



THE INNOVATIVE CHOICE
FOR BETTER INDOOR AIR



BRIO® 650

Powerful air cleaning

Ultra-quiet operation

Removes PM2.5,
ozone & viruses

ASHRAE 241 compliant

Patented technology

BRIO® 650 PERFORMANCE GUIDE

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The IAQ problem

Daily news reports highlight growing outdoor air quality issues, but little attention is given to the air we breathe indoors. We spend over 85% of our time inside where the air can be two to five times worse than outdoor air, with spikes to 100x worse.

Three reasons that IAQ can be poor:

1. If it's a bad air day outside, the same will hold true indoors due to infiltration from doors, windows, and the comings and goings of daily life.
2. Outdoors, pollutants can dissipate quickly into the atmosphere. Indoors, without effective air filtration, they concentrate instead.
3. There may be additional pollution sources inside including viruses and pathogens, microplastics, gas stove emissions, cleaning products, printer and copier toner, pet dander, mold, and dust mite waste.

For healthy IAQ these fine and ultrafine particles and gases need to be removed quickly and effectively, but HVAC systems are *not* designed to do so.

Viruses

Bacteria

PM2.5

Ozone

Auto exhaust

Wildfire smoke

Environmental dust

Mold spores

Pollen

Combustion by-products

Microplastics

Dust mite waste

Cleaning products

Printer & copier toner

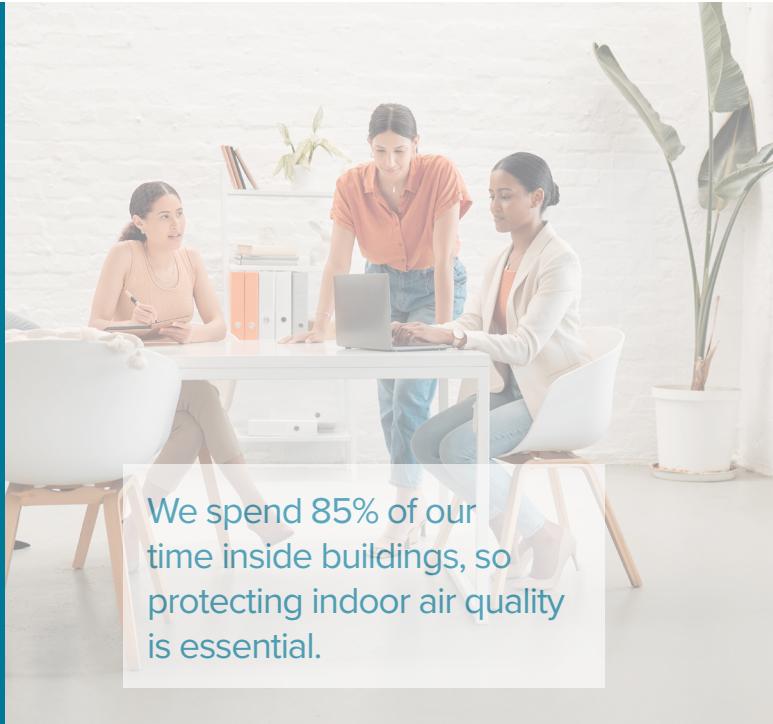
Asbestos

Coal & lead dust

3D Printing

Why IAQ matters

Viral and bacterial infections
Inflammation
Respiratory distress
Allergies and asthma
Lung and heart disease
Cancers
Cognitive function decline
Lower student performance and test scores
Reduced productivity and task completion
Increased stress and sick days



We spend 85% of our time inside buildings, so protecting indoor air quality is essential.

Infectious aerosols (germs and viruses) are spread easily indoors. In addition to airborne illness, there is a strong link between breathing fine and ultrafine particles and significant health concerns--from asthma to heart disease to dementia.

In the classroom and at work, brain function, productivity, and attendance can also be compromised.

Those most at risk are children, older adults, and people with compromised immune systems due to disease or illness.

At risk locations:

- High-density workspaces
- Classrooms and meeting rooms
- Congregate living (care homes, etc.)
- Anywhere with poor air quality (AQI)

HVAC and the clean air gap

HVAC systems should be the go-to solution for indoor air improvement.

