BETTER AIR *through* SCIENCE

2020 Sales Presentation

9/1/2020

DISCLAIMERS

Global Plasma Solutions (GPS) uses multiple data points to formulate performance validation statements. GPS technology is used in a wide range of applications across diverse environmental conditions. Since locations will vary, clients should evaluate their individual application and environmental conditions when making an assessment regarding the technology's potential benefits.

The use of this technology is not intended to take the place of reasonable precautions to prevent the transmission of pathogens. It is important to comply with all applicable public health laws and guidelines issued by federal, state, and local governments and health authorities as well as official guidance published by the Centers for Disease Control and Prevention (CDC), including but not limited to social distancing, hand hygiene, cough etiquette, and the use of face masks.

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ABOUT GLOBAL PLASMA SOLUTIONS

Our patented technology targets airborne particles, pathogens and odors to clean indoor air scientifically, cost effectively and for good.

How?

With a best-in-class commitment to:

- innovation
- product development
- continuous technological enhancements

And we have the certifications, patents and record of category firsts to prove it.

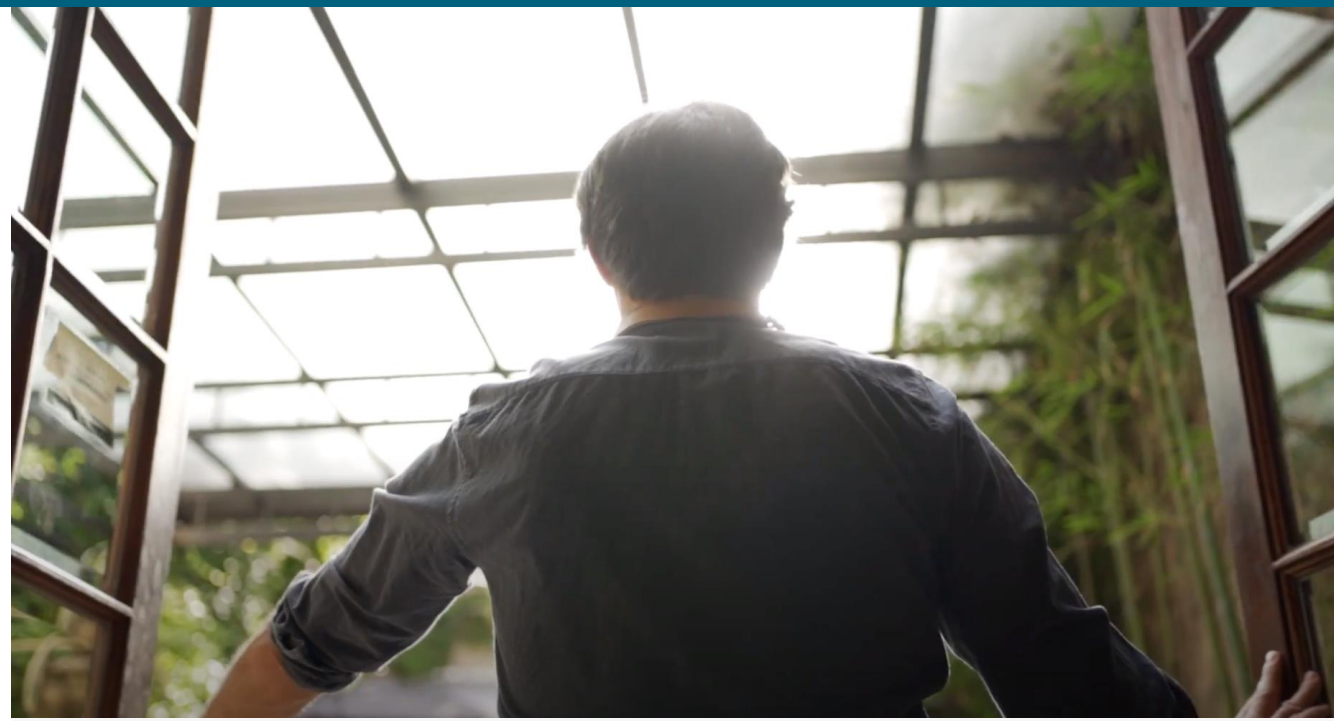
"Solutions" is in our name.

Because we solve indoor air challenges — safely and effectively.

WE SOLVE INDOOR AIR CHALLENGES

It's all about perfecting your Indoor Air Quality (IAQ)

> We never stop thinking about Indoor Air Quality.
>
> Ways to improve it.
>
> And ways to keep improving on those improvements.



The American Society of Heating, Refrigerating and Air-Conditioning Engineers, or ASHRAE, is a professional association seeking to advance heating, ventilation, air conditioning and refrigeration systems design and construction. They recommend these 4 steps to better Indoor Air Quality…

- **Actively clean the air**
- **Improve ventilation.** (1.5 times more during Global Pandemic.)
- **Improve filtration.**
- **Run the fan.**

At GPS, we relentlessly focus our solutions on accomplishing all four.

A PROVEN PROCESS TO CLEAN THE AIR

Our proven NEEDLEPOINT BIPOLAR IONIZATION technology, also known as NPBI,

delivers indoor air that's

safer and free of ozone

and other harmful byproducts.

All GPS NPBI™ products are UL registered and CE compliant. Through NPBI, GPS products clean the air by targeting airborne particulates, odors and pathogens, as well as save up to 30% on energy consumption and lower your carbon footprint.

Top-Flight Technology

GPS' technology is the only active air purification system that has been designed and approved to operate in commercial and private aircraft. Aviation applications require passing the stringent RTCA DO-160 test proving the technology does not generate EMF, line noise or interfere with the avionics in any way. GPS' technology is used in many healthcare applications and will not cause interference with the imaging equipment.

OSHPD
OSP COMPLIANT

c UL us

RTCA
THE GOLD STANDARD FOR AVIATION SINCE 1935
DO-160

INDEPENDENT 3RD PARTY TESTING
ATS LABS
EXCELLENCE IN ANTIMICROBIAL TESTING

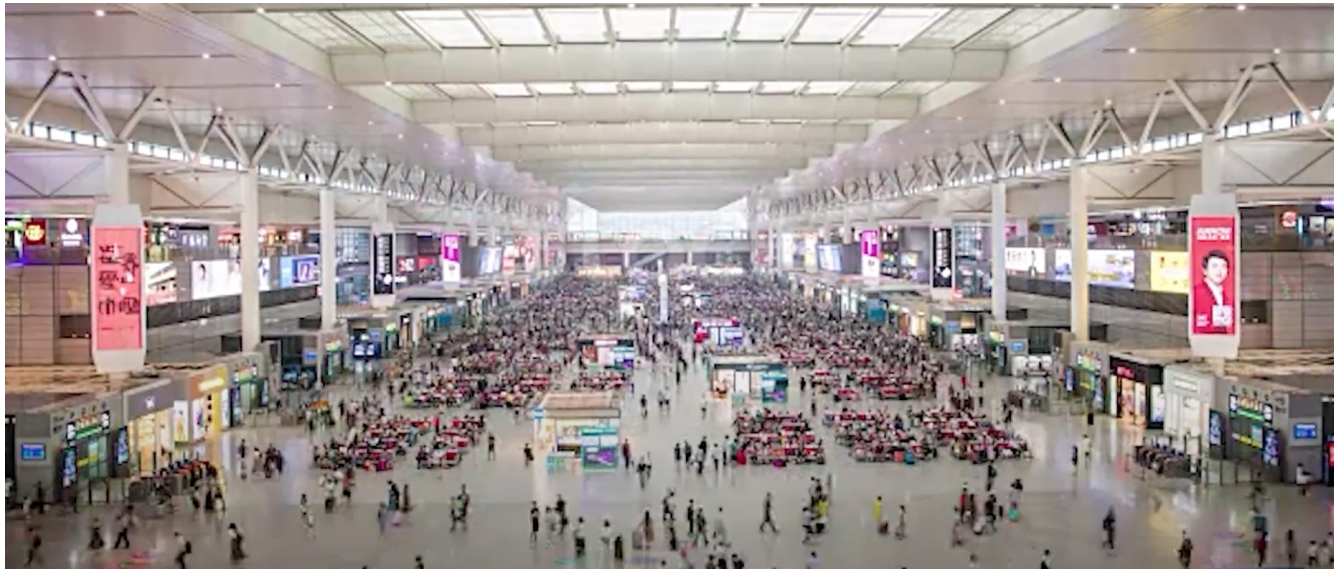
CE

EPA

UL

Fit For Any Challenge

GPS' NPBI technology works to safely clean the air inside industrial, commercial and residential buildings. It can be installed in any system in any building.



