Final Report

February 2021

ABOUT AURA AIR

At Aura Air, we believe the act of breathing should be as nature intended.

Clean, pure and simple.

A constant since birth, breathing sets our life's rhythm. Inhale. Exhale. Fresh clean air clears our mind and rejuvenates our body without us committing a second thought.

With a quest to reclaim our natural right to clean air, Aura Air developed the world's smartest air purification system, one that cleanses and disinfects your indoor air while vigilantly monitoring its quality in real-time. Cutting-edge in design, Aura is remarkably simple to install and effortless to operate.

Just hang it up and plug it in.
We'll do the rest.

The Pilot

Provide a comprehensive solution for improving and managing the air quality in an Subway restaurant, while increasing awareness of air quality in the entire chain. The pilot will be executed through an interactive data-based approach providing recommendations for the chain, staff and visitors.

Schedule:

Week 1	End of week 1	Weeks 2-3	Week 4
Installation and Measurements	Comprehensive Report	Full Operation Dashboard and Display Screen	Feedback & Summary

Key Parameters and their Health Effect:

VOC's

Volatile organic compounds are compounds that easily become vapours or gases. They are released from burning fuel such as gasoline, wood, coal or natural gas. They are also released from many consumer products such as cigarettes, solvents, paints, glues, wood preservatives, cleaners, disinfectants, air fresheners, building materials, pesticides and more. Formaldehyde, ethanol, toluene, and benzene are just a few examples of VOC's. Not all VOC's are harmful, but a large number of them are. Some of the health effects of VOC's are short-term such as irritation of the eyes, headaches, and dizziness. Others have long term effects such as fatigue, loss of coordination, liver and kidney damage and even cancer.

CO2

Carbon dioxide is a colorless gas that is naturally present in the earth's atmosphere. It is produced by all the organisms on earth that perform respiration. It is an essential gas for life on earth since plants use it for photosynthesis. However, in high concentration that can often occur in indoor environments, it can have harmful effects that may include headaches, dizziness, restlessness, tingling or pins/needles feeling, difficulty breathing, sweating, tiredness, and increased heart rate. That's why it is important to monitor its levels in indoor environments.

PM 2.5 and PM 10

Particulate matter (PM) or also known as atmospheric aerosol particles are microscopic solid or liquid matter suspended in the atmosphere of Earth. These particles include coarse particles with a diameter of 10 µm or less (PM10) and fine particles with a diameter of 2.5 µm or less (PM2.5). PM10 includes particles as dust, pollen, and mold. PM2.5 includes particles such as combustion particles, organic compounds, metals, bacteria and more. The effects of inhaling particulate matter that has been widely studied in humans and animals include asthma, lung cancer, respiratory diseases, cardiovascular disease, premature delivery, birth defects, low birth weight and premature death.

Indoor Air Quality Standards

AQI

An air quality index (AQI) is used by government agencies to communicate to the public how polluted the air currently is or how polluted it is forecast to become. Different countries have their own air quality index, corresponding to different national air quality standards.

Aura air quality index (AQI) was developed based on academic research, national AQIs, and other important considerations.

OSH

Occupational safety and health is a field that ensures the safety and health of the people at work. Each country has its own set of standards and regulatory authority to enforce them. The first standards for indoor air quality and air testing started from this field, especially in industries like coal mining, gas, and petrochemical processing in which people are exposed to chemicals during their workday but it also evolving to more modern work environments like offices and open spaces.

LEED

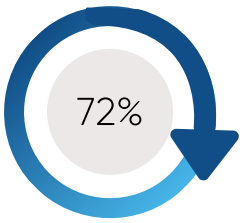
Leadership in Energy and Environmental Design (LEED) is one of the most popular green building rating system in the world. Green building is the practice of designing, constructing and operating buildings to maximize occupant health and productivity, use fewer resources, reduce waste and negative environmental impacts, and decrease life cycle costs. When it comes to indoor air quality, LEED defines standards of certain pollutants that has to be monitored prior to the occupancy of a new building or after renovation of an old one. These pollutants include PM2.5, PM10, CO, ozone, tVOC, Formaldehyde and specific VOC's like Benzene and Toluene. The disadvantage of LEED standards is that it doesn't monitor those pollutants after occupancy.

