EnviroKlenz®

Indoor Air Quality Case Studies

Study Background

Timilon conducted case studies with educational partners at various locations in the United States during the COVID-19 pandemic. EnviroKlenz Air System Plus was deployed and operational alongside an air meter that measures and records particulate matter. The EnviroKlenz Air System utilizes multi-stages of filtration consisting of patented technology for a broad array of contaminates, UVC (254 nm wavelength), and HEPA. The air meter provides real-time estimates of particulate matter concentrations (PM1, PM2.5, PM10) and particle size distribution using a combination of multiple light scattering-based particle sensors.

The systems ran in operational educational environments with daily schedules being carried out as usual.

Increases and decreases in the particulate matter were observed as expected given the conditions with the air monitor.

The results from the case studies with the EnviroKlenz Air System Plus were compared to particulate matter data from the Environmental Protection Agency (EPA). From 2000-2019, the EPA, through a nationwide network of over 400 monitoring sites, developed ambient air quality trends for PM 2.5 particle pollution, representing fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller. In the EnviroKlenz case studies, a broader range of particles was monitored, all with similar trends, but for illustration purposes, the data collected aligned to the size range of the EPA data is shown by plotting the national standard and the top 10 percentile for air quality for comparison.

EnviroKlenz®

New Jersey School

Indoor Air Quality Case Study

EnviroKlenz®

New Jersey School

TEST DETAILS

Testing Period: 12/9/20 - Present

Setting: 1,000 square foot classroom with 10 ft high ceilings

Equipment Used: (1) EnviroKlenz Air System Plus and (1) Quant-AQ commercial-grade aerosol measurement instrument. Readings were captured in the ranges of PM10, PM2.5, and PM1(sub-micron-sized)

Running Time: The EnviroKlenz Air System Plus is typically only run during school hours.

Monitor status: Kept on throughout testing period

Observation: Spikes can be seen at night and decrease in the morning, which shows the abilities of the EnviroKlenz Air System Plus to remove particles quickly

At an east coast school, one EnviroKlenz Air System Plus was used per classroom. For this case study, the air meter was allowed to be set up in advance of the EnviroKlenz Air Systems Plus deployment to establish background PM 2.5 readings. The readings were taken before the school dismissal for Thanksgiving Break. The EnviroKlenz Air Systems were deployed following the return in December. The baseline readings showed the impact of student movement in the facility with spikes during high traffic times such as arrival and dismissal as expected. Once the EnviroKlenz Air Systems were deployed, the spikes leveled off, and the monitoring area was able to maintain PM 2.5 levels at or below the EPA national standard when that was not the case before deploying the EnviroKlenz Air Systems.

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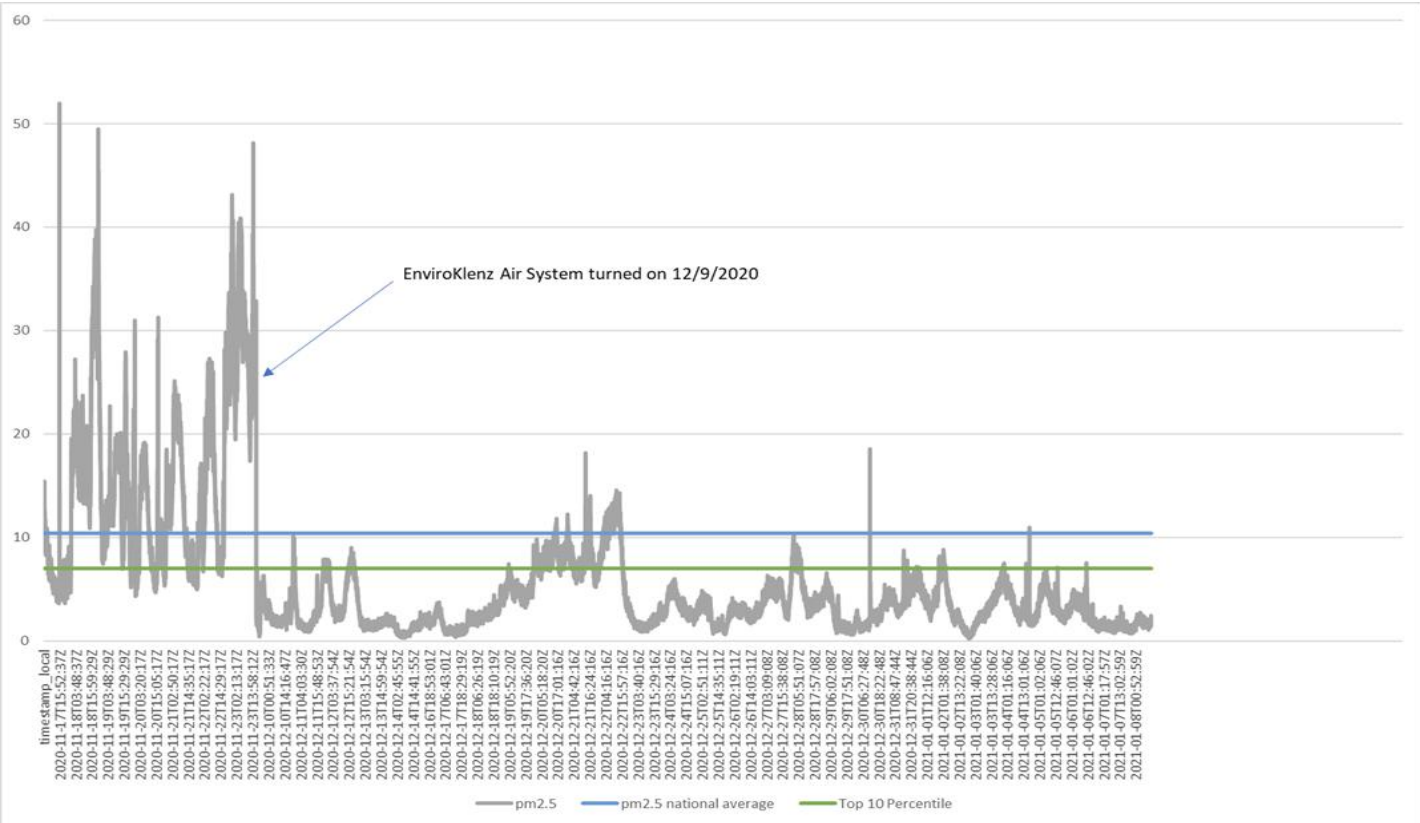
New Jersey School