- Agriculture
- Airports
- Animal Care
- Arenas & Stadiums
- Banks
- Casinos
- Child Care
- Convention Centers
- Fitness
- Food Service
- Hospitals
- Institutional
- Manufacturing
- Office Building
- Retail
- Schools & Universities
- Senior Care
- Transportation
- Theater
- Worship

WHO WE WORK WITH

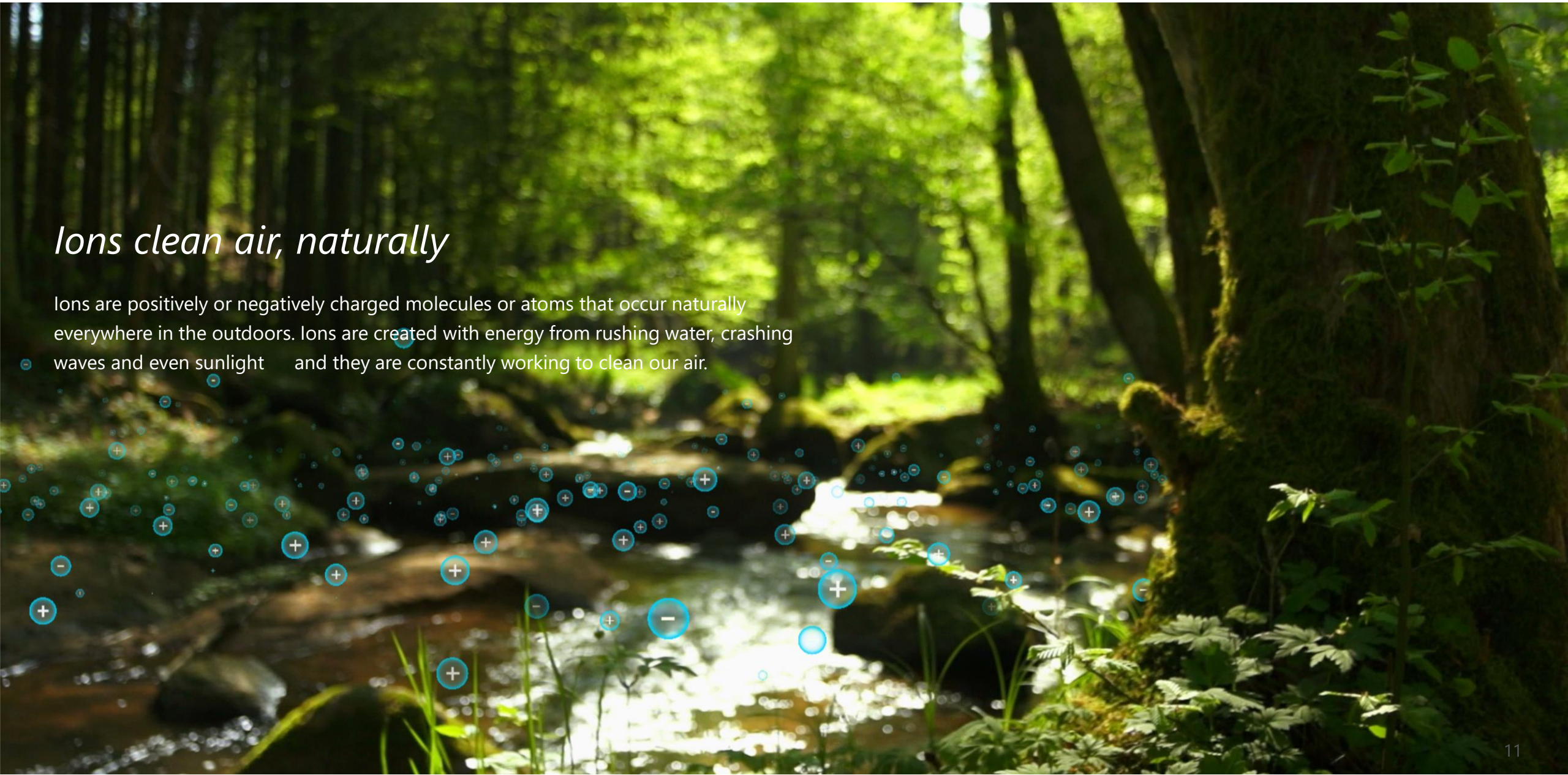
250K+ Satisfied Installations

GPS

The POWER *of* IONS

GPS Technology

WHAT IS AN ION?



Ions clean air, naturally

Ions are positively or negatively charged molecules or atoms that occur naturally everywhere in the outdoors. Ions are created with energy from rushing water, crashing waves and even sunlight and they are constantly working to clean our air.

WHAT IS AN ION?

Unfortunately, there are lower concentrations of ions indoors

A typical outdoor environment has 450 to 2,000 ions per cc. Ions are naturally occurring and are higher near areas with rushing water or at higher elevations. Ions near waterfalls have been measured at upwards of 19,000 ions per cc. Indoor ion concentrations in buildings without ionizers generally range from 1,000 to 3,000 ions per cc.

source: https://www.alphalabinc.com/about-air-ions/

Ionization is the process of using voltage to electrically charge air molecules.

WHAT IS NPBI TECHNOLOGY?

NPBI produces ions to clean indoor air

GPS' patented NPBI technology safely introduces ions into your indoor airstream using the airflow in your existing ventilation system as a delivery method.

No matter your existing ion concentration, employing NPBI technology can enhance it by 1,500 to 7,000 ions per cc.

When GPS is used in commercial and industrial buildings, ion levels have been measured to rival those of the highest-concentration outdoor settings.

GPS NEEDLEPOINT BIPOLAR IONIZATION VS. OTHERS

	GPS NPBI™	Other BPI	Corona Discharge	HEPA Filters	Carbon Filters	Ultraviolet (UV)	UV-PCO
No Harmful Byproducts	●			●	●		
Reduces Airborne Particles	●	●	●	●			
Reduces VOCs	●	●	●		●		●
Reduces Pathogens	●	●	●	●	●	●	●
Reduces Energy Cost	●	●	●				
Treats In-Room Air	●	●	●				
No Replacement Parts	●						
No Maintenance	●						
Simple To Install	●						
Low Total Cost	●	●					

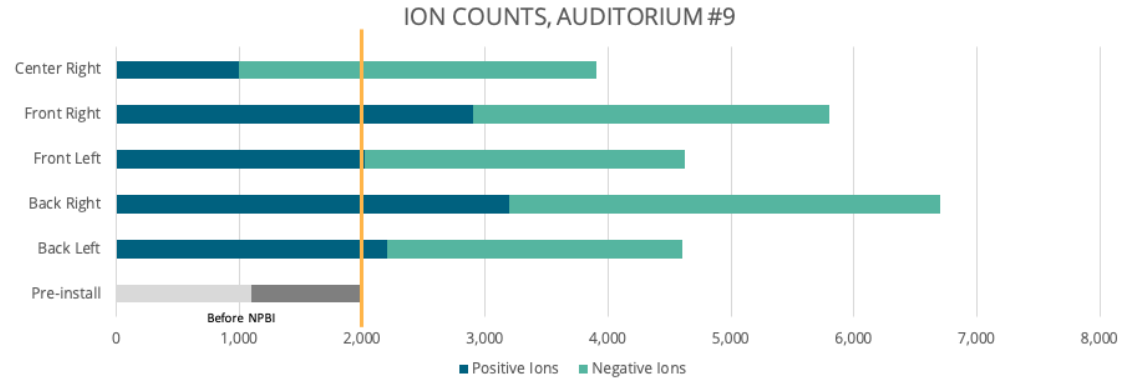
The use of this technology is not intended to take the place of reasonable precautions to prevent the transmission of pathogens. It is important to comply with all applicable public health laws and guidelines issued by federal, state, and local governments and health authorities as well as official guidance published by the Centers for Disease Control and Prevention (CDC)

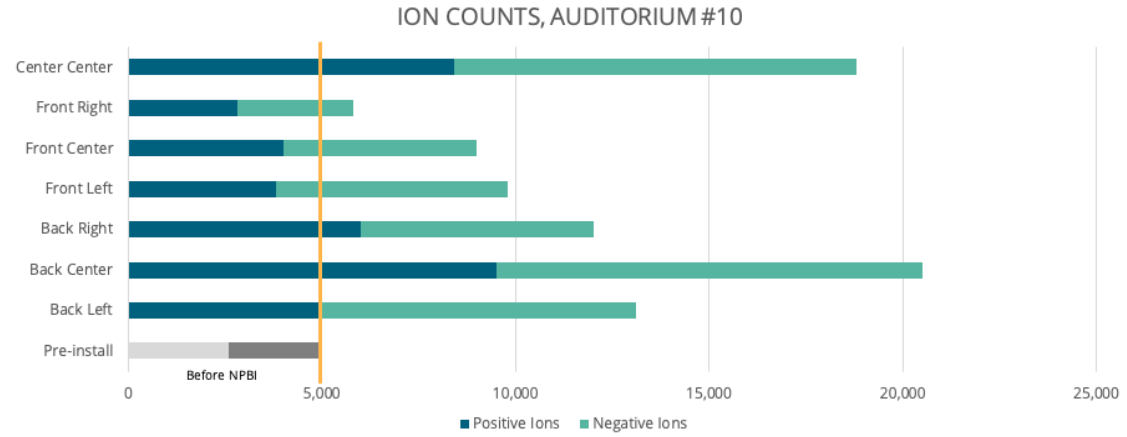
field testing

But don't take our word for it. Let's let the ions do the talking.

