



Why and When to Change UV Lamps?



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The number of UV-C installations in new air conditioning units and as retrofits to existing HVAC systems has grown substantially over the last decade. Reasons for specifying UV-C lamps in new HVAC equipment include sustained cooling coil heat-exchange efficiency, lower maintenance costs and downtime, and far better indoor air quality. Similar reasons exist for retrofitting UV-C lamps in existing air handlers, which help return A/C units to initial capacity, improve poor indoor air quality, and reduce or eliminate costly coil and plenum cleanings.

Another reason for the increased growth is the credibility gained when adding UV-C in HVAC equipment was substantiated by ASHRAE, who also established a UV technical committee (TC 2.9) in 2005. TC2.9 has since published significant chapters on UV in the 2008, 2011 and 2012 ASHRAE *Handbooks!*

Among the topics covered by ASHRAE is lamp replacement, i.e., that UV-C lamps should be replaced at the end of their useful life, either based on radiometer measurements or by using UV-C equipment manufacturers' recommendations.

Most lamp manufacturers list a UV-C lamp's "useful life" as 9000 hours, or slightly more than the 8760 hours in a typical year. At 9000 hours, a quality lamp's output falls below 85% of its original level. While it's preferred that lamps be changed at this point, many operators leave them in place because the characteristic blue-colored lamplight has not diminished at all. This is not correct as actual UV-C output could be very low.

So, what's the most cost-effective replacement strategy to maintain high UV-C performance?

On this matter, UVR concurs with feedback that has been reported to us by our customers based on their own field experience.

Outages: Running lamps longer results in lamp outages occurring typically one at a time, so the building engineer must inspect lamp installations routinely for lamp burn-outs.

Replacing lamps only as they burn out requires more inventory so that when lamps begin to fail in larger numbers, passed the 9,000 hour window, there are enough spares to replace them.



Measurement: A radiometer is accurate only when its sensor is installed permanently in one place so that the readings are repeatable; however, a radiometer monitors only one lamp.

Scheduled Replacement: Most of the user groups we work with report that they set up an annual replacement schedule because such a schedule:

- Provides lead-time to order a full set of lamps.
- Eliminates having to carry inventory with the exception of a few lamps as a hedge for breakage.
- Reduces labor costs and downtime by consolidating the change-outs into one service interval.
- Eliminates the buying, installing, and maintaining of a radiometer for uncertain lamp measurements.
- Frees staff from having to monitor the lights on a frequent basis toward the end of the 9000-hour window, and more.
- Provides maximum UV-C output to keep the fly-by kill of airborne microorganisms as high as possible – which can result in lower absenteeism's.