CASE **STUDY**

Schools and Universities

SCHOOL SYSTEMS

THE CAMFIL CITY M ROOM AIR PURIFIER ADDED TWO ACH (AIR CHANGES PER HOUR) WITH UP TO A 98% REDUCTION IN PARTICULATE COUNT

COMPANY PROFILE

Mid-Atlantic school system with multiple elementary and middle school facilities as well as three high schools dedicated to providing a safe environment for successful learning.

THE SITUATION

A comprehensive approach was taken to address all areas of concern with the goal of in-school learning for all students. One key area of concern was the quality of the air in all facilities and the long term health effect on faculty, students, employees and visitors.

Understanding the limitations of the existing HVAC systems in many facilities, the decision was made to utilize the benefits of room air purifiers to supplement existing filtration. Using an academic approach consistent with the school system's teaching methods, evidence-based material was demanded in order to determine which air purification technology would achieve the school's air quality goals. Camfil was requested to demonstrate the real-world effectiveness of the City M air purifier and provide documentation of particle removal.

THE ACTION

Over 300 City M room air purifiers were installed in classrooms throughout the school system with limited or non-existing central HVAC systems. Two elementary schools were selected for detailed evaluation to determine if the units improved classroom air quality.

Particle counters were used to establish a baseline before the City M air purifiers were activated and before students entered the two facilities. The particle count per cubic foot was based on three size ranges – 0.3 - 0.5 microns, 0.5 - 1.0 microns and 1.0 - 5.0 microns. All the micron sizes are far too small to be seen but are potentially hazardous to student health.

After a baseline of initial air quality was established, nearly 2,000 separate counts were conducted on the three particle sizes. A data evaluation was conducted to determine if the City M air purifier improved air quality in the rooms.

THE RESULT

The City M air purifier delivered noticeably improved indoor air quality. Particle counts in all three size ranges dropped significantly when the City M air purifiers were activated in classrooms with or without students and faculty. In addition, it was determined the units added a minimum of two ACH (air changes per hour) which improved the overall room ventilation.

The City M provided a safer environment for teachers and students to facilitate a return to in-school learning.

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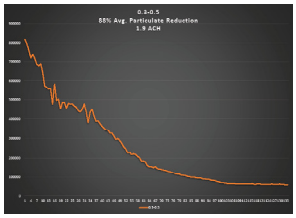
THE PROOF

Particle counts on three size ranges were recorded and graphed to demonstrate particulate reduction over time based on the ACH for the specific room tested. Based on cubic feet and CFM; one room achieved 1.9 ACH and the other just under 3 ACH.

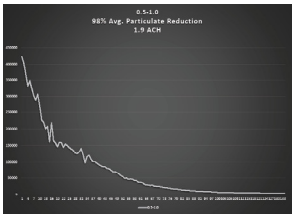
The particle count prior to filtration varied by location and ranged from a high of 815,000 per ft^3 in the 0.3 to 0.5 micron range to a low before filtration of 34,400 per ft^3 in the 0.5 - 1.0 micron range.

Counts were taken over a two hour time frame during the school day with regular activities occurring in the room.

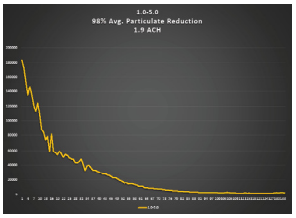
0.3 to 0.5 micron

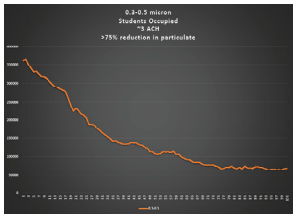


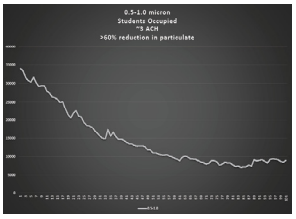
0.5 to 1.0 micron

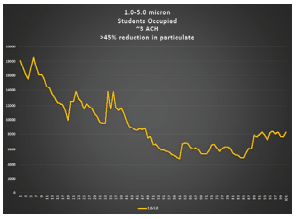


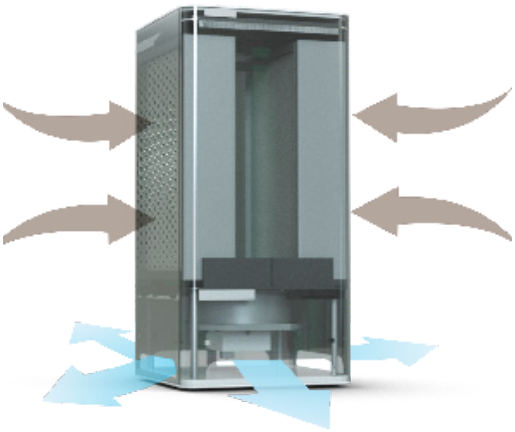
1.0 to 5.0 micron











Air intake is through two sides of the unit and into activated carbon modules that are effective on ozone, organic gases and odors, volatile organic compounds (VOCs) as well as many other chemical contaminants.

Once through the activated carbon modules, air encounters HEPA filters that have been individually tested and certified to remove 99.995% of MPPS. High efficiency on "Most Penetrating Particle Size" is a more difficult standard to achieve and preferred when ultra-clean environments are required.

Clean air exits on all four sides at the bottom of the unit at a higher velocity. This creates a low pressure zone near the intake vents which draws unfiltered air more efficiently from the breathing zone while lessening the possibility of the airstreams mixing.

Physical Specifications

Height	28"
Width	13"
Depth	13"
Weight	35.27 lbs
Filter Weight	8.75 lbs
Operating Temperature Range	Low -13° F High 140° F

Fan Performance

Speed	Airflow (cfm)	Energy (watts)	Noise (dB)
1	22	4	16
2	39	5	21
3	56	6	28
4	75	7	35
5	148	19	45
6	256	55	54

Electrical Data

Voltage	110 - 120 Volts
Frequency	50 - 60 Hz
Motor Speed	3200 RPM (max speed)
Power	55 Watts (max speed)