Effectiveness of engineering intervention on the position of forging industry workers

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Abstract

Background: Heat stress as a harmful physical agent in workplace, if is not properly controlled, can cause undesirable effects on the performance and health of personnel. This study aimed to evaluate the heat stress and efficacy of engineering interventions on WBGT index in work station of the workers in a forging industry.

Methods: This experimental study evaluated WBGT index in one of the forging industries of Tehran in summer 2010. In order to control the radiant temperature, as the most effective factor on WBGT, fireproof flexible fabric was used as shield to reflect and insulate radiant heat. Efficacy of the intervention was evaluated by comparison of WBGT index before and after the intervention, using Statistical paired t-test and SPSS software version 14.

Results: Average value of WBGT index in all 12 workstations before the intervention was estimated to be 21.31˚C which was higher than the standard limit. This value reached to 45.26˚C after intervention. Radiant temperature was identified as the most important factor which should be controlled. Data analysis indicated that difference in radiant heat at the height of head, and ankles was statistically significant before and after intervention ($P \leq 0.05$). However it was not statistically significant at the height of waistline ($P \geq 0.05$).

Conclusion: Results of the study showed that using flexible fabric shields is a good way to control the radiant temperature and thermal stress. These shields are inexpensive and easily installed, and don't block front sight of the operator. These shields are easily shaped to fit the workspace and due to the lack of sharp edges they are safety approved. Hence it seems that these heat shields are able to be widely used in order to control the radiant heat in the forging industry.

Key words: heat stress, WBGT, engineering intervention, thermal control, thermal shield, forging industry.

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