

ISRP 2002 abstract

Presenter/author	Title	Abstract
Caretti, David M. <i>US Army Edgewood Chemical Biological Center</i>	Evaluation of Personal Cooling Technologies to Alleviate Mask Thermal Discomfort	Previous research suggests that the only measurable thermal load impacts of a respirator are subjective feelings of warmth and discomfort. Therefore, mask design efforts should be directed to address these concerns either through mask modifications or the use of supplemental cooling items. In this regard, four personal cooling technologies were evaluated to determine their potential to alleviate mask-associated feelings of warmth and discomfort during use in hot working environments. The evaluated technologies included a miniature neck-cooling device and three form-fitting balaclavas fabricated from different moisture wicking and heat transfer materials. Four subjects completed one-hour heat exposure sessions (32.1 ± 0.2 °C, $53.8 \pm 8.2\%$ RH) comprised of rest and walking while wearing a full-facepiece respirator and an encapsulating protective suit with and without each cooling device. Subjective ratings of work effort, facial and whole body comfort, and thermal sensation were obtained from the beginning to the end of each test session in 10-minute intervals using specific scales. Comparisons of subjective responses showed no significant differences between any of the experimental conditions. These findings indicate that the personal cooling strategies assessed in this investigation were ineffective methods for alleviating mask thermal discomfort when worn with protective overgarments in the heat.