

# EnviroGuard Frequently Asked Questions

**Q: What is the measure or the criteria behind a rating of good for air quality on the app?**

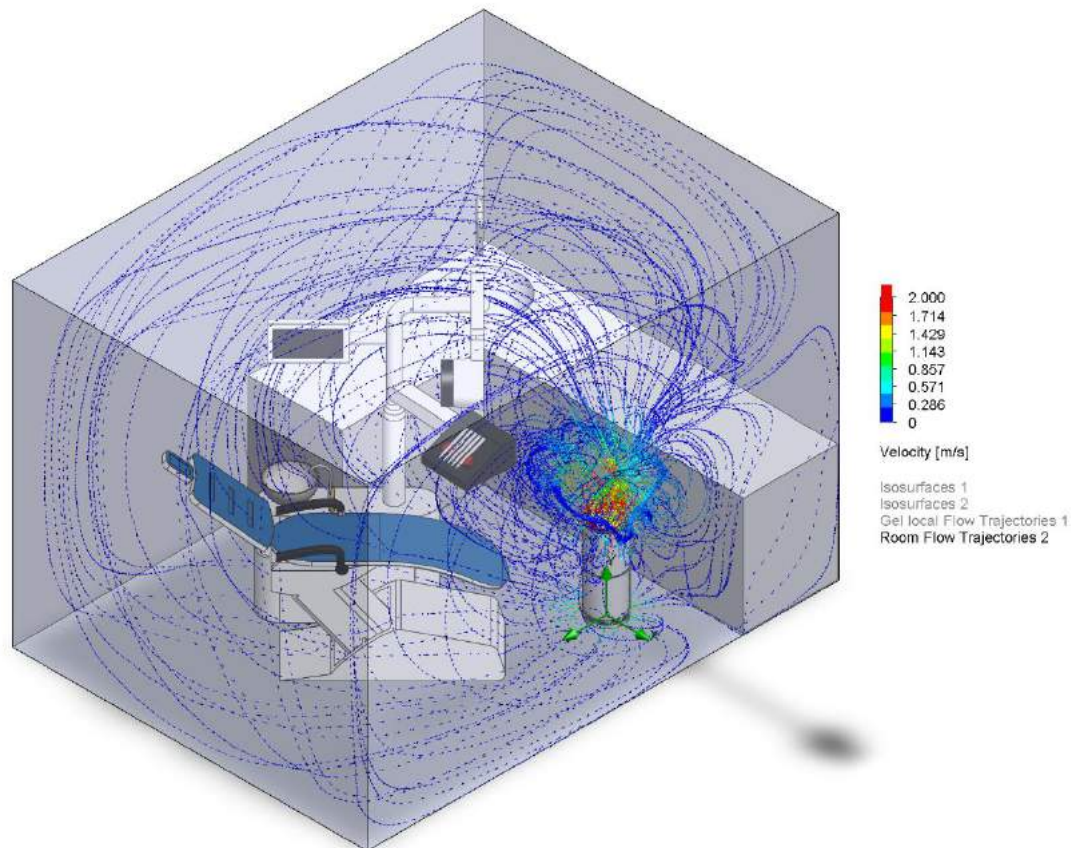
A: The criteria is based on the particle count of PM1, PM2.5 and PM10. Based on these results we then advise the air quality level, an example of this would be the following for PM10:

Particle Count	Air Quality Level
0-50	Good
51-100	Average
100+	Bad

We are also planning to implement different criteria for different countries based on their respective country regulations when setting up the device.

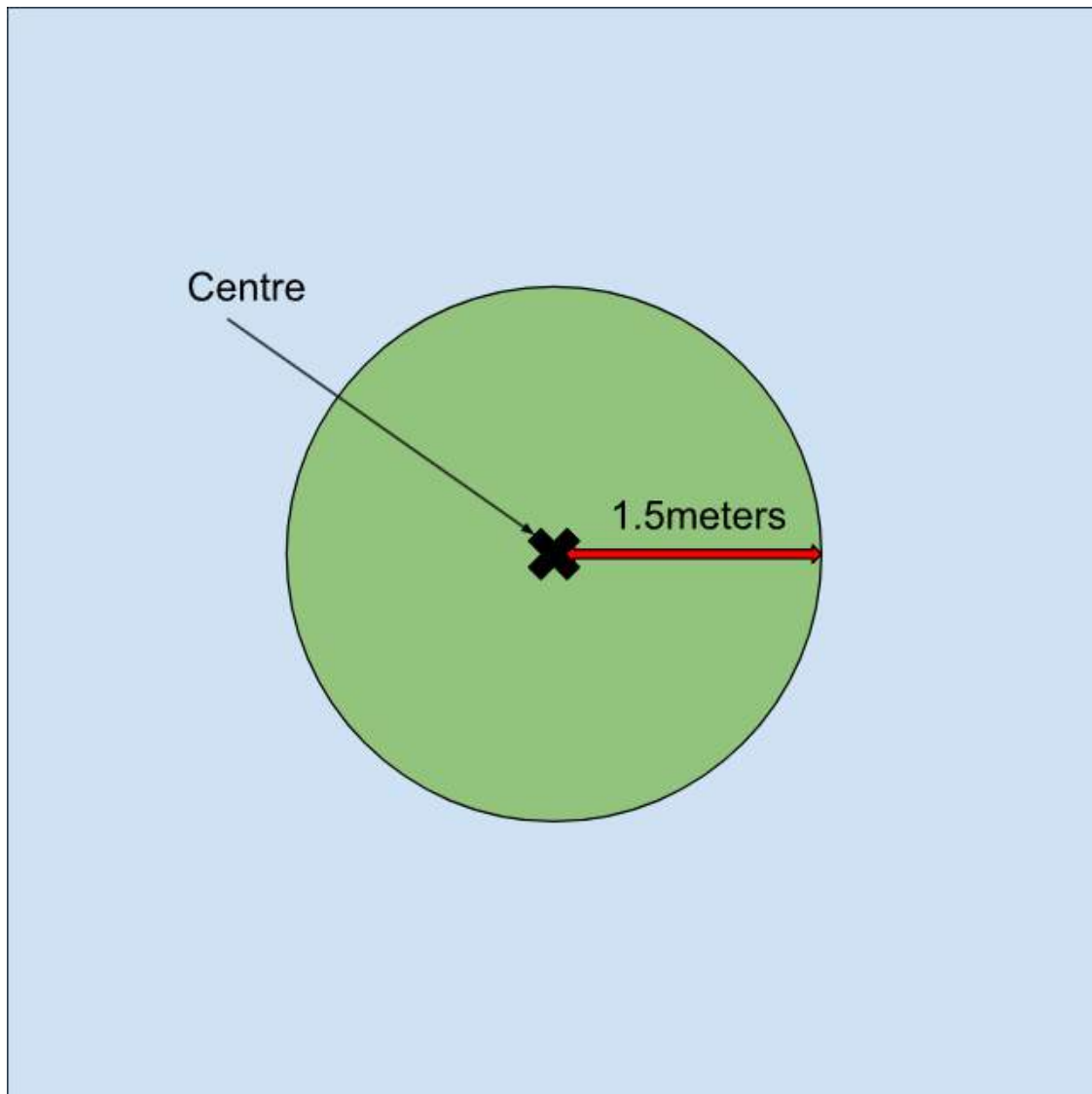
**Q: Are there any air dispersion models to show how the active ingredient should be dispersed within a given space?**

