

# **Mechanical Testing of Futsal Footwear: Friction Coefficient Under Different Sliding Direction**

## **Abstract**

This study aimed to clarify the differences on friction coefficient of footwear used in futsal when mechanically measured in two different sliding direction. Available Friction Coefficient (AFC) and Traction Force (TF) of three futsal footwear with different outsole design (S1, S2 and S3) were measured using a novel six-degree of freedom mechanical test in anteroposterior (AP) and mediolateral (ML) sliding direction. Results have shown differences of AFC value when measured in different sliding direction (AP and ML) for all three shoes. In addition, it was observed that S2 shoe was the least affected in terms of reduction of AFC value when compared between AP and ML direction. It was also observed that among the three shoes tested, S2 has produced the highest TF in both AP and ML direction as compared with other shoes. From these findings, it can be suggested that traction performance of sports footwear should be evaluated by multi-directional sliding approach, and conventional one directional footwear evaluation standard such as BE EN ISO 13287 is most likely not adequate to analyse sports footwear–sports playing surface traction performance in real world.

## **Keywords**

Football codes; Force platform; Friction coefficient; Futsal; Interaction; Mechanical; Shoes; Traction