

**THE EFFECT OF TINTED WINDOW ON DAYLIGHTING AND
COOLING LOAD IN BUILDING**

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ABSTRACT

THE EFFECT OF TINTED WINDOW ON DAYLIGHTING AND COOLING LOAD IN BUILDING

Malaysia country was a tropical climate, the temperatures is quite hot. In this country the energy consumptions (kWh) for the air-conditioner is very high, it is needed to use alternative way to reduce energy consumption (kWh) for cooling load. Most of the building was using a tinted window to control the daylighting levels and to reduce cooling load energy consumption (kWh) in building. Malaysian Standard which is based on research suggesting people to set the lowest temperature with only 24 ° C for the conservation of energy (kWh). This is a good step in order to reduce energy consumption but by using tinted window at the same time it will save more energy (kWh). The shading devices such tinted window with the properties of shading coefficient (SC) and visible light transmission (VLT) are surely affecting the daylighting levels and energy consumption inside buildings. Therefore, this study is aiming to further complement the research done, by evaluating the benefits of using tinted window to optimize the daylight while reducing the cooling load at the same time. This study carried out at UiTM Shah Alam test building with method of field data and computer simulation using energy10 software. The test building equipped with air-conditioner that has power factor value of -0.989 and set with 24°C. Four systems with different type of tinted window type 4, 5, 6 and 7 are test for about 8 days to get the data of daylight intensity (Lux) and energy consumption for cooling load (kWh) inside the building. The result was compared with control system (without tinted window) to determined the percentage energy savings (%) for each type of tinted window.

CHAPTER 1

INTRODUCTION

1 Background of study

With daylighting there is an impact of cooling load inside building. The thermal gain associated with daylight was distributed inside building spaced. However, this cooling impact will be affected by the glazing and shading system characteristics.

(Dr. Arasteh *et al.*, 1986)

Therefore, it is very convenience to use the alternative way to reduce energy consumption of cooling load inside building. Malaysia country which is in tropical climates, during peak hours most of the buildings envelope were heated and solar radiation distributed through window. The transmission of solar radiation increased cooling load. Cooling load is the rate of heat which must be removed from the space to maintain a specific space air temperature and moisture contain. (ASHRAE, 2004-2005)

Through a window point of view, using tinted window have a large influence of cooling loads. The best window will transmit as much as visible portion of the sun energy as is desired for the particular applications while rejecting the rest of the solar radiation mean to reduce cooling load. Shading devices are useful for reducing energy consumption as well as controlling daylighting levels, privacy and avoid glare from windows. (Jian Yao *et al.* 2011)

From this study, the effect of tinted window on daylighting and cooling load will gives the scientific results on energy consumptions performance, thermal performance and daylight intensity inside building based on the type of tinted window. The set point temperature inside building was set according to the Malaysian Standard. The most dominant or better type of tinted window will be recommend based on performance result.