A: Yes, please see below a report of the EnviroGuard ProX flow analysis in a market-tested room.



**Q: How to determine the optimal placement of units within a given space to achieve maximum performance?**

A: The optimal placement of the device in the room is anywhere within a 1.5-meter radius within the centre of the room to allow the device to sanitise the room with a 360 degree scan of the room. Additionally as shown in the airflow report, the top of the device can be kept away from air conditioner vents to stop the sanitisation exiting the room before it can come in contact with surfaces.



However, the unit can be placed in a corner as shown by the airflow models of dispersion, it will just take longer to sanitise the adjacent corners as a result.

**Q: Is there any data to support a viral, as well as a bacterial load reduction in the air?**

A: No, the viral claim comes from the AerisGuard Filter treatment. This is not to say there isn't a reduction in viral load per se. it just has not been tested to date.

**Q: What is claimed to be the active ingredient? Many air sanitisation units claim that free radical or hydroxyl ions are produced which in turn act as active ingredients.**

A: EnviroGuard Pro X uses a proprietary gel technology designed in our Lab with vast experience in surface contamination prevention and infection control. The active component of the proprietary gel is Hydrogen Peroxide which is well known to have sanitising properties. Hydrogen peroxide is an oxidising agent and generates highly reactive hydroxyl radicals, OH<sup>-</sup>.

**Q: Why a minimum of 6% hydrogen peroxide is required to achieve efficacy in a liquid based disinfectant, but when in gaseous form a sub-1ppm level of an undisclosed gas, derived from hydrogen peroxide, provides 2 to 4 log efficacy?**

A: The 5.8% concentration of hydrogen peroxide is formulated in a gel form rather than a liquid form. Once gaseous hydrogen peroxide is released from the gel it dissociates and forms highly reactive hydroxyl radicals which provide the 2-4 log efficacy as per independent Eurofins testing using EN 17272 test protocols. Any hydrogen peroxide remaining in the gaseous form in the air is below 1ppm and ultimately breaks down to oxygen and water.

**Q: Surfaces in a given room will not all be accessible to small aerosols dropping from the air. Surfaces may be shadowed by other items. How do these areas get sanitised?**

A: Hydrogen peroxide is released in the gaseous form from the proprietary gel and the subsequent reactive gaseous hydroxyl radicals. There are no aerosols released via the gel, only gas, so there is no issue with the active sanitisers as they can reach all surfaces.

**Q: How many units are required to treat a room? The Data shows room size in m<sup>2</sup> and airflow in m<sup>3</sup>. What ceiling heights are assumed and have tests been performed to demonstrate that all the air in a space gets circulated through the equipment, rather than a small proportion of the room being recirculated several times? The data suggests an underlying assumption that the unit can recirculate all the air in the room in a given timescale.**

A: The ceiling height is assumed to be 2.7m which is one of the most standard heights in buildings. The number of units required depends on the room size. The number of air turns per hour is as follows;

Pro X setting	Speed	10m <sup>2</sup>	30m <sup>2</sup>	100m <sup>2</sup>
25%	3	3.4	1.1	0.3
50%	5	6.5	2.2	0.6
75%	7	9.6	3.2	1.0
100%	10	19.1	6.4	1.9

**Q: What are the results if the room is left untreated or with the filtration equipment only? i.e. without the Purox Gel.**

A: The EnviroGuard unit will continue to filter the air but it won't sanitise the air or surfaces.

**Q: A Hepa 13 filter should be able to filter out a large proportion of viruses and bacteria in the air. Given this fact, what is the purpose of the chemical filter?**

A: Yes, however, the AeriGuard Bioactive Filter gives additional efficacy in reducing mould, bacteria and viruses (including COVID-19) on contact. The Aeri Filter contains a biocide that has been independently tested against Covid-19 Wuhan strain (not a surrogate virus used by most of the suppliers in the industry) It specifically prevents the colonisation of harmful indoor pathogens in the filter. Traditional filters tend to become blocked by a build-up of this material and become less effective over time.

**Q: From the marketing material the claim is that the filter system removes 99.97% of mould, viruses, bacteria etc, whilst the same claim is made for the Hepa filter on its own. If this is correct, why not just use the Hepa filter on its own? How often does each element of the chemical filter require servicing and how is this measured?**

A: The Filter and the Gel are consumables that need to be changed depending on the use of the unit and the conditions of the environment. In general terms, the Filter should be replaced approximately every 12 months and the Gel every 3 months. The EnviroGuard App provides accurate feedback on the usage progress of the Gel and Filter.

**Q: How much noise does the unit make? High levels of recirculation through a Hepa 13 filter will require a significant circulation unit.**

A: The noise of the EnviroGuard unit ranges from 33 to 59 dBA depending on the fan speed (1 low speed – 10 high speed) The EnviroGuard unit uses a DC brushless fan which is very quiet. The noise levels are below or similar to other air purifiers in the industry.

**Q: What is the safety procedure for changing filters given that they are there to capture a range of pathogens? How are the filters disposed of?**

A: The filter comes with a small handle that can be used to remove the filter from the unit and place it in the general garbage bin.

