DRAFT FOR DEVELOPMENT

DD CEN/TS 15676:2007

Wood flooring — Slip resistance — Pendulum test

ICS 79.080; 97.150

BSI British Standards

National foreword

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The UK participation in its preparation was entrusted to Technical Committee B/543, Round and sawn timber.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Wood flooring - Slip resistance - Pendulum test

Plancher en bois - Résistance à la glissance - Essai au pendule

Holzfußböden - Gleitwiderstand - Pendelprüfung

This Technical Specification (CEN/TS) was approved by CEN on 27 October 2007 for provisional application.

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Foreword

This document (CEN/TS 15676:2007) has been prepared by Technical Committee CEN/TC 175 “Round and sawn timber”, the secretariat of which is held by AFNOR.

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1 Scope

This Technical Specification specifies the method of applying the pendulum test to wood flooring, in order to determine the slip resistance.

2 Normative references

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

EN 13756:2002, *Wood flooring — Terminology*

ISO 7619-2, *Rubber, vulcanised or thermoplastic — Determination of indentation hardness — Part 2: IRHD pocket meter method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13756:2002 apply.

4 Test method

4.1 Principle

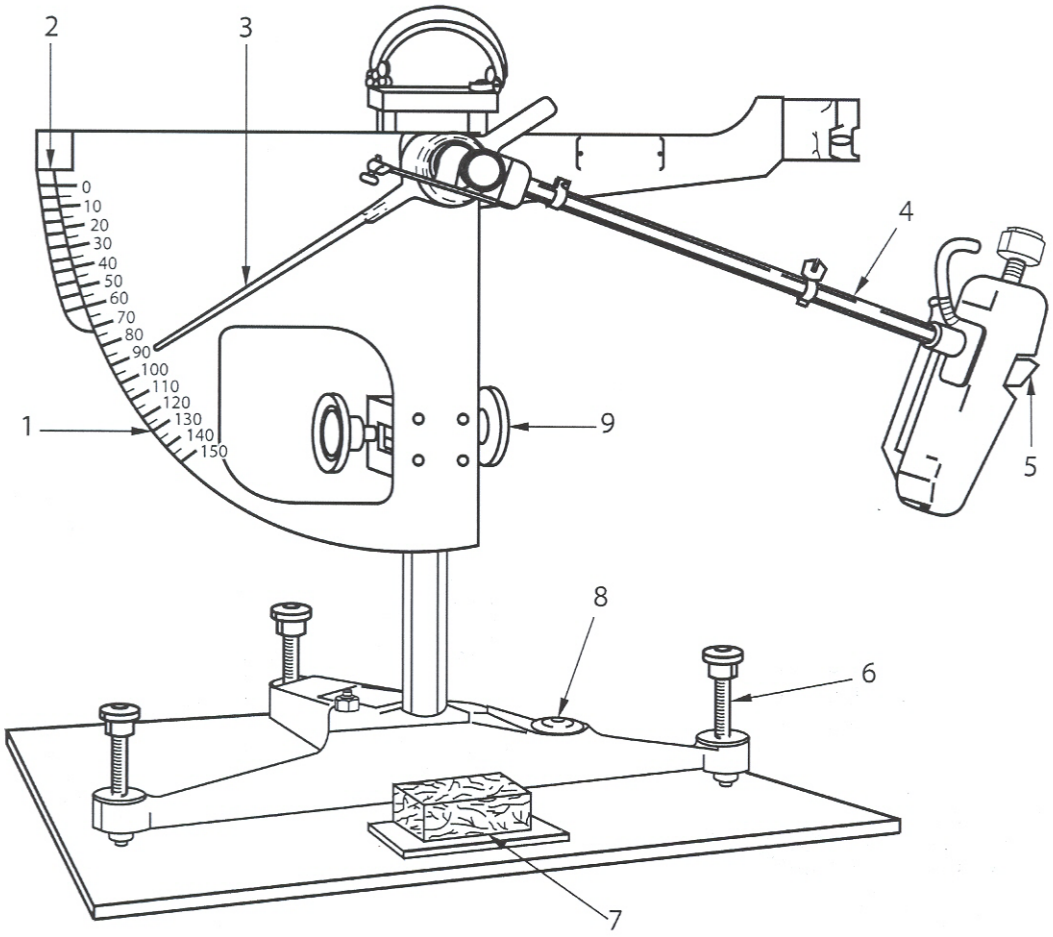
The measurement of slip resistance on the specimen is made using the pendulum friction test equipment to evaluate the frictional properties of the specimen on the upper face.

The pendulum friction test equipment incorporates a spring loaded slider made of a standard rubber attached to the end of the pendulum. On swinging the pendulum the frictional force between the slider and test surface is measured by the reduction in length of the swing using a calibrated scale.

Due to the intended uses of the wood flooring the measurement is carried out on dried surface (see Annex A for wet measurement).

