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Work in Heat: Ventilation Solutions in Clothing

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51) Work in heat: ventilation solutions in clothing.

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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.

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