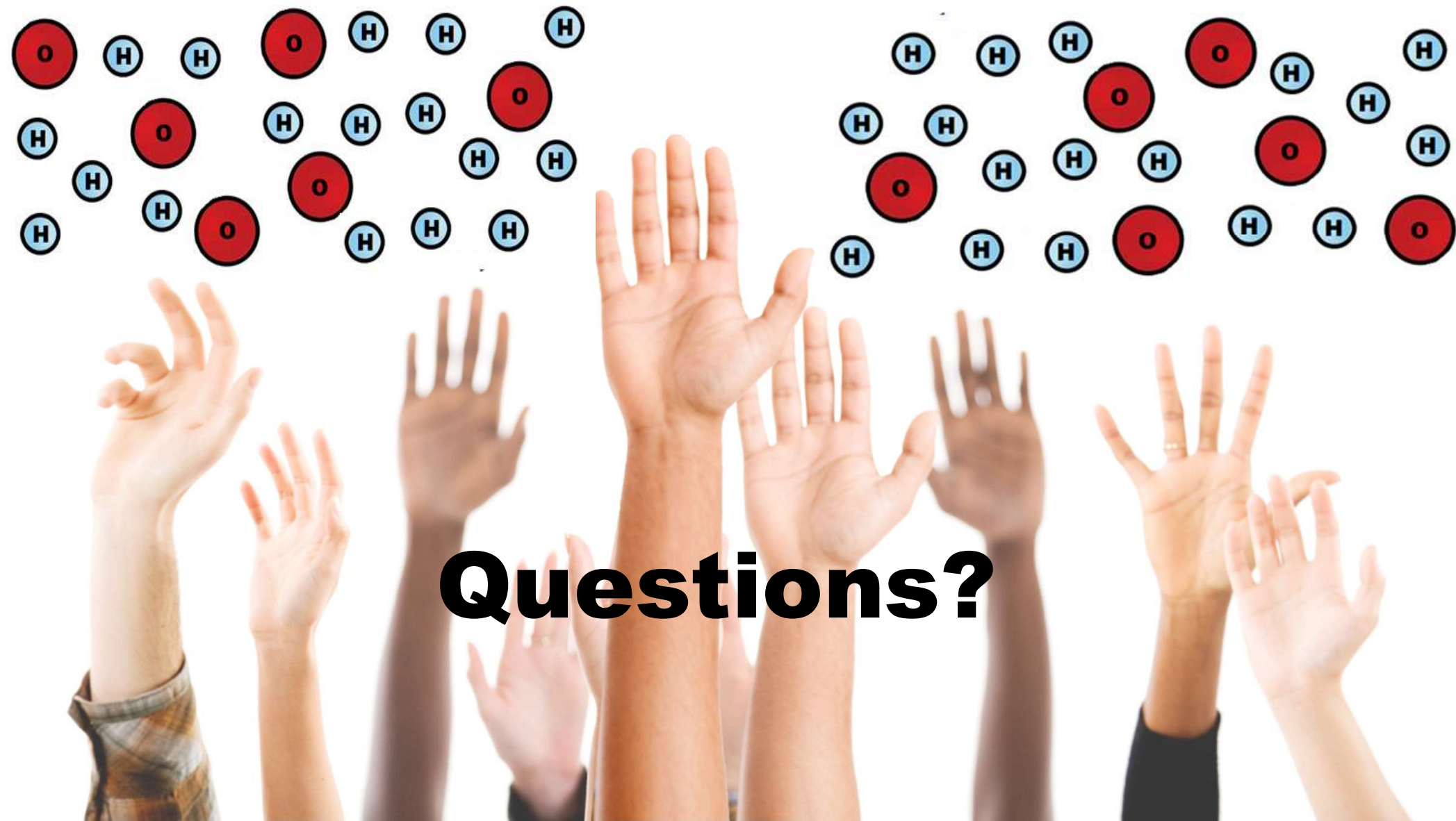
Phenomenal Air's Marketing Collateral

No Online Sales / No YouTube Installations
<https://vimeo.com/263602658/78fb4d2b31>

Personalized Marketing Support
Zoom / MS Teams virtual training
Web Support
Personal Use

Residential Video Books
<https://vimeo.com/344785729>





Questions?