



## An Investigation of the Relationship among Skid Resistance, Mean Texture Depth and Abrasion Resistance for Different Macrotextures of Concrete Pavements

Jalalkamali, R.<sup>1</sup>, Dibaei, M.M.<sup>2</sup>, Jalal Kamali, M.H.<sup>2\*</sup> and Hassani, A.<sup>3</sup>

<sup>1</sup> Assistant Professor, Civil Engineering Department, Shahid Bahonar University of Kerman, Kerman, Iran.

<sup>2</sup> Ph.D. in Highway Engineering, Tarbiat Modares University, Tehran, Iran.

<sup>3</sup> Professor, Faculty of Engineering, Civil Engineering Department, Tarbiat Modares University, Tehran, Iran.

© University of Tehran 2021

Received: 10 Feb. 2020;

Revised: 14 Nov. 2020;

Accepted: 22 Nov. 2020

**ABSTRACT:** Road accidents are one of the ten major causes of death in the world. Lack of enough friction and skid resistance of the pavement surface are known as important factors in traffic accidents. In this study, to evaluate the relationship between skid resistance and pavement surface macrotexture, five methods of creating macrotexture on concrete pavements were used. Sand Patch test, British Pendulum and Wide Wheel Abrasion tests were employed to obtain mean texture depth, skid resistance and abrasion resistance of the surface, respectively. Results showed that brushing on fresh concrete surface (parallel or perpendicular to the traffic direction) can improve frictional properties of pavement surface, drastically. This method increased British Pendulum Number (BPN) and friction coefficient by 32% and 38% (in average), respectively. Friction coefficient of parallel brushing was quite similar to perpendicular (0.2% discrepancy), while its abrasion resistance was 4% higher. Hence, as a finding, parallel brushing is the most recommended texturing technique in respect to friction. Generally, concrete pavement texturing decreases surface abrasion resistance, but burlap dragging improved this index by 2.5%. Nevertheless, burlap dragging results could be deceptive due to the high sensitivity to initial setup conditions. In other words, measurement scale of the studied testing procedures are small in respect to the scale of protuberances caused by burlap dragging method.

**Keywords:** Abrasion Resistance, British Pendulum Number, Macrotexture, Mean Texture Depth, Skid Resistance.

---

\* Corresponding author E-mail: m.jalalkamali@gmail.ac.ir