Frequently Asked Questions (FAQs)

Product: Scitech AiroSAN (Negative Ion Based Air Purification Device)

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1. How does the Airosan purify air?

The Airosan harnesses the ability of negatively charged air particles to remove airborne pathogens and pollutants. Negative ions emitted by the negative ion generator react with atmospheric oxygen and water molecules to form highly reactive Superoxide (O^-), Hydroxyl (OH^-) and Hydrogen Peroxide ($H_2O_2^-$) radicals, which are known powerful atmospheric detergents. Negative ion radicals are effective in deactivating outer walls in viruses and oxidizing cell membranes in bacteria and fungi, thereby reducing airborne pathogen infectability. Dust particles and aerosols (<PM 2.5) are known to be removed from the air by settling due to coagulation and the cluster forming effect induced by negative ions. Other pollutants such as SOx, NOx and VOCs are removed due to oxidation on exposure to negatively charged radicals. A study[1] done at Indian Institute of Technology, Delhi (IIT-D) demonstrates the antibacterial activity of negative ions on Escherichia coli and Pseudomonas fluorescens after exposure of up to 4 hours. Maximum killing was observed when the plates were positioned in front of the negative ion generator.

Aerosols have been proven to be the most likely carriers of pathogens in an enclosed room since they do not easily settle down and form clouds that move around the room as induced by the air movements. These aerosols travel from one person to another and through the air-conditioning and filtration systems unhindered. Most pathogens are smaller in size and thus lodge themselves on to the aerosols and move around with them increasing the risk of spreading infections. The Airosan is not only capable of deactivating the pathogens, but also effective in dispersing and settling down aerosols. A 2005 comparative study[2] published by the Centre for Health-Related Aerosol Studies, University of Cincinnati, USA shows varying levels of aerosol removal between the devices available in the market. The removal efficiency of the more powerful ionic purifiers reached about 50% after 15 min and almost 100% after 1.5 h of continuous operation in the chamber under calm air conditions.

In addition to removal of harmful substances from the air, the negative ions are also known to have a positive effect on all living beings – humans, plants and animals. In some case-studies, plant growth was seen to have been accelerated due to presence of negative ions.

2. Are there any side-effects from using the Airosan?

There are no side-effects due to the prolonged use of negative ion generators. However, users should understand that some air ionisers may produce positive ions and/or ozone while producing negative ions, which are harmful to the human body and prolonged exposure to these may result in adverse health conditions. **User must note that the Airosan does not emit positive ions or ozone while in operation.**

[1] https://pubmed.ncbi.nlm.nih.gov/18444070/
[2] https://pubmed.ncbi.nlm.nih.gov/15982270/

A 2014 study[3] has shown a statistically significant influence of negatively ionized particles, above all on blood pressure. Exposing humans with proper circulatory indicators six hours a day for more than a dozen days to negative air-ions in concentrations of 10,000 ions/cm3 results in a 5% drop in systolic pressure and around 2% drop in diastolic pressure. However, exposing people to positive air-ions in concentrations of 25,000 ions/cm3 results in destabilization of the circulatory indicators.

Another Japanese study[4] has shown that low concentrations of Superoxide constitute a portion of atmospheric negative ions in the form of O(2)-(H(2)O)(n), which has been reported to have a stimulatory effect on Superoxide Dismutase activity. If Superoxide Dismutase is activated by negative ions containing Superoxide, aerobic metabolism could be improved.

3. How many negative ions does the Airosan generate and what is the maximum exposure limit for humans?

The Airosan Cube-5 and Cube-5 Compact models produce 2 billion ions per second.

There is no maximum exposure limit for humans. The more exposure to negative ions, the better it is.

4. Is the Airosan tested scientifically?

Yes, the Airosan has undergone rigorous scientific and pathological testing.

The efficacy of the device in deactivating/killing SARS COVID-19 virus is studied and certified by Rajiv Gandhi Centre for Biotechnology at Thiruvananthapuram, a premier research institute established by the Ministry of Science and Technology, Govt. of India and recognised by the Indian Council of Medical Research at New Delhi (ICMR). The test results have shown no detection of SARS CoV2 specific RNA after 60 minutes of exposure to AiroSAN.

