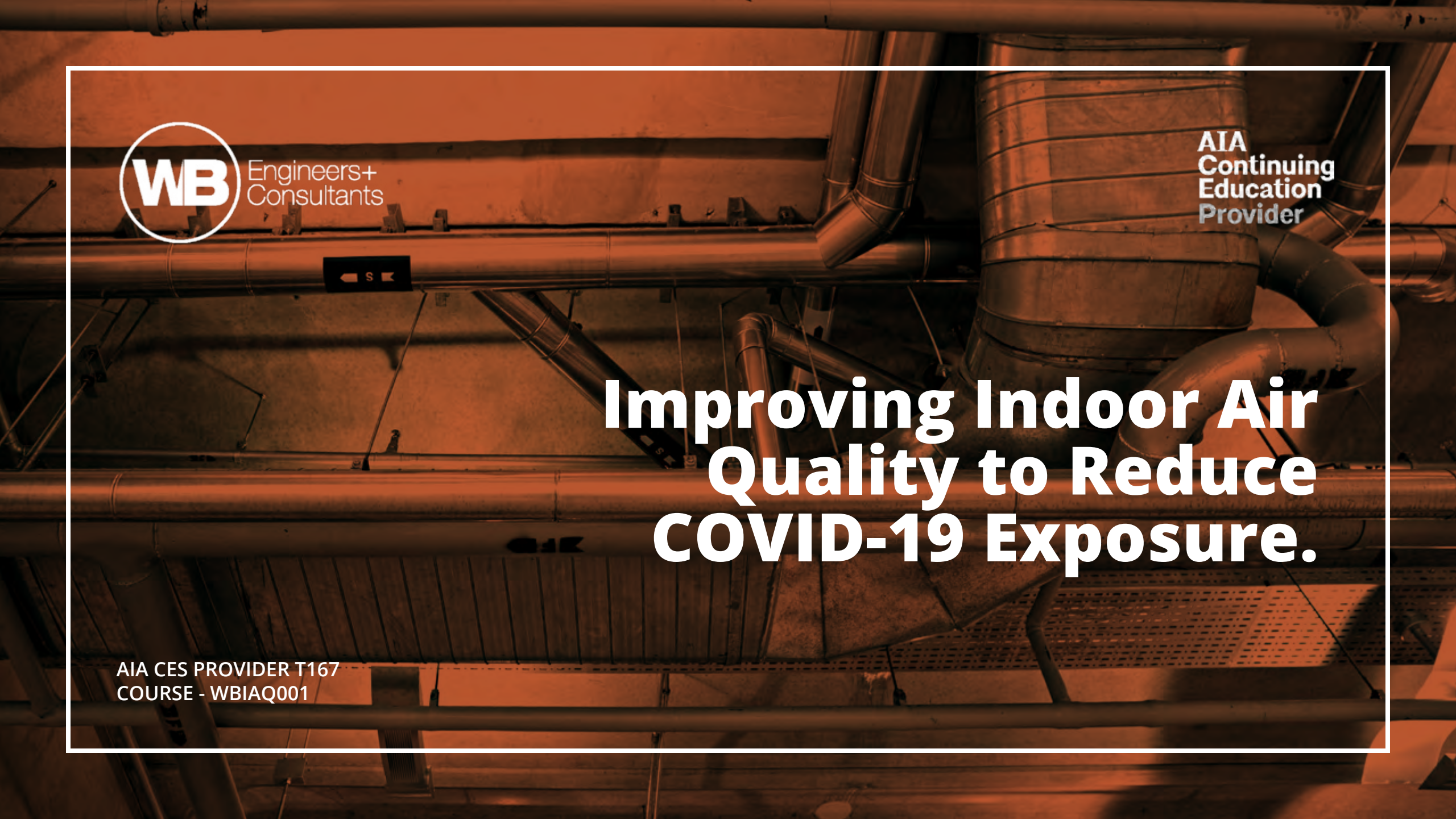

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Improving Indoor Air Quality to Reduce COVID-19 Exposure.

AIA CES PROVIDER T167
COURSE - WBIAQ001

Housekeeping items

- WB Engineers is a registered AIA approved provider
- Sign in to receive AIA CES course credit
- Certifications of completion are available upon request

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Learning objectives

- Understand what buildings can and should do to reduce potential exposure to COVID-19
- Explain short-term solutions for MEP systems, including maintenance for plumbing systems, electrostatic cleaning, and dilution ventilation
- Understand long-term systems MEP system modifications, including MERV filters, UVGI, PCO, ionization systems and humidification
- Explore costs for various solutions

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Hope is not a strategy.