Unfortunately, these filtration systems were designed to protect machinery, and not to remove fine and ultrafine particles or gases from the air.

The pandemic highlighted this gap between HVAC capabilities and much needed control of infectious aerosols.

Post-pandemic, it is well-recognized that HVAC systems aren't providing cleaner, healthier indoor air.

Adapting these systems to remove viruses, infectious aerosols, and other PM2.5 without considerable expense or energy use turns out to be a difficult task.



For most existing HVAC systems, a predetermined upper limit on effective operation means that upgrading to high-MERV-rated filters is not an option.

For HVAC systems that can accommodate higher-MERV filters, increased backpressure restricts airflow and increases power use. This raises operating costs and conflicts with sustainability goals.

Higher energy costs are incurred even in periods when increased filtration is not required – such as when a building is not occupied.

Higher performance filters also need changing frequently which adds to maintenance costs.



How to close the clean air gap

Well-designed air purifiers can supplement HVAC systems in several important ways:

- During high-risk periods, as set forth in *ASHRAE Standard 241 Control of Infectious Aerosols*
- In situations and locations where density fluctuates including classrooms and conference rooms
- When occupancy occurs outside typical building (and HVAC system) hours
- For areas that HVAC systems don't reach adequately or effectively



Selecting the right in-room air purifier

Look for these key features

- A clean air delivery rate (CADR) well-matched to the space and based on the desired number of air changes per hour.
- Rapid removal of pathogens and toxins, fine and ultrafine particles and ambient ozone. Ask for verified, third-party test results for assurance.
- Ozone-free operation. Look zero-ozone test results
- Ultra-quiet operation for reduced stress and successful adoption. Check the dB(A) on all speeds.
- ASHRAE Standard 241 compliance for control of infectious aerosols, smoke, and other ultrafine particulates.
- Constant performance with no degradation or CADR dropoff between filter changes.
- Low maintenance costs and a low cost to own. Look for low cost, long-life filters.

Brio 650: designed to deliver healthy indoor air with no performance drop

- A clean air delivery rate (CADR) designed for large spaces
- Rapid removal of toxins, PM2.5, ultrafine particles, *and* ozone
- Zero-ozone per UL 2998
- Ultra-quiet operation: 40-53 dB(A) with no pure tones
- ASHRAE Standard 241 compliant
- Patented electrostatic technology for constant CADR performance
- High-capacity, low-cost filters for low lifetime costs and maintenance



Ideal for commercial and residential use, Brio® 650 employs patented APART electrostatic technology to quickly and quietly clean the air in large and extra-large rooms.

Developed by air quality experts at the University of Washington, APART™ technology traps ultrafine particles, including viruses, without filter clogging.

Brio delivers a constant, clean air flow between filter changes, something clogging HEPA air cleaners can't do.

Energy Star certified, Brio 650 saves money on energy costs and on maintenance, as well, with high-capacity, low-cost disposable filters.

Brio 650 provides real-time IAQ monitoring with an auto mode and programmable scheduling.

The unique Agentis Air-designed fan achieves industry-leading quiet operation even at the highest speed.

For added safety, Brio 650 is zero-ozone and effectively removes unhealthy ambient ozone.

Inside Brio 650

Powerful, patented, and quiet

Brio® 650 delivers a constant clean airflow to extra-large spaces up to 1000 square feet, with no performance drop off between filter changes. Brio's non-clogging technology lowers costs, energy use, and maintenance.

Clean air out



6. Ultra-quiet Vane-Axial Fan

Innovative, proprietary design eliminates pure tones and keeps sound levels lower than a hushed conversation, even on Brio's highest speed.

5. Refresh Plus Filter

Brio safely removes ambient ozone using catalytic degradation.

4. APART™ Collection Cartridge

Electrostatically charged particles are drawn out of the airflow and into the APART cartridge, keeping the clean air delivery rate high, with no clogging. Brio's low-cost, disposable APART cartridge can last a year or longer

3. Particle Charger

Fine and ultrafine particles, as small as 10 nm, receive an electrostatic charge as they flow past a field of ionizing gold wires.

