

The Practical Investigation Of Mean Radiant Temperature Impacts For Thermal Comfort In An Office Space In The Tropics

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ABSTRACT

This study was conducted to evaluate the thermal comfort in a high rise office space located in the tropics. Unilever Malaysia office space was selected as the study field. This study was conducted to identify the impacts of MRT on thermal comfort and its effects on the cooling capacity of an UFAD. Also, the study was aimed to improve the design of the air distribution system in the tropics. The thermal comfort was evaluated using three approaches, namely Fanger's thermal comfort model as an objective evaluation using the ASHRAE Thermal Comfort Program, modified air velocity input model as a model suitable for small interval changes in wind velocity using Microsoft Excel spreadsheet, and also Euler's equation model as a numerical analysis using MATLAB. Overall, the thermal comfort levels ranged from -1.030 to -1.803 on the PMV scale by using Fanger's thermal comfort model. The other two approaches showed a lower PMV reading, due to uncertainties. The average MRT obtained was 23.3°C. According to the results, when the MRT increases, the thermal comfort level increases for an environment which is relatively cool. The effect of MRT on thermal comfort was studied and it is concluded that by decreasing the MRT, the supply air temperature can be increased to achieve the same level of thermal comfort and therefore, energy can be conserved.