In July 2020, GPS installed brand new Needlepoint Bipolar Ionization Systems in a Cinemark movie theater in Dallas, Texas. We took readings to determine the number of air-cleaning ions present before and after installation. Here are our results:

GPS FC 48 FIELD TEST DATA JULY 2020 CINEMARK DALLAS METRO





WHAT IS OZONE?

Ozone (O3) occurs naturally in the upper atmosphere and reduces the amount of harmful UV radiation reaching the Earth's surface. The presence of ozone in the lower atmosphere, in the air we breathe, results primarily from volatile organic compounds (VOC) and nitrogen oxides (NOx). Inhaling ozone is linked to respiratory damage that increases with frequency and duration of exposure.

ASHRAE's Environmental Health Committee that "the introduction of ozone to indoor spaces should be reduced to as low as reasonably achievable."

sources:
EPA.gov Indoor Air Quality (IAQ)
ASHRAE Filtration/Disinfection

What is UL-2998 and why is meeting this standard so important?

UL-2998 is an environmental claim validation created by Underwriters Laboratory (UL).

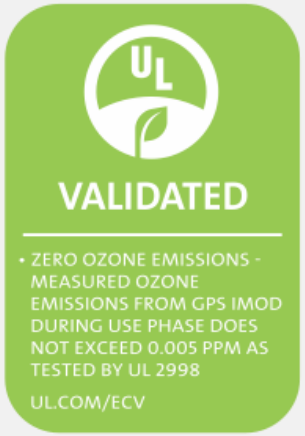
Indoor air purification systems that meet this strict standard are considered ozone-free.

This crucial standard helps people make informed choices when selecting systems and safeguards them against false claims that may jeopardize safety.

Qualifying products must demonstrate they emit less than 0.005 ppm (5 ppb). This is 10 times more stringent than the UL 867 requirement of 0.05 ppm (50 ppb).

Some key decisions based on UL-2998 validation:

- August 2020 – CDC encourages use of IAQ solutions that meet UL 2998
- August 2020 - ASHRAE recommends products that have been verified as certified air cleaning devices by the California Air Resources Board or as zero ozone emitting devices using UL 2998. (Covid-19 FAQ's)
- July 2020 – ASHRAE includes ionization as part of its guidance on reopening schools & universities.
- April 2020 – ASHRAE Epidemic Task Force presentation relays Bipolar Ionization Air Cleaning products must comply with UL 2998 and ASHRAE 62.1




NO OZONE
NO HARMFUL BYPRODUCTS

NPBI GENERATES IONS WITHOUT PRODUCING OZONE OR OTHER HARMFUL BYPRODUCTS

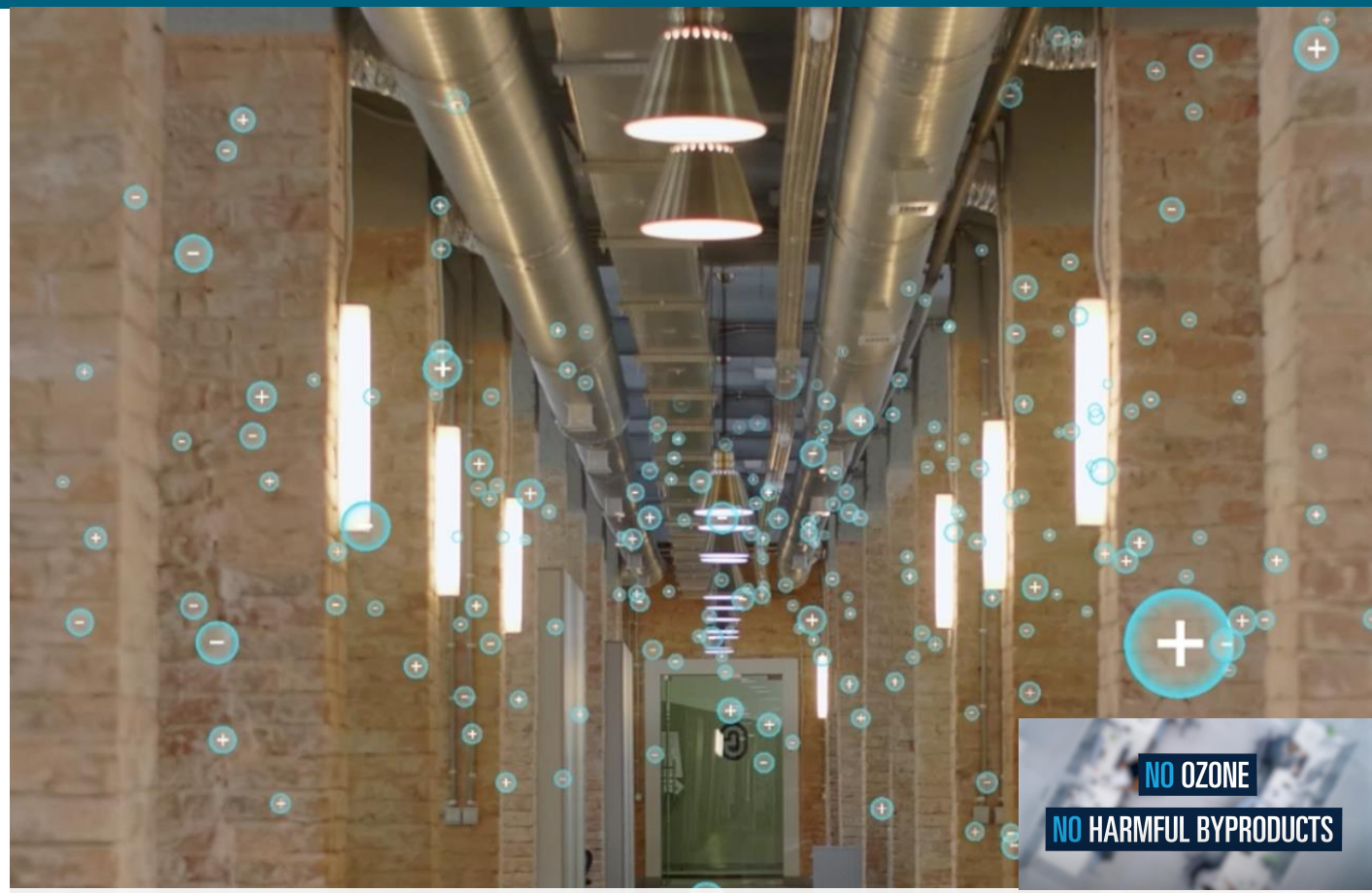
Ozone is a harmful byproduct of other ionization products – but not GPS'.

GPS offers NPBI products that are UL certified to not produce ozone, meaning the air is safer and cleaner to breathe.

Older systems and competing technologies may create corona discharge that is evidence of ozone.

American Lung Association states "the long-term effects of ozone are aggravated asthma, bronchitis, emphysema, accelerated aging of the lungs, diminished lung capacity, decreased lung function and early death".

NPBI™ lets you bring outdoor freshness to the indoors — safely and without worry.



A NOTE ON BPI VS. NPBI

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) views all BPI as one technology. But **NPBI is NOT the same as traditional BPI. They are two very different technologies.**

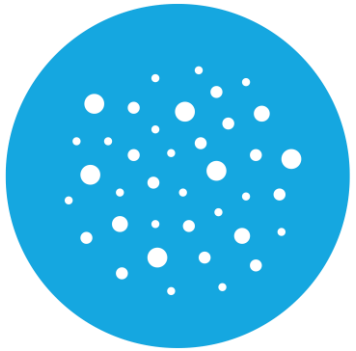
We are working to improve ASHRAE's understanding of NPBI as we continue our development, testing and validation. NPBI is both safe and effective, and GPS is tirelessly driving widespread awareness and acceptance of this valuable, new technology.

Come see for yourself how GPS products stack up against the competition

We invite you – **at no cost** – to come test our products head-to-head with any others you'd like to compare for ion or ozone output.

We've built a 12x8x10 test chamber – the same volumetric size used in UL 867 and UL 2998 ozone testing — at GPS Corporate Headquarters. And we urge you to come use it, our laboratory facility and the equipment at our Charlotte customer experience center to see why GPS products clean indoor air safer and more efficiently than any others.

HOW NPBI WORKS

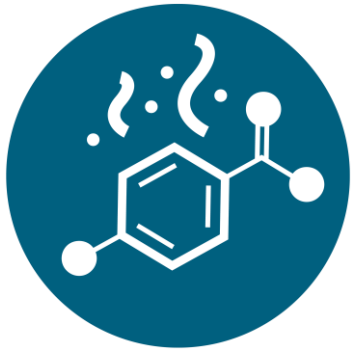


TARGETS PARTICLES

When ions disperse throughout a room, they combine with particles suspended in the air. This creates a snowball effect, in which particles of opposite polarity cluster together. The larger a particle becomes, the easier it is to capture in filtration systems.

REDUCES PATHOGENS

During the NPBI™ process, contact with ions disrupts pathogens' surface proteins, rendering them inactive and unable to replicate.



TACKLES ODORS

GPS' NPBI™ technology breaks down chemical, pet, cooking and other odors into basic harmless compounds, leaving indoor air fresh smelling and free of odor-causing VOCs.

