

## ABSTRACT SUBMISSION



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### **Thermophysiological Comfort of Protective Clothing Systems**

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#### **ABSTRACT (NO MORE THAN 500 WORDS:)**

Clothing provides a portable environment maintaining human body comfort. Personal protective clothing, such as firefighting garments and encapsulated chemical suits, is to protect its wearer from hazards in the workplace and must be worn regardless the environmental thermal conditions. While in use, protective clothing insulates the body, resulting in rapid accumulation of body heat and moisture inside the clothing system. The body heat and moisture cannot be quickly moved away from the skin and dissipated into the environment, causing over-retention of internal body heat, thermal stress and thermophysiological discomfort. When working under extreme environments, such as facing intensive heat, or flame, the wearer's performance and safety is jeopardized. Hence, thermal comfort is highly desirable for a clothing system like personal protective equipment in the environment where the risk for the wearer facing to high temperature is very high, and protection from extreme external heat and hazards cannot be compromised. It is therefore a great challenge to design the clothing system for both protection and comfort. This presentation introduces examples of personal protection clothing systems, recent development of protective clothing design for thermal regulation and the methods for comfort evaluation. It focuses on firefighting garments, and chemical protective clothing. The textile material design and new technology integration into the clothing system are also discussed for regulating body temperature and maintaining the wearer's thermal comfort.