FREQUENTLY ASKED QUESTIONS-VIRO8

1. What is UV-C?
The letters “UV” relates to the entire Ultraviolet spectrum. This spectrum is broken down into four frequency ranges:
• Vacuum (VUV)
• Short Wave (UV-C)
• Middle Wave (UVB)
• Long Wave (UVA)
UV-C is the frequency that is the most germicidal. Optimum damage to microorganisms occurs at 254 nanometers.

2. What is UVGI?
The term UVGI refers to Ultraviolet Germicidal Irradiation.
• Federal Agencies such OSHA, NIOSH and the CDC use the term when directly referring to the process of killing surface and airborne microorganisms.

3. What is deactivation?
Doses of UV-C energy may not cause immediate cell death but the microbe may be “deactivated”.
• Some function may still exist but replication is impossible so the organism is not viable and soon dies.
• Continuous doses over time have been shown to hasten cell death.

4. How does UV-C affect germs and mold?
• UV-C destroys a microorganism’s nucleus or DNA causing cell death or making replication (cell division) impossible.
• UV-C also degrades simple organic material at the molecular level.

5. Does UV-C work?
Yes, thousands of references to this effectiveness can be found in literature and in actual applications.
• Extended Abstract from NIOSH and the University of Cincinnati wherein UV-C was tested against the heartiest of bacteria.
• Tulsa University study conducted at the Public Service Company of Oklahoma wherein a 2log (99%) reduction of surface and airborne mold was achieved using UV-C lighting.
UV-C is used worldwide, more in other countries per capita than in the US.

6. Why doesn’t Viro8 use an anti-microbial coating on Solution AHU’s?
Anti-microbial coatings, such as AgION™, are not an effective method of deterring microbial growth.
• The life expectancy of the coating is greatly reduced because the silver ions released by the coating are catalyzed by the moisture that travels through the drain pan.
• Secondly, the coatings do not kill airborne microbes.
• Thirdly, the coatings do not keep surfaces from getting dirty. Coatings are not a substitute for regular maintenance and cleaning which are required regardless.

Filter Questions

1. Don't filters remove Microorganisms?

Not all mechanical filtration removes all microorganisms. Some filters are capable of "catching" or eliminating them from the air stream but they do not effectively "kill" the microbes.

• Antimicrobial treated filters rely on direct contact to kill the microbes. As the filter builds a layer of dirt on it, this direct contact is eliminated and the microorganisms will not be affected by the chemical treatment.

• Treated filters will not accomplish the task of eliminating the growth on the coil and the subsequent contamination
of the breathing zone by those bio-contaminants.

• UV-C options kill microorganisms in the air and on the surfaces.

• More important is the fact that filters do not abate microbial growth on surfaces of the air handling components.

2. Do I need UV-C if I use treated filters?

Treated filter media in no way addresses the growth of microorganisms on other surfaces and in drain pans, which lead to the eventual buildup of organic material.

• In these latter and more important issues, UV-C is the only non-chemical continuous source of control.

3. Do UV-C lights replace filters?

No, a UV-C option is an air conditioning component that works in conjunction with mechanical filtration and is not intended to replace components such as filters, etc.

Sizing Questions

1. How do I size my UV-C option?

For either a surface decontamination or airborne inactivation application, Viro8 utilizes a proprietary, third party validated math modeling tool to scientifically design UV-C options. The guess work has been taken out of the selection process. Every time you select a UV-C option you can be assured that it is the appropriate size for your particular application.

• No additional outside software needed to make the best possible selection.

• The factory should always be consulted for sizing applications involving infectious disease particles.

2. What are the recommended UV-C operating limits- temperature, humidity and velocity?

Unlike conventional UV-C fixtures, our fixtures are designed to UL specifications such as being of drip-proof construction
and perfect electronic function at 55-135ºF.

• Essentially, our UV-C fixtures have no limits in HVAC equipment as they were designed specifically for that use.

• Rules of thumb are 55-135ºF, 99% RH and 1000 fpm respectively.