Executive Summary

+ Increase Fresh Air

+ Increase Airflow in the Building

+ Increase Filter Efficiency

+ Possibly Add Active Mitigation (UV-C lights or Electronic Air Cleaners)

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Dilution Ventilation

Flush out the bad and bring in the clean.

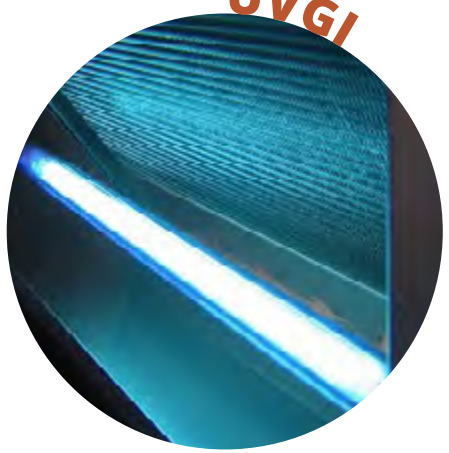
Dilution Ventilation

What's the cost?

What buildings should consider in the **long-term** to limit occupant's potential exposure to viruses.

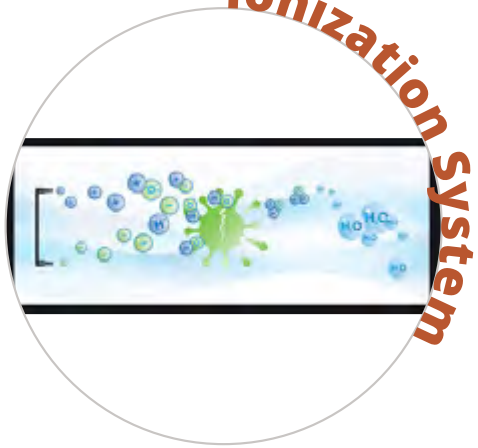
Filtration

UVGI



PCO

Ionization System

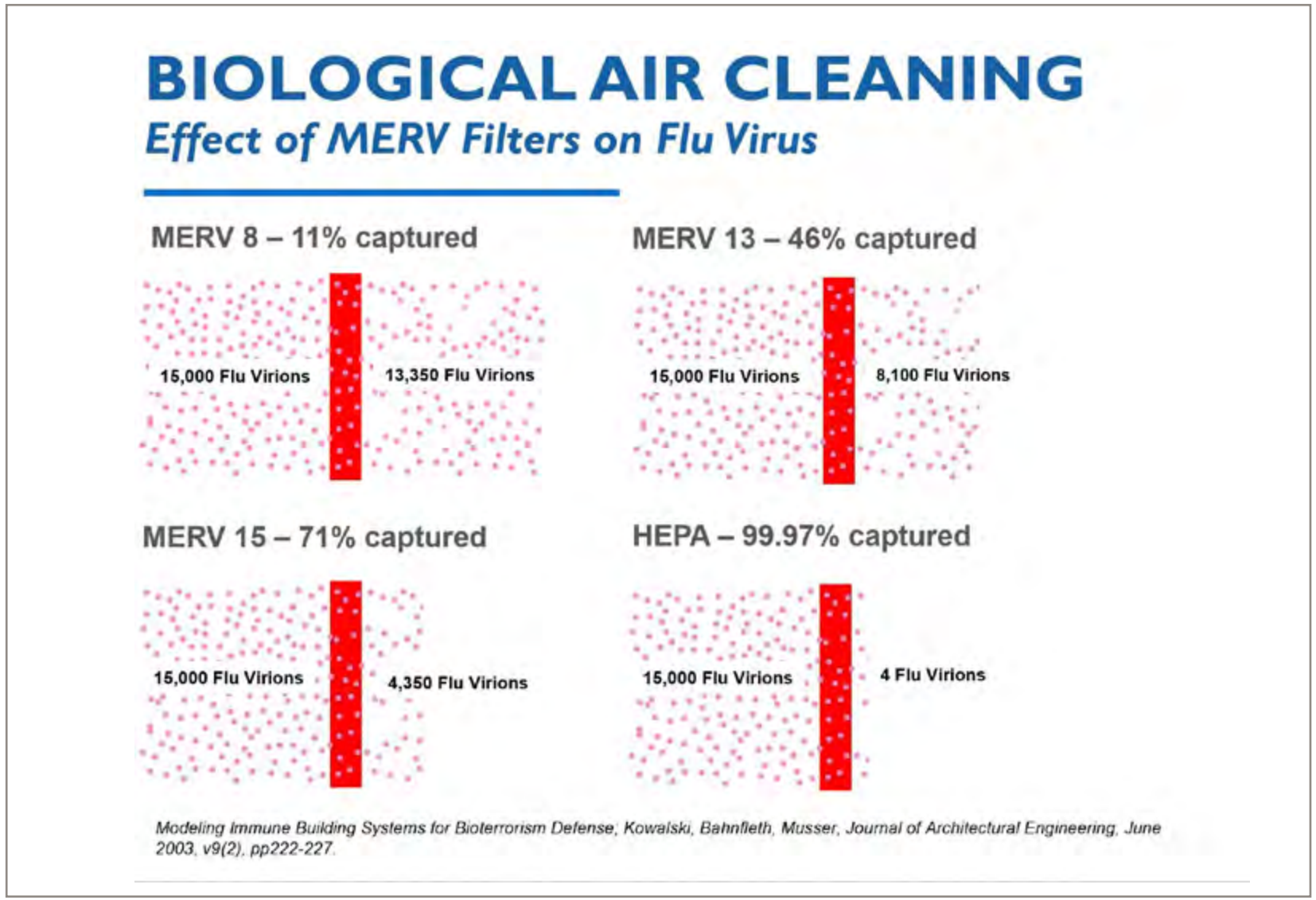


Humidification

Filtration

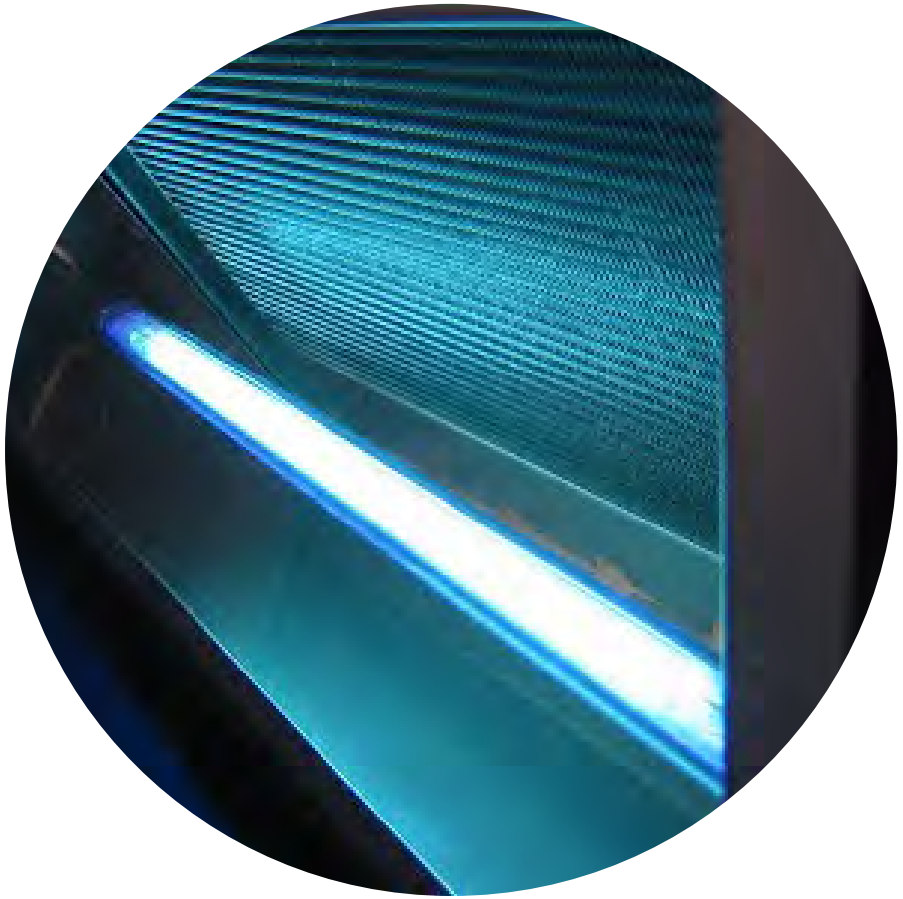
First line of defense.

