MSU Air Quality Initiatives 2020-2021

Based on CDC and ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) ventilation guidance, MSU's efforts have/ are focused on increasing fresh (outside) air flow within buildings to reduce as much as possible recirculation of internal air, rigidly maintaining regularly scheduled filter changes (quarterly) on all systems, installing/ and further-planned installations of UV light disinfection and bipolar ionization devices in air handling units [$2.0M], and enzyme treating to the heat transfer coils within building HVAC systems [$700K]. MSU HVAC specialists have increased the fresh air flow to the greatest extent possible without damaging building systems. When considering indoor temperature and humidity limits, all data is not in 100% alignment on what ranges are most effective in mitigating COVID-19, however, research indicates that relative humidity levels between 40%-60% assist in maintaining control of other existing airborne molds, viruses, and bacteria. Spaces are maintained within this range to the greatest extent possible based on an individual building's system. Likewise, UV lighting systems have not been specifically tested against COVID-19, but they have been proven effective in the deactivation of other mold, bacteria, and viruses.

Additionally, MSU (within the next 9 months) is completely replacing selected Air Handling Units in greatest need across the campus located in Mitchell, McComas, IED, Harned, Walker, Carpenter, and Allen. The new ACHs will be capable of enhanced filtration measures. [$3.3M]

Listed below are classroom buildings where UV lighting installations have either been completed, are next to be completed, or are currently in discussion for installation. The focus of this list is classroom/instructional buildings and spaces, but other common spaces across campus that are not listed below have had UV or bipolar ionization devices installed with priority determined by density of usage and a building's existing HVAC system as determined by MSU engineers.

UV Installed	UV End of October	UV Discussed Next	Enzyme Treated
OMAC	Ag & Bio	Acad. Comp. Lab	OMAC
McCool	Allen Tower	Ballew	McCool
Allen Annex	Bowen	Briscoe	Allen Annex/Tower
Library	Carpenter	Cobb	Library
Band Hall	Garner	Clay Lyle	Band Hall
Bettersworth	Giles	Herzer	Bettersworth
*McCarthy	Howell	Magruder	Hilbun
*Newell Grissom	IED	Moore	Harned
Hilbun	Landscape Arch.	Patterson	Simrall
Harned	Lloyd Ricks	Middleton	Bost
Swalm	McComas	Rula	Carpenter
Simrall	Meat Science	Thompson	Howell
Hand	Montgomery		McComas
McCain	Walker		Montgomery
*Bost			Walker
Dorman			
Thompson Annex			
Wise			
Poultry Science			
ADS			

**Non-traditional classrooom space*

Basics of Employed Technologies

Blue Box Enzyme Treatment

The coils in an HVAC unit capture microbes where they build up and become reservoirs of nasty and infectious stuff, and reduce system airflow, which makes the unit work harder to less effect. “Blue Box” treatment shoots an enzyme deep in the coils to release the biofilm, and then the technician injects a thick Chlorine Dioxide foam into the coils to complete the disinfection process.

UV Lighting in Central AHUs

UVC lamp devices are placed in central air-handling systems for the purpose of disinfection of recirculated air (and surfaces) collected from many spaces in a building. Control of bioaerosols can improve indoor air quality and thus enhance occupant health [ASHRAE 2009; Menzies et al. 2003] Ultraviolet light is of a shorter wavelength (~200nm to ~280nm) than that of visible light (~400nm to ~700nm) and devices placed in AHUs are designed to produce the optimal wavelength (~265nm) on the electromagnetic energy scale to inactivate microorganisms.

Bipolar Ionization (limited usage)

Charges oxygen molecules and converts them to charged atoms that then cluster around microparticles, surrounding and deactivating harmful substances like airborne mold, bacteria, allergens, and viruses. The charged atoms also attach to expelled breath droplets and dust particles that transport viruses, enlarging them so they are more easily caught in filters.