**Q: Do they also have an industrial unit that acts like a misting or fogging applicator?**

A: No

**Q: If these units are introduced in a building that uses fragrances to enhance their air, the product will remove these fragrances via the carbon filter which could cause a problem for the customer.**

A: Yes, the EnviroGuard unit will reduce/remove the fragrances but at the same time will remove undesired VOCs which could be harmful to the building/property occupants.

**Q: What is the science behind the claimed surface sanitisation action of the Purox Gel?**

A: The science behind EnviroGuard Gel sanitisation is based on a well-known technology called Vaporised Hydrogen Peroxide or VHP.

**Q: What is claimed to be the active ingredient? Many air sanitisation units claim that free radical or hydroxyl ions are produced which in turn act as active ingredients.**

A: EnviroGuard Pro X uses a proprietary gel technology designed in our Lab with vast experience in surface contamination prevention and infection control. The main active component is Hydrogen Peroxide which is well known to have sanitisation properties.

**Q: As the amount of active ingredient being emitted from the unit is not measurable, how can a consistent or minimum dose be guaranteed?**

A: The only emissions are water and hydrogen peroxide vapour. The rate of release depends on fan speed, humidity and temperature.

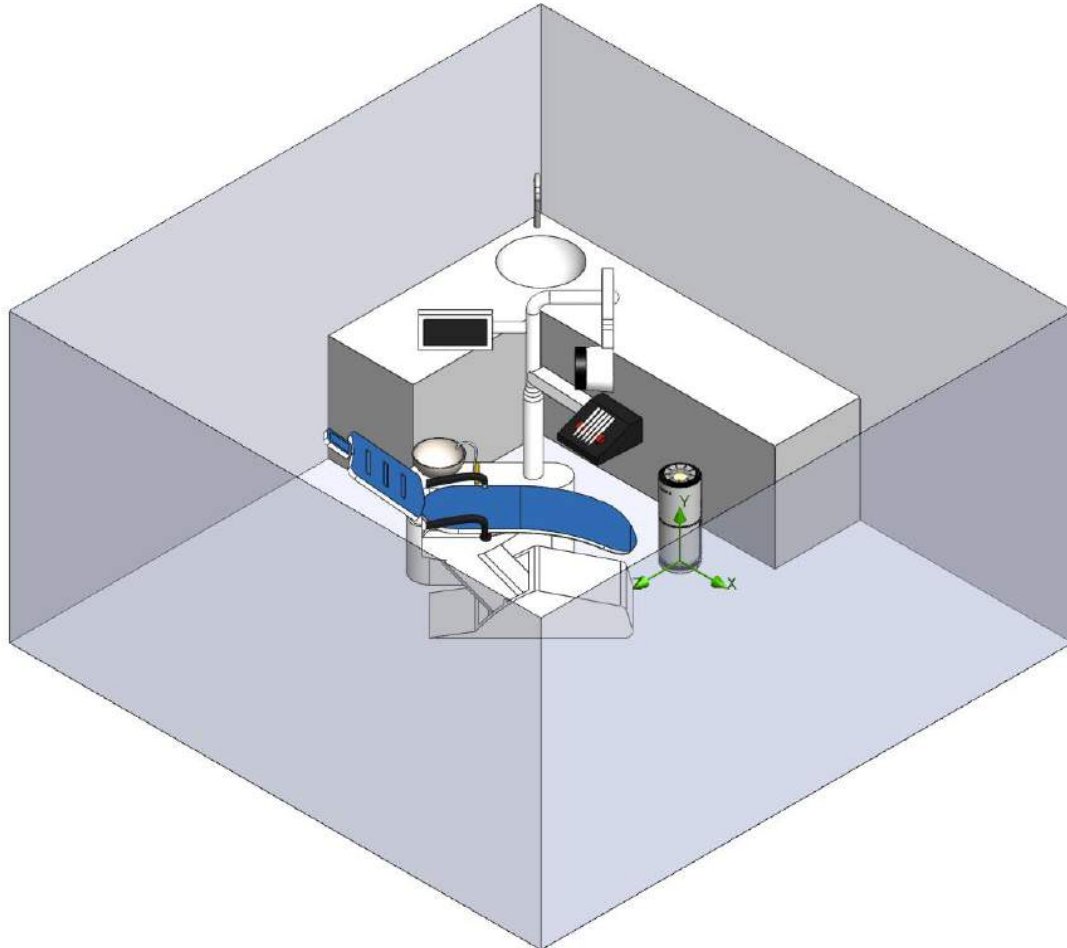
We have carefully assessed the amount of vapour released with these parameters at their realistic maximum and validated that even under these extreme conditions the level of hydrogen peroxide vapour is at least one quantum below recommended safety concentrations for continuous exposure.

The unit has been independently validated that even at cool temperatures with low speed range fan settings there is a quantifiable decrease in viable bacteria and fungal spores due to EnviroGuard and that the compound filtration system can effectively decrease the airborne viral concentration.

# Additional Information

## 1. Purpose:

To investigate how different air purifiers will perform in different room designs across different industries. This should also help establish the airflow requirement (and thus device size) for the unit.



## 2. Method:

Using Solidworks simulation software, different rooms will be modelled to replicate industry standards and then different air purifiers can be placed in the room to analyse the airflow performance.