1. 360° Air Intake

Effective cleaning begins at the base as Brio's powerful, high efficiency fan and BLDC motor quietly draws air in from all directions.



Dirty air in

2. Pre-Filter

Larger debris, carpet fibers, and pet hair are removed as air flows through Brio's pre-filter.

Brio 650: Key features

PM2.5 REMOVAL	Patented APART electrostatic technology with disposable particle collection cartridge
AIR INTAKE	360-degree intake at elevated base
MOTOR	High-efficiency and quiet brushless DC (BLDC) with no pure tones
FAN TYPE	Custom Agentis Air axial fan with CFD-optimized stator for quiet, effective performance
FAN SPEEDS	Four speeds (1,2,3,4) for a range of conditions
IAQ MONITOR + AUTO MODE	Laser particle counter displays 5 levels of indoor air quality and activates auto mode
SCHEDULER	Schedule start, stop, run times up to 24 hours
NIGHT MODE	Turn off display lights for uninterrupted sleep
OZONE REMOVAL	Zero-ozone per UL 2998. Refresh Plus filter removes ambient ozone
WHEELED BASE	Ergonomically designed with rugged in-line wheels



Brio® 650: More reasons to choose

- Precision IAQ sensor with top and side indicators
- Auto mode for responsive air cleaning and reduced energy costs
- Night mode to reduce sleep disruptions
- Scheduler for seven-day-a-week start and stop times
- Timer for simple-use periods



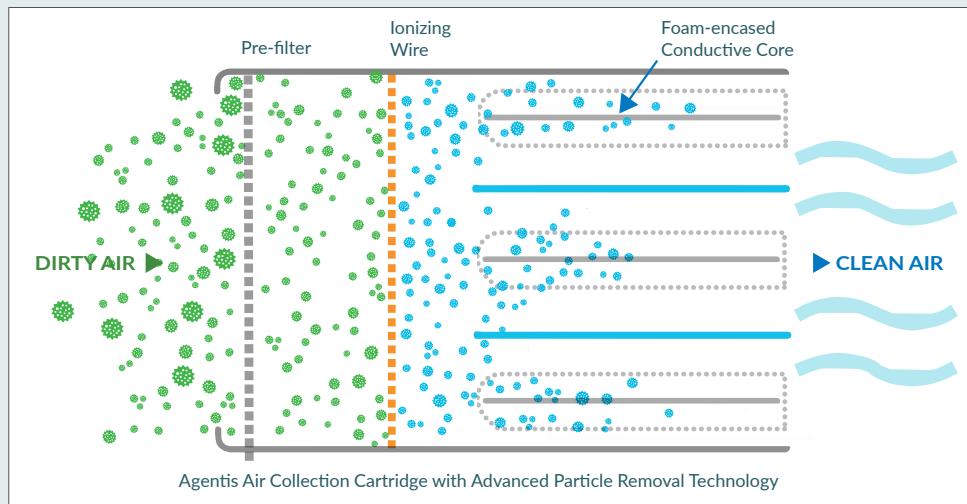
- Durable, resilient exterior with unique honeycomb internal walls for structural integrity without excess weight
- Rugged, in-line wheels to easily move Brio 650 across the room
- Fast, tool-free filter and cartridge replacement. Simply open door, pull out the filter and replace

Patented APART™ technology

In 2014, a research team at the Sensors, Energy, and Automation Laboratory in the University of Washington's Department of Electrical and Computer Engineering established a program to develop low-maintenance electrostatic filtration technology.

applications can be tuned to perform at a range of filtration levels for even greater energy savings.

APART air purifiers differ from traditional electrostatic precipitation in the collection media used. The collecting electrodes are sandwich-like structures with a lightweight



The result of this research is Advanced Particle Removal Technology (APART™), patented for exclusive use in Agentis Air products, including Brio 650.

The technology features porous, collecting electrodes that hold a large capacity of particles regardless of their physical properties and resistivity, and in certain

conductive inner layer surrounded by an open-cell, non-conductive porous structure.