Filtration


BIOLOGICAL AIR CLEANING
Effect of MERV Filters on Flu Virus
MERV 8 – 11% captured
15,000 Flu Virions
13,350 Flu Virions
MERV 13 – 46% captured
15,000 Flu Virions
8,100 Flu Virions
MERV 15 – 71% captured
15,000 Flu Virions
4,350 Flu Virions
HEPA – 99.97% captured
15,000 Flu Virions
4 Flu Virions
Modeling Immune Building Systems for Bioterrorism Defense, Kowalski, Bahnfleth, Musser, Journal of Architectural Engineering, June 2003, v9(2), pp222-227.

UVGI

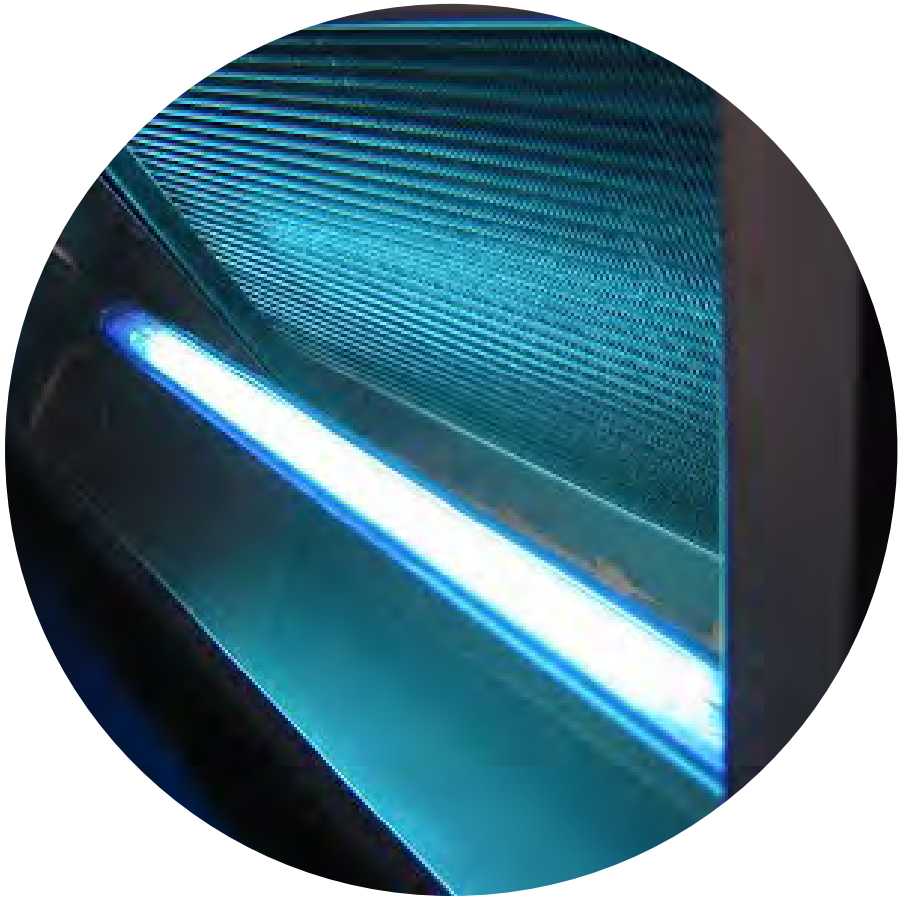
(ultraviolet germicidal irradiation)



Kills what it catches.

UVGI

(ultraviolet germicidal irradiation)

