Improved Air Quality in Class A Apartment Development with Airocide Air Purification Systems

INTRODUCTION

Sharjah Sustainable City is the first sustainably built city in Sharjah, United Arab Emirates. The city is powered by renewable energy generated by rooftop solar panels and is constructed with sustainable materials. City designs are made to have green low operating costs. It reuses 100% of its wastewater for landscape irrigation and maximizes recycling to divert waste from landfills.

Within this eco-conscious environment, a luxury villa facilities management group in Sharjah Sustainable City is actively seeking green and sustainable solutions for Indoor Air Purification. SteriLumen offers cutting-edge FDA Class II approved Air Purification systems Developed for NASA. Airocide not only delivers green technology but also provides local implementation support tailored to the unique environmental challenges in the U.A.E, ensuring superior Indoor Environmental Quality (IEQ) seamlessly integrates with the city's ethos of sustainability.

The first fully integrated, Net Zero energy community in the Emirate of Sharjah

IMPLEMENTATION

- (1) Airocide GCS-50 air purification devices was installed to improve the IEQ in the center of the villa living area.
- Qualitative and quantitative testing (pre and post-installation) were carried out for common indoor environmental quality parameters.
- Post measurements for indoor environmental quality were taken after the air purifiers had been in operation for (1) week.

Installation of Airocide showed conclusive results:

SAMPLING LOCATION	TEST METHOD	ANALYTICAL RESULT		REDUCTION LEVEL
		Results Obtained Pre-Installation	Results Obtained Post-Installation	
Center of the Villa Living Area	Respirable Suspended Particulate Matter (PM 2.5), µg/m³	54.1	18.2	66.4%
	Respirable Suspended Particulate Matter (PM 10), µg/m³	95.9	27.5	71.3%
	Total Suspended Particulate Matter (TSPM), µg/m³	112.1	31.3	72.1%
	Carbon monoxide (CO), ppm	0.0	0.0	-
	Carbon dioxide (CO2), ppm	474.0	756.0	N/A
	Oxygen (O2), %	20.9	20.9	N/A
	Ozone (O3), ppm	0.00	0.00	-
	Temperature, °C	21.5	25.1	N/A
	Relative humidity, %	52.0	49.0	N/A
	Formaldehyde, ppm	0.00	0.00	-
	Nitrogen dioxide (NO2), µg/m³	0.0	0.0	-
	Sulphur Dioxide (SO2), µg/m³	0.0	0.0	-
	Total VOC, µg/m³	1837.0	216.0	88.2%
	Total Bacterial Count, cfu/m³	9	7	22.2%
	Yeast & Mold in air, cfu/m³	2	2	0.0%

IMPACT

1. Mold Spores:
    a. Mold growth in buildings presents significant challenges, posing risks to both occupants' health and the structural integrity of the property.
    b. Clean air is paramount, especially for individuals with allergies or sensitivities to mold or chemicals. Even the smallest organic gases from household chemicals or mycotoxins from mold can be problematic.
    c. Installing Airocide effectively eliminates mold and odors, thus preserving indoor air quality and promoting a healthier environment.
2. VOCs, PMs, Ozone:
    a. VOCs, PMs (Particulate Matter), and ozone are all harmful to health, contributing to various illnesses, both fatal and non-fatal. They can lead to symptoms such as fatigue, nausea, headaches, allergies, and more.
    b. Purifying air contaminated with particulate matter is crucial. Using Airocide to remove PM 2.5 and PM 10 particulates like smoke, ash, dust, and dander significantly improves air quality.
    c. Ozone, though naturally occurring, can be harmful to the environment and human health.
    d. Installing Airocide to eliminate these airborne threats not only improves occupants' health but also adds significant value to the Villa by providing a safer environment.
3. Viruses:
    a. Viruses, responsible for a range of illnesses including the common cold, spread easily through coughing and sneezing.
    b. Airocide effectively eliminates viruses from the air, reducing the risk of viral diseases and enhancing overall indoor air quality.
4. Bacteria:
    a. Bacteria, despite being invisible to the naked eye due to their small size, are ubiquitous and known for causing illnesses.
    b. Airocide's technology ensures the removal of bacteria from the air, guaranteeing a safe and healthy indoor environment for occupants.

CONCLUSION

- The installation of the Airocide GCS-50 unit has effectively eradicated any odors stemming from VOCs and mold that were previously noticeable in the villa's living area. This is supported by the quantifiable reduction in quantitative IEQ parameters, including those parameters most responsible for particulate matter and VOCs (Reduction of: PM 2.5 by 66.4%, PM 10 by 71.3%, TSPM by 72.1%, and VOCs by 88.2%).

- The goals and objectives of providing practical and implementable Indoor Air Purification solution to reduce mold and ensure safe and air has been successfully achieved. Along with a qualitative reduction of odor, the installation of the equipment has resulted in quantitative reduction for common indoor environmental quality parameters.

Airocide GCS-50