Relationship between the measured friction coefficients of floors on a horizontal surface and on a 10 ramp

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Abstract

The measured friction coefficients using almost all the commercially available slipmeters on ramps were different from those of the same tile on a horizontal surface because of the gravity. Establishing the mathematical relationship between the measurements on a ramp and on a level surface was essential in assessing the friction at the shoe–floor interface. In this study, friction measurements were conducted on both a horizontal surface and a 101 ramp under different footwear materials, floors, and surface conditions. Significant results were obtained for the measured friction coefficients under the inclined angle, footwear material, floor, and surface conditions. A regression model was established to describe the relationship between the friction coefficients of the same tile on a horizontal surface and on a ramp. This model is significant at po0.0001 with an $R2$ of 0.98. This model may be used to adjust the readings obtained on 101 ramps to report true friction at the footwear–floor interface.