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Thermal effects of headgear: State-of-the-art and way forward

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Introduction

Headgear is widely used in both occupation and leisure. Much research attention has been spent on optimizing impact properties of helmets (Deck and Willinger, 2006; Mills and Gilchrist, 2008). However, thermal comfort of headgear is suboptimal in neutral and warm environments. In fact, thermal discomfort is often given as a reason not to wear protective headgear (Orsi et al., 2012; Patel and Mohan, 1993). Enhanced thermal comfort of headgear is likely to improve the willingness to wear (protective) headgear, and motivated an increasing number of studies, of which most were published in the last decade. The available body of literature allows for a valuable first review on the thermal effects of headgear.

Methods

The literature on thermal effects of headgear was reviewed aiming at providing a sound basis for improving helmet design, and for effective future studies.

Results

Four topics will be addressed: (i) the effect on thermal physiology, health and performance, (ii) heat and mass transfer, (iii) methods for studying thermal effects of headgear, (iv) design considerations (Bogerd et al., 2015). Several topics will be detailed by other contributions to this conference from COST Action TU1101, which enhances the accessibility of the subject on ergonomics of headgear for the audience of this conference.

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