

## The Perspective of Smart Thermoregulation in Personal Protective Equipment

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**Abstract :** Aside from injuries due to direct contact with hot or cold substances or objects, exposure to extreme temperatures in the workplace involves physical hazards to workers. On the other hand, a poorly acclimatized worker may have reduced performance and alertness and may, therefore, be more vulnerable to the risk of accidents and injuries. Due to the incompatibility of the standards put in place with certain workplaces and the lack of thermoregulation in many protective equipments, thermal strains remain among the physical risks most present in many work sectors. However, many of these problems can be overcome thanks to the potential of intelligent textile technologies allowing intelligent thermoregulation in protective equipment. Nowadays, technologies such as heating elements, cooling elements are applied in products intended for sport and leisure, and research work has been carried out in the integration of temperature sensors and thermal stress detectors in personal protective equipment. However, the usage of all of these technologies in personal protective equipment remains very marginal. This article presents a portrait of the current state of intelligent thermoregulation systems by carrying out a synthesis of technical developments, which is accompanied by a gap analysis of current developments. Thus, the research work necessary for the adaptation and integration of intelligent thermoregulation systems with personal protective equipment is discussed in order to offer a perspective of future developments.

**Keywords :** personal protective equipment, smart textiles, thermoregulation, thermal strain

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