The efficacy of the device in deactivating/killing pathogens is studied and certified by Agharkar Research Institute at Pune, a premier research institute established by the Ministry of Science and Technology, Govt. of India and recognised by the Indian Council of Medical Research at New Delhi (ICMR). The test results have shown >99% reduction in pathogen cells after 60 minutes of exposure to AiroSAN.

Each Airosan is tested for its negative ion emission levels using one of the leading ion counting devices manufactured by Alpha Lab USA.

The Ozone level for the device has been tested at SGS Lab, Pune, a leading air quality monitoring agency accredited and licensed by NABL, New Delhi. The test results have shown no incremental changes in the Ozone levels which means the device is not emitting any harmful Ozone in the surrounding environment.

5. Is disinfection guaranteed?

The use of the Airosan does not guarantee disinfection of a space. It is only an air purification device that helps to reduce infectibility and load of pathogens and allergens and to reduce concentration levels of airborne pollutants and particulate matter.

[3] http://www.pjoes.com/Effects-of-Air-Ions-on-Human-Circulatory-r-nIndicators%2C89221%2C0%2C2.html
[4] https://pubmed.ncbi.nlm.nih.gov/30274196/

6. What is the maximum size of a room for the effective use of the Airosan?

The Airosan Cube-5 and Cube-5 Compact models are effective for an undivided volume of 5,000 cubic feet. For standard room size of 10 feet, this means the devices are effective for an undivided area not more than 500 square feet.

The Airosan technology is highly scalable, and an engineered solution can be designed by us to meet large volumetric requirements such as in the case of airports, malls, theatres, open office floors, factories and warehouses.

7. What are the advantages of Airosan over conventional filter-based air purifiers?

The Airosan uses a superior technology than conventional filtration. The negative ions react directly with pathogens, allergens and pollutants in the air and cause their deactivation or removal from the air anywhere within the enclosed volume. Filter based devices rely on high power blowers to pass the air through filters. In essence, the entire volume of air must be forced through the filter for effective removal of airborne pollutants. The air that cannot be sucked does not get filtered.

Conventional purifiers require the filters to be periodically removed, cleaned and if necessary, replaced. This requires additional effort and cost. Moreover, the HEPA filters catch certain pathogens but does not kill or deactivate them. Unsafe handling and disposal of such HEPA filters is a likely threat for causing contamination and spread of infectious pathogens. The Airosan does not require any maintenance or handling and disposal of expensive filters making it the least expensive and most easy device to operate.

It is also observed that fungal growth is attenuated by the presence of negative ions in the air. Hence, it is highly recommended to use the Airosan in kitchens, restaurants, food processing units and food storage units.

The excess negative ions that may come in contact with living beings (humans, plants and animals) have a naturally positive effect on the recipient's well-being. Negative ions are known for enhancing the growth among plants and have a soothing effect on living being. This is also evident at places such as seashores, waterfalls, and flowing streams, where negative ions are naturally generated in huge numbers. We always feel happier, calm, and relaxed in such places.

8. Is there a proof that the Airosan is working?

The blinking LED light inside the Airosan is a proof of negative ions being generated. If the LED is continuously glowing or not glowing, the device may be faulty or not grounded properly. The device does not emit negative ions continuously, but it does so in packets at regular intervals. Negative ions are emitted only when a high voltage charge is applied to certain metal antennae. The blinking LED only glows when a significantly high electric charge is applied to the emitter and is hence a proof that the device is working.

9. How do we assess the efficiency of the air purification?

The Airosan has been tested in ICMR accredited lab for its efficacy in reducing airborne pathogens, allergens, particulate matter and pollutants. One can observe the machines' ability in purifying the air by noting the visual reduction of airborne particles, smoke and dust; reduction in allergic reactions among occupants; and the accumulation of black soot-like dirt around the Airosan. Effectiveness of negative ions for controlling pathogens, pollutants and allergens is well established. Each finished unit is tested for ion generation.

We recommend that one should believe in proven scientific facts as we do in case of washing hands with soap and using alcohol-based sanitizers. There is, at the moment, no other technology that will deactivate pathogens in an ambient environment or remove aerosols, allergens and pollutants at the same time.

10. Is it stand alone or needs to be mounted on wall?

The Airosan Cube-5 and Cube-5 Compact are tabletop devices. The device can be moved to any convenient location, however, should not be touched when switched ON. The Cube-5 Comact may be hung in inverted position like a lamp if ceiling can support 3kgs. Safety precautions must be exercised in the proximity of the device when it is switched ON. Keep device out of reach of children. Do not insert any object inside the device at any time. Always use grounded power supply.

