

**EFFECT OF VERTICAL GLAZING SOLAR CONTROL MATERIALS
ON SOLAR HEAT GAIN AND OPTICAL PERFORMANCE IN
MALAYSIA: A CASE STUDY OF UiTM TEST CELL**

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ABSTARCT

EFFECT OF VERTICAL GLAZING SOLAR CONTROL MATERIALS ON SOLAR HEAT GAIN AND OPTICAL PERFORMANCE IN MALAYSIA: A CASE STUDY OF UITM TEST CELL.

This is a field study to evaluate the effect of vertical glazing solar control materials on solar heat gain and optical performance for building. A test cell located in the campus of UiTM Shah Alam is used as case study. Thermocouple type T was used to measure the surface temperature of the test cell wall facing north and south and surface temperature of window facing north with three different types of solar control materials, Control, System 1 and System 2. The thermocouples were attached at external and internal surface of walls and windows. The data of surface temperature was recorded by automated data logging system at an interval of 5 minutes for duration of 35 days. The solar heat gain was calculated and compare between the system and orientation. The natural daylighting pass through the window was measured using Hobo at an interval of 5 minutes for duration 35 days at the center of the building. The solar heat gain calculation depends on thermal characteristics of the window, there are the SC and Uvalue. If the value of the brick thickness for the south wall changed to $x_{brick\ control} = 0.338\text{m}$, $x_{brick\ System1} = 0.438\text{m}$, $x_{brick\ System2} = 0.523\text{m}$, the value of solar heat gain reduced almost similar to the value of solar heat gain for wall facing north. The difference of optical characteristics of solar control materials depends on its visible transmittance. Control has $SC = 1.00$ and $V_t = 88\%$, therefore it has the highest solar heat gain and illuminance. System 1 has $SC = 0.29$ while System 2 has $SC = 0.25$, hence System 1 and 2 has the amount of solar heat gain almost similar. The V_t for System 1 and 2 is 19.5% and 3.8% . System 1 has the amount solar heat gain slightly higher than System 2 but it permits illuminance that satisfies the common use in house and office. However, sometime it still exceeds the common range and causing glare.

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