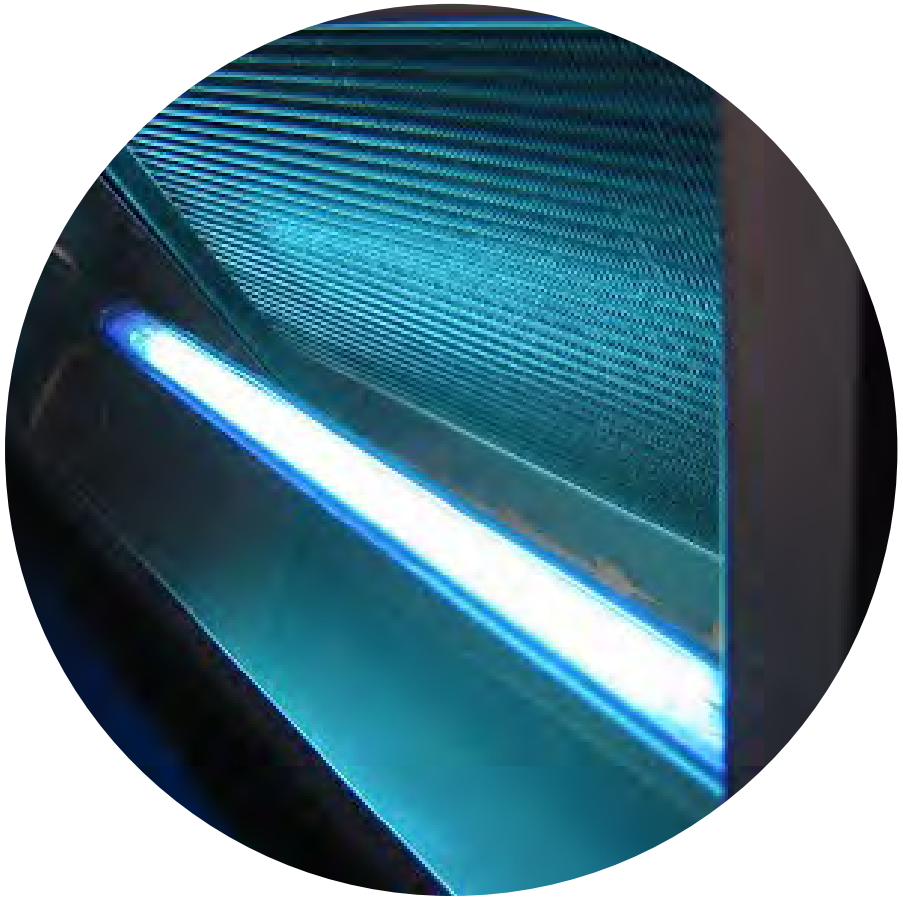


Options

Concerns

UVGI

(ultraviolet germicidal irradiation)

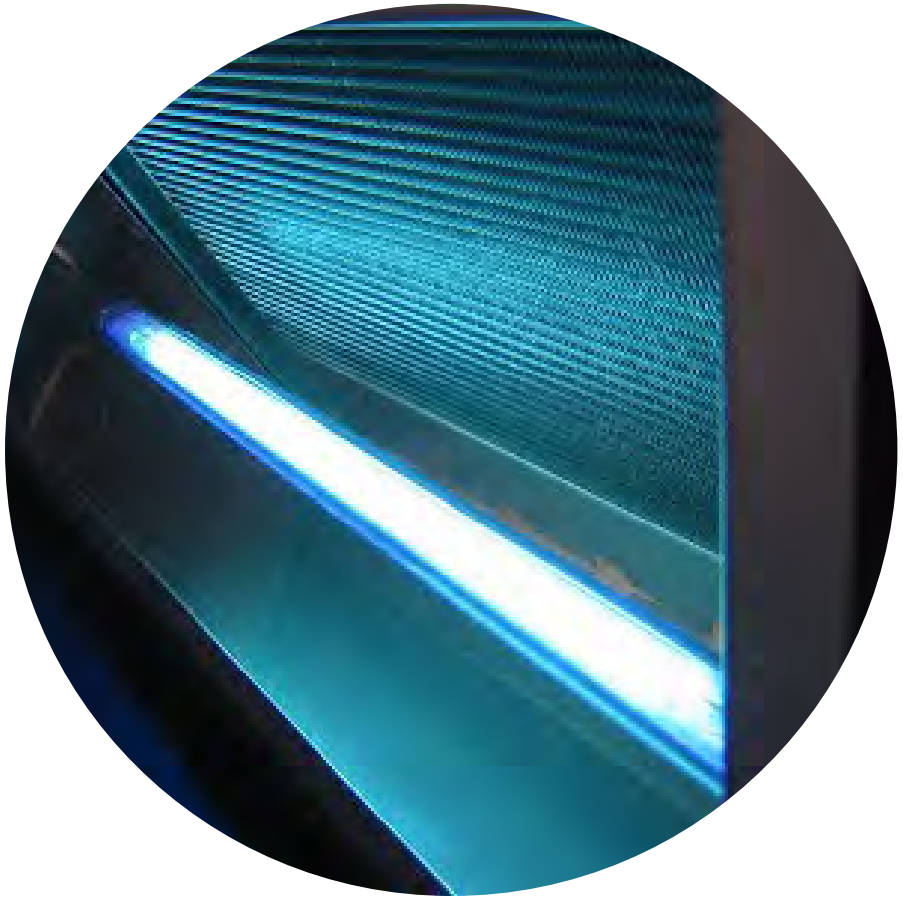


Incorrect design and installation is dangerous and ineffective

Protect the People

UVGI

(ultraviolet germicidal irradiation)



Cost

What's the cost?

