SLOVENSKI STANDARD
SIST EN 14903:2018

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Podloge za športne dejavnosti - Sistemi večnamenskih podlog za notranjo uporabo - Preskusna metoda za ugotavljanje odpornosti proti trenju pri vrtenju

Surfaces for sports areas - Multi-sports floor systems for indoor use - Test method for determination of rotational friction

Sportböden - Synthetische Sportböden für den Innenbereich - Bestimmung der Drehreibung

Sols sportifs - Systèmes de sols multisports pour utilisation en intérieur - Méthode d'essai de détermination de la glissance en rotation

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Surfaces for sports areas - Multi-sports floor systems for indoor use - Test method for determination of rotational friction

Sols sportifs - Systèmes de sols multisports pour utilisation en intérieur - Méthode d'essai de détermination de la glissance en rotation

Sportböden - Synthetische Sportböden für den Innenbereich - Bestimmung der Drehreibung

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European foreword

This document (EN 14903:2018) has been prepared by Technical Committee CEN/TC 217 “Surfaces for sports areas”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2018, and conflicting national standards shall be withdrawn at the latest by December 2018.

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1 Scope

This European Standard specifies a method for the determination of the friction between multi-sports floor systems excluding synthetic turf for indoor use and a rotating foot with a vertical load. The method is applicable to tests carried out in the laboratory and on site.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 660-1, *Resilient floor coverings — Determination of wear resistance — Part 1: Stuttgart test*

EN 60051 (all parts), *Direct acting indicating analogue electrical measuring instruments and their accessories (IEC 60051)*

EN ISO 291, *Plastics - Standard atmospheres for conditioning and testing (ISO 291)*

ISO 21948, *Coated abrasives — Plain sheets*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
friction coefficient
horizontal force between the test foot and the sports surface (resulting from the measured torque) divided by the vertical load on the foot during rotation

Note 1 to entry: See 4.6 to determine the coefficient of friction.

3.2
vertical load
vertical force exerted on the sports floor by the test foot

3.3
torque
result of forces occurring at the eccentrically positioned test soles when the test foot rotates onto the sports surface under vertical load

Note 1 to entry: The torque equals the force multiplied by the distance of the skids from the centre of the test foot.

4 Determination of rotational friction

4.1 General principle

Friction is measured by allowing a circular test foot, with attached test soles, to rotate on the sports surface under a vertical load. The friction resistance is calculated by recording the torque when the rotating test foot touches the test surface and then slides in rotation until the foot comes to a complete stop. From this, the coefficient of friction, μ, is calculated.

4.2 Sampling

4.2.1 Laboratory testing

The supplied test sections shall be large enough to carry out tests in at least three different places. For area elastic floors, only the top layers (wooden surface, PUR coating, PVC covering or linoleum) need to be used in the test.

For point-elastic and mixed-elastic floors, the total system shall be tested. For combi-elastic floors, a minimum of the top layer, including the elastic layer, shall be tested.

If necessary, the test pieces shall be glued to a stiff panel such as plywood to achieve a firm and stable support. The floor material under test shall be fixed to the laboratory floor to avoid movement during the test.