SAVES ENERGY

By keeping indoor air cleaner, NBPI reduces the amount of air required from outside to keep things fresh—saving you initial ventilation equipment costs and up to 30% on energy consumption.

TARGETS PARTICLES

targets particles

reduces pathogens

tackles odors

saves energy

Tiny airborne particles such as dust, dander, pollen, smoke and even pathogens often go unseen in the air.

The smaller the particles, the more dangerous they are — as the most miniscule can pass deeper into human lungs.

Even common dust and dander can cause respiratory issues and worsen pre-existing conditions like asthma and allergies.

Our patented NPBI technology reduces fine particulate matter by safely introducing ions into the air stream, causing particles to cluster together for easier filtration by your HVAC system.

The smaller the particles, the more dangerous they are — as the most miniscule particles go deeper into the lungs.

TARGETS PARTICLES

targets particles

reduces pathogens

tackles odors

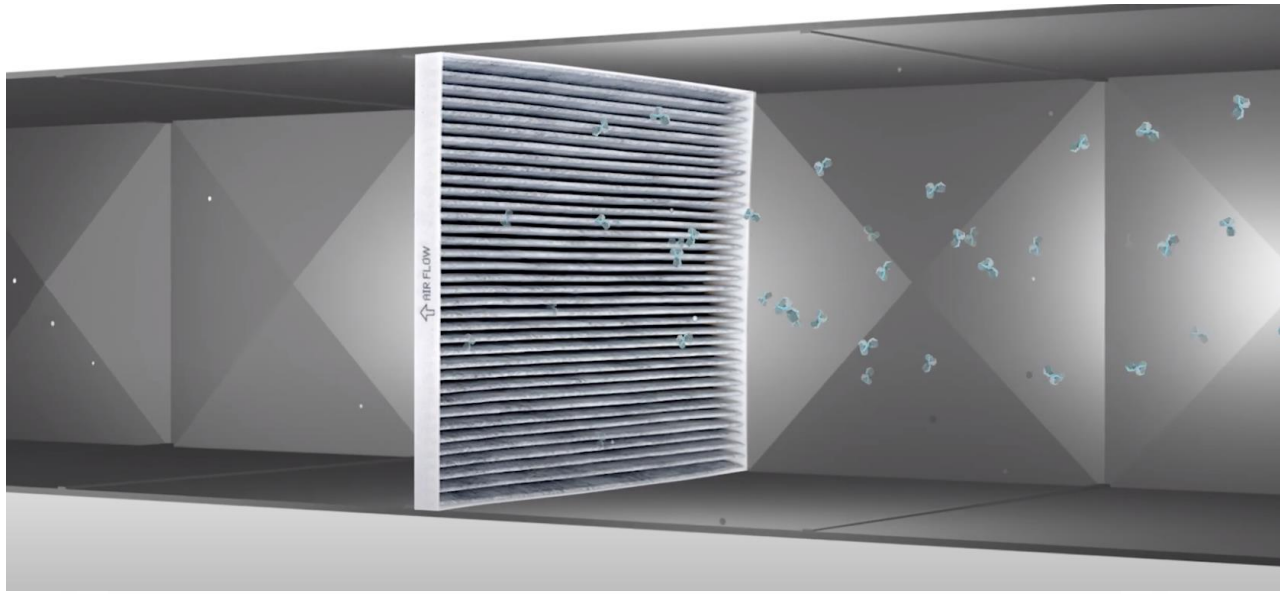
saves energy

GPS' NPBI technology so effectively removes particles from the air, it can make a MERV 8 filter perform like a MERV 13 filter.

MERV measures a filter's ability to capture particles of varying sizes. It stands for Minimum Efficiency Reporting Value and ranges from 1 to 20. The higher a system's MERV rating, the more effective — and more expensive — a particular filter is.

GPS works continuously with independent laboratories to validate performance. NPBI is verified by Blue Heaven Labs, a 3rd party laboratory, to enable MERV 13 efficiency using only MERV 8 level filtration.

Buying replacement MERV 13 filters would cost up to 75% more than MERV 8 filters…in perpetuity. Not to mention fan energy costs.



Do I produce airborne particles?

- A person sitting or still generates about 100k particles per ft^3
- Sitting down or standing up generates about 2.5M particles ft^3
- Walking generates about 10M particles per ft^3
- Exuberant motion generates about 30M particles per ft^3
- Grinding/sweeping/welding adds billions of particles per ft^3
- 2 surfaces rubbing generate billions of particles per ft^3

Harvard study links poor air quality to higher coronavirus death rates

Studies have long shown exposure to fine particulate matter puts people at heightened risks for lung cancer, heart attacks, strokes and even premature death.

Public health officials have lately suspected a link between dirty air and serious illness and death from Covid-19.

In an analysis of 3,080 counties in the United States, researchers at the Harvard University T.H. Chan School of Public Health found that a person living for decades in a county with high levels of fine particulate matter is 15% more likely to die from the coronavirus than someone in a region with as little as one measured unit ($\mu g/m^3$) less of fine particulate matter.

Breathing in such microscopic pollutants, experts say, inflames and damages the lining of the lungs over time, weakening the body's ability to fend off respiratory infections like Covid-19.

source: *New York Times "New Research Links Air Pollution to Higher Coronavirus Death Rates"*

REDUCES PATHOGENS

targets particles

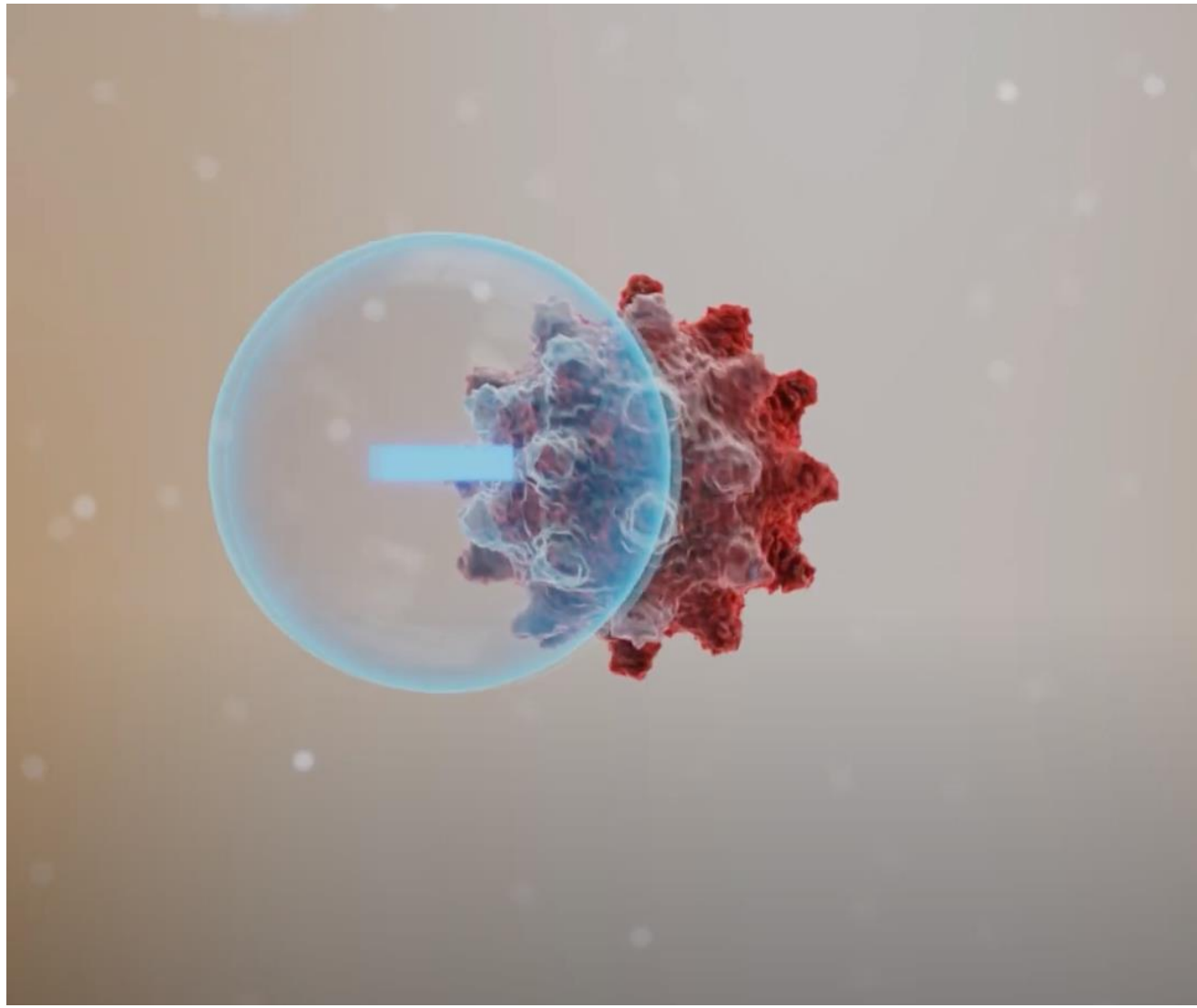
reduces pathogens

tackles odors

saves energy

NPBI Reduces The Spread of Disease

Our patented technology is particularly effective against pathogens — such as mold, viruses and bacteria. As ions produced via the NPBI system come into contact with airborne pathogens, they engage with surface proteins and render them inactive.



