ABSTRACT

Under the aesthetic consideration, the owners and renters prefer to glass curtain wall buildings in Taiwan. A glass curtain wall building usually was designed to have high window-wall-ratio, which caused more cooling energy used and made the occupants of the building significantly discomfort as result of induced extensive solar radiant. Although there are many studies had focused on the effect of windows on energy consumption, but the impact of windows on occupants was discussed recently. This study discussed the impact of windows-wall-ration and blinds on the thermal comfort of building occupant.

Two full scale rooms, one of them was treated as a reference room for comparisons, was constructed in Tainan County for the purpose of this study. Experiments were undertaken during the summer season to examine the effect on the thermal condition for two different window sizes and three types of blinds. To quantify the impact of windows on occupants, PMV-PPD index standardized in the ISO 7730 was used. In almost all cases with blinds the mean PPD is met to the 20% PPD criterion of ISO standard 7730 for an occupant nearby the window, but this is not true for without blinds, even though the window-wall-ratio was decreased to 0.5. The effect of blind use and window-wall-ratio on energy consumption was also investigated. In this study, the potential of better windows design to improve comfort was quantified primarily, so the non-energy benefits could be valued along with energy savings offer by these windows, and would encourage consumers to choice them.

Keywords: windows-wall-ration, blinds, thermal comfort.