COMPARISON TO NATIONAL AVERAGE

The data in this graph shows the air quality of a school in New Jersey that was running an EnviroKlenz Air System. You will see that **the EnviroKlenz Air System Plus was able to maintain PM 2.5 levels at or below the EPA national standard.**

The blue line represents the **National Standard** and the green line represents the **top 10 percentile**.



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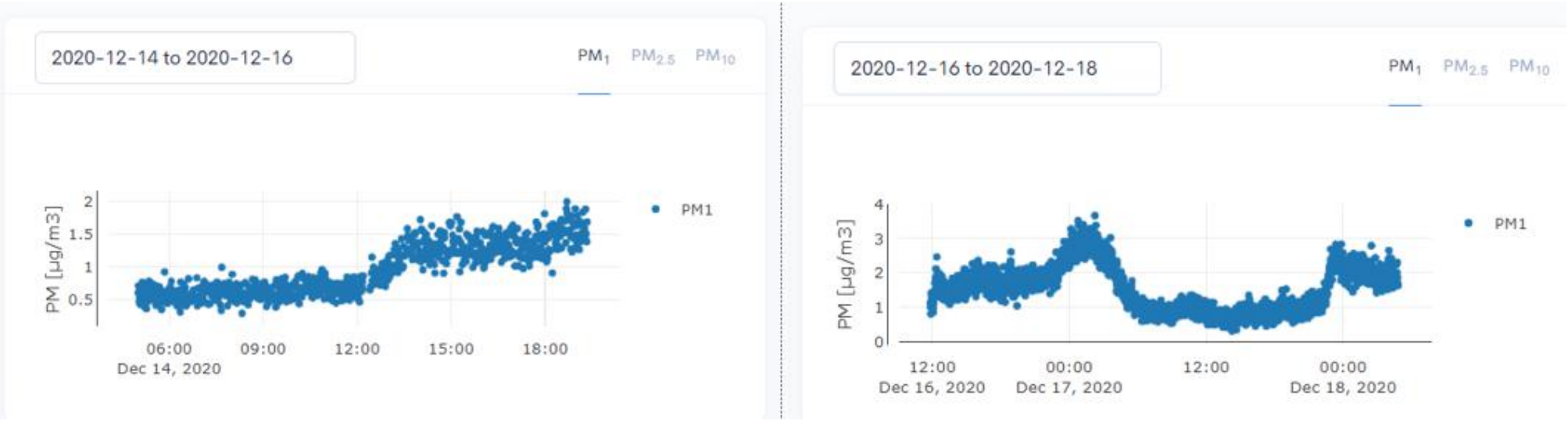
New Jersey School

THE RESULTS

12/14/20 - 12/18/20

• The EnviroKlenz Air System Plus managed to impressively keep PM1 levels below 4ug/m3 and consistently held PM1 levels under 2ug/m3.