Charged particles are attracted to the conductive middle portion due to the electrostatic field generated by the potential difference between the collecting and repelling electrodes.

Brio[®] 650: Technology advantages



HEPA and MERV filters clog with use, reducing performance, and require frequent replacement, increasing cost and landfill waste

Traditional metal collecting plates require manual washing to remove pollutants and must be air dried

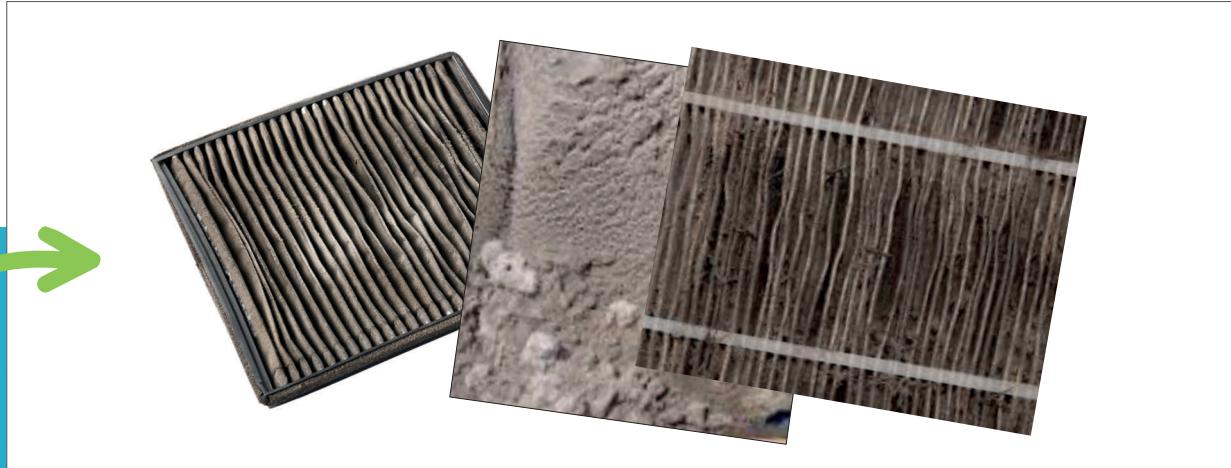
Brio's electrostatic technology features non-clogging, long-life disposable collection cartridges

Brio 650 vs Traditional ESP Air Cleaning

APART™ technology removes several common, critical issues found in traditional electrostatic filters:

- Load capacity is significantly greater than traditional filters due to the large surface area and the volume of the foam collection plates
- Inexpensive and lightweight collecting cartridges are replaceable and disposable, eliminating the need to wash traditional metal plates
- APART technology is zero-ozone and also prevents particle re-entrainment





Brio 650 vs Mechanical (HEPA, MERV)

Brio 650 has several important advantages:

- APART ESP technology removes ultrafine particles 50% faster than comparably sized HEPA air purifiers
- Brio removes UFP that lower MERV filters can't
- Brio's CADR stays above 95% of original CADR. Under identical conditions, HEPA air purifiers drop to 50% or less of their original CADR
- The filter media replacement interval is considerably longer, which lowers cost and maintenance
- Brio uses less energy than higher-MERV-rated filtration solutions
- Brio removes ambient ozone

Brio® 650: Ultra-quiet operation

Sound level range: 40-53 dB(A)
with no unpleasant pure tones

If an air purifier is perceived as annoyingly noisy or intrusive, users may decide to turn it down or turn it off. Disruptive noise can reduce productivity and communication and increase stress. Office noise has been called “the silent productivity killer.”

