

KPS FACILITIES' RESPONSE TO COVID-19

When the onset of COVID-19 created a challenge for indoor environments across the world, Kalamazoo Public Schools (KPS) immediately began responding to the challenge in March of 2020. TowerPinkster's engineers, specializing in HVAC, were hired to assess each KPS facility and make recommendations for corrections and improvements to every building's heating, ventilation, and air conditioning (HVAC) system.

TowerPinkster's engineers assessed the condition, deficiencies, and attributes of the mechanical HVAC systems in every facility by focusing on evaluating each air system including the functional operation, increased ventilation ability, building purge feature, and improved air filtration.

1. Functional Operation

KPS operates 34 buildings containing more than 1,000 air systems. TowerPinkster took a systematic approach to the evaluation of the air systems serving every classroom and building. Beginning with the elementary schools, deficiencies were identified that could impact indoor air quality and safety given the pandemic. As issues were identified, work orders were generated to improve functional operation.

2. Increased Ventilation

TowerPinkster made recommendations to increase indoor air quality by increasing the quantity of outdoor air that is pulled into every occupied space. This provides a dilution effect reducing the likelihood of virus transmission.

3. Building Purge

To remove contaminants that occupants may bring into a building such as viruses, KPS implemented a daily pre-occupancy purge and post-occupancy purge of building air. This strategy is focused on removing airborne viruses from occupied spaces.

4. Improved Filtration

TowerPinkster recommended increasing the filtration for every air system to the level that captures 90% of particles 1 micron and larger; MERV 13 [Minimum Efficiency Reporting Value] filters achieve this. To complement the filters, bipolar ionization devices were installed in all KPS buildings and busses.

Summary

The strategies above comprise the engineering controls KPS implemented before the 2021-2022 school year to mitigate virus transmission. They are meant to complement the CDC's recommendations for vaccinations, masking, quarantining, and contact tracing. TowerPinkster and KPS strive for continuous improvement, including further virus mitigation strategies such as installing HEPA filtration.

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**Bipolar Ionization device
concealed within HVAC equipment.**



**Wall-Mounted air purifier,
located based on HVAC needs.**

It is important to know that viruses do not typically exist in the air alone, rather, they are attached to particles or droplets in the air. Bipolar ionization devices produce both positive and negative ions. When these ions travel into the occupied space, they charge particles and droplets in the air, which in turn makes the particles and droplets more likely to attract each other to form larger particles. It should be noted that the point of bipolar ionization is NOT to kill the virus, rather to make the virus particles larger and more effectively caught in the filters.