Our *Testing Approach*

SENSITIVITY TESTING

A petri dish containing a pathogen is placed underneath a laboratory hood, then monitored to assess the pathogen's reactivity to NPBI over time. This controlled environment allows for comparison across different types of pathogens.

SIMULATION TESTING

Counts of airborne pathogens are taken before and after aerosolizing them into a sealed, unoccupied laboratory environmental room installed with NPBI technology. The larger space more closely resembles a real world environment.

SPECIALTY TESTING

Unoccupied laboratory test environments are designed to evaluate NPBI performance in conditions unique to particular industries or customers, and may include special circumstances such as higher than average ion concentrations.

INDEPENDENT LABORATORY TESTING RESULTS SUMMARY

Pathogen	SARS-CoV-2	Norovirus*	Human Coronavirus 229E	Legionella	Clostridium Difficile	Tuberculosis	MRSA	Staphylococcus	E. Coli
Time In Chamber	30 min	30 min	60 min	30 min	30 min	60 min	30 min	30 min	15 min
Rate Of Reduction	**99.4%**	**93.5%**	**90.0%**	**99.7%**	**86.8%**	**69.0%**	**96.2%**	**96.2%**	**99.6%**
Testing Lab	INNOVATIVE BIOANALYSIS	ATS	ALG	EMSL	EMSL	EMSL	EMSL	EMSL	EMSL

* Surrogate for Norovirus, actual strain tested was Feline Calicivirus, ATCC VR-782, Strain F-9.

TACKLES ODORS

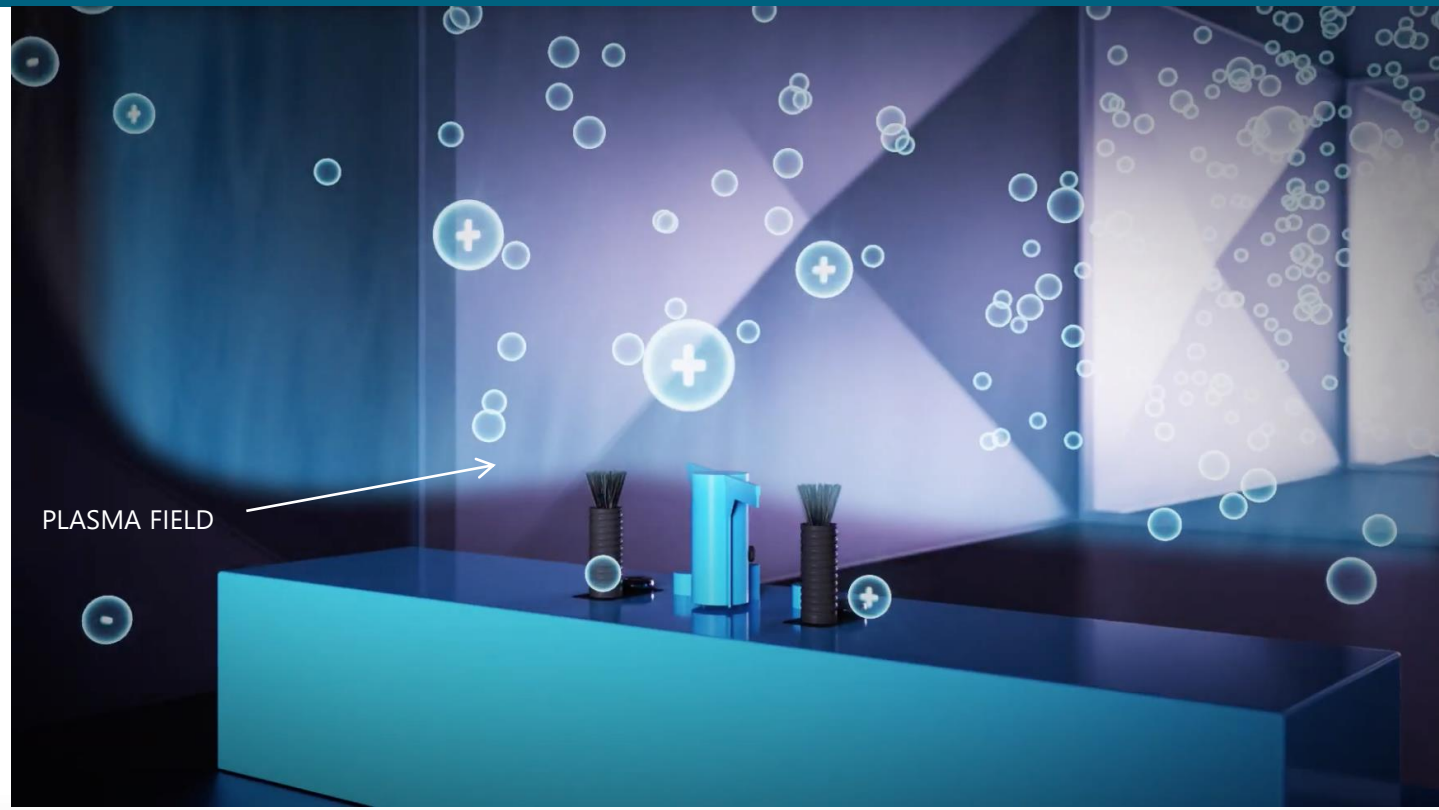
targets particles

reduces pathogens

tackles odors

saves energy

The NPBI plasma breaks down odors, gases and VOC's into harmless compounds.



What are VOC's...

VOLATILE ORGANIC COMPOUNDS

We come in contact with 100's of VOC's each Day.

SAVES ENERGY

targets particles

reduces pathogens

tackles odors

saves energy

Using GPS' NPBI allows for reduction in Outdoor Air (OA)

- ASHRAE 62.1 specifies minimum ventilation rates for new and existing buildings, to protect occupants against adverse health effects.
- Both the Ventilation Rate Procedure (VRP) and Indoor Air Quality Procedure (IAQP) are part of ASHRAE 62.1
- IAQP requires substantially lower outdoor air intake vs. VRP – based on use of air cleaning technology.
- Cleaner air, with lower 'contaminants of concern' lessens demand on HVAC systems, reducing upfront capital costs and ongoing energy usage.

Results-Driven

INNOVATIONS

GPS Products

GPS IONIZATION SYSTEM QUICK SELECTION GUIDE

ASSORTMENT SUMMARY

GPS Model	Install Locations	Cooling Capacities	Input Voltage	Auto Clean	Data Sheet	Installation Manual/IOM
GPS-iMOD™	Duct, In the Air Flow, Between Evaporator & Coil Filter	0-4800+ CFM / 1-15+ Tons	24/120/208-240 VAC		GPS-iMOD	GPS-IOM-iMOD
GPS-DM48-AC™	Duct, In the Air Flow	0-4800 CFM / 1-12 Tons	24–240 VAC	✔	GPS-DM48-AC	GPS-IOM-DM48-AC
GPS-FC48-AC™	Fan Inlet, In the Air Flow, Zone Diffuser	0-4800 CFM / 1-12 Tons	24–240 VAC	✔	GPS-FC48-AC	GPS-IOM-FC48-AC
GPS-FC24-AC™	Fan Inlet, In the Air Flow, Zone Diffuser	0-2400 CFM / 1-6 Tons	24–240 VAC	✔	GPS-FC24-AC	GPS-IOM-FC24-AC
GPS-iRIB-18™	In the Air Flow	0-2400 CFM / 1-6 Tons	110–240VAC		GPS-iRIB-18	GPS-IOM-iRIB
GPS-iRIB-36™	In the Air Flow	0-4800 CFM / 1-12 Tons	110–240VAC		GPS-iRIB-36	GPS-IOM-iRIB
GPS-FC3-BAS™	Fan Inlet, In the Air Flow, Zone Diffuser	0-2400 CFM / 1-6 Tons	24VAC		GPS-FC3-BAS	GPS-IOM-FC-3T-BAS

GPS-FC-3-BAS™

GPS-FC-3-BAS™

The GPS-FC-3-BAS™ unit is designed to be mounted inside of fan coils, heat pumps, PTACs, ductless mini-splits and air handlers up to 3,200 CFM or 8 tons. It's compact size and simple mounting requirement allows it to be mounted almost anywhere in just a few minutes. | data sheet

Input Voltage	24VAC
Power Required	12 Watts
Frequency	50/60HZ
Total Ion Output	>350M ions/cc/sec
Airflow Capacity	0 - 3,200 CFM
Temperature	-20° to 160°F
Humidity	0-100% RH
Unit Dimensions/ Weight	2.6"L x 1.9"H x 1.3"D / 0.23 lbs
Electric Approvals	UL
Compliance & Certifications	UL 867, UL 2998, OSHPD Seismic (OSP), IAQP, CE
BAS Alarm Contact Rating	"Dry" Contact Type - 5 A/120V Maximum

