A Post-Pandemic Guide for Determining the Proper Air Cleaning Technologies for Your Facility

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Air Cleaning Options

- Passive Cleaning
  - –Introduction of Outside Air
- Active Cleaning
  - –Filtering and Technology
- Combination Cleaning
  - –Best of Both Worlds?

Passive Cleaning (Outside Air)

- Pros
  - Easy to Achieve if HVAC has Dampers
  - Nearly All Commercial Equip Has It
- Cons
  - Requires Heavy Filtration and Frequent Changes
  - Reduction of Supply Air
  - Equipment Must Be Running for it to Work
  - Increased Energy Consumption
  - Difficult to Control Humidity

Active Air Cleaning Options

- HEPA Filtration
- MERV Filtration
- Bi-Polar Ionization (BPI)
- Ultraviolet Germicidal Irradiation (UVGI a.k.a. UV-C)

HEPA Filtration for COVID

- Pros:
  - Less Initial Hardware Expense Than other Technologies
  - Captures Small Airborne Particulates
  - Reduction in VOCs
  - CDC Recommended
- Cons:
  - Difficult to be Added to Existing HVAC Equipment
  - Extended Run Times on Equipment Required for Effectiveness
  - Decreased CFM at Equipment, causing:
    - Inefficient HVAC Equipment Operation
    - HVAC Equipment to be Replaced More Frequently
  - Higher Consumable Costs (Frequent Replacement of Filters)
  - Must perform a Test and Balance to Accommodate for the Dramatic Pressure Reductions
  - Must be used with other technologies

MERV13+ Filtration for COVID

- Pros:
  - Easily Deployed if Proper HVAC Filter Frame is in Place
  - Less Initial Hardware Expense than Other Technologies
  - Captures Small Airborne Particulates
  - Provides Surface Disinfection in HVAC Equipment
  - Reduction in VOCs
- Cons:
  - Extended Run Times on Equipment Required for Effectiveness
  - Decreased CFM at Equipment, causing:
    - Inefficient HVAC Equipment Operation
    - HVAC Equipment to be Replaced More Frequently
  - Higher Consumable Costs (Frequent Replacement of Filters)
  - Must perform a Test and Balance to Accommodate for the Dramatic Pressure Reductions.

Bi-Polar Ionization / H_2O_2 for COVID

- Pros:
  - Latent Benefit for Odor Control
  - Potential Latent Benefit for CO_2 Reduction
  - Provides Surface Disinfection in HVAC Equipment
  - Reduction in Some Hydrocarbons?

Bi-Polar Ionization / H_2O_2 for COVID

- Cons:
  - Lack of Peer Reviewed Data. Does it Really Work?
    ASHRAE specifically says “Convincing scientifically-rigorous, peer-reviewed studies do not currently exist on these emerging technologies; manufacturer data should be carefully considered.”
  - Extended Run Times on Equipment Required for Effectiveness
  - May Create Ozone (O_3) [technology dependent]
  - Increases Oxygenated VOCs Downstream
  - Continual Maintenance (Ionization Probes Must Be Kept Clean)
  - Only Breathable Zone Effectiveness
    and this is not well described in the peer review literature

UVC for COVID

- Pros:
  - Many Peer Reviewed Studies
  - Recommended by ASHRAE, FDA, CDC, NIH, WHO
  - Has Been Used for Decades in the Medical World
  - Easily Deployed (Many Applications are ‘Drill-n-Fill’)
  - Low Maintenance (Easy Lamp Replacement)
  - Works for Air Cleaning
    - Bench, translational and practical data available
  - Works for Surface Cleaning in Unoccupied Rooms
  - Provides Surface Disinfection in HVAC Equipment
  - No Ozone (O_3) Production (requires 254nm light)
  - Best Long Term ROI

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UVC for COVID

- Pros:
  - Odor Control when Combined with TiO2 Filtration
    - TiO_2 well supported by peer reviewed literature
  - Inactivates COVID and all COVID Variants
  - Kills Black Mold
  - Inactivates Cold and Flu Viruses
  - Kills Legionnaire's Disease
  - Kills Coli and Staphylococcus
  - Kills Salmonella
  - 99.9% to 99.9999% Effectiveness
  - Studies Indicate Better Employee/Student Attendance (not sick as often)
    - Controlled studies available from commercial settings

UVC for COVID

- Cons:
  - Not All UVC Products are the Same (Buyer Beware!)
  - Not Safe for Direct Viewing
  - Higher Initial Investment
  - Requires Evidence-Based Approach for Efficacy
  - ‘Radiation’ Stigma

