How can iAIRE enhance indoor air with Filters and Ionization

December 3, 2020

Agenda

- What is happening in the market
- Air cleaning technology comparisons & test data
- What does iAIRE recommend
- Why is feedback important
- How can iAIRE provide this system enhancement
- What is offered
- Technical data
  - Submittal information
  - IOM
  - UL
  - AHRI
- Warranty
- What if Lennox wants more information or help

HVAC market concerns

- With the recent outbreak of the COVID-19, almost everyone is trying to answer some basic questions:
  - Is it safe to go back to work or to a store?
  - What do I need to do to keep my customers or employees safe?
- As recent studies are showing, COVID-19 like many viruses can be transmitted via air begging the question:
  - What do I do to make my indoor air clean?

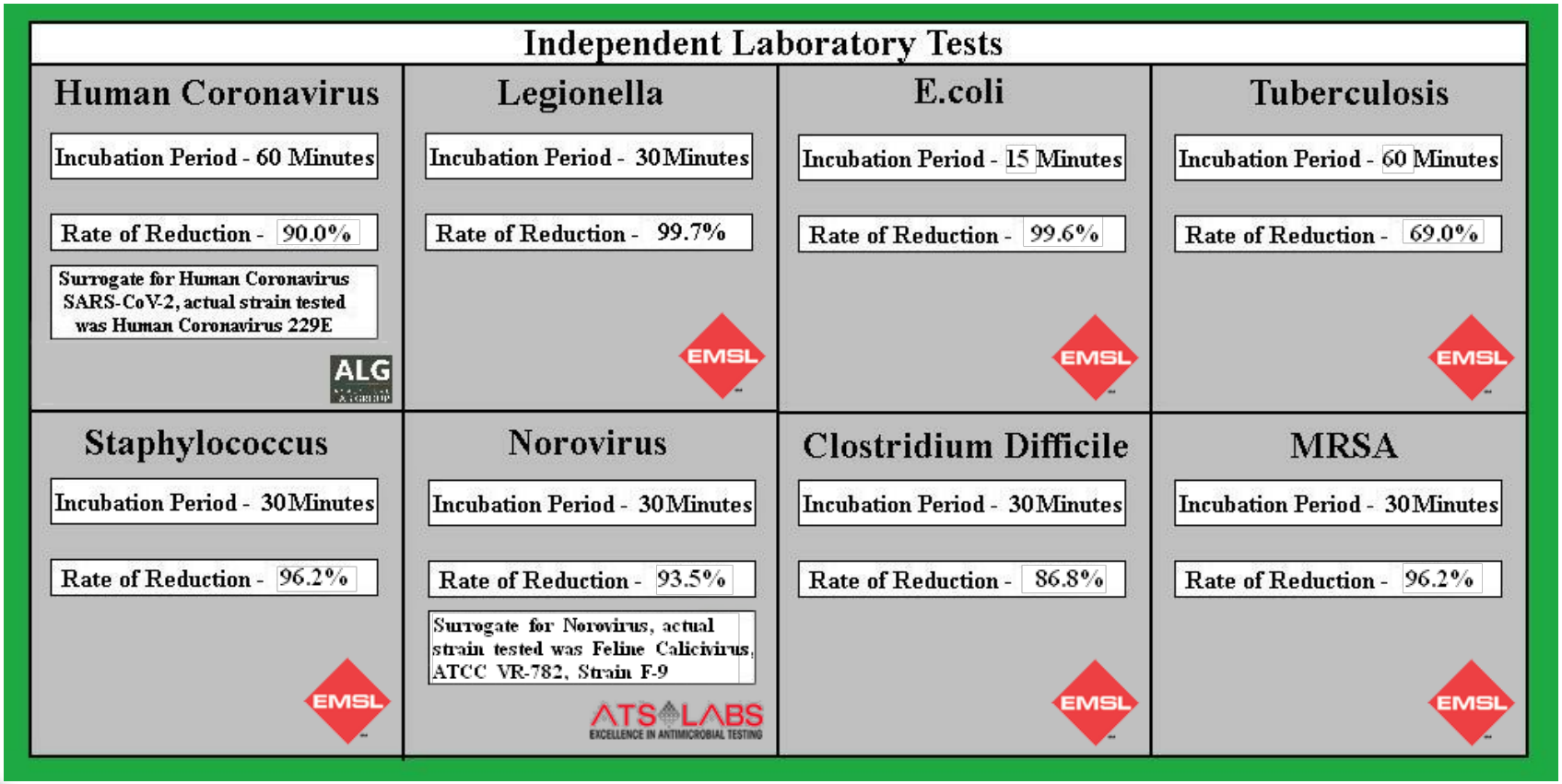
HVAC market concerns

- HEPA filtration has been the gold standard in the HVAC industry for years in making the indoor air quality as good as it can be.
  - This is what hospital operating rooms utilize.
- Recent studies have found that there are some COVID-19 particles that are smaller than what HEPA filtration can capture
- This raises the question of what technology should be used in addition to HEPA filtration
- Governor of NY says that HEPA filters are required to open malls and maybe other buildings where large groups gather