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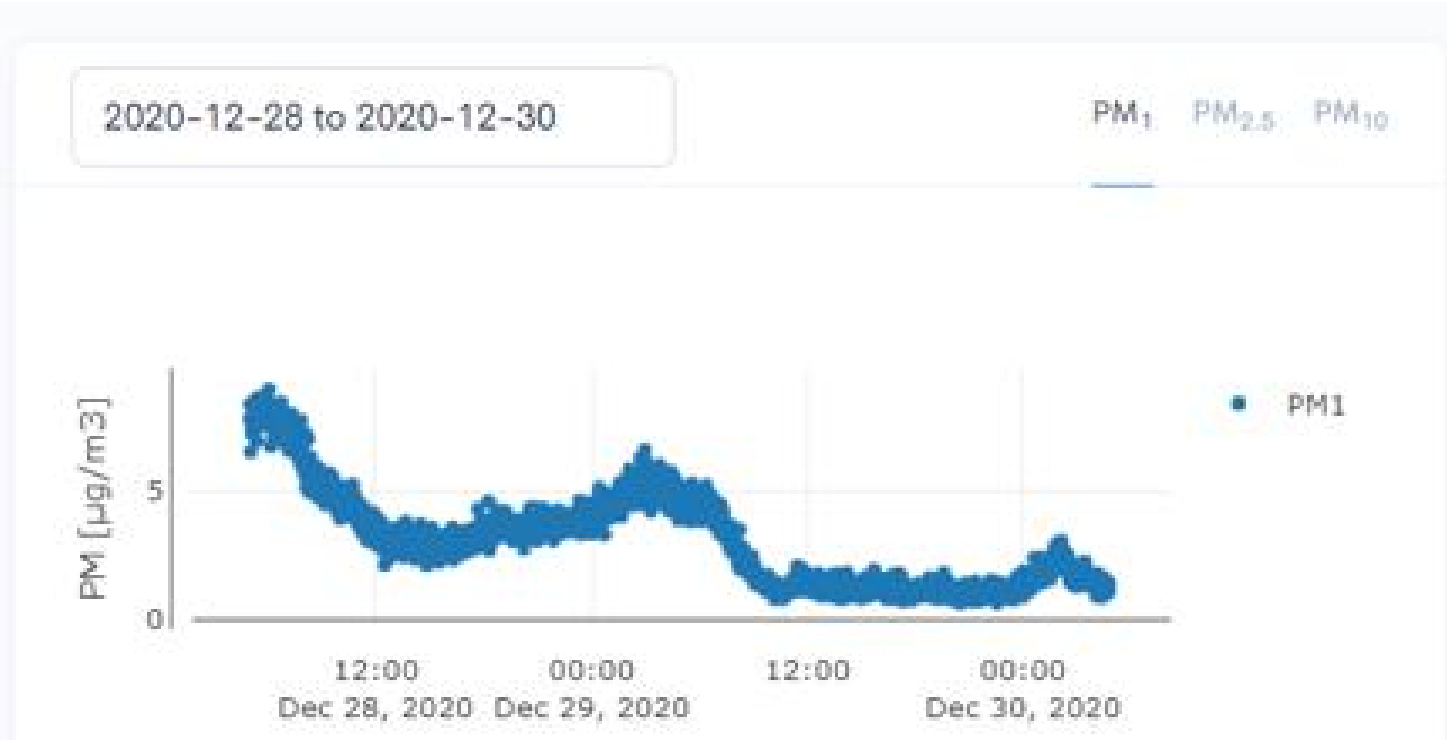
New Jersey School

THE RESULTS

12/28/20 - 12/30/20

- The EnviroKlenz was shut off on the weekends and at night.
- Data shows the quick PM1 reduction to baseline following the weekend and mornings.
- By mid-week, levels were under 2 ug/m3.



