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TB spead prevention - Novel closed UVGI luminaire / fixture (including LED lighting)

Wilhelm Leuschner
Ultraviolet and Visible Light Laboratory (UVLL), South Africa

According to World Health Organization (WHO) estimates, South Africa ranks the third highest in the world in terms of TB burden (0.4–0.59 million), after India (2.0–2.5 million) and China (0.9–1.2 million). HIV is fueling the TB epidemic with more than 70% of TB patients also living with HIV. UVGI technologies are commonly used to prevent the spread of airborne TB microorganisms. The main challenges facing the UVGI fixture designer include, high disinfection effectiveness and excellent eye and skin safety. For a UVGI installation the total life cycle (cost of ownership) for every specific application / installation is seldom sufficiently considered. The two main componensts are: capital expenditure and operational expenditure. Capital costs include fixture cost and installation cost; which usually includes mounting and electrical reticulation costs; as well as possible additional ventilation and UVC radiation screening costs. Operational costs include electrical power and energy costs and maintenance costs (lamp and ballast replacements, cleaning, etc.). A holistic approach to designing a UVGI system, has to focus on the fixture but also the application, simple fixture installation, limited electrical reticulation changes, energy efficiency, low maintenance and environmental aspects such as noise and air draft introduction from the fixtures. A novel closed UVGI luminaire / Fixture has been developed to address all the criteria mentioned. It is a closed unit with low noise level fans to move the air through the UVC dosing zone in the fixture. The unit includes an energy efficient LED panel light at the bottom, so that the UVGI unit can replace legacy fluorescent light fixtures, without any new or additional electrical reticulation. Simple maintenance is built into the design of the fixture. The prototype has been tested for effectiveness, safety and energy efficiency.

Biography

Wilhelm has completed his D Eng degree in 1986 at the University of Pretoria. He has been with the Department of Electrical, Electronic and Computer Engineering for 38 years, of which 18 years as head of the department. He started the Light and Vision Laboratory at the University of Pretoria. He is currently emeritus professor at UP and owner of the UV and Light Laboratory (ULL). He is the author of numerous published and presented papers and the holder of a number of patents.

fwleuschner@gmail.com

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