4.2 Apparatus

4.2.1 The pendulum friction test equipment shall be manufactured as show in Figure 1. All bearings and working parts shall be enclosed as far as possible.



Key

1	C scale (126 mm sliding length)	6	levelling screw
2	F scale (76 mm sliding length)	7	test specimen holder
3	pointer	8	spirit level
4	pendulum	9	vertical adjustment screw
5	rubber slider		

Figure 1 — Pendulum friction test equipment

4.2.2 The pendulum test equipment shall have the following features:

1) a spring loaded rubber coated slider as specified in 4.2.4 to 4.2.10. It shall be mounted on the end of a pendulum arm so that the sliding edge is (510 ± 1) mm from the axis of suspension;

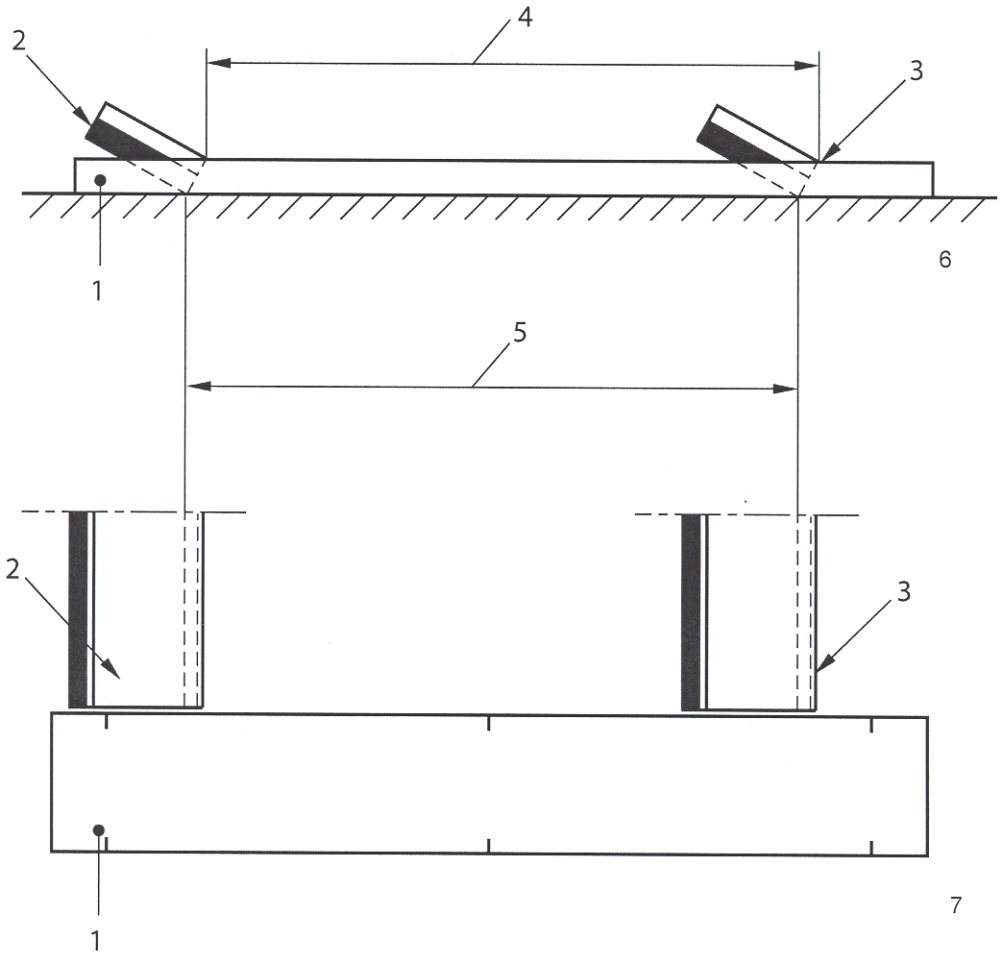
2) means of setting the support column of the equipment vertical;

3) a base of sufficient mass to ensure the equipment remains stable during the test;

4) means of raising and lowering of suspension of the pendulum arm so that the slider can:

   — swing clear of the surface of the specimen and

   — be set to traverse a surface over a fixed length of (126 ± 1) mm. A gauge with this distance marked is required as shown in Figure 2.



Key

1 gauge

2 slider

3 reference edge

4 sliding length

5 actual sliding length

Figure 2 — Sliding length gauge

5) means of holding and releasing the pendulum arm so that it falls freely from a horizontal position;

6) a pointer of nominal length 300 mm, balanced about the axis of suspension, indicating the position of the pendulum arm throughout its forward and moving over the circular scale. The mass of the pointer shall be not more than 85 g;

7) the friction in the pointer mechanism shall be adjustable so that, with the pendulum arm swinging freely from a horizontal position, the outward tip of the pointer may be brought to rest of the forward swing of the arm at a point (10 ± 1) mm below the horizontal. This is the 0 reading;

8) a circular C scale, calibrated for a sliding length of 126 mm on a flat surface, marked from 0 to 150 at intervals of five units.