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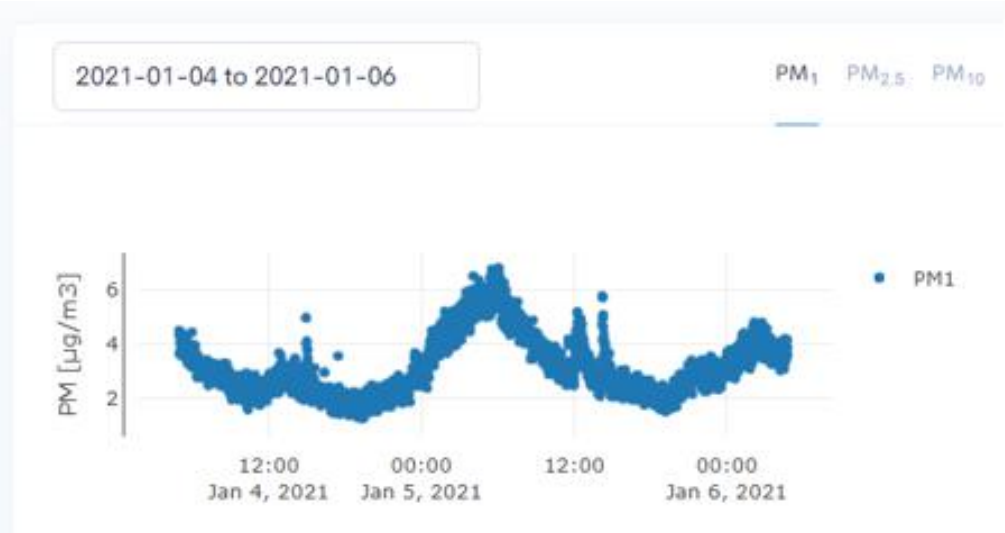
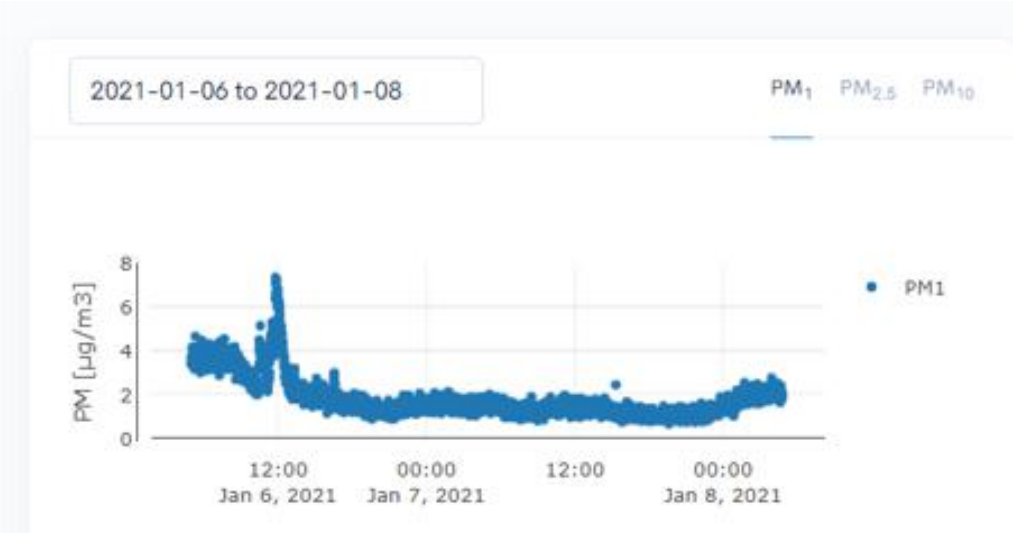
New Jersey School

THE RESULTS

01/04/21 - 01/08/21

• Due to increased activity following the holidays, PM1 levels were slightly elevated, but still stayed below 6ug/m3 and was under 4ug/m3 by mid-week.





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Massachusetts Dental College

Indoor Air Quality Case Study

EnviroKlenz®

Massachusetts Dental College

TEST DETAILS

Testing Period: 12/16/20 - Present

Setting: 1,000 square foot operatory with 10 ft high ceilings. High-aerosol producing and non-aerosol producing procedures were performed throughout the testing

Equipment Used: (1) EnviroKlenz Air System Plus and (1) Quant-AQ commercial-grade aerosol measurement instrument. Readings were captured in the ranges of PM10, PM2.5, and PM1(sub-micron-sized)

Running Time: The EnviroKlenz Air System Plus is run only during class hours, typically on low

Monitor status: Kept on throughout testing period

Observation: Spikes can be seen during procedures, but the EnviroKlenz Air Systems impressively keep levels under 10 {ug/m3}

The EnviroKlenz Air System Plus was deployed at a dental college as a supplement to capture aerosolized matter during procedures. The facility already had excellent air quality, but the systems were deployed to mitigate pathogens during procedures to prevent them from circulating in the air. The EnviroKlenz Air Systems were turned on before a procedure and were allowed to run during and after quickly capturing confined area particulates and aerosolized matter.