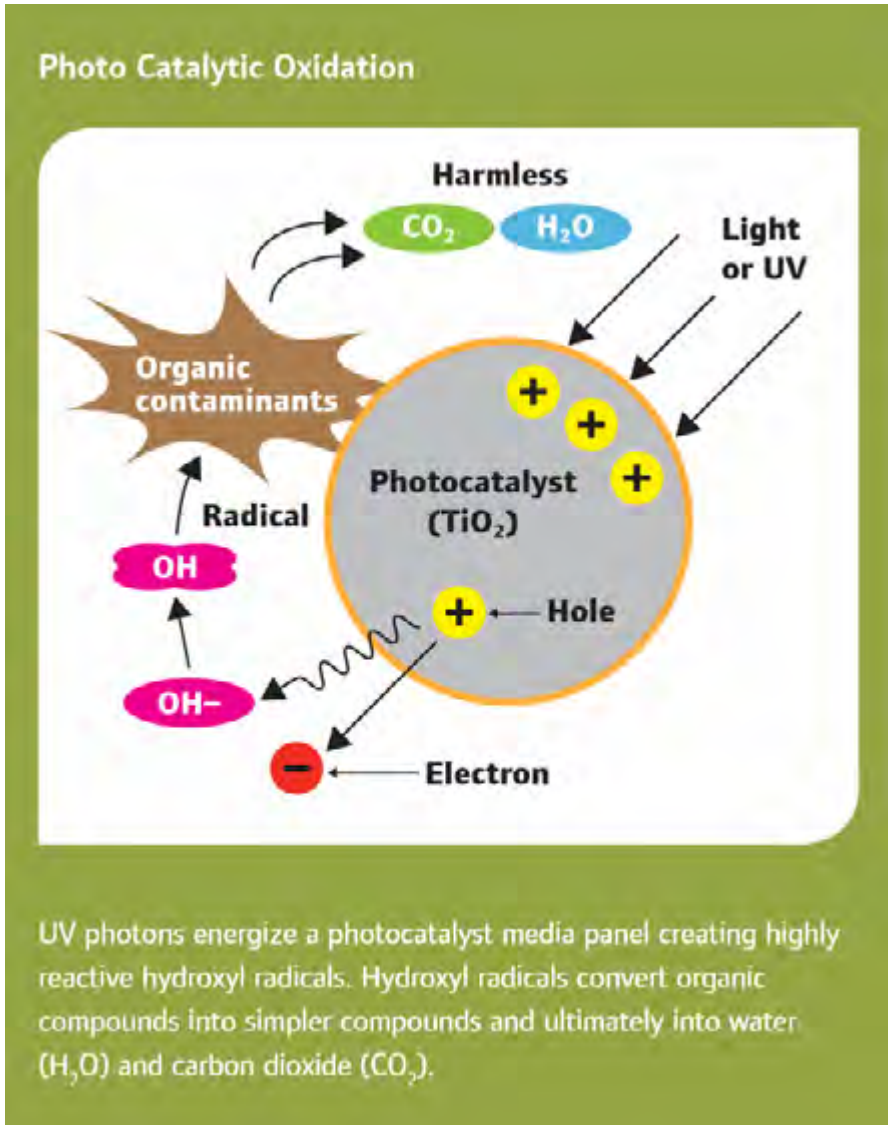
PCO

(photocatalytic oxidation)

PCO reduces airborne virus, biologic and VOCs with every volumetric air change through the system.

PCO

(photocatalytic oxidation)



PCO

(photocatalytic oxidation)

