

15 An Investigation into the possibility of heat strain amongst coke oven workers wearing ventilated helmet respirators

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A review of some unpublished studies, mainly in Wales, of the Airstream ventilated helmet and thermal discomfort, found that improved theoretical protection from a dangerous hazard did not necessarily give effective protection in practice. Conversely, climatic chamber experiments at the Polytechnic of Wales indicated that the helmet could improve comfort,

On the coke ovens the Airstream respirator is worn to protect against carcinogenic dust. It had been stated that such use of the respirator could result in over exposure to the hazard of excess heat, possibly due to a change in behaviour when protected. Thus field measurements of the actual effects of hot summer conditions were required, to assess whether wearing Airstream helmets during coke oven work resulted in unacceptable heat strain.

Despite maximum weather temperatures around the 23°C to 27°C (dry bulb) range, and work temperatures up to 78°C (dry bulb) and 109°C (black globe), the WBGT's (Wet Bulb Globe Temperatures) were only in the 22°C to 24°C range, when weighted according to exposure times. The International Standard (ISO 7243, 1982) gives safe reference WBGT's of 28°C and 26°C respectively for persons acclimatised and not acclimatised to heat in such conditions. Confirmation of non-excessive heat strain was also shown by generally acceptable heart rate values during work and recovery periods, and by (ISO) reasonable body temperatures.

These acceptable average WBGT's and lower heat strain responses were probably attributable to the short work periods - 25 to 50% of each shift - and to appropriate safe exposures by workers. No evidence of unsafe behaviour while wearing the helmets was observed. Consequently heat strain under these conditions was shown to be unlikely.

Nevertheless a need remains for relevant standards and legislation to be understood and accepted before they are enforced. Both health and safety may then be enhanced as workers are confronted by a wider range of hazards in the industrial environment.

Reference

ISO 7243 (1982) Hot environments- estimation of heat stress on working man. based on the WBGT index.