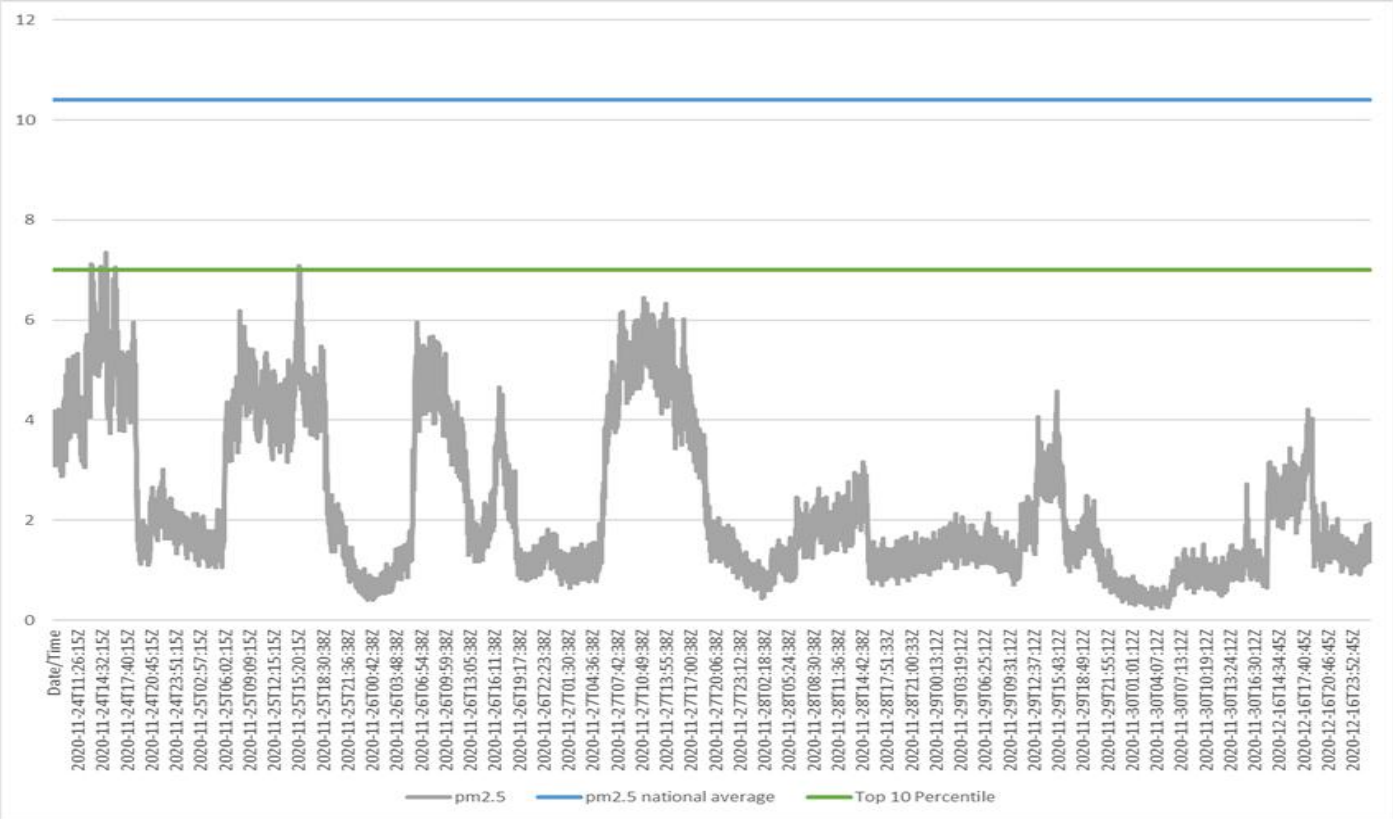
EnviroKlenz®

Massachusetts Dental College

COMPARISON TO NATIONAL AVERAGE

The data in this graph shows the air quality of a dental college in Massachusetts that was running an EnviroKlenz Air System. You will see that the EnviroKlenz Air System kept the PM2.5 particulates **below the national top 10 percentile for over 95% of the time the system was running.**

The blue line represents the **National Standard** and the green line represents the **top 10 percentile**. With the EnviroKlenz Air System Plus, this classroom consistently exceeded the air quality standards of the top 10%.



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Massachusetts Dental College

THE RESULTS

12/17/20 - 12/19/20

• Data was still collected on weekends while the **EnviroKlenz Air System Plus was turned off** and classes were not being held.

• Despite the lack of students and procedures, **PM1 levels increased to over 10 {ug/m3}**