• Please contact the factory for safety requirements when operating outside these boundaries

Questions About Lamps

1. Are All UV Lamps The Same?

Not all UV-C lamps are created equal.

• Our product uses germicidal UV lamps (UV-C) which utilize a protective coating on the inside of lamps minimizing the effect of mercury absorption into the surface of the glass.

• Non-coated glass or a quartz tube absorbs the mercury faster and thus minimizes the output of UV.

• Non-coated glass or quartz tubes also require more mercury within the lamp to compensate for loss of mercury into the glass wall.

2. How much mercury is in a lamp?

Our UV-C lamps utilize 5.5 or less mg of mercury per lamp compared to quartz UV-C lamps which can exceed 100 mg's of mercury.

• Extensive testing has been done on the long-term performance of both soft coated glass UV-C lamps and quartz glass UV lamps. The results show that after 9,000 hours of operation, the quartz lamps tested were producing only 53% of their original output, whereas the coated soft-glass lamps averaged above 80%.

3. How do you dispose of the used tubes?
UV-C tubes fall into the same category as fluorescent lights.
• All users should dispose of them the same way they dispose of their fluorescent lights and follow any EPA and state guidelines.
• Large users should already have a fluorescent light program in place that simply includes the germicidal lights.
4. Should the tubes be cycled with the fan or run continuously?
Like fluorescent lights they run better and longer when running continuously.
• For maximum effectiveness, always run them continuously.
5. How do you know when to change the Tubes?
IAQ or mold control, require changing the lamps when their output decreases by 20% is common. This usually occurs in about 12 months.
• For infectious disease applications, change-out should be performed using a radiometer and following factory specifications.
6. Do the lights need cleaning?
UV-C lamps do not normally require cleaning as part of normal operation (high levels of mineral particulate maybe an exception).
• Cleaning is recommended if the glass lamp has been touched during installation.
• The lamp tubes will usually degrade common organic debris that may accumulate on the glass, thus periodic cleaning may not be required.
• When cleaning simply use 99% pure alcohol or a mild liquid window cleaner and a lint free cloth. It is best not to leave too many impurities behind

Miscellaneous Questions
1. If I can't see UV-C energy, what do I see?
The blue color comes from an inert gas in the tube.
• The tube can be lit (and blue) yet not produce much if any UV-C energy at all.
• Remember that UV-C is in the non-visible part of the light spectrum.
2. Can UV-C options be used at 50Hz?
Yes, all of our voltage options can, as they are independent of line frequency.
3. Is UV-C expensive?
In commercial, industrial or institutional buildings, the costs for lost heat exchange efficiency; air horsepower, surface cleaning and drain pan tablets far exceed the cost of a UV-C factory installed option.
• This excludes routine labor, downtime, complaint service, absenteeism, loss work and litigation and the costs of duct cleaning, service calls and system change-out.
• Replacement lamp tubes are far less expensive than all the above.
4. Can UV-C save energy?
Yes, Energy savings are through increased heat absorption (transfer), reduced air horsepower (or increased air volume) and/or reduced run time, including the condenser.
• Reductions and increases always manifest themselves in some ultimate form of energy saving.

Is UV-C Safe Questions

1. Is UV-C harmful?

Yes, UV-C is harmful to all organic matter including human beings.

• Even brief exposure can result in skin irritation and/or eye irritation that could lead to serious consequences after prolonged exposure.

• We take great pains to provide the utmost in safety precautions and designs that incorporate meticulously designed safety interlocks.

2. Does UV-C produce ozone?

No. As the lamp ages and the intensity decreases, the lamp will not change its wavelength, hence will not fall below 200nm and will not produce ozone.

• Our lamps are made with soft glass (soda barium) where the mercury vapor produces spectral lines at 254nm.

• The soft glass eliminates the production of 185nm wavelengths no matter what age the lamp is; in short, as the lamp ages, the spectral range does not change.

3. Are UV-C options CE Listed?

Yes. For complete safety, our fixtures shall have been tested and Listed as CE.