## 3. Background:

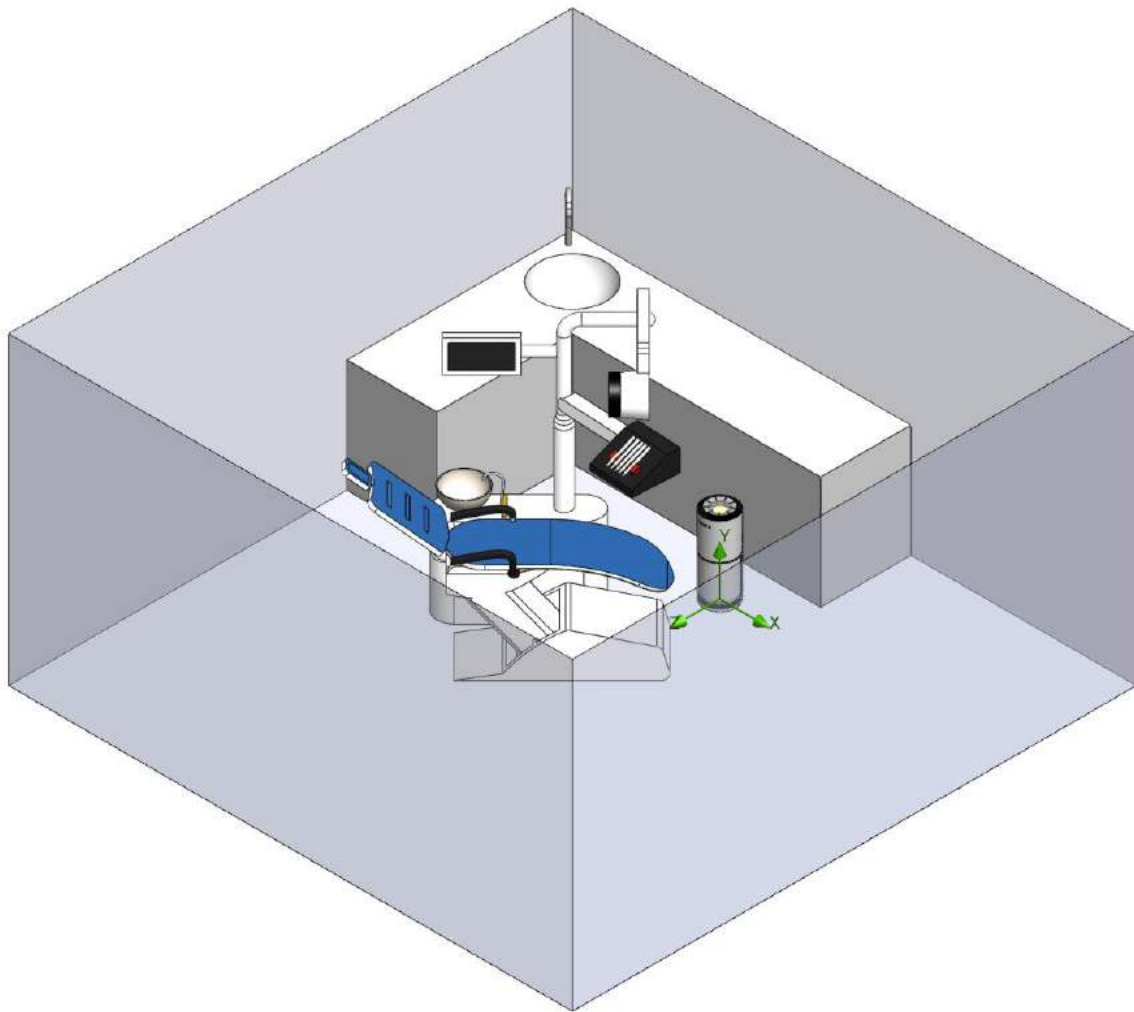
### 3.1. EnviroGuard Pro X Unit

The current EnviroGuard Pro X has a maximum airflow rate of 500m<sup>3</sup>/hr on boost. For a standard 5m x 5m x 2.5m room (62.5m<sup>3</sup>), this will equate to 8 air changes per hour. Note: this is a theoretical air change per hour number that is calculated based on just the volume of the space and the throughput of the device, the actual effective filtering of the air across the whole room would be longer.

## 3.2. Dental Industry

### 3.2.1. Treatment Room

- The average size for a treatment room is: 4/5m x 3.4 /4m
- There would be L-shaped joinery - 2m long against one wall and 3m long against the other - with a 600mm depth in the joinery. It will have a sink and small equipment on top. Height is 1m.
- The chair normally takes up 5m<sup>2</sup> space in the room when it is angled.
- The rooms have to be disabled-compliant to allow for access by wheelchair.