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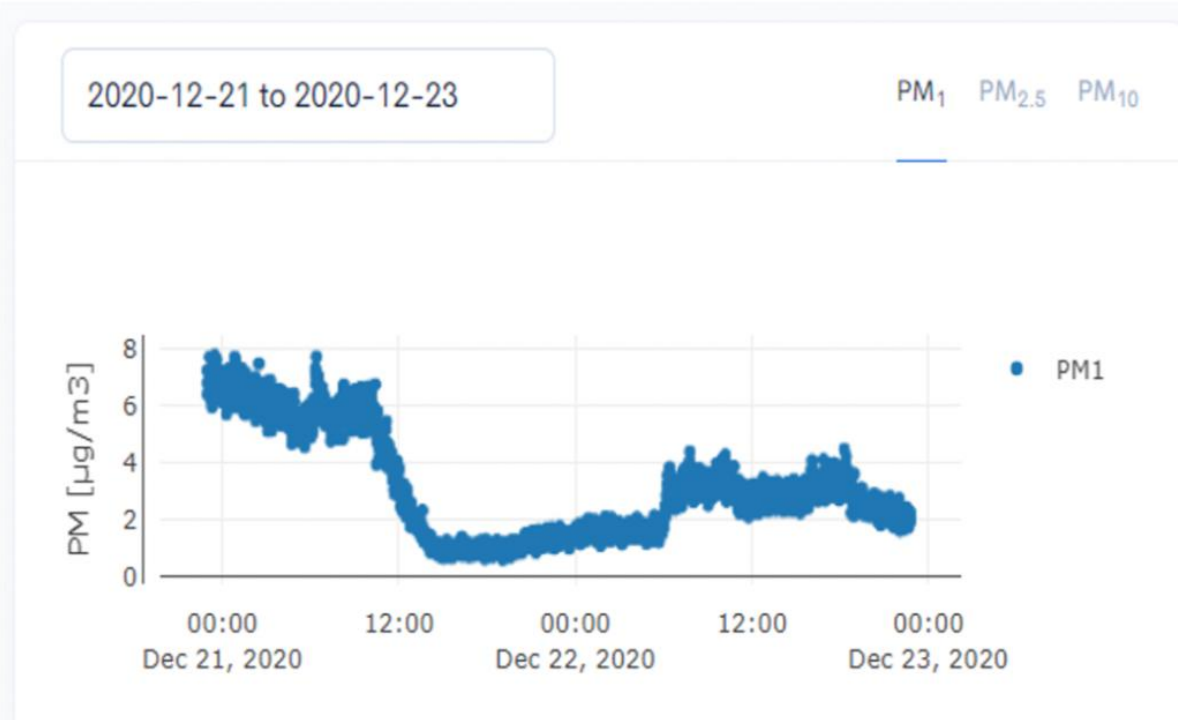
Massachusetts Dental College

THE RESULTS

12/21/20 - 12/23/20

• The EnviroKlenz was turned on Monday morning at the start of classes.
• Starting particulate levels were baseline during weekends when the EnviroKlenz is off and few students are present.
• Once the EnviroKlenz® Air System was turned on, the **particulate levels quickly began to decrease**; even with classes being held.
• Even during aerosol producing activities, **little to no spikes occurred.**



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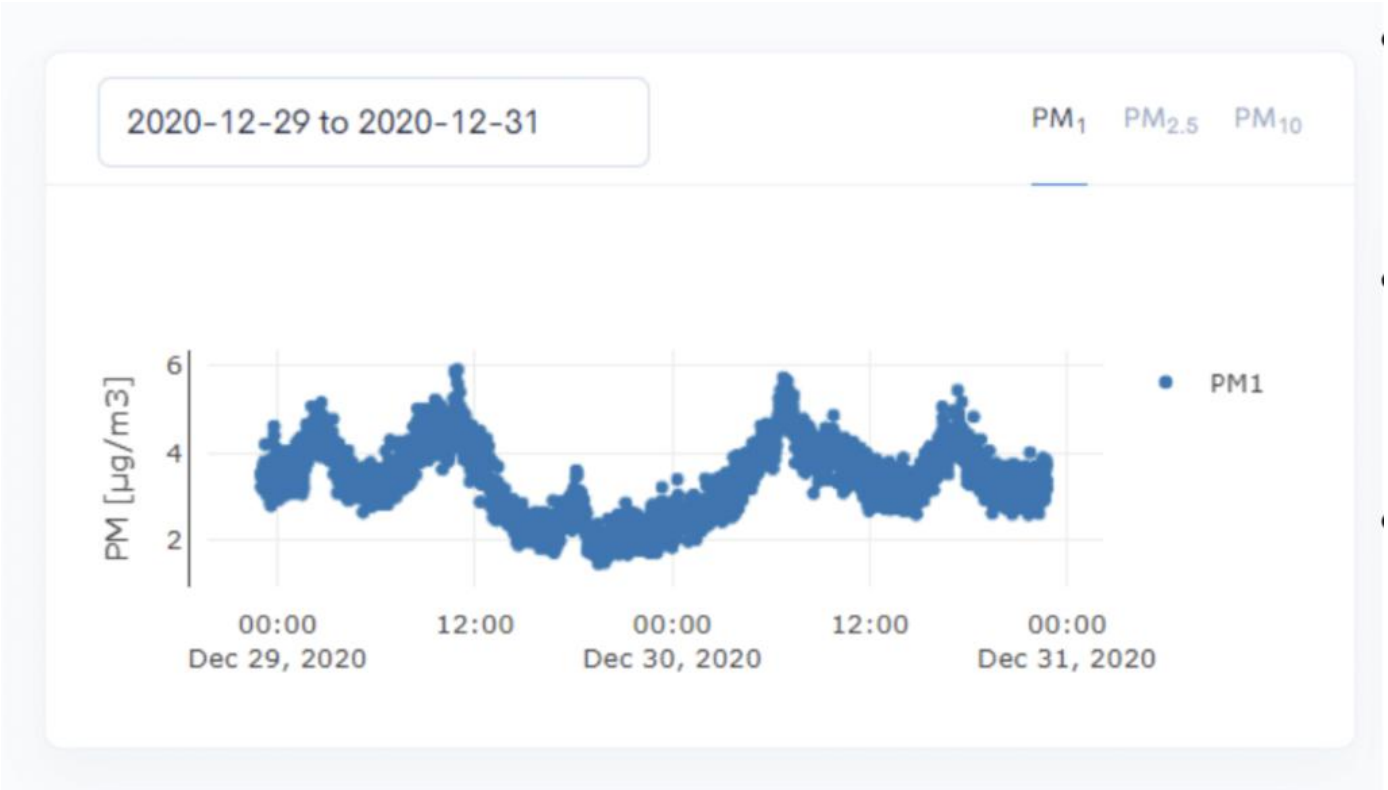
Massachusetts Dental College

