FINANCE & COMMERCE

LS BLACK CONSTRUCTORS

Why you should be talking about indoor air quality.

EXPERT FORUM

November 16, 2021 /// www.lsblack.com

Agenda

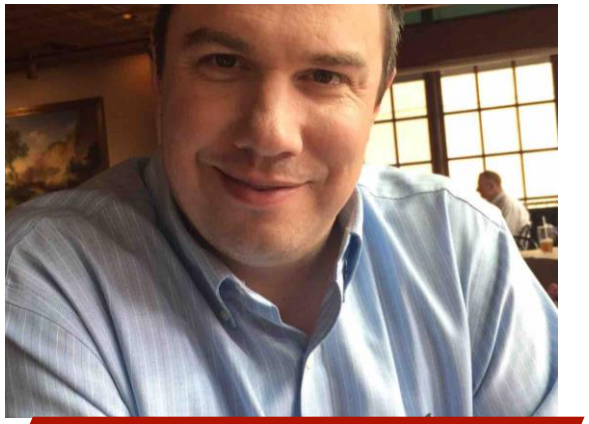
1. Introductions
2. Air quality is under the microscope due to COVID-19
    - Stats about Healthcare acquired infections (HAI's)
3. Current systems and code requirements (Bob/Eric)
    - What are we doing now to combat air quality?
4. Do surface contaminants affect your air quality? (Tom/Brian)
    - Our experts weigh-in
5. Impact of chemical disinfectants on building occupants (Tom)
6. Innovative solutions (Tom/Brian/Eric)
7. Where do we go from here and why you need to start planning now. (all panelists)

PANELISTS

Bob Dehler

Minnesota Dept. of Health

24 years of engineering experience
12 years with the State of Minnesota



Eric Krause

Allina Health

23 years of industry experience
Master Plumbing and Boiler Operators License

Tom Holm

Green Science Solutions

30+ years experience in Science and Technology

PANELISTS

Brian Evan

Wold Architects and Engineers

10+ years of engineering experience
Mechanical systems specialist

Michael Puncochar

LS Black Constructors

19 years of construction experience
7 years in the Healthcare Sector

HVAC AIR QUALITY MEASURES

- **Ventilation** – bring spaces at least up to current minimum code requirements
- **Filtration** – Consider upgrading to minimum MERV 13 filters
- Other considerations if minimum ventilation and filter requirements cannot be met:
  - **In room filtration** – HEPA air recirculation devices – increase air changes within a space

More Is Not Always Better

Stronger May Just Be More Harmful

Prevention Is As Important As Removal

We Can Do Better

We Must Be Smarter

The Power of Oxygen

Oxidant	Oxidation Potential, V
Fluorine	3.0
Hydroxyl radical (-OH)	2.8
Atomic Oxygen (O)	2.4
Aqueous Ozone (H_2O_3)	2.1
Ozone Gas ($O_{3,}$)	2.1
Hydrogen peroxide (H_2O_2)	1.8
Potassium permanganate	1.7
Chlorine dioxide	1.5
Chlorine	1.4

More Powerful – Less Contact/Dwell Time

Less Powerful – Longer Contact/Dwell Time

Ions are the Cleaners
Oxygen, UVC are the Assassins

Better Use of Existing Technology

Surface Cleaning and Disinfecting

- Urethane Floor Coatings
- Aqueous Ozone
- UV Lights
- Shoe Sanitizing (UV light/Ozone)

Indoor Air Purifiers

- Filtration - HEPA
- UV Lights
- Ionization
  - Needle Point (-)
  - Bipolar (+/-)
- Ozone-low dose
- Photocatalytic Oxidation (Hyd. Rad)
  - Advanced PCO
  - Advanced Hydrated PCO

Laundry Systems

- Aqueous Ozone
- Hydroxyl Radicals

Monitoring & Testing

- ATP Meters
- IAQ Sensors

INNOVATIVE SOLUTIONS & CONTROL STRATEGIES

- **Ultraviolet Lights** – coil disinfection and airstream disinfection
- **Bi-polar Ionization** – newer technology, not much data regarding effectiveness outside of lab conditions.
- **Aqueous Ozone**
- **Air Quality Monitoring**

- **Control Strategies**
  - Time of day scheduling – 2-hour pre and post occupancy flush
  - CO2 reset – disable so as not to reduce ventilation during light occupancy conditions
  - Occupancy sensor ventilation reset – disable occupancy sensor control that limits ventilation

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