- A dental treatment room with An EnviroGuard Pro X Unit scenario: the room model size is 5m\*5m\*2.7m.



### 3.2.2. Hygienist Room

- The average size for a Hygienist room is: 3m x 4m
- There would be a small joinery cupboard. 2m long and 600mm deep. Height is 1m.
- The chair normally takes up 5m<sup>2</sup> space in the room and is straight.
- The rooms have to be disabled-compliant to allow for access by wheelchair.

### 3.2.3. Waiting Room

- The average size for a waiting room is: m x m
- There would be a seating as well as a counter and desk behind it.

### 3.2.4. Procedural and In-between Patient Times

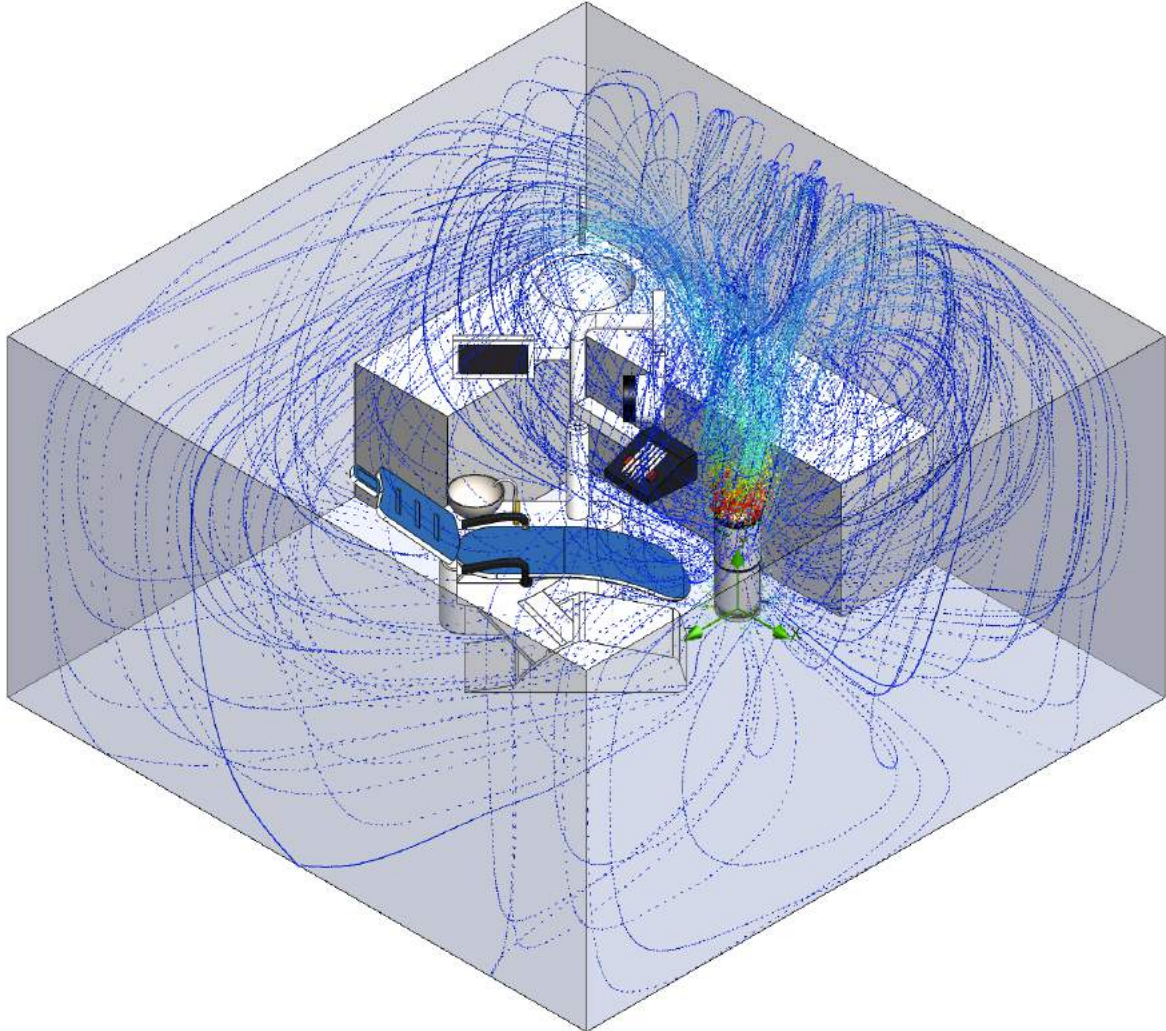
- General Practice Dentist
  - These are the cohort that do basic scape / cleans and drill & fill - majority of the dental cohort.
  - Procedural time frames / appointments - 40-50mins
  - Cleaning time between patients - 3-5 mins.
  