UV-C for COVID with NetX

- Network Thermostat Controls with UV-C
  - NetX Controller can be Added to NetX Thermostats
  - NetX Controller:
    - Resides on NetX Remote Sensor Bus
    - Manages UV-C Lamp Operation
    - Monitors UV-C Lamp Operation
    - Data Logs UV-C Lamp Operation
    - Alerts (email / SMS) When Lamp Needs to Be Replaced
    - Alerts (email / SMS) When Lamp is Not Working
    - Extends Lamp Life by Up To 4.5 X (Over Typical Applications)

UV-C Reference Materials

with shortened links

- **Ten scientific reasons in support of airborne transmission of SARS-CoV-2**

  t.ly/iw58

- **FDA: UV Lights and Lamps: Ultraviolet-C Radiation, Disinfection, and Coronavirus**

  t.ly/ynFv

- **Coronavirus in Public Restrooms**

  t.ly/mVrk

- **CDC: Covid Data Tracker Weekly Review**

  t.ly/ilzo

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UVC Reference Materials

with shortened links

- **ASHRAE: Ultraviolet Air and Surface Treatment**

  t.ly/tKKE

- **AMCA: Ultraviolet Air and Surface Treatment**

  t.ly/4mFr

- **UV-C irradiation is highly effective in inactivating SARS-CoV-2 replication**

  t.ly/WQhN

- **Effect of ultraviolet germicidal lights installed in office ventilation systems on workers' health and wellbeing: double-blind multiple crossover trial**

  t.ly/NoBP

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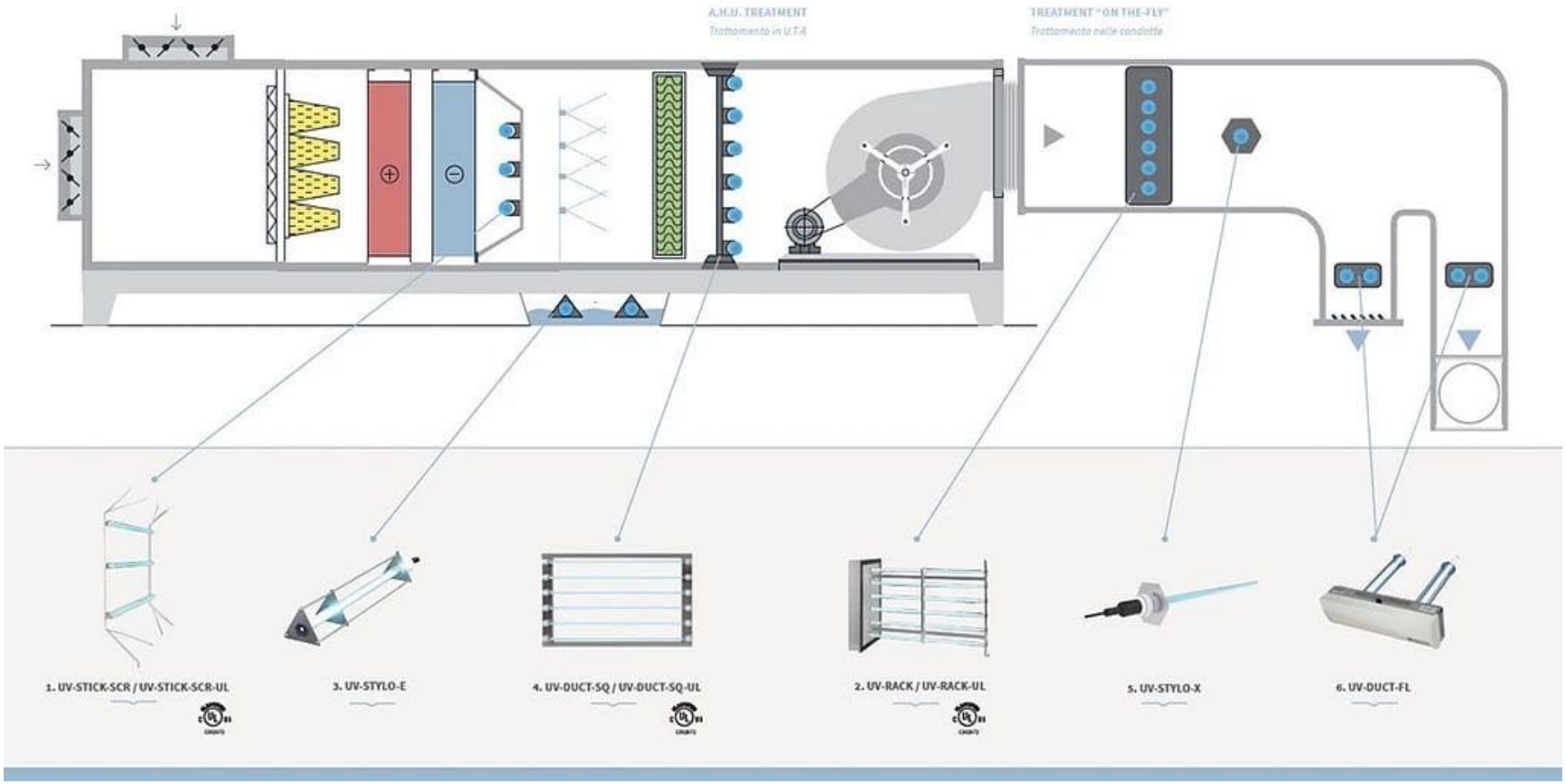
UV-C for COVID with NetX