AUTO CLEANING

GPS-FC48-AC™

An automatic self-cleaning, lightweight NPBI system that handles up to 4,800 CFM or 12 tons. Designed for multiple mounting options including fan inlet, interior duct walls or floors. | data sheet

PRODUCT	VOLTAGE	CFM RATING	IONS/cc/sec
GPS-FC48-AC	24-240 VAC	4,800	> 400 million

GPS-DM48-AC™

The world's first automatic self-cleaning, duct mounted, lightweight NPBI electronic air cleaner. The maintenance free unit is designed for indoor or outdoor duct mounting and can handle up to 4,800 CFM or 12 tons. | data sheet

PRODUCT	VOLTAGE	CFM RATING	IONS/cc/sec
GPS-DM48-AC	24-240 VAC	4,800	> 400 million

GPS-FC24-AC™ / S™

An automatic self-cleaning, lightweight NPBI system that handles up to 2,400 CFM or 6 tons. Designed for multiple mounting options including fan inlet, interior duct walls or floors. | data sheet

PRODUCT	VOLTAGE	CFM RATING	IONS/cc/sec
GPS FC24 AC	24-240 VAC	2,400	> 300 million

BARS & STRIPS

GPS-iRIB® 18/36

The GPS-iRIB is available in 18" and 36" lengths. They are made from a flexible chemical, heat and cold resistant Kapton® material containing a circuit with special carbon fiber ion emitters soldered into the circuit traces. This mechanism is engineered to deliver the highest level of ionization with the least amount of energy in the most compact size. Designed for 3200 CFM or 8 tons. | data sheet

PRODUCT	VOLTAGE	CFM RATING	IONS/cc/sec
GPS-iRIB-18/36	110-240 VAC	3,200	> 35 million/ft

GPS-iMOD®

The GPS-iMOD is a modular NPBI system that is field assembled to any length up to 240 inches in 6-inch increments. The fiberglass composite and carbon fiber GPS-iMOD can be mounted in various environments. It can treat 50–250 CFM per inch of bar, depending on the application. | data sheet

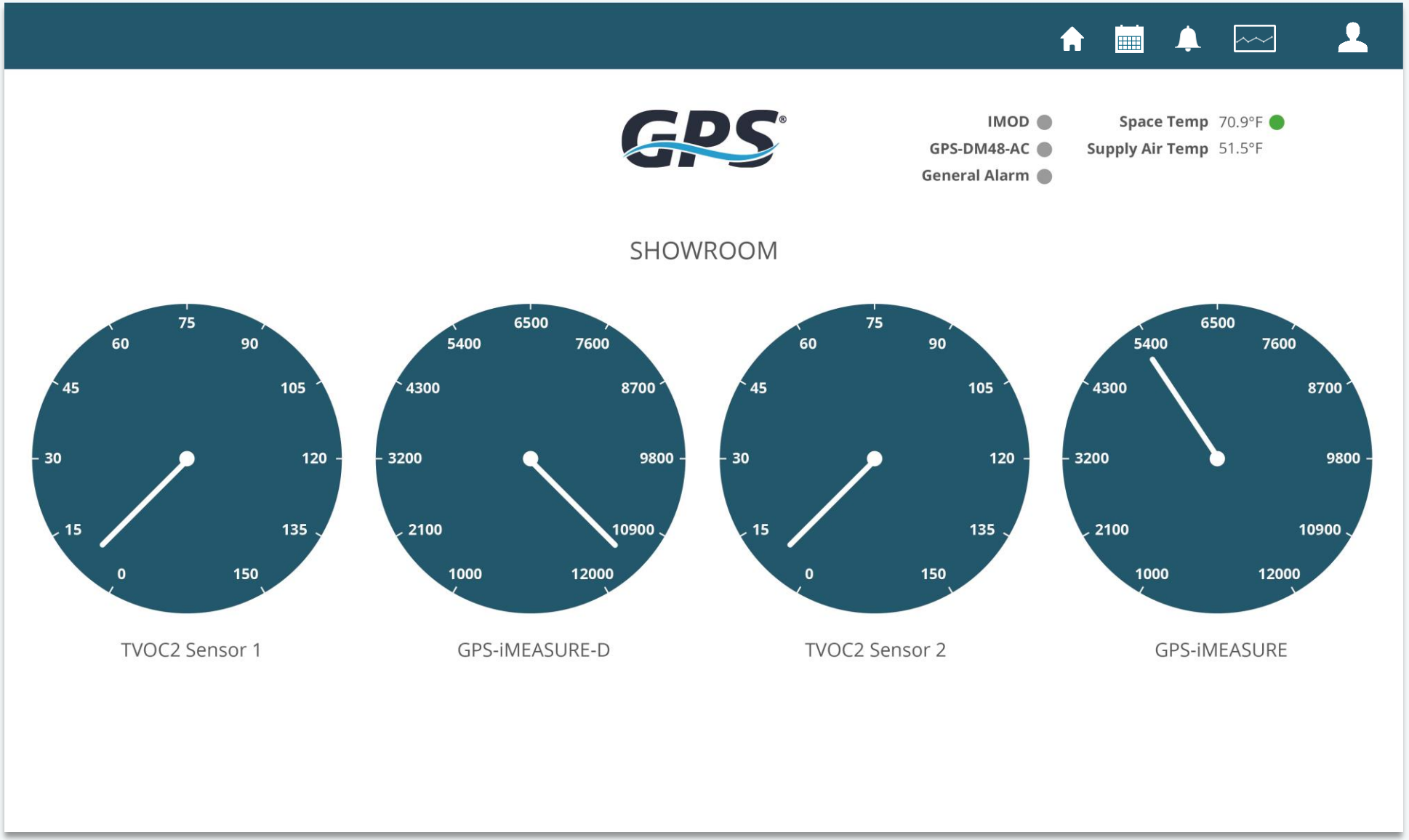
PRODUCT	VOLTAGE	CFM RATING	IONS/cc/sec
GPS iMOD	24-240 VAC	Sized per coil	> 840 million Ions/cc/sec per 6 inches of bar

GPS-iMEASURE™

The GPS-iMEASURE is the first commercially available ion detector that can be permanently mounted in the space to measure ion levels in real time and report back to a BAS.

GPS-iMEASURE-D™

The GPS-iMEASURE-D ion detector is permanently mounted in the duct downstream of any GPS ionization device. It measures ion levels in real time and reports back to a BAS. It includes three sensitivity levels: 20,000/200,000/2,000,000 ions/cc/sec that can be set based on the application and in-duct location.


IMOD
GPS-DM48-AC
General Alarm
Space Temp 70.9°F
Supply Air Temp 51.5°F
SHOWROOM
TVOC2 Sensor 1
GPS-iMEASURE-D
TVOC2 Sensor 2
GPS-iMEASURE

UNDERSTANDING ION CONCENTRATION

What is an average range for natural ion count?

- Naturally occurring ions are everywhere in the outdoors; the energy found near areas with rushing water, higher elevation or a lot of sunlight tends to increase ion counts.
- A typical outdoor environment has 450–2000 ions per cc, but ions near waterfalls have been measured at upwards of 19,000 ions per cc.
- Indoors, natural ion concentrations generally range from1,000 to 3,000 ions per cc.

What factors influence ion concentration?

- The concentration of ions indoors may vary from room to room, or even day to day with and without NPBI technology.
- Strong air circulation, ventilation and a lot of electronic equipment can increase baseline ion concentrations –and even natural factors such as a recent thunderstorm.
- Higher levels of contaminants and other types of particulate tend to lower baseline ion counts.

source: https://www.alphalabinc.com/about-air-ions/

Devices

- You can test the ion concentration in your indoor environment before and after employing NPBI technology with **third-party** air ion counters, available for purchase through AlphaLab Inc or through GPS.
- Ion counters may be set to measure + and – ions separately or combined. GPS represents ionization levels as the combined total of + and – ions.

How to Use

- To measure, position the handheld air ion counter approximately 2" from the register, directly within the air stream, while the HVAC system is active.
- Ensuring the grounding wire is plugged-in, hold for at least 30 seconds to determine the range of ions per cc. Measurements will continuously fluctuate.

Model: AIC2
Accurate within 20%

Model: AIC
Accurate within 25%

BAR ACCESSORIES

GPS-iDETECT-P™

The GPS-iDETECT-P is a plenum-mounted ionization detector that confirms the output from the GPS-iMOD. The GPS-iDETECT-P provides the ability to monitor ionization status in a plenum to confirm that the ionization equipment is working properly.

GPS-NEMA4-OE

The GPS-NEMA4-OE is a NEMA 4X-rated fiberglass enclosure designed to house one GPS-iMOD power supply. The panel adds a superior finished look to any project while providing the required protection against foreign substances, such as water and dust, when power supplies are mounted in non-NEMA 1 rated environment.

GPS' products are easy to install and easy to own, with features like universal voltage input (24V 240V AC or DC) and auto cleaning.