THE RESULTS

12/29/20 - 12/31/20

- Data was collected during the week to particulate levels after baseline had been achieved
- Different procedures, including **aerosol** and **non-aerosol** activities, were performed.
- Despite the presence of students and procedures, **PM1 levels stayed below 6 {ug/m3}**



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Public School in the Midwest

Indoor Air Quality Case Study

EnviroKlenz®

Public School in the Midwest

TEST DETAILS

Testing Period: 11/19/20 - Present

Setting: 1,000 square foot classroom with 10 ft high ceilings.

Equipment Used: (1) EnviroKlenz Air System Plus and (1) Quant-AQ commercial-grade aerosol measurement instrument. Readings were captured in the ranges of PM10, PM2.5, and PM1(sub-micron-sized)

Running Time: The EnviroKlenz Air System Plus is run only during school hours.

Monitor status: Kept on throughout testing period

Observation: Increase, or spikes, were observed at higher traffic points of the day when students were more likely to be entering, moving, or leaving the facility.

At a midwestern city urban school, the air systems showed a steady overall decrease in particulate matter (PM 2.5) over a 2-week monitoring period. The building did have central heating and air in this site that helps steady air quality readings with air exchange. Increase (or spikes) were observed at higher traffic points of the day when students were more likely to be entering, moving, or leaving the facility.

The EnviroKlenz Air System helped keep the air quality higher than the EPA national standard for 2.5 particulate matter, and much of the time in the top 10 percentile. This illustrates the benefit of supplemental air systems that can capture and mitigate a broad array of environmental contaminants as they enter or are stirred up the air space without needing to circulate fully out of the room with air exchange.