Options

Concerns

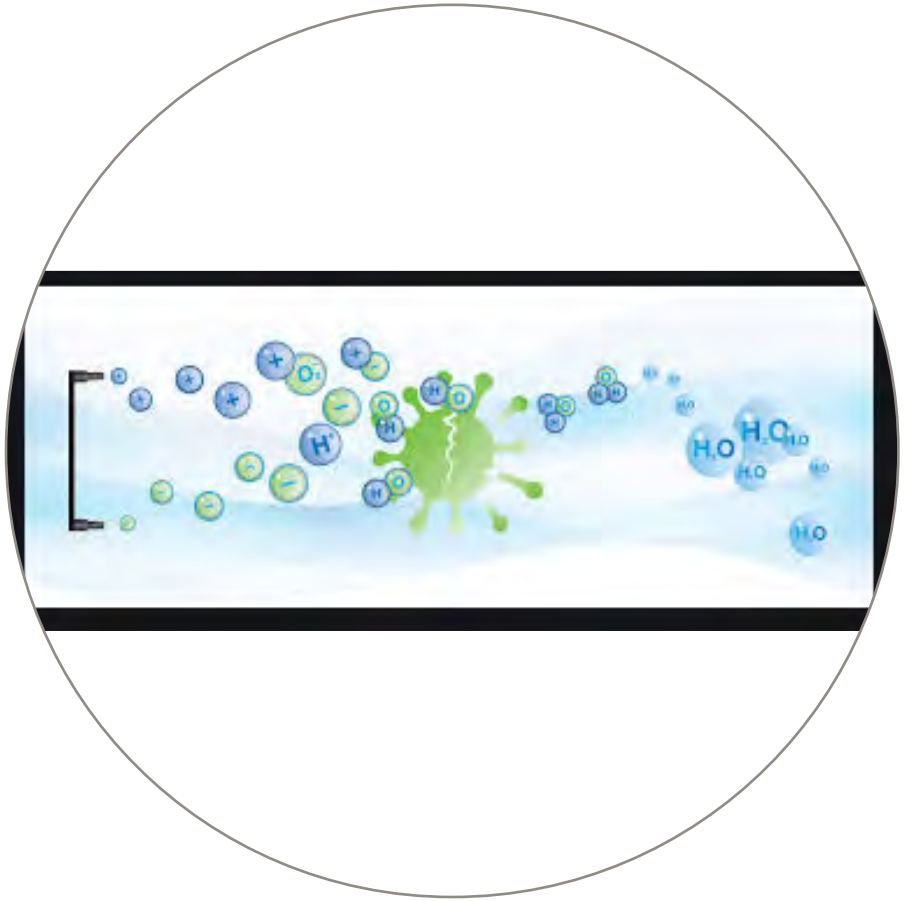
PCO

(photocatalytic oxidation)

Cost

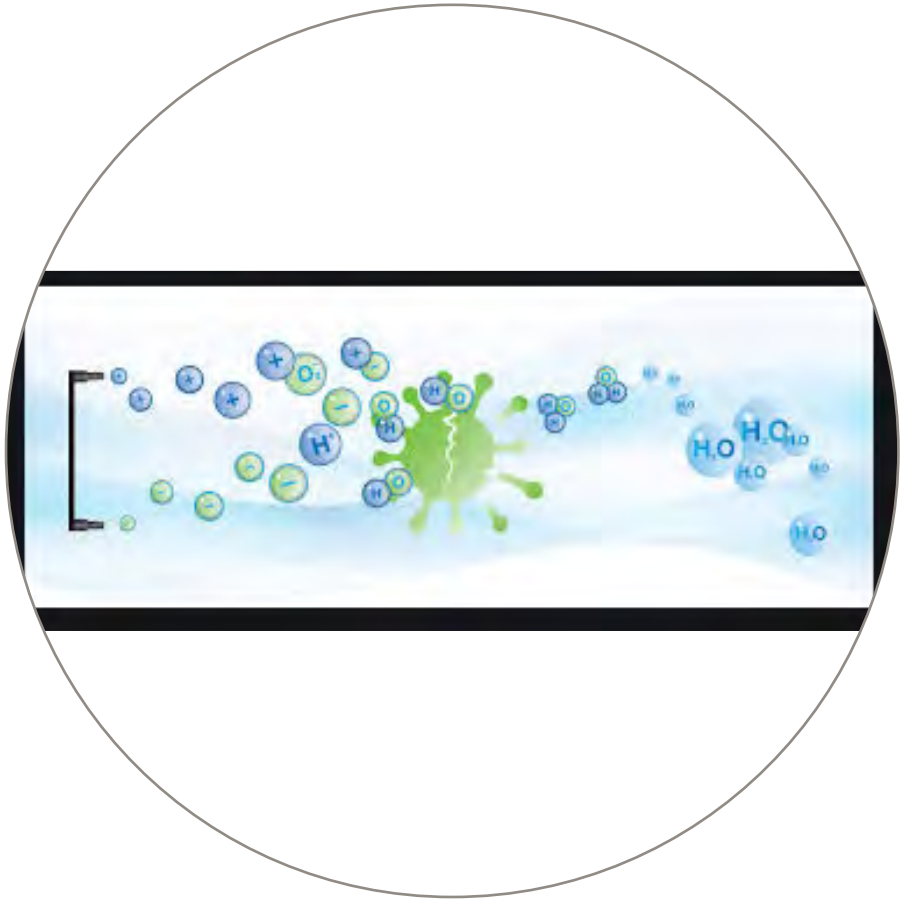
What's the cost?