Installation

- We designed our products to be easy to install across many indoor and outdoor environments and conditions.
- Typical installations can be completed in 30 to 60 minutes per system with no special tools required.
- Our products were designed for flexibility with mounting, offering multiple mounting options at the fan inlet, in the duct work, zone diffuser, or between the evaporator coil and filter.

INSTALLATION EXAMPLE

GPS-iMOD®

The GPS-iMOD is a modular NPBI system that is field assembled to any length up to 240 inches in 6-inch increments.

Only GPS systems provide auto-cleaning AND zero maintenance

Auto-Cleaning

- Our auto-cleaning, lightweight systems are designed for easy use, ultimate convenience and optimal long-term performance.
- Our programmable auto-cleaning systems clean the carbon fiber brush emitters on your desired schedule, ranging from every day to every 5 days.

Maintenance Free

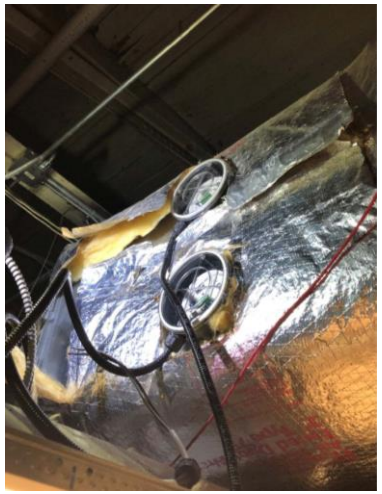
- Unlike UV lights or traditional BPI, our NPBI technology does not require any replacement parts over the lifetime of the product.

AUTO-CLEANING FEATURE

PRODUCT INSTALLATION GALLERY

Now that you know how well we work, perhaps you'd like to see where. Check out our Installation Gallery to see GPS products on the job.

GPS-DM48-AC™ | GPS-DM48-AC Manual



GPS-FC48-AC™ | GPS-FC48-AC Manual

GPS-iMOD® | GPS-iMOD Manual



GPS-iMOD® | GPS-iMOD Manual


APPENDIX

Additional Resources

FAQs & Case Studies

FAQs – GENERAL

How long do the ions last in the air?
Typically small ions have a life expectancy of about 60 seconds before they touch a surface or particle to discharge.

What does universal voltage input mean?
GPS products with universal voltage input will operate with any voltage in the range of 24 – 240 VAC or DC. The auto-cleaning line of products senses the input voltage automatically and the internal circuitry adapts to the voltage. The GPS-iMOD power supply comes with a built-in selector switch. The GPS-iRIB operates on voltages between 110-240VAC.

Does the technology generate line noise or EMFs?
GPS' technology does not generate line noise and does not generate electromagnetic forces. GPS' technology is the only ionization technology approved by the FAA for installation on aircraft — having passed stringent DO-160 certification — proving no line noise and no EMFs, which could be detrimental to aircraft avionics.

Will humidity effect the NBPI ion output?
Humidity does not affect the ionization output; however, if water condenses on the needle tips, ions cannot be emitted and the ion output will be greatly reduced or cease.

SAVES ENERGY | WHAT ABOUT CO2?

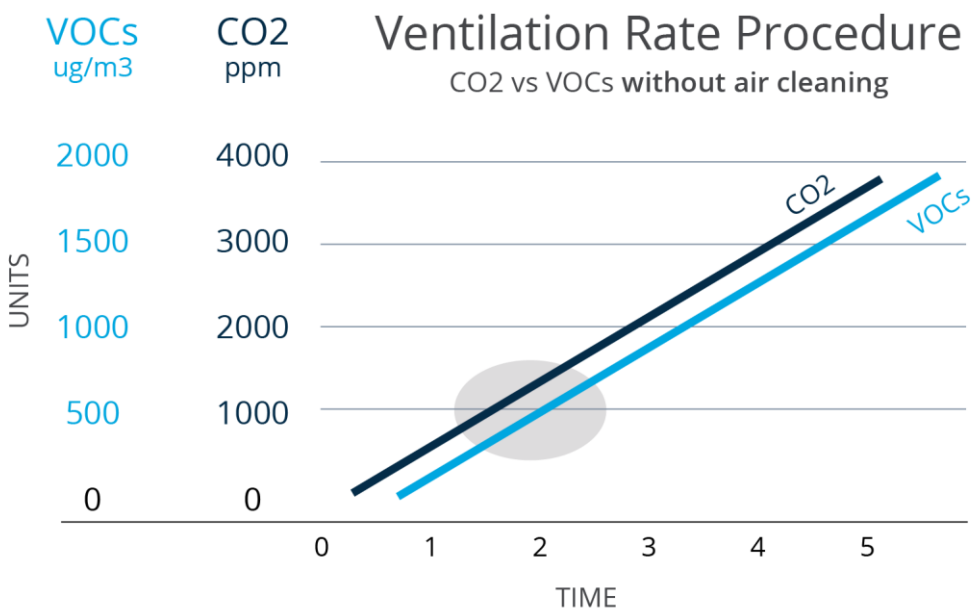
targets particles

reduces pathogens

tackles odors

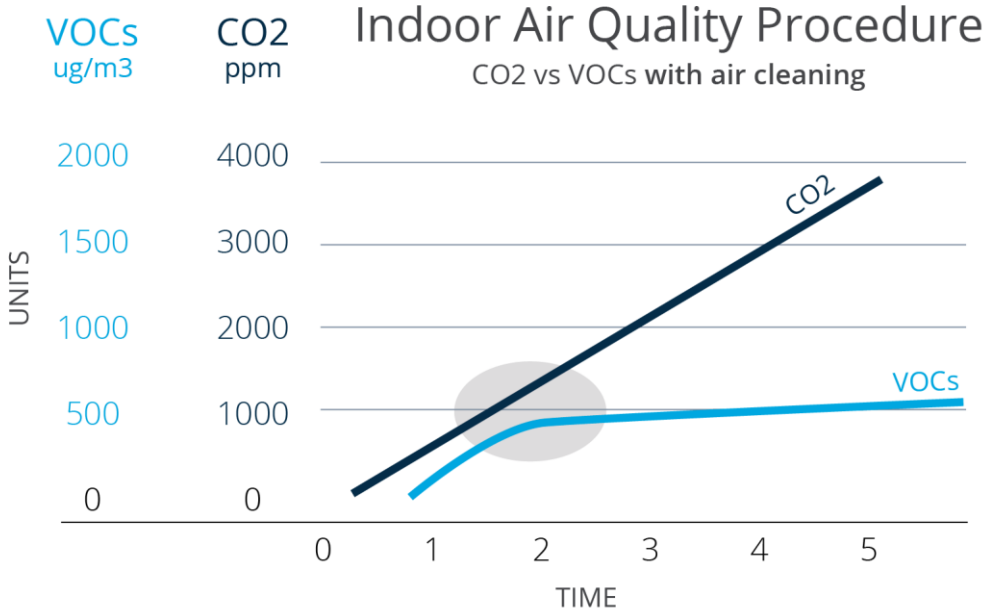
saves energy

CO2 vs VOCs



ASHRAE 62 VRP

– Must maintain 700 PPM above outdoors



ASHRAE 62 IAQP

– Allows up to 5,000 PPM in accordance with OSHA & NIOSH PPM

AMALIE ARENA

CAPEX Savings = $1 million; Annual OPEX Savings = $115,000

700+ Tons of Cooling Capacity Saved

THE CHALLENGE

The Amalie Arena, formerly known as the Tampa Bay Times Forum, underwent renovations in 2015. The original design of the HVAC system required approximately 202,000 CFM of outside air, according to the ASHRAE Ventilation Rate Procedure, to dilute the contaminants in the air and produce acceptable indoor air quality. The renovation of 2015 meant upgrades that would cost millions of dollars.

THE SOLUTION

Utilizing the ASHRAE Indoor Air Quality Procedure, the GPS-iBAR® needlepoint bipolar ionization system was installed to control airborne contaminants while reducing the amount of outside air needed. This solution provided excellent indoor air quality all while providing capital and operating cost reductions.

THE RESULTS

By installing the GPS-iBAR technology to improve indoor air quality, the outside air intake was reduced to 108,000 CFM for a total savings of 94,000 CFM, or about 700 tons of cooling capacity. The reduction in cooling capacity resulted in a savings of more than $1 million in capital equipment. Furthermore, the facility is realizing an annual cost savings of approximately $115,000 in energy expenditures, while reducing their carbon footprint.

BOSTON CHILDREN'S HOSPITAL

Fume and Odor Removal Within 48 Hours

THE CHALLENGE

Children's Hospital needed to upgrade their HVAC system to deal with noxious diesel fumes and street odors emanating from a nearby construction zone.
The hospital staff and patients had been complaining about the odors that the existing UV light system was unable to control. The facilities management team was also looking for a solution to keep the entire depth of the coils clean and free of biofilm . Their UV systems only treated a few inches of the coil depth.

THE SOLUTION

The hospital chose to install the GPS-iMOD® needlepoint bipolar ionization system to (1) control the noxious diesel fumes, (2) destroy the odors coming from the construction site, and (3) destroy the microorganisms that produced the biofilm on the coils.

