



# SLOVENSKI STANDARD

## SIST EN 13745:2004

01-oktober-2004

---

### Podloge za športne dejavnosti – Ugotavljanje odboja svetlobe

Surfaces for sports areas - Determination of specular reflectance

Sportböden - Bestimmung der gerichteten Reflexion

Sols sportifs - Détermination de la réflectance spéculaire

Ta slovenski standard je istoveten z: EN 13745:2004

[SIST EN 13745:2004](https://standards.iteh.ai/catalog/standards/sist/2c94cdd9-4f34-4d66-a17d-3b2d638dbe18/sist-en-13745-2004)

<https://standards.iteh.ai/catalog/standards/sist/2c94cdd9-4f34-4d66-a17d-3b2d638dbe18/sist-en-13745-2004>

#### **ICS:**

97.220.10

Športni objekti

Sports facilities

**SIST EN 13745:2004**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 13745:2004

<https://standards.iteh.ai/catalog/standards/sist/2c94cdd9-4f34-4d66-a17d-3b2d638dbe18/sist-en-13745-2004>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13745**

February 2004

ICS 59.080.60; 97.150; 97.220.10

English version

**Surfaces for sports areas - Determination of specular  
reflectance**

Sols sportifs - Détermination de la réflectance spéculaire

Sportböden - Bestimmung der gerichteten Reflexion

This European Standard was approved by CEN on 10 December 2003.

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.

**STANDARD PREVIEW**  
**(standards.iteh.ai)**  
SIST EN 13745:2004  
<https://standards.iteh.ai/catalog/standards/sist/2c94cdd9-4b4-4d66-a17d-3b2d638dbe18/sist-en-13745-2004>



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

**Management Centre: rue de Stassart, 36 B-1050 Brussels**

**Contents**

page

Foreword.....	3
1 <b>Scope</b> .....	4
2 <b>Normative references</b> .....	4
3 <b>Principle</b> .....	4
4 <b>Apparatus</b> (see Figure 1).....	4
5 <b>Test piece</b> .....	5
6 <b>Conditioning</b> .....	5
7 <b>Procedure</b> .....	5
8 <b>Expression of results</b> .....	6
9 <b>Test report</b> .....	6

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 13745:2004

<https://standards.iteh.ai/catalog/standards/sist/2c94cdd9-4f34-4d66-a17d-3b2d638dbe18/sist-en-13745-2004>

## Foreword

This document (EN 13745:2004) has been prepared by Technical Committee CEN/TC 217 “Surfaces for sports area”, 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 August 2004, and conflicting national standards shall be withdrawn at the latest by August 2004.

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.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13745:2004](https://standards.iteh.ai/catalog/standards/sist/2c94cdd9-4f34-4d66-a17d-3b2d638dbe18/sist-en-13745-2004)

<https://standards.iteh.ai/catalog/standards/sist/2c94cdd9-4f34-4d66-a17d-3b2d638dbe18/sist-en-13745-2004>

## 1 Scope

This European Standard specifies a method for the determination of the specular reflectance of certain surfaces for indoor sports areas.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO/CIE 10526, *CIE standard illuminants for colorimetry*.

## 3 Principle

A collimated incident light beam is directed onto a test piece taken from the sports surface which is mounted in an integrating sphere and the total light reflected is detected by a photocell.

## 4 Apparatus (see Figure 1)

**4.1 Integrating sphere**, of any diameter, having a matt white interior surface of similar reflectance to that of the reflectance standard and baffles.

**4.2 Light entrance port and sample port**, both centred on the same great circle of the sphere with at least 170° of arc between the centre of the light entrance port and the centre of the sample port. The axis of the irradiating beam shall pass through the centres of the light entrance and sample ports. The sample port shall not exceed 4 % of the internal reflecting area of the sphere and shall subtend an angle of 8° at the centre of the light entrance port.

**4.3 Reflectance standard**, designed as part of the interior wall of the sphere adjacent to the sample port. The angle of rotation shall not exceed 10°.

**4.4 Baffles**, designed so that light cannot pass directly from the entrance port to the photocell or, in position 2 (see Figure 1), from the illuminated area of the sphere wall to the photocell.

**4.5 Mountings for test piece**, such that the angle of incidence of the light beam on the test piece is between 80° and 85°.

NOTE This avoids light which is specularly reflected being lost through the entrance port.

**4.6 Light source and filter**, a tungsten or tungsten–halogen lamp appropriately filtered to give the colour temperature of one of the illuminants A, C or D65 in accordance with ISO/CIE 10526. The light beam so provided shall be substantially unidirectional, to illuminate the test piece. The maximum angle which any ray of this beam makes with its axis shall not exceed 3°. The beam shall not be vignetted at either port of the sphere. The cross-section of the beam at the sample port shall be approximately circular, sharply defined and concentric within the port, leaving an annulus of  $1,3^\circ \pm 0,1^\circ$  subtended at the entrance port.

**4.7 Photoelectric cell(s)**, positioned on the sphere  $90^\circ \pm 10^\circ$  from the light entrance port, to measure the radiant flux within the sphere with output measurements proportional within 1 % to the incident flux over the range of intensity used. There shall be no reading when the sphere is dark. The photoelectric cell shall have a spectral response approximating to the  $V(\lambda)$  response of the eye.

**4.8 Light trap**, such that when in position at the sample port and when there is no test piece present, the light beam shall be totally absorbed and the photoelectric cell (4.7) output shall be less than 1 % of the full scale reading.

## 5 Test piece

Cut three test pieces from the surface, each having a diameter equal to that of the sample port.

## 6 Conditioning

Condition the test pieces for a minimum of 3 h at the test temperature. Unless otherwise specified, the test temperature shall be  $23^\circ\text{C} \pm 3^\circ\text{C}$ .

## 7 Procedure

Ensure the annulus dimensions are correct whenever apertures or focus are changed.

With the sphere in position 1 (see Figure 1) and the light source switched off, check that the photoelectric cell reads zero.

With the sphere in position 1 (see Figure 1) and a light trap in the sample port, switch on the light source. Measure the photoelectric cell output  $I_1$ .

With the sphere in position 2 (see Figure 1), measure the photoelectric cell output, which is the incident intensity  $I_2$ .

With the test piece in the sample port and the sphere in position 1 (see Figure 1), measure the photoelectric cell output  $I_3$ .

Repeat the procedure for each of the other two test pieces.

## EN 13745:2004 (E)

## 8 Expression of results

Calculate the reflectance  $R$  of the test pieces in per cent (%) as follows:

$$R = \frac{I_3}{I_2} \times 100$$

where

$I_2$  is the photoelectric cell output with the sphere in position 2 (see Figure 1);

$I_3$  is the photoelectric cell output with the test piece in the sample port and the sphere in position 1 (see Figure 1).

NOTE  $I_1$  should be sufficiently small that no correction is required.

Calculate the mean of the three reflectances.

## 9 Test report

The test report shall include the following information:

- a) reference to this European Standard, i.e. EN 13745:2004;
- b) complete identification of the surface tested including type, manufacturer's reference and previous history;
- c) type of light source used and the type of filter used;
- d) type of instrument used, including the make and model;
- e) temperature at which the test was carried out;
- f) mean reflectance.