Air cleaning technologies comparison

	NPBI	Corona Discharge	HEPA Filters	Carbon B	Ultraviolet (UV)	UV-PCO	Scent Generators
Destroys VOC's	Yes	Yes	No	Captures	No	Yes	No
Reduces Airborne particulates	Yes	Yes	Yes	No	No	No	No
Kills Pathogens, bacteria, virus & germs	Yes	Yes	No	Captures	Yes	Yes	No
Treats in-room air	Yes	Yes	No	No	No	No	Yes
Produces harmful byproducts	No	Yes	No	No	Yes	No	Yes
Maintenance	When brushes go bad	2 years	Quarterly	Monthly	Yearly	Yearly	Monthly
Easy to install	Yes	No	No	No	No	No	Yes
Low total cost	Yes	No	No	No	Yes	Yes	No
Reduces Energy Cost	Yes	Yes	No	No	No	No	No
Re-engineering of HVAC needed	No	No	Yes	Yes	No	No	No
Produces Ozone	No	No	No	No	Yes	Yes	No
NPBI = Needle point bi-polar ionization - This is the method that iAIRE manufactures and sells							

Ionization Independent Test Results



Independent Test Results

- UL867
  - Electro-static Air cleaner standard
  - Low/No ozone
  - Electrical safety of unit

What does iAIRE recommend

- iAIRE is recommending that buildings install both HEPA or MERV13 filtration and ionization into every HVAC unit. These units should all allow feedback to make sure the system is working as designed.
  - This will create better air than either HEPA filters or ionization by themselves
  - This would be the cleanest air possible utilizing current technology
- iAIRE is suggesting that customers be offered a menu of choices.
  - Ionization by itself (lowest cost)
  - HEPA filtration by itself (this would include a high static fan and potentially double wall construction)
  - Ionization and HEPA filtration together with high static fans and double wall construction
- The above would be sold as either:
  - Factory installed option on new units
  - Field installed kit for building retrofits
  - Field installed kits could be for any manufacturer

Why is feedback important

- In this health-conscious environment where people are afraid to go out in public whether for leisure or work, iAIRE believes that tenants, customers and employees are going to want to know 2 things
  - Has the building owner/operator done something to improve/ensure indoor air quality
  - Does the building have a means to prove that air cleaning is being performed

Why is feedback important

- iAIRE utilizes a VOC sensor to provide feedback.
- This lets customers know if the air is clean or dirty
- Better method than just assuring ions are present in space

How can iAIRE provide a solution

- It is largely assumed that HEPA filtration cannot be added after an HVAC unit is built or installed in the field
  - The additional static that HEPA filtration creates cannot normally be overcome with forward curved squirrel cage blowers
  - The additional fan power normally requires additional electrical power at the unit that is not always present
  - If a new unit is required, the combination of a different footprint, and additional weight and power are normally not possible

How can iAIRE provide a solution

- Because of the way that iAIRE has built it's DOAS units over the last 6 years, iAIRE is in a unique position to be able to provide a field solution.
  - iAIRE has been taking a customer provided RTU or split system and modifying it into a DOAS units.
  - This process includes options like installing double wall, filter racks and changing out the supply fan for a high static/high efficiency blower when required
  - iAIRE also has our own line of ionization products that are sold and installed in DOAS units

How can iAIRE provide a solution

- iAIRE utilizes EC (electronically commutated) backward inclined blowers
  - More than 80% efficient at converting electrical to fan power
  - Belt driven blowers are normally 40 – 55% efficient
  - The difference in efficiency normally allows for a stronger motor to overcome the additional static filters that the HEPA filters bring without requiring more electrical energy for the fan

How can iAIRE provide a solution

- iAIRE found that most manufacturer's cabinets cannot handle the additional static pressure, therefore iAIRE adds structure support to keep the cabinets working as designed
- iAIRE has built various filter racks for standard units
- iAIRE has various means to provide ionization in HVAC equipment