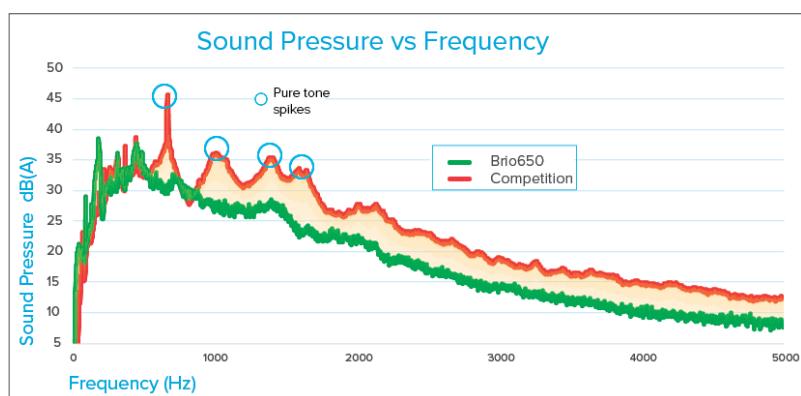
Due to the logarithmic scale used in sound measurement, a seemingly small 5 dB(A) difference doubles the perceived sound.

For air cleaners, a non-invasive sound profile is essential to delivering better indoor air quality and better productivity. Recognizing this, Agentis Air has invested R&D resources to ensure that Brio 650

delivers optimal performance and minimal noise disruption.

Using complex computational fluid dynamic (CFD) modeling we optimize fan designs and remove distracting pure tones, replacing them with more pleasing complex tones.

Our integrated design studio, prototyping shop, and testing facility are used to develop dozens of prototypes through an iterative improvement cycle to reduce dB(A) and remove pure tones while maintaining performance.



Why eliminate pure tones?

Pure tones and complex tones differ significantly in their composition and how we perceive them.

Pure tones consist of a single frequency, producing a simple sine wave pattern that sounds thin and artificial to the human ear. In contrast, complex tones are composed of multiple frequencies, including a fundamental frequency and additional harmonics, resulting in a richer and more natural sound.

Complex tones are generally easier and more pleasant to listen to and are more easily ignored by the human ear.

Removing pure tones from Brio 650's sound profile ensures that the sound produced will not be a distraction.



A result of iterative CFD modeling and prototyping, Brio 650's proprietary vane-axial fan with custom blades achieves powerful cleaning effectiveness and ultra quiet operation.

Indoor ozone and health issues

If ozone is a problem outside, it can easily become one indoors, too.

The US EPA has said an eight-hour average exposure greater than 70 parts per billion is considered unhealthy. But 70 PPB may not be safe enough. There is a growing body of research suggesting that much lower levels of ozone can diminish lung function, especially for children and people with other risk factors, such as advanced age, pregnancy, and respiratory conditions.



Infiltration happens easily when doors or windows are left open, allowing ozone to enter a space, or when outside air is used for ventilation. Even with windows closed, indoor ozone can reach 25 to 50% percent of the outdoor ozone level. HVAC systems do not inherently reduce it.

HVAC systems also don't eliminate ozone formed indoors due to a range of products

Ozone is a reactive gas with an oxidizing, corrosive effect on living cells and tissues. Both short-term and long-term exposure to ozone are harmful to health.

used including ozone-generators, some water purification systems, photocopiers, and laser printers.

Additionally, when ozone combines with other VOCs and household chemicals, toxic formaldehyde gas can be produced.

Short term exposure:

- Shortness of breath, wheezing, and coughing
- Increased risk of asthma attacks and respiratory infections
- Increased susceptibility to pulmonary inflammation and medical emergencies

Long-term ozone exposure:

- Respiratory illnesses
- Metabolic disorders
- Nervous system issues
- Reduced fertility
- Poor birth outcomes
- Cardiovascular disease
- Cancer

Brio® 650: Ambient ozone removal

Indoors, ambient ozone can be dangerously high, yet most air cleaning systems are not able to remove it.

HEPA and MERV systems can only remove particles. Photocatalytic oxidation (PCO) technology eliminates ozone, but removal is slow, reducing effectiveness and value. Add-on carbon filters also work slowly, are often under-scaled, and quickly expended, increasing replacement filter costs.

Brio 650's Refresh Plus filter uses catalytic degradation to remove ozone as it flows through the purifier. This highly effective method provides rapid removal.

Brio 650 is zero-ozone compliant, per Underwriters Laboratories guidelines, so you won't be at risk from ambient ozone. When ozone increases, due to pollution, wildfires, or other causes, Brio brings the air quality back safety, to zero-ozone.

