Work in Heat: Ventilation Solutions in Clothing

Kuklane, Kalev

Published in:
Arbete och hälsa

2011

51) Work in heat: ventilation solutions in clothing.

Kalev Kuklane

The Thermal Environment Laboratory, Division of Ergonomics and Aerosol Technology, Department of Design Sciences, Faculty of Engineering, Lund University, Sweden

Introduction: There are several solutions to keep the workers at good thermal state at hot or cold workplaces, for example, PCM (phase change materials) and ice; electrically heated clothing; increase/decrease clothing insulation, e.g. with smart textiles; water based cooling/heating; air based systems, ventilated clothes.

Methods: Following methods can be used to increase the ventilation in the clothes: use of air permeable clothes; increase possibilities for ventilation (design solutions); active ventilation (e.g. fans) etc. Polluted atmosphere may not allow to use the methods above. Ventilation in protective clothing, e.g. for CBRN protection may require inlet air filtering or a separate (compressed) air source.

Results and discussion: Various solutions have been tested with natural and forced ventilations, and flow rates. Dry and wet tests were carried out. Ventilation is an effective way to increase heat loss. Ventilation utilizes body own capacity (sweating) to regulate heat loss. At extremely high temperatures considerable air flows are required for sufficient cooling: 100 l/min may not be enough. The larger is the ventilated skin area, the more effective it is due to enhanced evaporation.

NR 2011;45(5)

VETENSKAPLIG SKRIFTSERIE
ARBETE OCH HÄLSA

55th Nordic Work Environment Meeting
(Nordiska Arbetsmiljömötet)

The Work Environment – Impact of Technological, Social and Climate Change

Editors: Maria Albin, Johanna Alkan-Olsson, Mats Bohgard, Kristina Jakobsson, Björn Karlson, Peter Lundqvist, Mikael Ottosson, Fredrik Rassner, Måns Svensson, and Håkan Tinnerberg.

NR 2011;45(5)

55th Nordic Work Environment Meeting
(Nordiska Arbetsmiljömötet)

The Work Environment – Impact of Technological, Social and Climate Change

Editors: Maria Albin, Johanna Alkan-Olsson, Mats Bohgard, Kristina Jakobsson, Björn Karlson, Peter Lundqvist, Mikael Ottosson, Fredrik Rassner, Måns Svensson, and Håkan Tinnerberg.

ARBETE OCH HÄLSA | VETENSKAPLIG SKRIFTSERIE

ISBN 978-91-85971-32-9 ISSN 0346-7821