

UV VALIDATION OF CEC PRODUCTS

Kill Rates (There will always be 10% survival due to microbials that cant be reached past 254 nm wavelength).

Machine	Lamps	Intensity per Lamp (I)($\mu\text{W}/\text{cm}^2$)	Watts per lamp (W)	Current (mA)	Voltage (V)	UV Output (nm)/Bulb	CFM	in/s	Cross sectional area (sq ft)	Overall intensity (I)	Standard rate constant (k)	Kill chamber length (in)	Time in kill chamber (s)	Surviving fraction of initial microbial population (air sanitation) $S=e^{(-kIt)}$
UVC 1400	8	120	48	800	60	253.7	1457	131.261261	2.22	960	0.29	16	0.1218943	0.0000%
UVCO 5000	3	50	21	400	30	253.7	807	58.267148	2.77	200	0.29	8	0.13729864	0.0348%
UVHDF 2500	8	50	21	400	30	253.7	2500	125	4	400	0.29	24	0.192	0.0000%
UV Bazooka	4	50	21	400	30	253.7	400	229.226361	0.349	200	0.29	24	0.1047	0.2305%

2 bulb rack (rated @ 1m)					
lamps	2	@ 2.0 in.	surface sanitation		
Watts per lamp (W)	26	ASHRAE standard	Minimum exposure time (min)	13.50534933	
current (mA)	425	our lamp		7.791547692	
Voltage (V)	60				
UV output (nm)	253.7	Surviving fraction of initial microbial population (air sanitation)			
Intensity ($\mu\text{W}/\text{cm}^2$)	65	CFM	t(s)	$S=e^{(-kIt)}$	
cross sectional area sq ft	2	1500	0.26266667	0.0050%	
kill area length (in)	39.4	2000	0.197	0.0595%	
ASHRAE Standard lamp Wattage	15	2500	0.1576	0.2628%	
k	0.29	3500	0.112571429	1.4351%	
I	130	5000	0.0788	5.1264%	



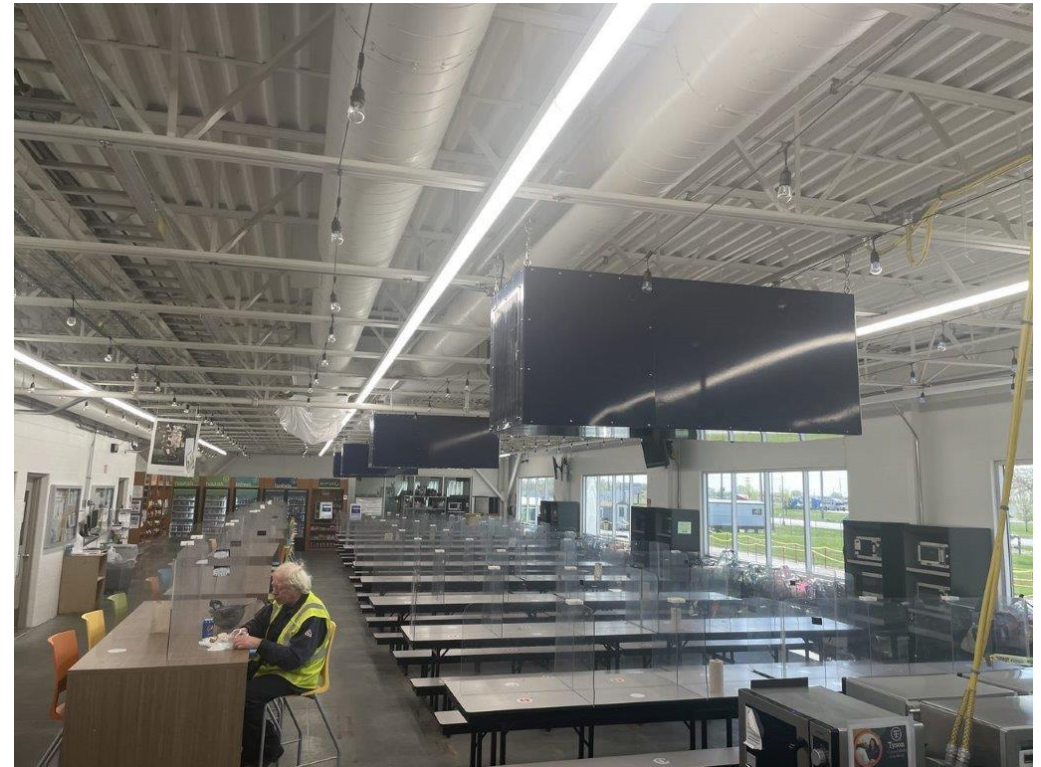
4 bulb rack (rated @ 1m)					
lamps	4	@ 2.0 in.	surface sanitation		
Watts per lamp (W)	26	ASHRAE standard	Minimum exposure time (min)	13.50534933	
current (mA)	425	our lamp		7.791547692	
Voltage (V)	60				
UV output (nm)	253.7	$S=e^{(-kIt)}$ surviving fraction of initial microbial population (air sanitation)			
Intensity ($\mu\text{W}/\text{cm}^2$)	65	CFM	t(s)	$S=e^{(-kIt)}$	
cross sectional area sq ft	4	2500	0.3152	0.0000%	
kill area length (in)	39.4	5000	0.1576	0.0007%	
ASHRAE Standard lamp Wattage	15	7500	0.105066667	0.0363%	
k	0.29	10000	0.0788	0.2628%	
I	260	15000	0.052533333	1.9044%	

Kill area is rated at 1m diameter from the bulb without filters or anything blocking light

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THE UV-C/HEPA DEVELOPMENT

In the test/development phase with Tyson, the results indicated an average bacterial reduction of roughly 320% in the locations tested within 2 days of the unit installation.



ST. FRANCIS AIR TESTING AND VALIDATION

1. CEC will collect samples prior to installation and post installation and have a 3rd party lab provide the results for the validation at our expense. For the Tyson prototype tests, they were astonished at reduction of mold and bacteria so quickly. That is what set them up to mandate the systems in all their plants. Since the prototype units, we have upgraded the systems to HEPA Filtration offering even more protection with the use of our products.
2. CEC would like to propose initiating a testing program where we work with a science class (or several) to do testing on a regular basis to further validate the effectiveness of the machines within the school throughout the year.
3. With constant testing and validation, the administration will have the data to assist in decisions as far as masking, social distancing, etc. as we continue to live through the pandemic.
4. This could be a showcase feature for the school as a recruiting tool spotlighting the continued efforts to do forward thinking in addressing issues as they develop and finding solutions to manage through them. Let's see it on the local news media as positives for our kids' educations.



FUNDING

- Anonymous donor to provide \$60,000
- CEC will donate 3 large machines for the gymnasium
- Provide a way to earmark funds for others to donate specifically for better air for our kids
- This could tie into the Ensuring your Future Campaign by highlighting the forethinking of this school to provide better air for our kids.
- We would love to