Filtration	Technology	Ozone removal method
Brio 650 with Refresh Plus	Catalytic degradation	Rapid removal, unlimited capacity
MERV, HEPA	Mechanical	None
Activated charcoal	Adsorption	Slow removal, low capacity
PCO	Photocatalytic oxidation	Slow removal

Compared to HEPA, MERV, and other common air cleaning methods, only Brio 650 reduces ambient ozone efficiently and quickly to zero.

Brio® 650: Specifications

Air Cleaning Performance	
Clean Air Delivery Rate (CADR) using AHAM/ANSI AC-1 standard	MS2 (Virus): 407 (CFM 691 m ³ /hr)
	PM2.5: 340 CFM (578 m ³ /hr)
	Pollen: 450 CFM (754 m ³ /hr)
	Dust: 369 CFM (627 m ³ /hr)
	Smoke: 313 CFM (532 m ³ /hr)
Airflow Rate	Speed 1: 220 CFM (374 m ³ /hr)
	Speed 2: 310 CFM (527 m ³ /hr)
	Speed 3: 420 CFM (713 m ³ /hr)
	Speed 4: 510 CFM (866 m ³ /hr)

Brio 650 Measurements	
Dimensions	18.25" x 18.25 x 28"
	46 cm x 46 cm x 71 cm
Weight	50 lb. (22.7 kg)
Power Cord	8 feet (245 cm)

On the highest speed setting, Brio 650 is quieter than a hushed background conversation, while using only 59W of power. On lower speeds, Brio is even quieter, while still delivering an effective, high CADR.

Sound level		Power consumption		PM 2.5 CADR	
Speed 1	39 dB(A)	Speed 1	18W	Speed 1	201 CFM
Speed 2	44 dB(A)	Speed 2	21W	Speed 2	262 CFM
Speed 3	49 dB(A)	Speed 3	37W	Speed 3	322 CFM
Speed 4	53 dB(A)	Speed 4	59W	Speed 4	340 CFM

Certification and independent testing



Zero-ozone

Brio 650 removes ambient ozone and is validated by Underwriters Laboratories as a zero-ozone air purifier. Brio is also UL listed for safety.



CARB Certified

Brio 650 is certified by the California Air Resources for ozone-safe operation.



Intertek Tested

Independent testing at Intertek facilities ensures the accuracy of Brio 650 performance promises.

Brio® 650: Performance summary

Clean Air Delivery Rates for removal of fine and ultrafine particles, viruses, bacteria, and ozone have been measured at ANSI/NST-certified testing centers.

Pollutant	Minutes to Removal	% Removed with Brio 650	% Removed by Natural Decay
Covid/SARS-2	8	99%	9%
Smoke	16	99%	4%
PM2.5	15	99%	6%
Dust	11	99%	10%
Pollen	10	99%	21%
Ozone	7	97%	12%

ASHRAE Standard 241 compliance

ASHRAE Standard 241 provides guidance for controlling infectious aerosol transmission during periods of high risk.

In a departure from past guidance, Standard 241 introduces the concept of Equivalent Clean Air Flow, offering a formula based on space density and building type, to allow for the use of multiple air cleaning solutions in addition to outdoor air, and including in-room air purifiers.

Alone, outside air introduction provides aerosol dilution, but has a higher energy expense, as the air requires conditioning (heating or cooling) before it is introduced.

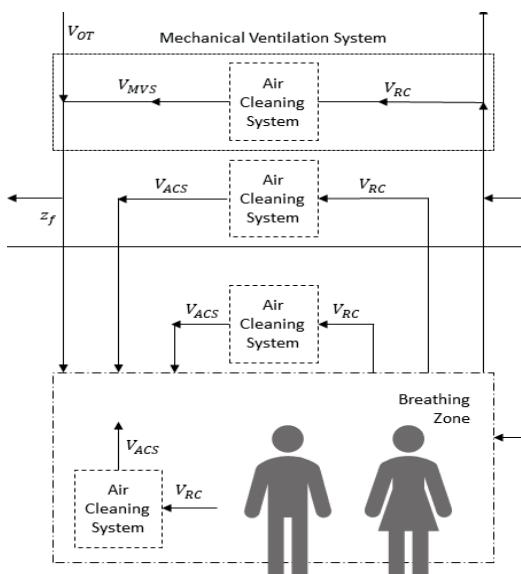
Unlike outdoor air, room air purifiers can provide clean air at a lower cost and with less energy use. More than a simple ventilation alternative, room air purifiers are well-suited to remove harmful viruses, pathogens, smoke and ultrafine particles.