THE RESULTS

The diesel fumes and other unpleasant odors were reduced, and coils sanitized within 48 hours, saving as much as 30% in power consumption. The hospital's alternative to resolving the odor issues with the GPS-iMOD would have been expensive renovations. The renovation would have added more demand to the system, creating high pressure drops. This would have resulted in a higher energy bill without 100% certainty of solving the problem.

CLEAN ROOM APPLICATIONS

89.7% Particle Reductions & Odor Reduced in 24 Hours

THE CHALLENGE

A new chemical introduced into the manufacturing process was creating odor issues for the employees working in clean rooms and adjoining spaces that shared the same air handling system. The noxious odor needed to be contained or reduced to improve the indoor air quality and working conditions for the employees.

THE SOLUTION

The GPS-iBAR® needlepoint bipolar ionization system was installed in the air handling system that treats the clean room's air.

THE RESULTS

The odors were reduced within 24 hours of the GPS-iBARs' installations. Additionally, the annual clean room certification process revealed that the total particle count was reduced by 89.7%. This new low particle count was the lowest the manufacturer had experienced in 10 years.

WEWORK RENOVATION

Reduced Renovation Cost By Over 50%

THE CHALLENGE

WeWork converts existing spaces into modern, beautiful, shared office spaces. With increasing occupancy, more air required treatment to ensure excellent indoor air quality.

THE SOLUTION

WeWork selected the GPS-DM48-ACTM to provide the best indoor air quality while minimizing costs by reducing the amount of outside air needed to ventilate the space. When new HVAC equipment is required, the GPS-DM48-AC permits smaller solutions. In other cases, the GPS-DM48-AC allows the owner to use the existing HVAC equipment. The self-cleaning needlepoint bipolar ionization equipment is perfect because it is mountable on any indoor or outdoor duct.

THE RESULTS

WeWork realized greater than 50% savings in the HVAC renovation costs by installing smaller air-handling equipment while shortening their building upfit timeline. By using the GPS- DM48-AC, WeWork also reduced the amount of energy required to condition their spaces, realizing savings in operating expenses while creating “a world where people work to make a life.”

THE LEARNING EXPERIENCE

10 Ton Reduction Per Location

THE CHALLENGE

The Learning Experience®, a national childcare center franchise, realized that a large portion of their monthly operating budget was allocated to the heating and cooling of their facilities. Annual HVAC maintenance for the larger air handling equipment was also unpredictable and often an unforeseen additional expenses.

THE SOLUTION

The self-cleaning GPS-FC48-ACTM was installed to reduce the amount of outside air needed to treat the indoor space. The technology also kills airborne pathogens and reduces the level of odor causing VOCs. Each installation incorporates 5 or 6 units to improve the indoor air quality of the building.

THE RESULTS

The Learning Experience realized a 10-ton reduction, or about 1,500 CFM, of outside air intake with the installation of the GPS-FC48-AC. This helped avoid costly HVAC equipment upgrades while reducing operating and maintenance costs. The needlepoint bipolar ionization technology also provides the added benefit of pathogen destruction, minimizing the amount of airborne pathogens and ultimate cross-contamination of germs between the children and staff. The GPS-FC48-AC is the specified solution for all the TLE® facilities across the country.

THE UNIVERSITY OF MARYLAND

85% Particle Reduction and No Ozone;
Exhaust Odors Gone Within 24 Hours

THE CHALLENGE

The University of Maryland, Baltimore buildings needed an applied solution to clean exhaust fumes and particles from helicopters using a nearby landing pad. The UV system installed in the HVAC system was unable to control the VOCs and particulate from the helicopters let alone odors generated within buildings.

THE SOLUTION

UMB tried several solutions and products and proved that the GPS- iMOD® was the best. Their existing UV system was ineffective and tube-type corona discharge products tested on-site produced ozone, aldehydes, and fine particles. The GPS-iMOD, which is UL 2998-listed for no ozone, helps control fine particles while destroying VOCs.

THE RESULTS

The GPS-iMOD reduced the exhaust fume odors within 24 hours and reduced the particles in the space by up to 85%. The GPS-iMOD not only destroyed the odors from the helicopter exhaust, but also cleaned the animal odors coming from the animals in the vivarium and test labs.

VALENCIA COLLEGE

Saved $180,000 and Reduced CFM by 9,300

THE CHALLENGE

The Valencia College Lake Nona Campus was constructed in 2012 and included the campus's first building. The project included state-of-the-art academic spaces, teaching labs, student services, bookstore, library, cafe, a Dean's suite, and administrative offices. The 88,821 sq. ft. campus was a $21.7 million project.

THE SOLUTION

Global Plasma Solutions installed the GPS-iBAR® in all the air handling units on campus. The GPS-iBAR is perfect for such a large facility because it kills mold, bacteria, and airborne pathogens while maintaining clean cooling coils.

THE RESULTS

The Valencia College, Lake Nona Campus was awarded 3 Green Globe certifications by Green Building Initiative. The GPS-iBAR reduced the outside air needed for ventilation by 9,300 CFM and saved $180,000 in chiller cost. The iBar was also compatible with their current air handling unit, which avoided costly renovation expenses. Testing revealed that there was no Fungi or Bacteria detected on the cooling coil fins.

GREER HIGH SCHOOL

$10,000 Annual Electric Savings

THE CHALLENGE

Greer High School was utilizing an outdated HVAC system that was bringing in excessive amounts of outside air, resulting in (1) wasted energy, (2) high humidity, and (3) mold growth.

THE SOLUTION

By utilizing the ASHRAE Indoor Air Quality Procedure, the school was able to incorporate GPS' needlepoint bipolar ionization (NPBI) technology to reduce the amount of outside air needed to condition the building. The GPS-FC-2TM and the GPS-iBAR® were the ionization systems installed to reduce the intake of outside air while improving the indoor air quality.

THE RESULTS

The school realized an annual energy savings of approximately $10,000 by using GPS' electronic air cleaners that allowed for a reduction in the per person outside air intake from 17 CFM to 5 CFM. The use of NPBI technology resulted in a lower capital expenditure while reducing the overall energy expense, thus providing the least costly ownership solution. Mold growth was abated by reducing the humidity level of the indoor air, creating a safer and cleaner space for the students and teachers.

PLANNED PETHOOD PLUS

100% Odor Removal in Two Days

THE CHALLENGE

The recovery area of the animal hospital is enclosed with no return air. The room was too warm, and the air was too stagnate to combat the overpowering smell of urine. Additionally, there was always the potential for bacteria growth on the stainless-steel tables of the operating room.

THE SOLUTION

The staff, including the acclaimed Dr. Jeff Young of Dr. Jeff Rocky Mountain Vet, decided to install the GPS-DM48-AC™ and the GPS-iBAR® on their existing air handling equipment to clean the odor, reduce the level of pet dander, and destroy the bacteria in the operating room.

THE RESULTS

The school 2 days after installing the GPS needlepoint ionization (NPBI) equipment the urine odor had subsided, solving a 25-year-old problem. The staff commented that there was a noticeable reduction in airborne particles, including animal dander.

CALGARY INTERNATIONAL AIRPORT

96% Particle Reduction Within 48 Hours

THE CHALLENGE

In 2017, as in prior years, the air traffic control tower at the Calgary International Airport (CIA) was having major indoor air quality issues due to smoke from the wildfires in British Columbia.

THE SOLUTION

In 2018, NAV CANADA installed the GPS-iMOD® system in the HVAC units for the air traffic control tower prior to the wildfire season. The intent was to test the ability of the GPS technology to not only reduce particles entering the facility, but to neutralize odors associated with the smoke.

THE RESULTS

The GPS-iMOD system helped reduce the amount of particulate entering the building by 87% at 0.3 microns within the first 48 hours of operations while still using their existing MERV 13 filters. The ionization caused the fine smoke particulate to agglomerate, making the existing filters more effective in catching the particles.

Particle reduction results using existing filters with GPS-iMOD system:

1. 87.2% reduction for particle size 0.3 micrometer (0.3 micron)
2. 95.4% reduction for particle size of 0.5 micrometer (0.5 micron)
3. 95.8% reduction for particle size of 1 micrometer (1 micron)

EDMONTON INTERNATIONAL AIRPORT

96% Particle Reduction Within 48 Hours

THE CHALLENGE

The NAV Canada Area Control Center at the Edmonton International Airport (EIA) was having major Indoor Air Quality issues and subsequent complaints due to the odors from airplane jet exhaust, decomposing de-icing fluid, a nearby horse racetrack, as well as the odors from a nearby cannabis processing facility. Other NAV CANADA locations, including Montreal, were also experiencing odor issues due to diesel fumes from back-up generators in the new powerhouse.

THE SOLUTION

In 2018, NAV CANADA installed the GPS-iMOD® system in the HVAC units for the Area Control Center at EIA as well as the Air Operation Center for the Montréal–Pierre Elliott Trudeau International Airport.

THE RESULTS

The GPS-iMOD system completely neutralized the odors entering the building. The effect was noticeable within 24 hours of installing the system. This included both the odors associated with the jet fumes as well as odors from all the other sources.


GPS®
Engineering Air for a Cleaner World™