- Dental Hygienists
  - These are people who also do basic scape and clean and general maintenance of oral hygiene - they used to work under a dentists' provider number however early last year they were able to get a provider number which allowed them to branch out and have their own practices either individually or within a dental practice
  - Procedural time frame / appointments - 50-60 mins
  - Cleaning time between patients - 10 mins
  
- Surgical Dental Practices
  - Practices that have Oral Max surgeons , Periodontists - involved in various procedures including: bone grafting for implants, cheek implants, alveolar bone grafting etc. They would employ a dentist who is trained in providing IV anaesthesia within the surgeon's chair practice.
  - Procedural time frame / appointments - 90 mins - 3 hours. If the procedure is longer than 3 hrs most of these patients would be managed in a day surgery situation.
  - Cleaning time between patients - varies. Normally a surgery like this operates as two chair surgical practice. Once the procedure is done AND the patient is still under sedation - the assistants will clean around the sedated patient and the Dr will go to the other room and start the next procedure. Once the patient awakens - they leave them to recover for approximately 15 mins more and then the patient is out. The room is then cleaned further - once the patient leaves the room. The time to clean would vary based on the equipment in the room and procedures that have been undertaken on that patient.

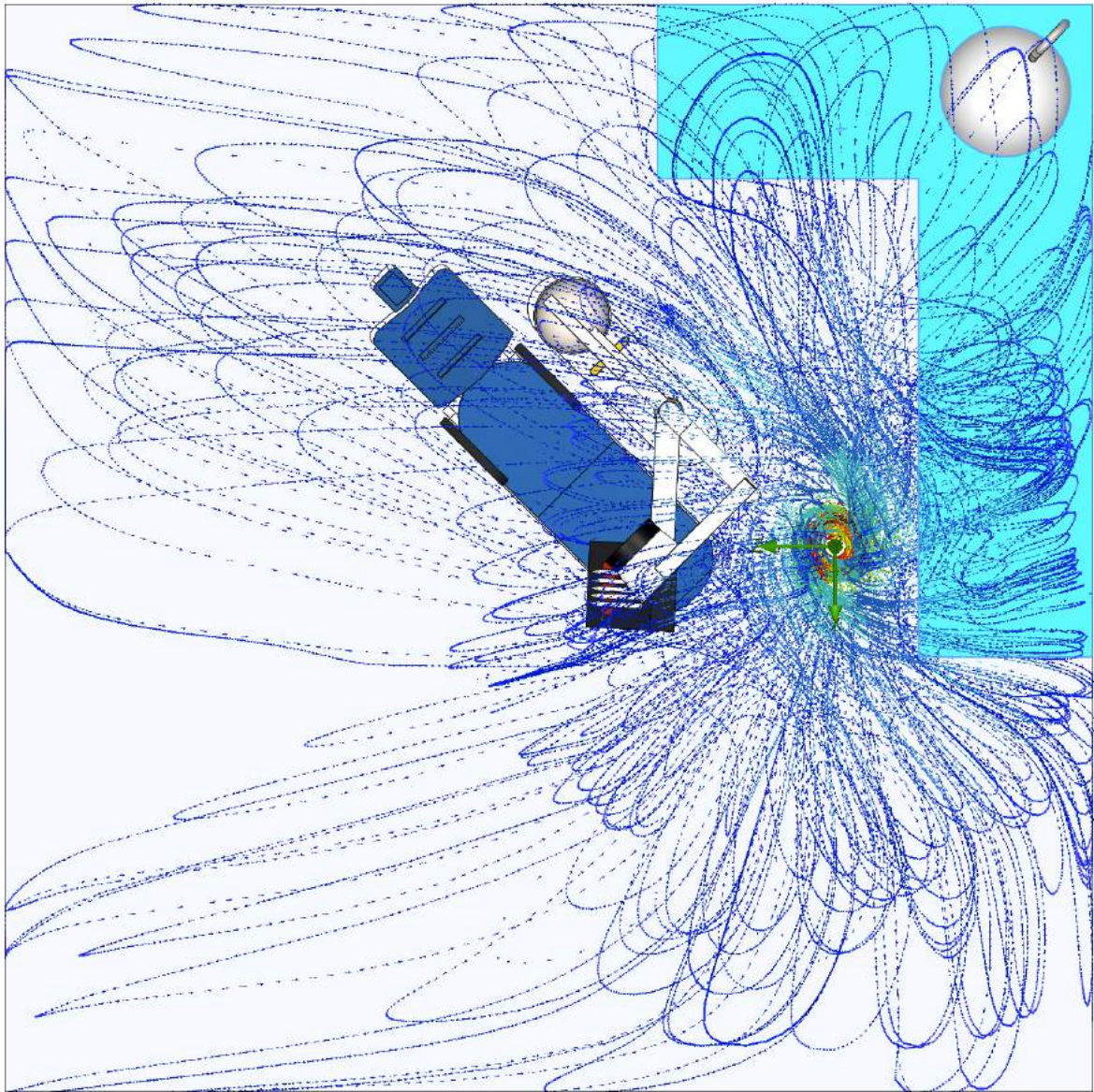


#### 4. Results

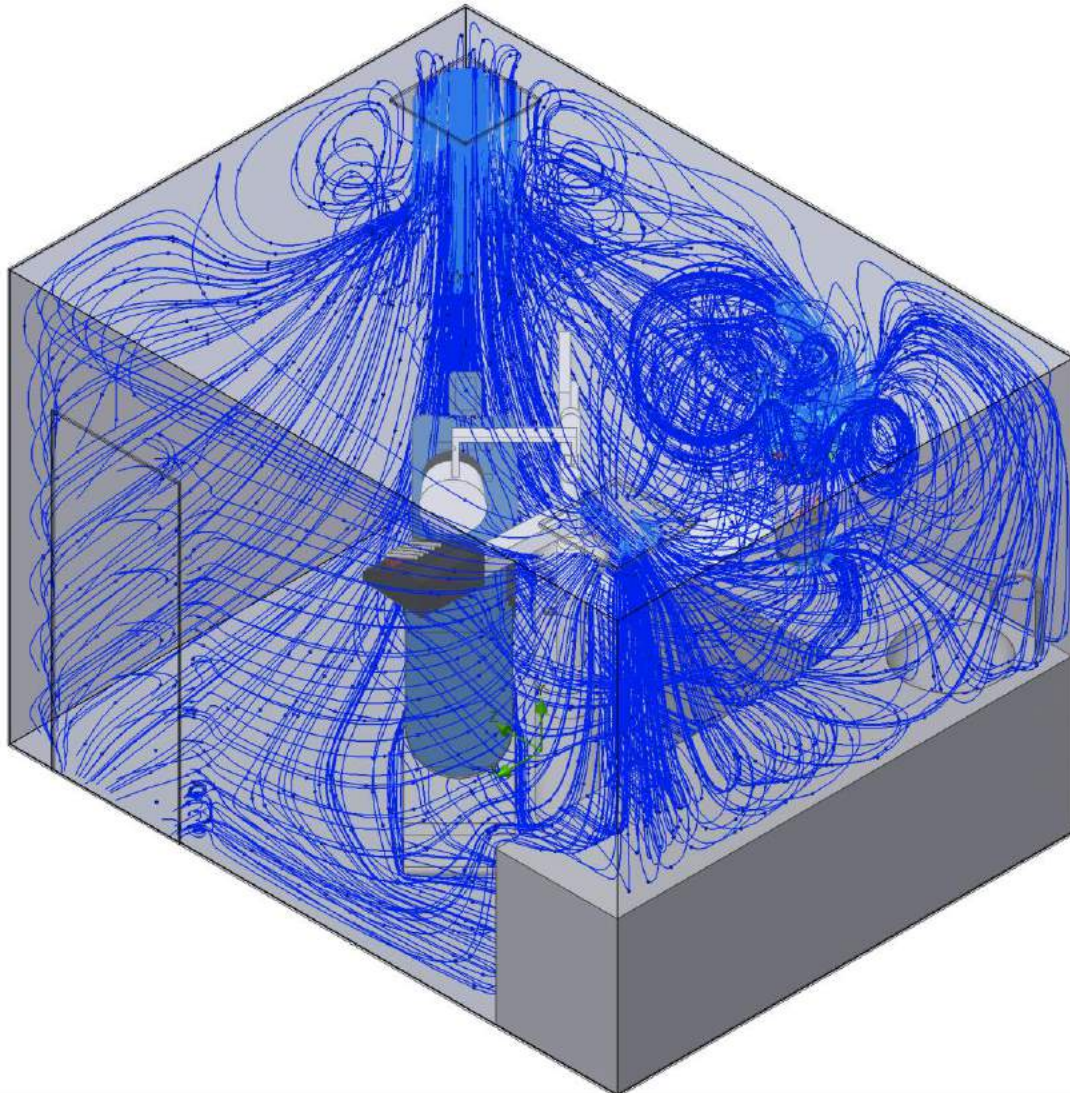
##### 4.1. EnviroGuard Pro X in a Treatment Room

