

ABSTRACT

Thermal comfort is considered as an important thing to support human productivity. Based on ASHRAE Standard 55 (2013), thermal comfort is defined as “the condition of mind that expresses satisfaction with the thermal environment and is assessed by subjective evaluation.” The research on thermal comfort in the building has been widely performed around the world. The purposes of this research were to evaluate thermal comfort and give recommendations in the air-conditioned office building of PT Sarihusada Generation Mahardhika Yogyakarta (SH1).

This research was conducted in the Green Room, the largest office room in SH1 by involving 28 healthy regular occupants who have been occupied in a cubicle and in the room for at least three months. The study was conducted for nine days in August to early September 2014. The indoor climate (air temperature, radiant temperature, WBGT, air humidity, air velocity) was measured by heat stress monitors and the subjective thermal responses were measured by the questionnaires. Both indoor climate and subjective thermal responses were measured simultaneously twice in a day. This research was performed by setting temperature set-point in air conditioning at (1) Normal condition (the subjects could adjust the room temperature as usual daily basis), 25°C (maximum standard temperature set-point of air conditioning for office rooms in SH1), 27°C (higher temperature set-point than the company's standard). Each of the conditioning was performed for three days.

The results of this research were: mean indoor air temperature was at 27.3°C, mean indoor radiant temperature at 28.2°C, mean indoor operative temperature at 28°C, mean indoor WBGT at 22.8°C, mean indoor relative humidity at 47%, mean indoor air velocity at 0.2 m/s, mean activity level at 1.1 met and mean clo at 0.57 . The comfort temperatures in this room were at 23°C (WBGT), 27°C (air temperature) and 27.7°C (operative temperature). The results based on the subjective thermal responses shown that the subjects were not satisfied with the current environment. To adapt to the environment, subjects performed some behavioral adaptations. The recommendations from this study are (1) displacing the subjects who sit closely to the air conditioning or changing the room layout (2) emphasizing the temperature set-point regulation for the air conditioning maximum at 25°C because on several occasions it was found that the subjects set the temperature set-point of air conditioning below 25°C (3) giving acrylic partitions on air conditioning (4) providing fan for the subject who tended to feel in warm sensation in this air-conditioned room.

Keywords: Thermal comfort, air-conditioned office building, subjective thermal responses, comfort temperature