The Results

Air Quality Improvement:

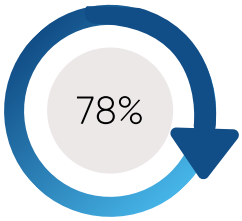
In weeks 2-3, Aura operated in Subway restaurant. The device disinfected and purified the air, significantly reducing the amount of harmful particles and parameters in the room:

VOC



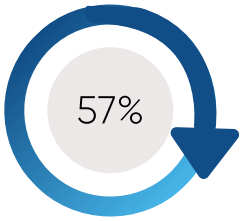
VOC levels were decreased by 72% as a results of the Ray Filter's Carbon layer

PM 2.5



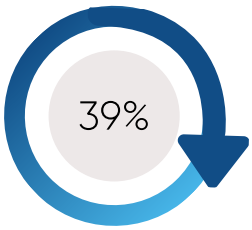
PM 2.5 levels were decreased by 78% as a result of the Ray Filter's HEPA layer

PM 10



PM 10 levels were decreased by 57% as a result of the Ray Filter's HEPA layer

AQI



Aura improved the AQI score by 39%

Our Filters Test Results

(From the Aura Air white paper)

The efficiency of the Sterionizer in removing different types of pollutants is presented in Table 2.

Table 2- Sterionizer efficiency tests

Substance	Substance name	Removal
Bacteria	Escherichia Coli	99%
	Escherichia Coli ATCC	91%
	Staphylococcus aureus	91%
	Pseudomonas aeruginosa	99%
	Staphylococcus aureus (MRSA)	99%
Fungus	Aspergillus Niger	97%
	Candida albicans	36%
	Dichobotrys abundans	90%
	Penicillium	95%
Mold	Cladosporium cladosporioides	97%
Spores	Bacillus subtilis var Niger	89%
Viruses	Influenza H1N1	99%
	Influenza H5N1	99%

Table 2 shows that the Sterionizer decreased the amounts of bacteria for at least 1 order of magnitude (more than 90%) for all the strains tested. It also decreased the amounts of fungus for at least 36% and the amounts of mold, spores, and viruses for at least 89% for all the tested strains.

Examples of the plates after incubation are presented in Figures 12-13:

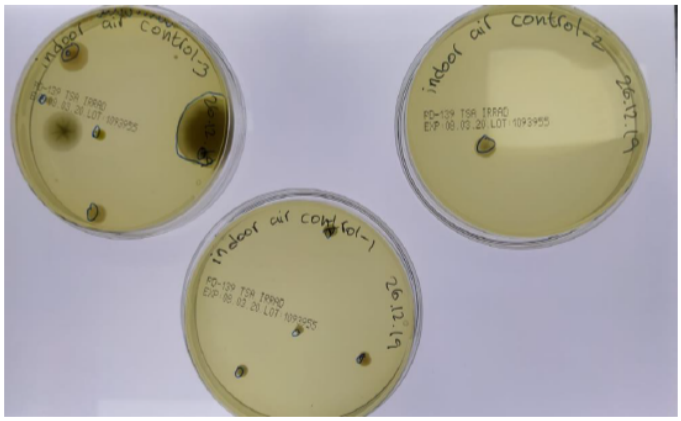


Figure 12: incubation results of the control plates on December 31st,2019

Figure 13: incubation results of the Ray filter+ Sterionizer+ UVc LEDs plates on December 31st,2019

Air Treatment Technologies in Aura Air

HEPA filter

HEPA stands for high-efficiency particulate air and it is an efficiency standard for air filters. The efficiency is measured in the ability of the filter to retain particles larger than 0.3 µm. These filters are used in environments that require a contamination control as food and pharmaceutical industries, hospitals, semiconductors and in vehicles and homes.

Carbon Filter

Carbon filtering is a method that uses a bed of activated carbon to remove contaminants using a process called adsorption. In this process, the molecules of the pollutant are trapped inside the porous structure of the carbon. This is a very effective method in the treatment of water and air, and it effectively removes volatile organic compounds (VOC's) and bad odors from air and water.

Smart Fabric

Our smart fabric is made from cotton impregnated with copper oxide. Copper is a powerful anti-bacterial agent that also has the ability to neutralize viruses, fungus, and mold. This is a patented and EPA-approved technology. The smart fabric is integrated into our Ray filter™ to enhance the ability of the filter to successfully deal with these pollutants.

The Sterionizer

The Sterionizer is a device based on the technology of bipolar ionization. The process of ionization uses UV light and electric currents to transform molecules of oxygen (O2) into two atoms (O). In this process, one of the atoms has an electron attached to it and as a result, it has a negative charge (O-) because electrons are negatively charged, and the other atom lacks an electron and is positively charged (O+). These atoms are very chemically active and when they attack molecules of water that are present in the air- there are two types of molecules formed: OH- and H2O2. These molecules attack and neutralize different pollutants- bacteria, fungus, mold, and viruses. This technology has another advantage- unlike unipolar ionization that produces high amounts of ozone (O3)- which is a dangerous substance, the Sterionizer emits very low concentrations of ozone that cause no health damage.

