



SLOVENSKI STANDARD

SIST EN 14954:2006

01-februar-2006

Površine za športne dejavnosti – Ugotavljanje trdote naravne trave in oblog iz nevezanih mineralov za zunanje športne dejavnosti

Surfaces for sports areas - Determination of hardness of natural turf and unbound mineral surfaces for outdoor sports areas

Sportböden - Bestimmung der Härte von Naturrasen und ungebundenen mineralischen Belägen für Sportböden für den Außenbereich

Sols sportifs - Détermination de la dureté du gazon naturel et des sols minéraux non liés pour les terrains de sport de plein air

Ta slovenski standard je istoveten z: EN 14954:2005

ICS:

97.220.10 Športni objekti Sports facilities

SIST EN 14954:2006

en,fr,de

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EUROPEAN STANDARD

EN 14954

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2005

ICS 97.220.10

English Version

Surfaces for sports areas - Determination of hardness of natural turf and unbound mineral surfaces for outdoor sports areas

Sols sportifs - Détermination de la dureté du gazon naturel et des sols minéraux non liés pour les terrains de sport de plein air

Sportböden - Bestimmung der Härte von Naturrasen und ungebundenen mineralischen Belägen für Sportböden für den Außenbereich

This European Standard was approved by CEN on 12 September 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard (EN 14954:2005) has been prepared by Technical Committee CEN/TC 217 “Surfaces for sports areas”, the secretariat of which is held by BSI.

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 May 2006, and conflicting national standards shall be withdrawn at the latest by May 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EN 14954:2005 (E)**1 Scope**

This European Standard specifies a method for the determination of hardness of natural turf and unbound mineral surfaces.

2 Principle

A cylindrical weight is released from a standard height onto the surface and its peak deceleration during impact is recorded.

3 Apparatus

3.1 Test weight, comprising a solid metal, plane-ended cylinder containing an accelerometer (3.2) securely fastened within a protective housing. The accelerometer shall be attached to a BNC connector (see Figure 1). The total mass of the assembly shall be $(2,5 \pm 0,005)$ kg for testing natural turf and $(4,5 \pm 0,005)$ kg for testing unbound mineral surfaces.

3.2 Accelerometer, the signal from which shall be conditioned by an amplifier and a filter. The gain of the amplifier shall be adjusted to match the output of the associated accelerometer so that the instrument displays hardness value directly. The filter shall be a two-pole low-pass Bessel filter with a 500 Hz cut-off frequency.

NOTE This type of filter is used because it has minimal overshoot with a step input signal.

The filter output shall be digitized by a micro-controller. The micro-controller shall sample the accelerometer output at a frequency of 20 kHz. The micro-controller shall determine the peak acceleration from the digitised waveform and use it to calculate the hardness value. The hardness value and drop number shall be displayed on the hand-held read-out. The drop number indicator shall increase with each measurement.

3.3 Coaxial cable, to connect the test weight to a recording meter (3.4).

3.4 Recording meter, capable of reading and displaying the peak deceleration of the test weight during impact with the test surface, filtered to limit the frequency to below 7 kHz and showing the deceleration in gravities (g).

NOTE Some meters show deceleration as impact values, where one impact value is equal to ten gravities. In such cases the displayed values will have to be multiplied by ten to convert to gravities.

3.5 Guide tube, to control the height of drop of the test weight while not restricting its free fall. The guide tube shall have a diameter of (54 ± 1) mm and a length of at least 600 mm. An air vent having a diameter of (10 ± 1) mm shall be positioned (40 ± 10) mm from the base of the tube. The guide tube typically has a circular flange at the base of approximately 150 mm diameter to allow the tube to stand vertically.

NOTE The apparatus described is similar in principle to that described by Clegg [1].

4 Procedure

Position the guide tube vertically on the surface to be tested and drop the impact weight down the tube. One of the following two release heights shall be used:

- a) for soccer, rugby and hockey pitches, the release height shall be (550 ± 10) mm;
- b) for golf, cricket and lawn bowls, the release height shall be (300 ± 10) mm.

After the impact of the weight on the surface, record the peak deceleration in units of gravities (taking the acceleration due to the gravity into account). Carry out the test five times consecutively on the same spot. After each series of five readings move the guide apparatus so that the weight does not impact with the surface on the same spot twice. Record the value of the fifth drop if it does not deviate more than two impact values from the previous one (20 g). If the value lies outside this range, consider the results as invalid and repeat the test.

5 Number and distribution of readings

Unless otherwise specified, take at least eight readings at random on areas less than 100 m², take 8 to 15 readings, as appropriate, on areas of 100 m² to 1 000 m² and 15 to 20 readings for areas of 1 000 m² to 5 000 m². Subdivide larger areas into two or more areas for testing.

6 Expression of results

For the 2,5 kg impact weight, hardness value is equal to the peak of g. For the 4,5 kg impact weight, hardness value is equal to the peak of g/10.

Calculate the mean hardness value for each area.

7 Test report

The test report shall include the following information:

- reference to this European Standard i.e. EN 14954:2005;
- complete identification of the surface tested, including its location, area and previous history;
- mean value of impact value and hardness;
- individual test results, if required;
- details of any deviation from the procedure.

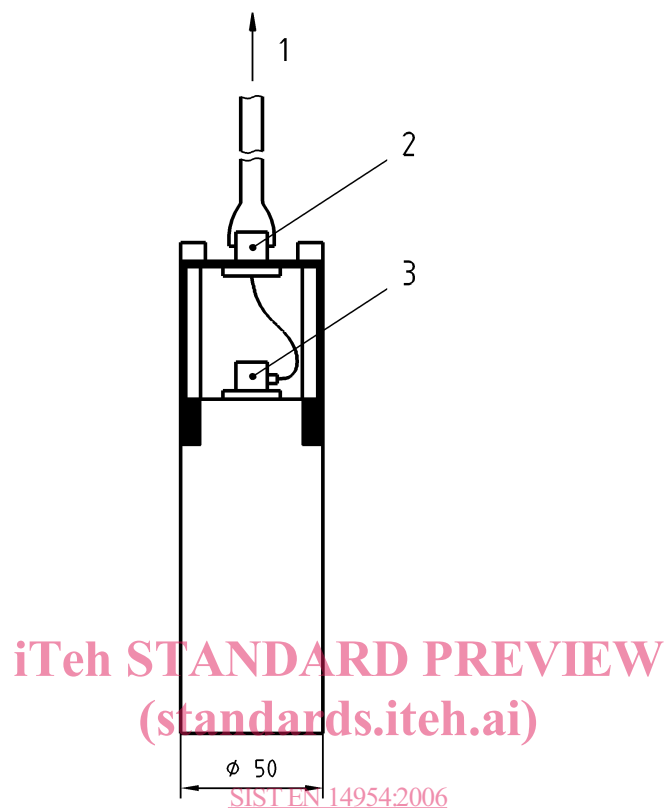
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Dimensions in millimetres



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Key

- 1 To meter
- 2 BNC connector
- 3 Accelerometer

Figure 1 — Test weight