What is offered

- Customer can choose what form of air cleaning they would like in a unit
  - Ionization only (any option with ionization would have the feedback loop to know ionization is working
  - HEPA Filters & rack only (any scenario with a HEPA filter also requires HS fan)
  - HEPA filters, filter rack and double wall construction
    - May need this to prevent fiberglass insulation from entraining in air stream
  - Ionization, HEPA filters and filter rack
  - Ionization, HEPA filters, filter rack and double wall

What is offered

- These can be offered as:
  - factory installed options
    - RTU or split system would be sent to iAIRE factory for the modification to be performed
  - Field installed Kit
    - iAIRE would provide a kit that could be installed in the field in an RTU unit. Many split systems would require additional space that would make the AHU larger and kits might not always work in the field

What is offered

ultraPURE indoor air quality solutions

FILTER / IONIZATION PART NUMBERING SCHEME

07/09/2020 v1.00

FI - 123 456 7 - 89 101112 - 1314 151617 - 18 19 20 - 21

MODEL (1,2,3)

(I.E. AB or DE)

SIZE (4,5,6)

MBTU's OR NOMINAL

VOLTAGE (7)

B - 24VAC, 1Φ
C - 115VDC
D - 115VAC, 1Φ
E - 208VAC, 1Φ
F - 208VAC, 3Φ
G - 230VAC, 1Φ
H - 230VAC, 3Φ
J - 277VAC, 1Φ
K - 460VAC, 3Φ
L - 575VAC, 3Φ

PRE FILTER SIZE (8,9)

01 - Depth of Filter (inch)
02 - Depth of Filter (inch)
04 - Depth of Filter (inch)
06 - Depth of Filter (inch)
08 - Depth of Filter (inch)

PRE FILTER TYPE (10,11,12)

M8 - MERV 8
M10 - MERV 10
M13 - MERV 13
M14 - MERV 14
E12 - HEPA 99.5%
H13 - HEPA 99.95%
H14 - HEPA 99.995%
U15 - HEPA 99.9995%

MAIN FILTER SIZE (13,14)

01 - Depth of Filter (inch)
02 - Depth of Filter (inch)
04 - Depth of Filter (inch)
06 - Depth of Filter (inch)
08 - Depth of Filter (inch)

MAIN FILTER TYPE (15,16,17)

M8 - MERV 8
M10 - MERV 10
M13 - MERV 13
M14 - MERV 14
E12 - HEPA 99.5%
H13 - HEPA 99.95%
H14 - HEPA 99.995%
U15 - HEPA 99.9995%

HIGH STATIC FAN (18)

0 - NO OPTIONS
A - HIGH STATIC ADDED

IONIZATION (19)

0 - NO OPTIONS
A - IONIZATION ADDED

DOUBLE WALL (20)

0 - NO OPTIONS
A - DW ADDED

FIELD INSTALLED (21)

0 - INSTALL
A - KIT

Submittal information

- As with other iAIRE products, iAIRE would be providing submittal information for the modification
  - This would include the following types of information based on what was ordered:
    - Electrical data on fans
    - Information on double wall
    - Information on # and sizes of filters
    - Information on ionization
    - Power requirements
    - Additional weight information
  - This data is added along with the standard unit submittal data

Installation information

- iAIRE would be putting together IOM manuals for this product.
  - iAIRE has most of this already designed for Carrier units and some York product.
  - With any other manufacturer's units, iAIRE could send one of our field techs to a unit in the field to get the data to make this kit for the unit. iAIRE would include the cost of this trip in the pricing.
    - This additional trip would not be necessary if the unit was a kit installed at the iAIRE plant. iAIRE would get the dimensions for the double wall and fan box in the plant once the unit arrives.

Warranty information

- With a field installed kit, the only warranty would be a 1-year parts warranty from the date of shipment. Since iAIRE is not installing the kit, there would be no other warranty
- If this is a factory installed option, iAIRE warranties the labor until start up the unit along with the standard 1-year warranty on the parts. Start-up being when power is first applied to unit and operation starts. Start-ups are performed by factory technicians located around the US.

UL listing

- iAIRE has a UL listing on the iAIRE DOAS units
- On modifications (including this product) iAIRE cannot provide a UL listing.
  - The way listings work, there would be hundreds of different units between all the manufacturers and the cost is too high
- In lieu of this, iAIRE adds high power wiring to meet NEC code
  - This means if you saw a high static fan wired in an iAIRE DOAS unit, you would not see wires in conduit running through the unit similar to how York would wire it's own blowers
  - In these modifications, iAIRE will run wires in conduit to meet NEC code just like a contractor would have to in the field installation to prevent an issue

AHRI listing

- If the fan electrical data is the same as or less than the fan electrical data that the base RTU/split system fan had when it was installed, the AHRI rating would still be intact

Where can I go for more information

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