Ionization System



Creates ionized particles.

Ionization System



Options

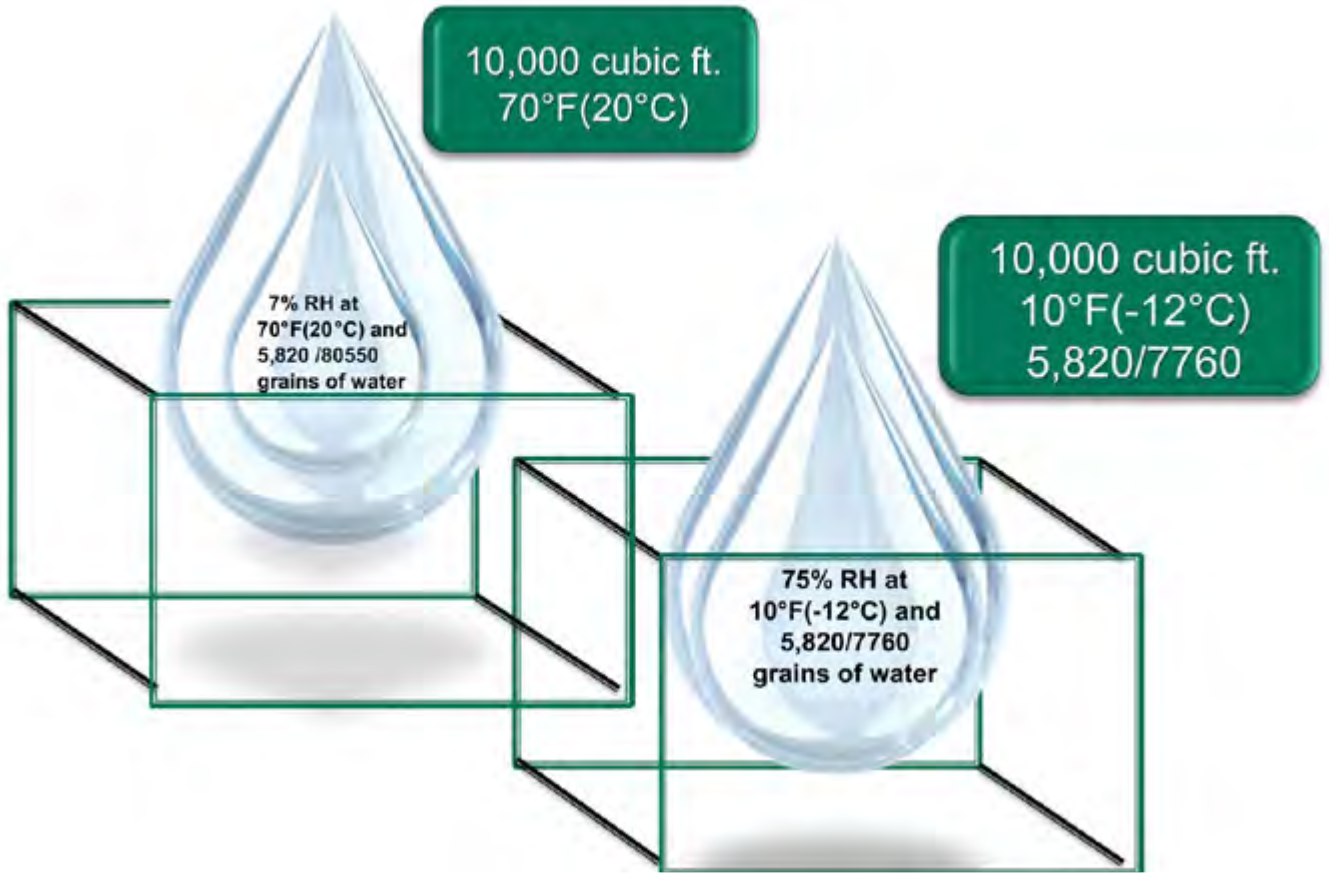
Concerns

Humidification

Reduces airborne transmission from person to person.

Humidification

How does warm air hold more moisture?



Humidification

Options

Concerns

Impact to productivity and occupant satisfaction.

Cost to double ventilation rates
$40/person/year

Productivity benefits
$6,500/person/year

MEP options are subjective and will vary greatly in cost and approach, dependent on both the existing systems in the building and any new systems to be introduced.

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