Austrian Comment/Proposal on

CEN/TC 217 N382 (prEN 14837) and N409 (Result of enquiry)

Abbreviations:

N 382: Surfaces for sports areas – Determination of slip resistance.

prEN (WI 00217049): Surfaces for sports areas – Determination of rotational resistance of sports surfaces

The comments made on Doc. N409 prove that the proposed test device exhibits too many technical deficiencies to expect results with a reliable level of acceptability However, this - and the missing comparable test results - should not be addressed here. This comment seeks to focus on the even more important question which in general was lost sight of:

Is the physical principle of the method suitable at all (i.e. from the general approach) to measure that property which is to be determined ?

Everybody who has studied the problematic nature of "friction" a bit closer knows that the relationships are much more complex than Coulomb put it once. Even the terms used show the difficulties involved:
Friction, sliding friction, kinetic friction, dynamic friction, adhesion, static friction, slip resistance, rotational friction, rotational resistance, traction.

In simple terms, it is about the horizontal forces which are active between the shoe sole and the "surface" of the sports surface. The quotation marks indicate that especially with synthetic turf there is no well defined surface any longer since the studded sole penetrates more or less the sports surface. The effect is extreme in the case of thick layers (up to 70 mm, type 7 of the "Specification" WG6 N575).

In Calgary 2003, the problem was dealt with in detail by Gerald Cole from a biomechanical standpoint 1) It is evident that we cannot seize these complex biomechanical processes with standardized test methods. However, if we completely uncouple from this, our testing becomes senseless/absurd. This means that we should retain attention on the most important parameters.

In the case of filled-in synthetic turf, the horizontal forces are subject to the way in which the sports shoe penetrates the synthetic turf and which vertical forces are effective. This aspect is completely neglected by the test procedure N 382. Therefore, the test principle must generally be considered non-suitable.

In this context, another presentation of the Calgary event should be recalled 2) when A. Cox mentioned priciple merasuring technical problems („On filled synthetic turfs the suitability of these machines are less clear...“).

In the search for an alternative we came across the test procedure "Rotational Resistance" as it is described in the UEFA manual and in the document prEN (WI 00217049). Despite of all the scepticism we initially had against this method, we are now convinced that - despite of some weak points - it has special advantages:

1) through the weights an exactly defined vertical force F_V is applied.
2) F_V can be varied in a wide range.
3) The test foot is so large that in addition to the standardized studs any other test sole of sport shoe sole or specific part of them can be attached.
4) Several labs do have long-term experience with this method (opposite to N 382)
5) The possible objection that this is some kind of "rotational" resistance and not the intended "translatoric" resistance doesn't hold water which could easily be proven (if necessary).

Conclusion:

N 382 should be eliminated. Instead, we should concentrate on using the reasonable potential of **prEN (WI 00217049)** by technical improvements in the sense of an optimization process**.** Certainly, a reasonable improvement would be an electronic recording/registration of the torque during the test since the complete continuous torque - time graph provides much more information than the maximum torque by itself.

1) Gerald Cole, Benno M. Nigg et al.: A Novel Method for Testing Traction of Sport Surfaces, (Calgary Symposium, August 2003, pp 253-268).
2) Alastair L. Cox: Test Methods for Assessing the Performance of Sports Surfaces (Calgary Symposium, August 2003, pp 269-291).

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