Questions from Mitigating Pathogen Transmission – Session One (10-21-2020)

1. When will this grant (Keeping Schools Safe Act) be available to apply?

   Response: The grant hasn't passed Congress yet but Senator Heinrich is working to get is passed with the next package. Varitec to follow up with more information once it is available.

2. How can we understand / measure the level of pathogens in the air?

   Response : This is the link that was shared from another attendee: https://www.health.state.mn.us/communities/ep/surge/infectious/airbornenegative.pdf

   This provides a really solid summary. While this summary is based on a hospital environment, our current pandemic and the future of those to come; most public facilities need to follow similar measures as a hospital. Figure 2 on page 4 provides an excellent concept of air changes required over time to clean a space. At this time there are no known commercially cost effective devices to measure pathogens / virus's in the air. We can make assumptions about the health of the air by measuring O2, IONS, Co2, Particle Count with PM1.0 device, Temperature and Humidity.)
   At this time, we do not know of a device that dynamically reads pathogen concentrations in a space. The question is, if there is a device, would it measure a defined virus or bacteria or provide a value for germicides in the air; viral, bacterial, or fungal?

3. The slide showed an energy wheel for outside air energy transfer. Will the wheel transfer the covid particulate back into the entering air air stream?

   Response: The link to ASHRAE's Epidemic Task Force for energy recovery systems offers language to this question:
   - *https://www.ashrae.org/technical-resources/energy-recovery*

4. Are we not in somewhat of a medical situation to minimize pathogens?

   Response: Yes, we are in a medical situation since we cannot predict how infected persons will react to ingestion of SARS-CoV-2; asymptomatically or critically. If we are treating ALL facilities like medical; there are many aspects that must be reviewed from Ventilation, Filtration, Pressure Control to Alternate Methods of Mitigation / Neutralization of Pathogens)

5. What is the recommended air exchanges for a medical institution? As a benchmark to compare to.

   Response:
   - *Per standard 170-2017 (Minimum Total Air Changes Hour/Minimum Outside Air Changes per Hour)*
     - *Minimum ACH Listed: Patient Corridor: 2/NR ACH*
     - *Standard Patient Room: 4/2 ACH*
     - *Single Bed Patient rooms: 6/2 ACH*
     - *Isolation Rooms – 12/2 ACH*
     - *Operating Rooms – 20/4 ACH*

6. If we commit to nighttime flush periods, that may cause issues with building temperature recovery during occupied hours in peaks and lows of cooling/heating seasons. Would we build this into the design capacities?

   Response: Yes. ASHRAE's Epidemic Task Force offers language on this.
   - *In lieu of calculating the air change rate, pre- or post-occupancy flushing periods of 2 hours (for a total of 4 hours) may be used since this should be sufficient for most systems meeting minimum ventilation standards.*
   - *To effect such a flush cycle, it would be scheduled into the BMS.*
   - *Also refer to Figure 2 on page 4: https://www.health.state.mn.us/communities/ep/surge/infectious/airbornenegative*

7. Is the unoccupied building flush 3 total air changes, or 3 changes per hour?

   Response: ASHRAE offers the language below on the Task Force Web Site
   - *Flush the building for a duration sufficient to reduce concentration of airborne infectious particles by 95%. For a well-mixed space, this would require 3 air changes of **outside air** (or 3 equivalent air changes including the effect of filtration and air cleaners) as detailed in the calculation methodology.*
   - *Air changes per hour, upon reflection, would be the air change reference.*

8. See link for AC in medical facilities (provided by another attendee): https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb2