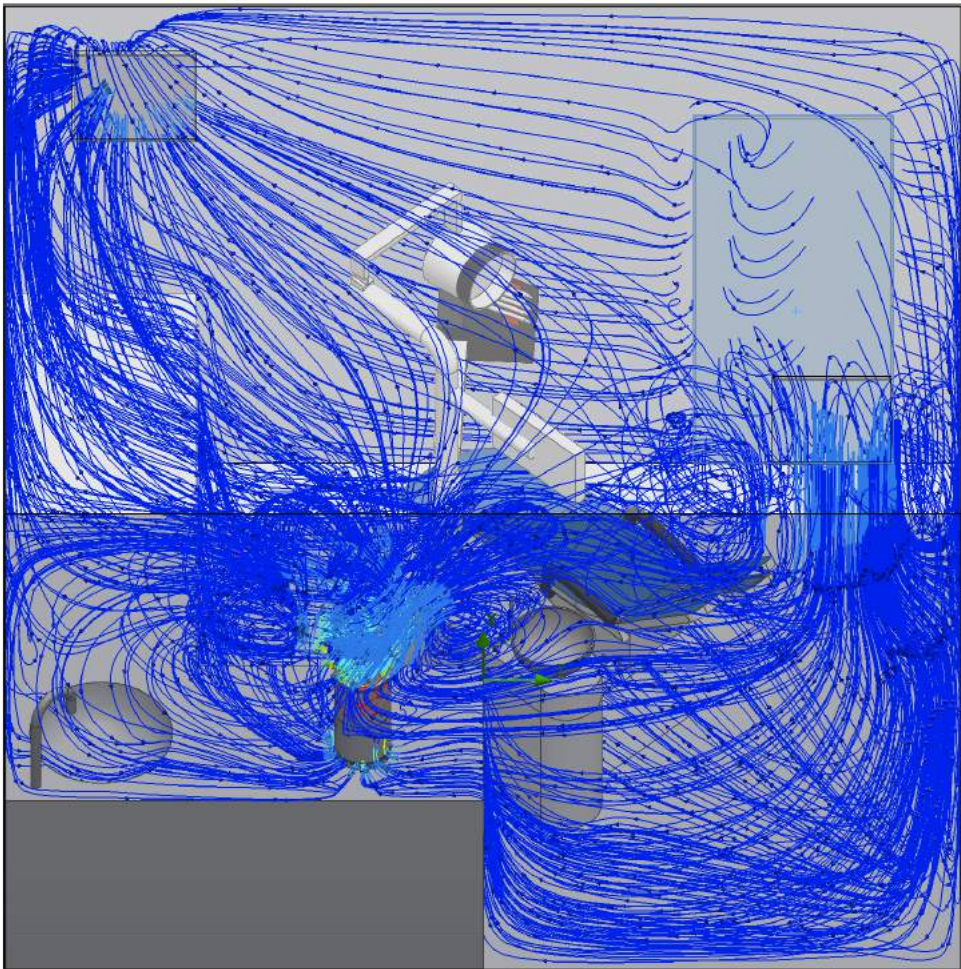
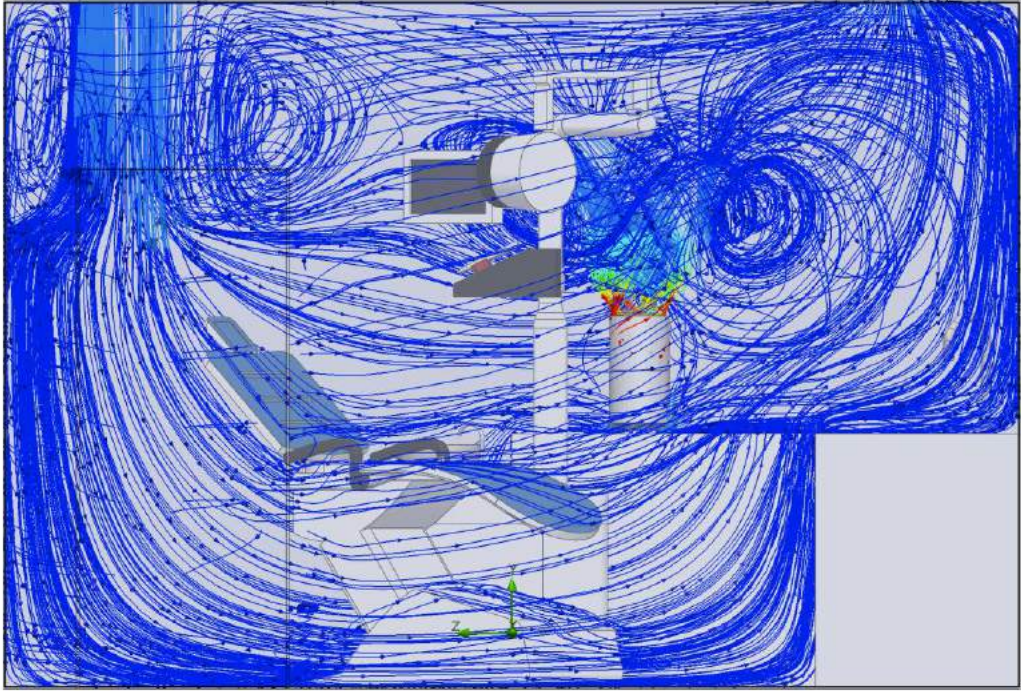
##### 4.1.1. The airflow trajectories in the room.





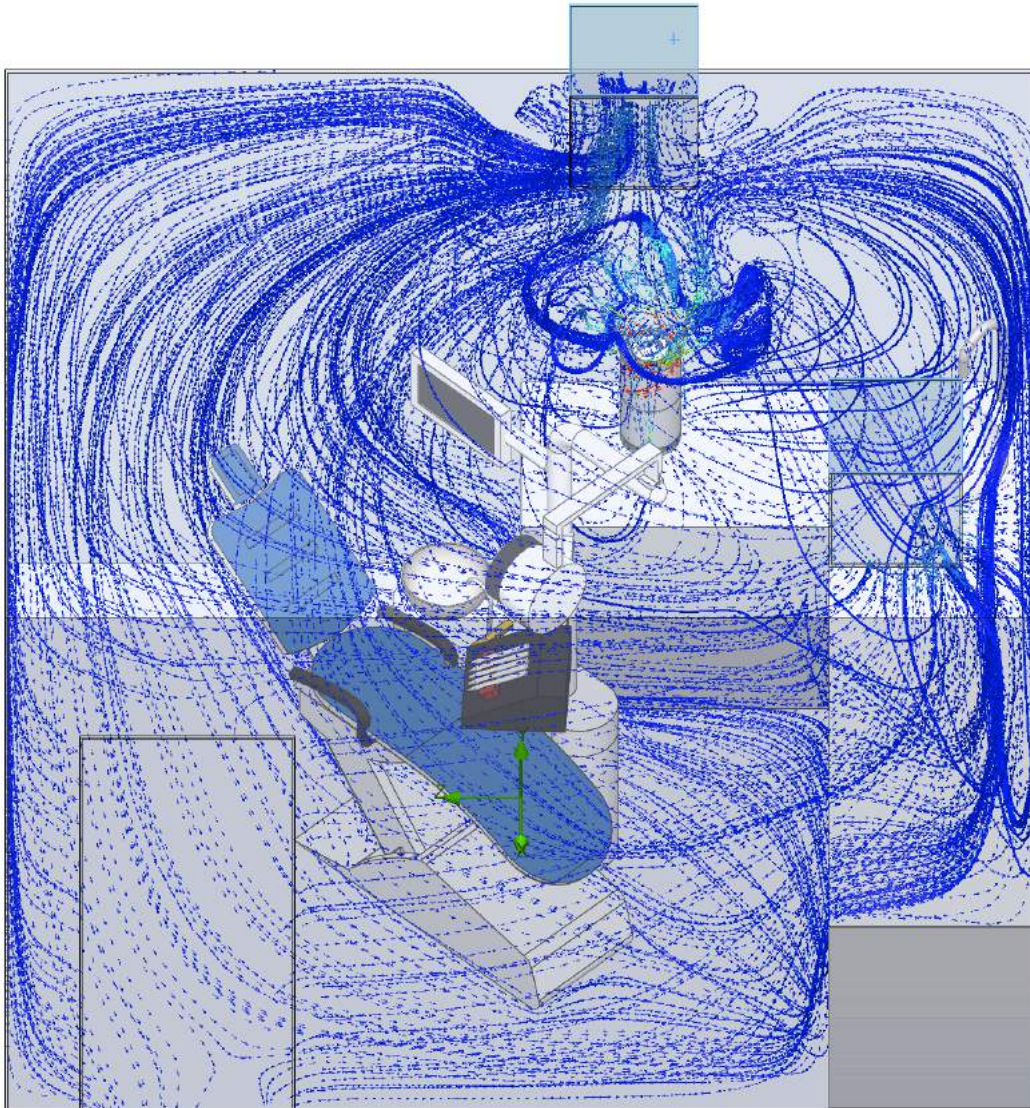
4.1.2. The air flow trajectories in the Hygienist room with air conditioning System.