Brio 650 is ASHRAE Standard 241 compliant, making it an accepted alternative to outdoor air during periods of high infection risk, and can be used in equivalent clean airflow calculations.

Performing to the highest commercial standards, Brio 650 can be an important tool in creating a safe building environment to protect occupant well-being. Compliance also ensures the ultimate in product quality and performance, safety, and effectiveness.

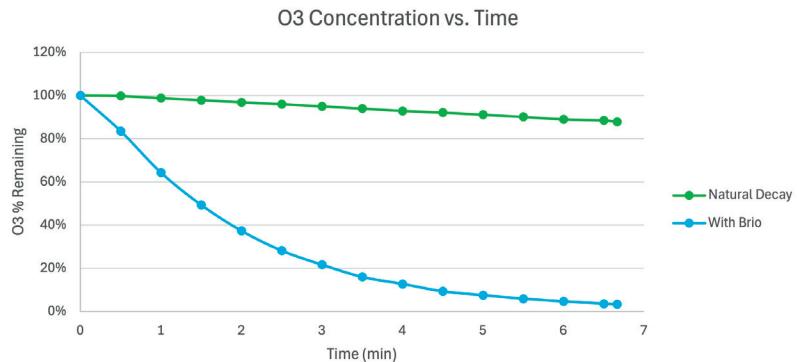
Agentis Air ASHRAE Standard 241 Assessment Tool

Using the Agentis Air assessment tool, the equivalent clean air flow per individual (ECAi) can be calculated for the specific density of any space. The tool provides guidance for the number of air purifiers needed based on the ECAi requirement and using local AQI conditions. The resulting energy savings is also calculated, using actual energy costs.

