



21CR Project 610-40030

Defining the Effectiveness of UV Lamps Installed in Circulating Air Ductwork

Updated 22 May 2003

Objective:

To identify the key factors and define through test validation, the impact of these factors on the effectiveness of UV_C light in circulating air ductwork. Effectiveness is defined as killing or neutralizing the most common varieties of bacteria, fungi, mold, and allergens likely to be present as air contaminants.

Information/items to result from this project:

Factors that impact on the effective design of UV_C lamps in HVAC ductwork to kill airborne microbes, such as:

1. Physical location of UV_C lamps: supply duct near the coil or return duct near the filter.
2. Actual radiation densities considering reflectivity of common ductwork material.
3. Intensity maps of “kill” zone with various lamp configurations and power output.
4. Type of bulb (ozone or non-ozone generating) and ballast characteristics.
5. Air velocity impact on time in “kill” zone.
6. Temperature and humidity effects on performance.
7. Effectiveness on various types of organisms.
8. By-products produced due to irradiation of airborne chemicals and microorganisms.

How are the results likely to be applied:

IAQ consultants – to remedy IAQ problems related to microbial contamination; HVAC manufacturers – integrating UV-C lamps in their systems; building equipment specifiers – assist in identifying effective IAQ products.

Research subcontractor:

Research Triangle Institute, Durham, NC (Principal Investigators: Doug Van Osdell, Ph.D. & Karin K. Foarde)

Status:

Project has been completed. The final report is available for download at no cost from the ARTI website.

Responsible 21CR Subcommittee: Indoor Environmental Quality