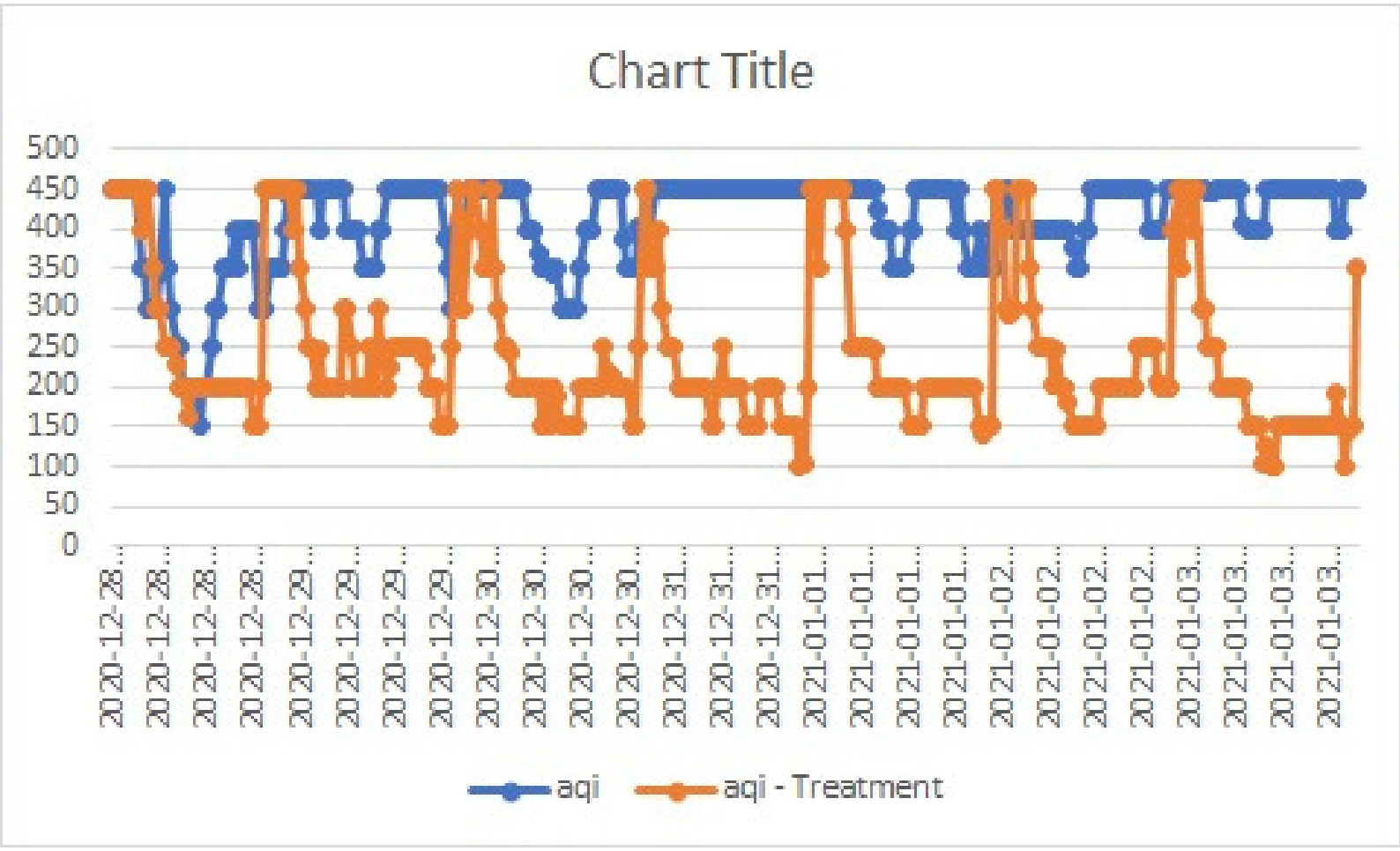
Pre-filter

The pre-filter is a filter that removes large unwanted contaminants from air and water. In HVAC systems and air purifiers, it is usually a washable mesh made from polymers like polypropylene. The pre-filter catches large particles of dust, pollen, insects, animal hair and other large particles.

UVc LEDs

Ultraviolet pressure lamps have been used for decades for the disinfection of air in hoods and clean rooms and for water disinfection. They are effective in neutralizing bacteria, viruses, and parasites by hurting the proteins on the cell membrane. Although there isn't enough research done on these lamps in air, they have a promising potential to have a meaningful effect in air as well and for this reason they will be tested for Aura's device.

General AQI - Treatment and detection



Sensor Name	Phase - 1 Deteaction	Phase - 2 Tretmeant	Improvment (%)
AQI	397.335	238.863	39
Co	43.0576	24.31223	43
Pm10	39.9512	17.083	57
Pm2.5	22.7387	4.9498	78
Voc	228.872	61.952	72
Co2	521.8266	429.6199	17