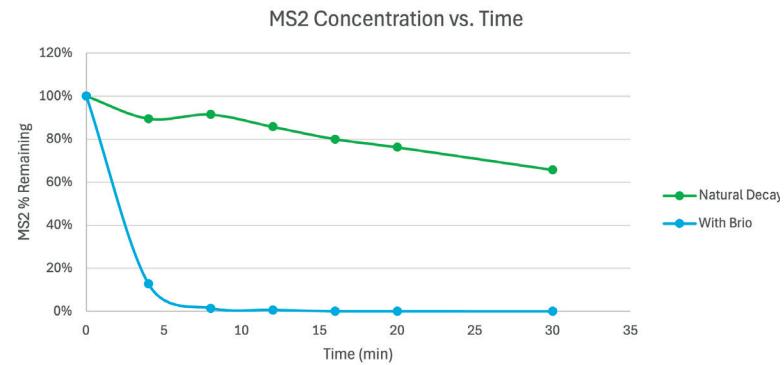


Brio 650: Certified Performance

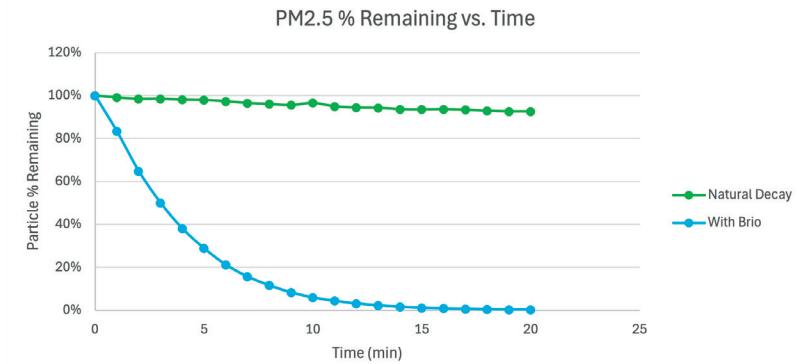
OZONE



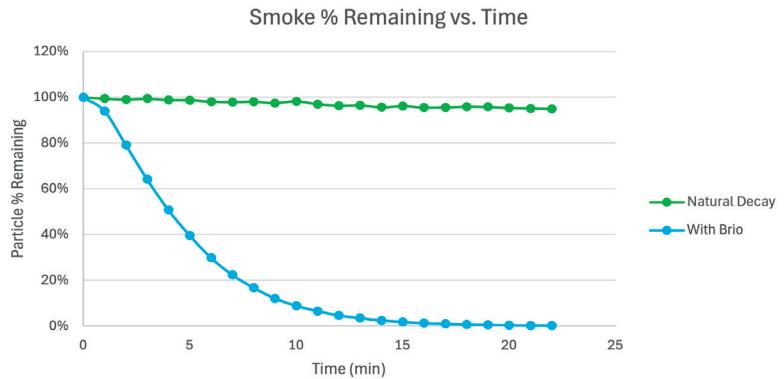
MS2



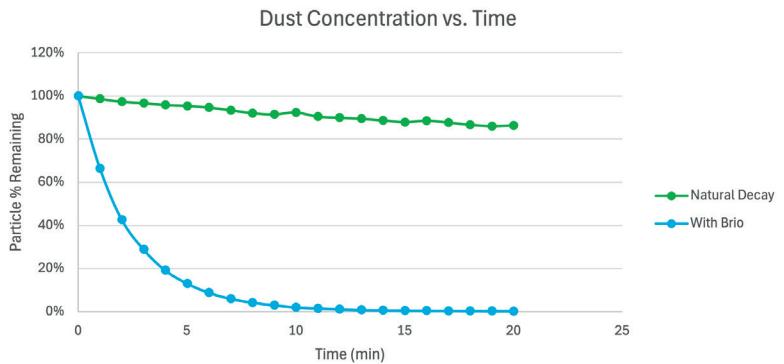
PM2.5



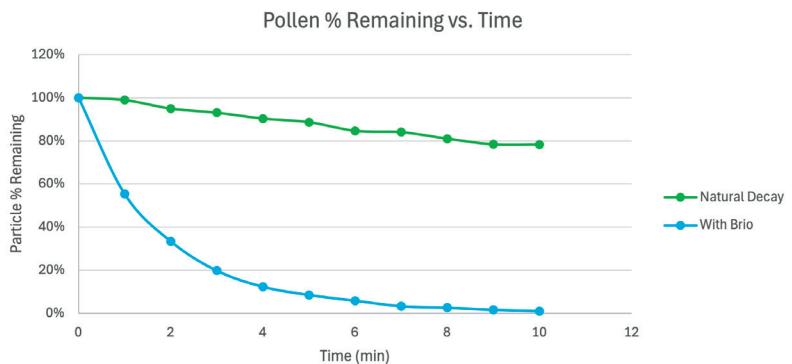
SMOKE



DUST



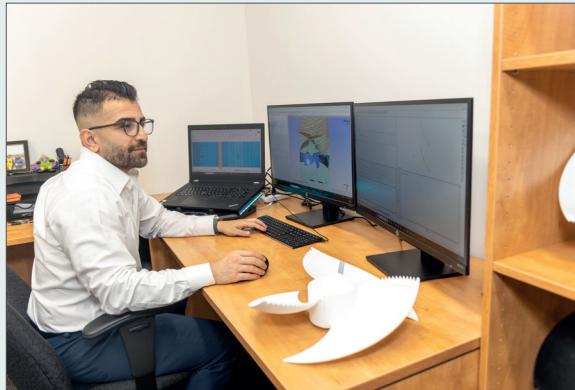
POLLEN



Agentis Air Integrated R&D Lab



In our Rockville, Maryland R&D lab, the Agentis Air team develops innovative, patented technologies to improve all aspects of air purification from pollutant removal effectiveness to noise reduction to energy reduction and sustainability.



CFD modeling for optimal fan design
3D printing and prototyping
Wind tunnel airflow testing
Soundproof chamber for sound optimization
CCM testing for filter design
CADR testing
Real-life office simulation space



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