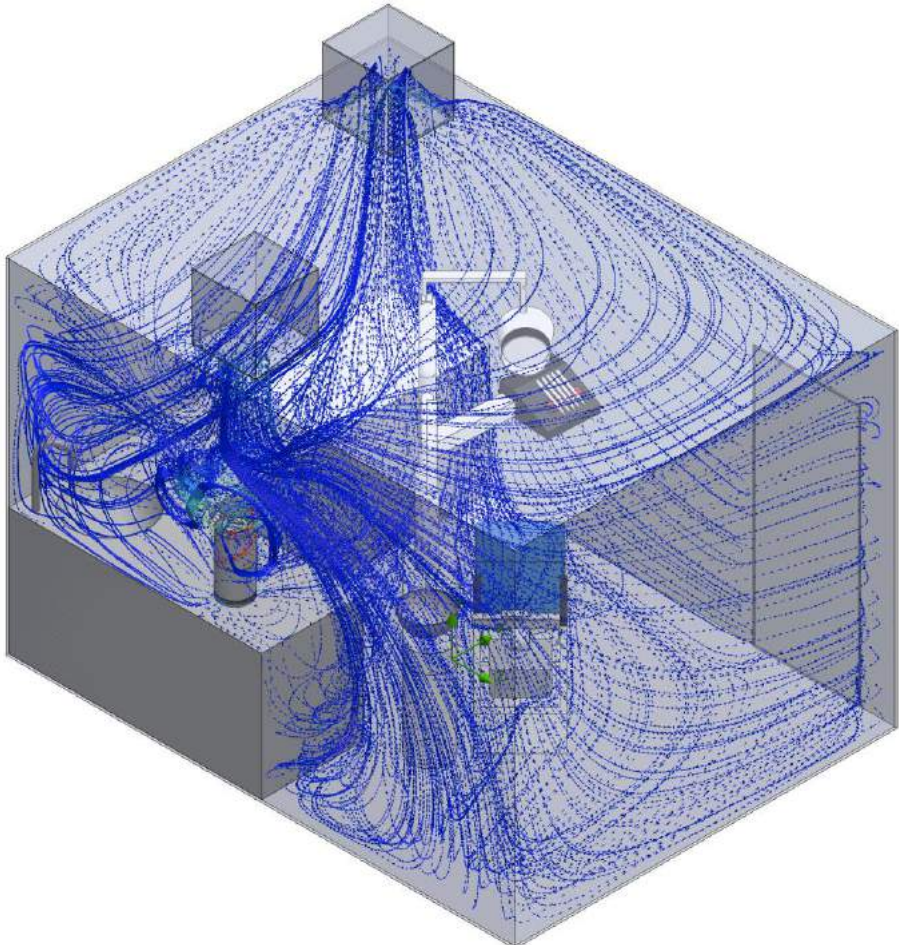
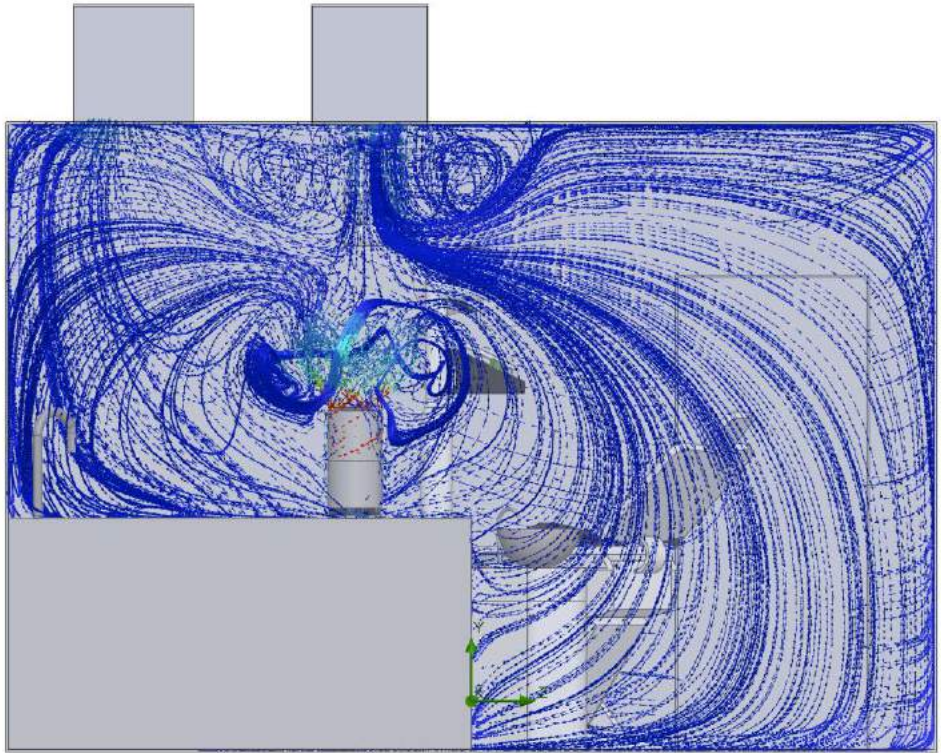




#### 4.1.3. The critical cases in the air conditioning System.

- The inlet of AC is over the device





- The outlet of the AC is over the device

