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CONDITIONS FOR EFFECTIVE DISINFECTION WITH UV-C RADIATION

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Ultraviolet-C (UV-C) radiation is high energy, short wave radiation widely used as cheap and effortless disinfection method in hospitals and other facilities. It can be used for disinfecting surfaces via open UV-C emitting lamps, air in heating, ventilation and air conditioning (HVAC) systems and water in specialized reactors. UV-C radiation has confirmed effectiveness in sterilizing air and water in very close proximity to radiation source. However, the common wall mounted open lamps used for room space and surface disinfection have their disinfection potential reduced due to usually poor lamp positioning and fast intensity drop of UV-C radiation.

In this paper, the optimal conditions for effective disinfection with UV-C radiation are presented. Using radiometric data gathered by direct UV-C radiation intensity measurements, the UV-C intensity distribution map is presented and used as model for intensity distribution in a test room. In addition a microbiological effectiveness verification using model *Escherichia coli* bacteria was carried out.

Gathered data shows that depending on room size a single UV-C lamp may not be enough to cover whole room with similar intensity reaching every point of measurement grid, thus elongating minimal time needed for complete room disinfection. This calls for usage of more than one UV-C emitter for achieving uniform intensity distribution throughout the room. Microbiological evaluation showed that *E. Coli* disinfection potential of UV-C light was lower than expected and thus a higher dose is required for achieving desired disinfection percentage.