11. Is the Airosan more effective indoors than outdoors?

Yes, the Airosan is effective only indoors or in spaces with limited flow of external air. It is ideal for places with minimal traffic and movement; however, such movement may be compensated by the use of more Airosan units.

12. What affects the production and saturation of negative ions?

Negative ions are formed when negatively charged electrons emitted by the ion generator react with airborne elements. The three most important negative ions, which are also known as atmospheric detergents, are Superoxide, Hydroxyl and Hydrogen Peroxide. For these to be formed in abundance, oxygen and humidity is required in abundance too. Hence in geographical regions where humidity is naturally high or in places where water coolers are used indoors, the production of negative ions is higher.

The initial time required for saturating an enclosed space with enough number (more than 15,000 ions/cm3) of negative ions may be a few hours, however, the Airosan is designed to rapidly replenish depleted negative ions on an ongoing basis. Hence spaces with low traffic and movement of air, goods and people have quicker saturation rates. Certain materials, surface coatings, electronic devices, magnetic fields, and static may actively absorb negative ions rapidly, thus affecting the time required for saturation.

13. How closely should the Airosan be located to the occupants?

The inner zone of radius 4 to 5 feet directly in front of the Airosan outlet grille has the highest concentration of negative ions. This inner zone is most useful for occupants who spend prolonged durations of time in that room.

14. Can it sanitise food items, surfaces, and liquids?

No. It can only purify air.

15. Does it require maintenance?

There are no consumables or filters that need to be changed or removed periodically and no device maintenance is required. An annual service call may be placed to check the ion emission and other electronic components. Outer surfaces of the device should be wiped with a clean dry cloth. Dust or cobwebs from the internal cavity may be removed by using a low-speed blower held at least 15 cms away.

16. What does the warranty cover?

The Airosan comes with a 1 year limited off-site repair warranty that covers manufacturing defects and electronic components only. The warranty is void if device is opened. The warranty does not cover damage or defect cause by accident, abuse, theft, mishandling or misapplication, power surge, physical damage, exposure to the elements or incidents arising from unforeseeable circumstances or events of force majeure; property or persons arising out of improper installation; fire, flooding, rodent menace, entry or contact of foreign bodies, entry or seepage of fluids, modification, repair or tampering by anyone other than company experts, utilisation of the device under conditions exceeding specification, unauthorised modifications or repairs; the unit being used with non-grounded or incorrectly polarised power supply, accident in transit, or in any event if the product serial number has been altered, defaced or removed.

For all repairs, device must be shipped to our office at Pune, India at the customers' own expense. Customer shall bear the shipping expenses both ways. If device is out of warranty, we will provide quotation for servicing and/or repairing the device prior to undertaking the work. Repaired device will be dispatched from Pune only after receipt of full payment. All open repair orders will be discarded if payment is not received within 3 months. Warranty on repairs shall only be for a period of 3 months.

17. For what duration can the device be operated continuously?

The device can be operational continuously for a period of 8 to 10 hours on a regular basis. It is recommended to keep the device OFF for a period of 15 minutes after every 2 to 3 hours if the device is used in an enclosed room with low fresh air intake rates. Except for some early release units, all devices are now fitted with an auto ON/OFF functionality which keeps the device ON for 2 hours and the keeps it OFF for 15 minutes and repeats the loop continuously. Such devices may be kept operational permanently.

18. Is there a need to use other air purification devices in addition to the Airosan?

In non-critical medical environments, the use of other devices is not required if the Airosan is in regular and extended use. Where pollution levels are significantly high and persistent and source of pollution is strong and near, then additional air filtration devices may be required for rapid filtration of particulate matter.

19. Can the Airosan be used in airconditioned spaces?

Yes, however, the Airosan should be kept at least 8 to 10 feet away from the air-conditioning unit.

20. How much energy does the Airosan consume?

Not more than a 10W light bulb.

21. What is the average noise level of the device in operation?

The noise level does not exceed 50db when operational.

22. Does it require installation and commissioning?

No installation or assembly required. Ready to plug and play straight from the box.

23. What is the average life of the Airosan?

We anticipate a service life of more than 10 years.