



Human-centred approaches in slipperiness measurement

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A number of human-centred methodologies—subjective, objective, and combined—are used for slipperiness measurement. They comprise a variety of approaches from biomechanically-oriented experiments to psychophysical tests and subjective evaluations. The objective of this paper is to review some of the research done in the field, including such topics as awareness and perception of slipperiness, postural and balance control, rating scales for balance, adaptation to slippery conditions, measurement of unexpected movements, kinematics of slipping, and protective movements during falling. The role of human factors in slips and falls will be discussed. Strengths and weaknesses of human-centred approaches in relation to mechanical slip test methodologies are considered. Current friction-based criteria and thresholds for walking without slipping are reviewed for a number of work tasks. These include activities such as walking on a level or an inclined surface, running, stopping and jumping, as well as stair ascent and descent, manual exertion (pushing and pulling, load carrying, lifting) and particular concerns of the elderly and mobility disabled persons. Some future directions for slipperiness measurement and research in the field of slips and falls are outlined. Human-centred approaches for slipperiness measurement do have many applications. First, they are utilized to develop research hypotheses and models to predict workplace risks caused by slipping. Second, they are important alternatives to apparatus-based friction measurements and are used to validate such methodologies. Third, they are used as practical tools for evaluating and monitoring slip resistance properties of footwear, anti-skid devices and floor surfaces.

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