4.2.2 Testing on site

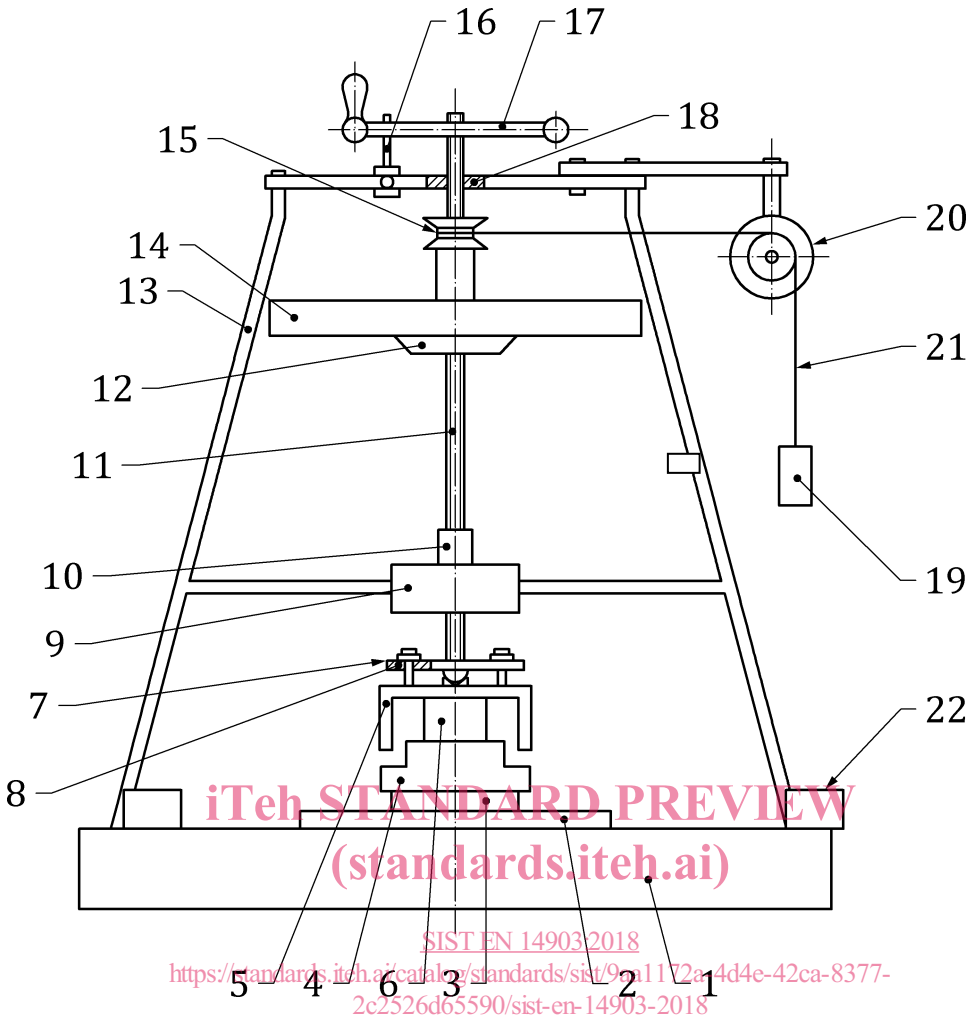
The entire sports surface shall be considered as the test surface, with the test points being chosen and noted.

4.3 Apparatus

4.3.1 Test device

4.3.1.1 The test machine is shown in Figure 1 and comprises a vertical shaft in a supporting frame with the measuring unit and the test foot, fixed to the bottom end of the shaft by means of a wobble hinge. At the upper part of the shaft, a weight is flanged, the lower part of the shaft is designed as a spindle. A constant impulse is exerted on the loaded shaft by means of a falling weight. The weight is freely suspended and connected to the shaft by a coiled polyester string which is guided over a rotating wheel.

The lower frame shall rest on a rubber lining to prevent movement of the apparatus during the test.



Key

1	test base (laboratory)	12	flange
2	surface sample (laboratory)	13	frame
3	skid(s) with test sole	14	weight/dead load
4	base part of test foot	15	coil
5	top part of test foot	16	stop pin/lever
6	torque measuring cell	17	hand wheel/bar
7	rubber disc	18	sliding bearing
8	wobble hinge	19	free hanging weight
9	guide/cage of ball bearing	20	wheel
10	ball bearing of spindle	21	polyester string
11	spindle	22	rubber lining

NOTE The test machine is commonly known as the Stuttgart sliding machine.

Figure 1 — Test machine

4.3.1.2 The test machine shall comprise of the following:

a) supporting frame mounted on a base plate with a rubber lining, minimum 15 kg with/without additional weights;

b) shaft with a bottom and middle section formed as a ball bearing spindle, diameter 20 mm, spindle pitch 12 mm/U guided by a radially and axially acting ball bearing, the top section of the shaft guided by a sliding bearing;

c) test foot (see Figure 2), comprising a steel disc having a diameter of (100 ± 1) mm;

d) sliding skids:

   1) sliding skids having a width of (20 ±0,1) mm, a base length of 45 mm (segments of a cylinder with a radius of (25 ±0,1) mm) the longitudinal axis of the skids (33 ± 0,1) mm apart from axis of the shaft;

e) torque measuring load cell, class 0,2 (linearity error);

f) free hanging weight, having a mass of (5,0 ± 0,1) kg;

g) coil having a diameter of 54 mm.

The total mass of the shaft, the flanged weight and the test foot shall be (20 ± 1) kg; The moment of inertia of the shaft, the flanged weight and testing foot: approximately 1 300 kg/cm^2 ± 200 kg/cm^2.

NOTE 1 A lead disc of 250 mm diameter and 25 mm thickness will meet this requirement. Depending on the details of construction, however, the required values of total mass and moment of inertia can be met easily by changing the dimensions of the lead disc.

The test sole material for the sliding skid shall be leather in accordance with EN 660-1, machine-split into 2 mm thick layers, the test surface being the newly split surface that has been manually roughened with a new sheet of abrasive paper in accordance with ISO 21948, having a grain size 100 in the direction of sliding.

NOTE 2 Leather-specification according to EN 660-1: pit-tanned sole leather, density: 1,04 ± 0,08 g/cm^3, shore hardness D: 60 ± 5. See also Annex A.