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Thermal comfort evaluation for Automobile industry workers in Chennai, India

S. Jeremiah Chinnadurai

Sri Ramachandra University, India

Abstract

Global rise in temperatures have a significant impact on the health and productivity of the workers in tropical settings. Thermal risk assessment is a potentially useful template that deals with both comfort- and stress-related issues at the same time. Thermal Comfort Index for workers in an automobile industry was evaluated during summer of 2012 using a risk assessment tool, Predicted Mean Vote-Predicted Percentage Dissatisfied (PMV-PPD) developed by Malchaire based on the ISO method 7730. Environmental parameters influencing heat stress were quantified as Wet Bulb Globe Temperature (WBGT) for 99 locations within the factory. The recorded minimum & maximum WBGT's were 18.6°C & 32.1°C respectively, with a mean of 29.1°C. PMVs for 98% of the locations in the industry exceeded vote 3, a calculated index for working in a very hot environments. Continuous allowable work duration was established based on predicted core body temperature as per PMV-PPD. Results show that workers in 70% of the locations did not exceed the maximum core temperature of 38°C and they could perform their regular activities for a 8-hour shift. In 20% of the locations the workers exceeded vote 4 and the allowable work duration of 2.5-3 hours. 10 % of the locations which were above vote 5 need urgent attentions as the workers were working much higher than the allowable work duration of 1 hour as per the tool. The preliminary results can be as a prompter for implementing stringent hygiene measures to reduce exposure and improve the thermal comfort of the workers.

Biography

Stephen Jeremiah chinnadurai, Scientist, Department of Environmental Health Engineering, Sri Ramachandra University India. Jeremiah has been involved in Occupational Hazard identification & Quantification including Occupational Heat stress since January 2010 in the Department of Environmental Health Engineering. Before joining in the Department he worked at a Research Organization and conducted Environmental Impact Assessment studies.