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UV-C for COVID with NetX

UV-STYLO-X Series

- Great for Quick Install
- Mounts at Registers or in Ductwork
- Simple ‘Drill n Fill’
- For Smaller Ductwork

- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UV-DUCT-FL Series

- Great for Quick Install
- Mounts at Registers or in Ductwork
- Simple ‘Drill n Fill’
- For Medium Sized Ductwork

- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UV-RACK Series

- Mounts in Ductwork
- Simple Installation
- For Large Ductwork

- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UL-STYLO-E Series

- Great for Quick Install
- Mounts at Coil or Drip Pan
- Waterproof

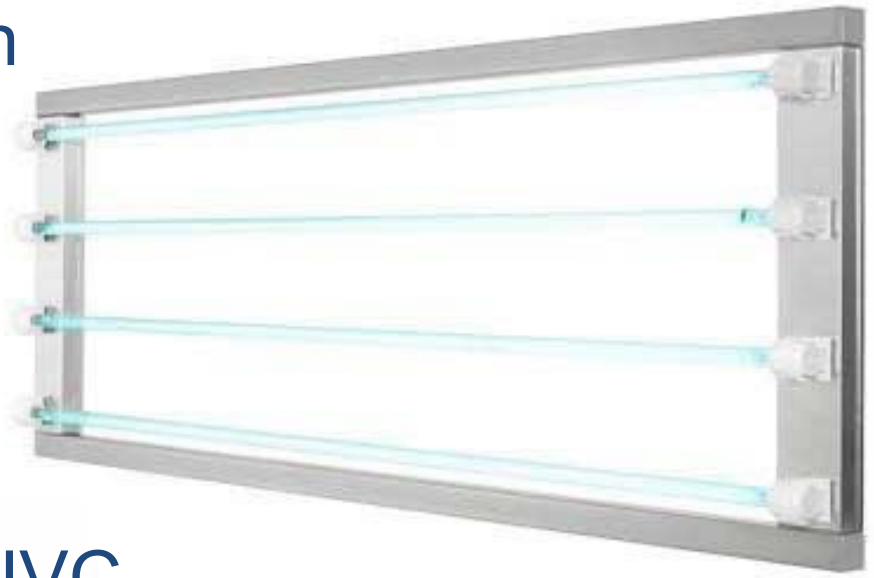
- Works with NetX NT-UVC Controller

UV-C for COVID with NetX

UL-DUCT-SQ Series

- RTU / AHU Installation
- Mounts at Coil

- For Larger Units



- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UL-STICK-SCR Series

- RTU / AHU Installation
- Mounts at Coil

- For Larger Units

- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UV-FAN Series

- In Room Applications
- Wall Mount
- Cafeterias
- Production Areas
- Storage Areas
- Food Processing Areas

- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UV-FAN Mobile Series

- In Room Applications
- Cafeterias
- Production Areas
- Storage Areas
- Food Processing Areas

- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UV-FAN-XS

- In Room Applications
- Small Areas / Rooms
- Wall Mount

- Works with NetX NT-UVC Controller

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UV-C for COVID with NetX

UV-FLOW

- In Room Upper Air Flow Applications
- Typical Mounting Above Doors
- Medical Clinics and Doctors Offices
- Several Product Variants Available

- Works with NetX NT-UVC Controller

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UV-C Cleaning with NetX

- Additional UV-C Products Available
  - Surface Disinfection
  - Water Disinfection
  - Boxes and Cabinets for Device Sterilization (medical equipment, masks, phones, etc.)

All Content Can Be Found Here!

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