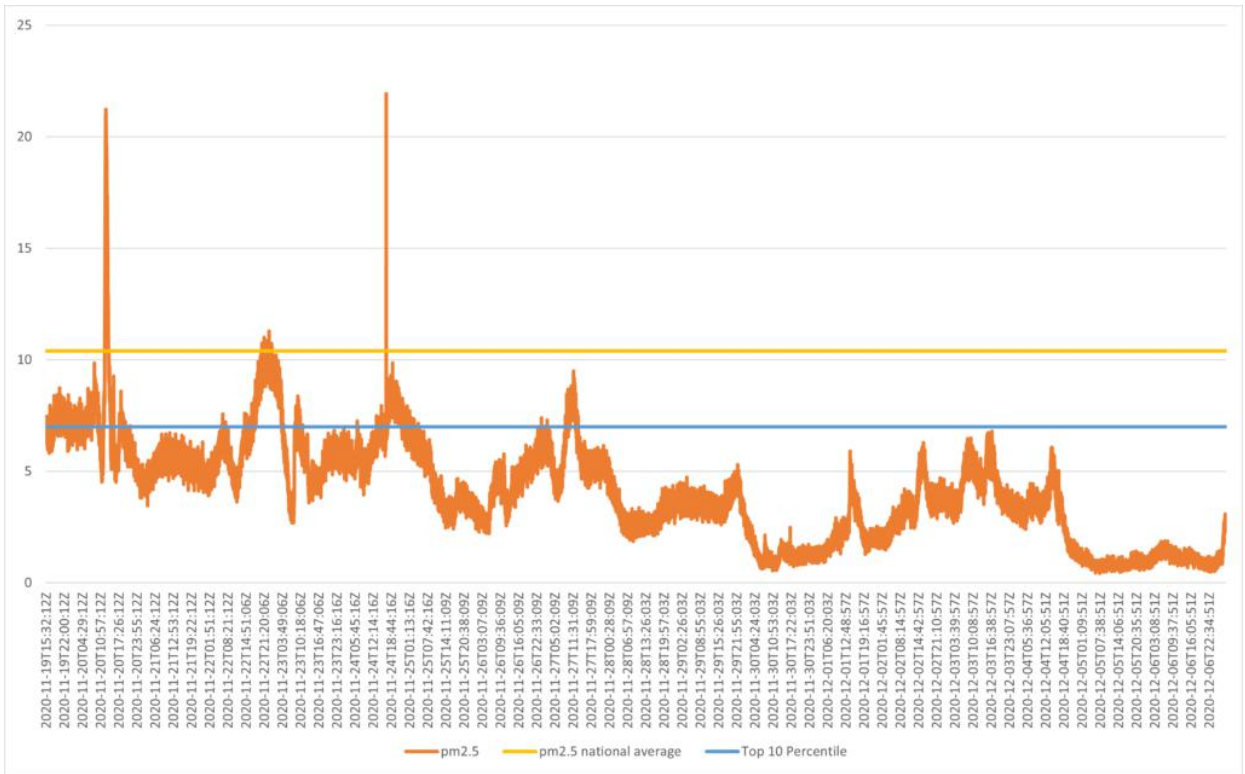
EnviroKlenz®

Public School in the Midwest

COMPARISON TO NATIONAL AVERAGE

The data in this graph shows the air quality of a midwestern urban school with the EnviroKlenz Air System. You will see that the EnviroKlenz Air System kept the **PM2.5 particulates below the EPA national standard and much of the time, as time progressed, in the top 10 percentile.**

The yellow line represents the **National Standard** and the blue line represents the **top 10 percentile**. With the EnviroKlenz Air System Plus, this classroom consistently exceeded the air quality standards of the top 10%.



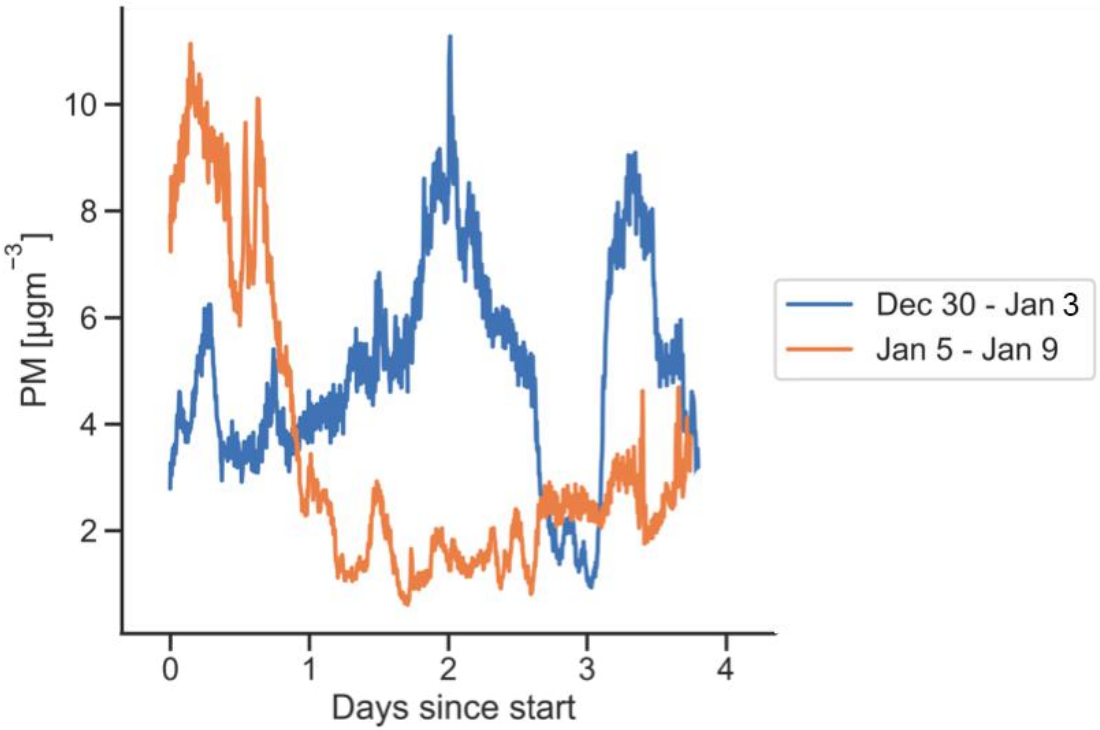
EnviroKlenz®

Public School in the Midwest

THE RESULTS

EnviroKlenz vs. Competing Carbon Technology
12/30/20 - 01/09/21

• The orange line represents an EnviroKlenz Air System Plus and the blue line represents a competing carbon air purifier. Both are rated for the same amount of square footage and CFM.
• The **EnviroKlenz Air System Plus is able to quickly remove the PM1 particulates** and remain near a steady-state over four days, while the **competing carbon system struggled to retain the particulates taken in** and displayed many peaks and valleys throughout the four days.



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