

**S3-4****Overview of WBGT clothing adjustments factors**

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**Abstract:** WBGT (wet bulb globe temperature) is a common index of the environment used to assess occupational exposures to heat stress. Occupational exposure limits use a threshold based on the internal heat generation represented by metabolic rate assuming a standard work uniform. Other clothing ensembles may change the effective environment to which the worker is exposed, and for this reason Clothing Adjustment Factors (CAFs) were introduced. A progressive heat stress protocol can be used to estimate CAFs. This paper discusses the progressive heat stress protocol, CAFs for a range of clothing ensembles and environmental, work, and clothing properties that affect the CAF. A summary of the work performed at the University of South Florida over the past 10 years is the basis for the presentation. While work demands and respirators have little influence, high vapor resistance interacts strongly with humidity level; porosity (ability to support convective air movement) is a better indicator of performance than MVTR; and layering has an intermediate effect than the sum of the layers. Early indications are that apparent and resultant evaporative resistance can be used to predict the CAF of an ensemble.

**S3-Designated Remark****Workplace heat stress, health and productivity – an increasing challenge for occupational safety and health**Ingvar Holmér<sup>1</sup>, Chuansi Gao<sup>1</sup>, Tord Kjellström<sup>2</sup><sup>1</sup>Thermal Environment Laboratory, Lund University, Lund, Sweden<sup>2</sup>National Centre for Epidemiology and Population Health, Australian National University, Canberra, Australia

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**Abstract :** Global climate change is already increasing the average temperature and direct heat exposure in many places around the world. In countries with hot seasons workers are already affected by working environments hotter than what the human physiological thermoregulatory system can cope with. A number of heat indices have been developed for assessment of tolerable limits of exposure. One that is commonly used in occupational health is the Wet Bulb Globe Temperature (WBGT). WBGT can be used to determine the proportion of a working hour during which a worker can sustain work and the proportion of that same working hour that (s)he needs to rest to cool the body down and maintain core body temperature below 38 °C. Using this procedure a "work capacity" estimate was calculated for selected heat exposure levels and work intensity levels. The work capacity rapidly reduces as the WBGT exceeds 26-30 °C and this can be used to estimate the impact of increasing heat exposure as a result of climate change in various parts of the world. Also WBGT can be calculated from standard meteorological data enabling simulation and predictions of heat exposure under different climate scenarios.