9. What is the typical MERV rating of filters in air handling units in centralized HVAC systems?

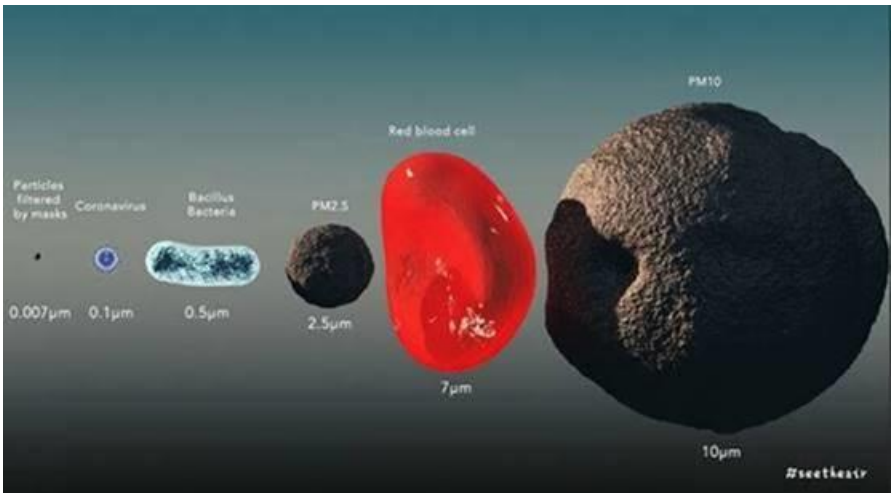
   Response: MERV 8

10. Comments on filter changes with MERV increase (from attendees):

    - *Where we have MERV 13 at APS, we find we change them 2-3 times more often than MERV 8.*
    - *11 filters were installed at our school. Should we request MERV 14. The building is 61 years old...*
      - *A: ASHRAE recommends a "MINIMUM" MERV13, but advocates for MERV14. It will depend on how old the HVAC system is as well.*
    - *We're seeing with two of our clients reduced time between filter changes to 1/2 or about 4-6 weeks in lieu of qtrly or every 3 mo..*
    - *We here at McCurdy Charter School were told that the new MERV 13 needed to be changed once every two months. as apposed to the every 3 month change with the MERV 10 we were using before*

11. Is the size of Covid the same as SARS?

    Response: COVID-19 is the name given to the symptomatic state resulting in a person infected by the SARS-CoV-2 virus. So, yes, SARS-CoV-2 is of a similar size to SARS-CoV-1 and other viruses measuring approximately 0.1 microns or 90 nanometers in size.



12. Isn't filter installation; minimizing bypass with every filter?

    Response: Filter frame sealing can result in a lot of particulate circumventing filtration regardless of a filters MERV rating.

13. There was a recent development in July by the University of Houston to come up with a heated nickel foam HVAC filter with a 99% "catch and kill" effectiveness, do you have any insight to that technology or any developments from that? https://www.uh.edu/news-events/stories/july-2020/07142020ren-covid-filter.php

    Response: Thank you for letting Varitec know. Upon initial review; this technology is in its infancy. It would appear to use some form of heating device or chemical to neutralize pathogens. Many questions left to be answered. How would the heat applied to the device affect the air stream? Would we need to add additional cooling to counteract the added heat. Right now the proven options are Both UVGI and NPBI (Needle Point Bi-Polar Ionization)

14. Why did you increase the static by 0.3" static on your 5 ton

    Response: MERV13 filtration adds approximately 0.3" wc resistance to an airstream, depending on air velocity and total air flow, when installed and clean. After the filter loads up the resistance increases and, a dirty MERV13, per Camfil/Farr, would offer two times the initial rated resistance.

camfil

High Efficiency, High-C

Performance Data

1" Nominal Depth	Part Numbers	Nominal Size (inches)	Initial Resis-tance (inches, w.g.)	Airflow Capacity (cfm)	Total Media Area (sq ft)
16 Pleats per Lin. Ft.	406769001	20x16	0.36	770	5.4
	406769002	20x20		970	6.7
	406769003	25x20		1210	8.5
	406769004	25x16		970	6.7
	406769005	24x24		1400	9.8
	406769006	20x14		680	4.7
	406769007	24x20		1160	8.1
	406769008	20x15		720	5.0
	406769009	24x12		700	4.8
	406769010	24x16		930	6.5
	406769011	25x14		850	5.9
	406769012	20x10		480	3.3
	406769013	25x25		1510	10.7
	406769014	25x18		1090	7.6
	406769016	16x16		620	4.3
	406769018	20x12		580	4.0
	406769019	20x18		870	6.1
	406769020	22x22		1170	8.2
	406769021	24x10		580	4.0
	406769022	25x10		600	4.1
	406769023	25x12		720	5.0
	406769024	25x15		910	6.3
	406769026	24x14		810	5.6
	406769027	16x12		460	3.2
	406769028	24x18		1050	7.3
	406769029	20x30		1450	10.2
	406769030	18x14		615	4.2

SPECIFICATIONS

APPLICATION	As a prefilter to higher efficiency final filters, or as a stand-alone filter for rooftops, split systems, free-standing units, package systems and air handlers.
FRAME	High wet strength beverage board
MEDIA	Synthetic
RECOMMENDED FINAL PRESSURE DROP	2x Initial pressure drop
COMMENT	Ratings: UL Class 900
MAX TEMPERATURE (°F)	175

15. How can we account for the unregulated air pressure going around the filter? In the event that we assume that not all filters are completely sealed.

    Response: I am not aware of any leakage "factor" that might be applied. Total amount of leakage will be case by case depending on air flow and velocity, the size of free area at the site(s) of the leak, the type of filter used (the more efficient the filter the more pressure drop. The more efficient the filter the higher the pressure drop across the filter and the greater the leakage rate)

16. Availability of MERV 13s is a BIG issue.

    Response: I have heard up to 12-weeks for MERV13 availability. Yet another reason we need to be depending on more than 1 method of providing clean air in our HVAC Systems