4.2.3 The mass of the pendulum arm, including the slider, shall be (1,50 ± 0,03) kg. The centre of gravity shall be on the axis of the arm at a distance of (410 ± 5) mm from the axis of suspension.

4.2.4 The slider shall consist of a rubber pad (76,2 ± 0,5) mm wide; (25,4 ± 1,0) mm long (in the direction of swing) and (6,4 ± 0,5) mm thick, the combined mass of slider and base shall be (32 ± 5) g.

4.2.5 The slider shall be held on a rigid base with a centre pivoting axis which shall be mounted on the end of the pendulum arm in such a way that, when the arm is at the lowest point of its swing with the trailing edge of the slider in contact with the test surface, the plane of the slider is angled at (26 ± 3)° to the horizontal. In this configuration the slider can turn about its axis without obstruction to follow unevenness of the surface of the test specimens as pendulum swings.

4.2.6 The slider shall be spring-loaded against the test surface. When calibrated, the static force on the slider as set by the equipment calibration procedure shall be (22,2 ± 0,5) N in its median position. The change in the static force on the slider shall be not greater than 0,2 N per millimetre deflection of the slider.

4.2.7 The initial resilience and hardness of the slider conform to Table 1, and shall have a certificate of conformity including the name of the manufacturer and date of manufacturing. A slider shall be discarded when IRHD value measured in accordance ISO 7619-2 fails to conform to the requirements of the Table 1 or not later than three years after manufacture.

Table 1 — Properties of the slide rubber

	Temperature °C				
Property	0	10	20	30	40
Resilience (%) [a]	43 to 49	58 to 65	66 to 73	71 to 77	74 to 79
Hardness (IRHD) [b]	53 to 65				

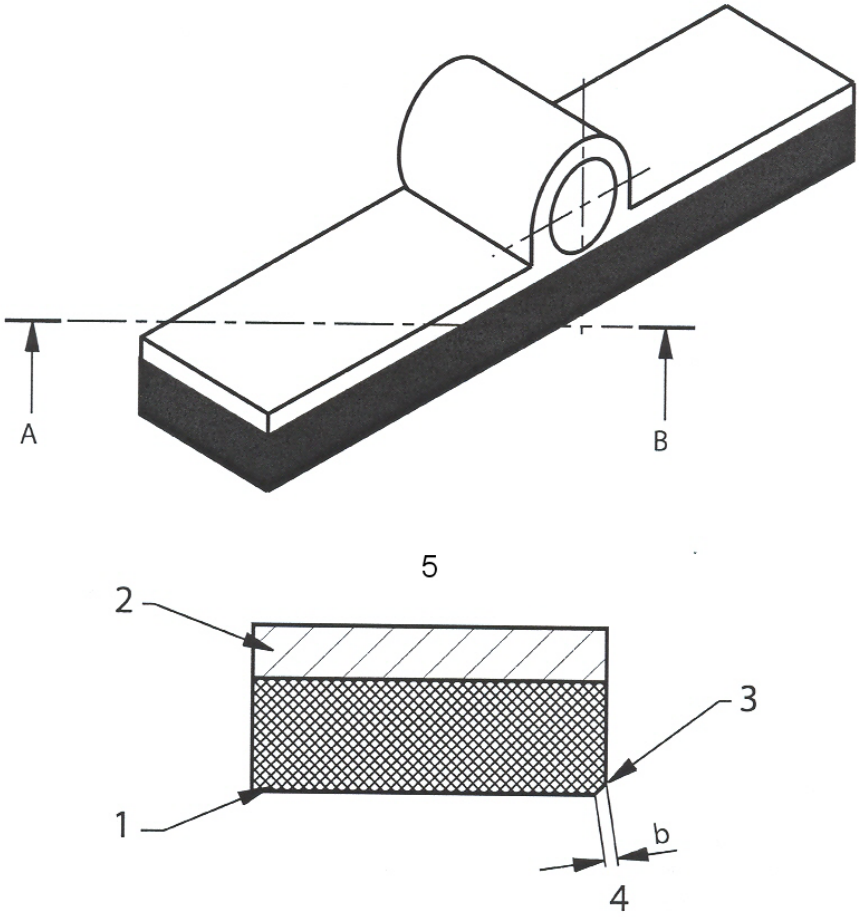
[a] Rebound test in accordance with ISO 4662.

[b] International Rubber Hardness Degrees in accordance with ISO 48.

4.2.8 The edges of the slider shall be square and clean-cut and the rubber free from contamination by, for example, abrasive or oil. The slider shall be stored in the dark at a temperature in the range 5 °C to 20 °C.

4.2.9 Before using a new slider it shall be conditioned to produce a minimum width of striking edge of 1 mm as shown in Figure 3.

This shall be achieved by setting up the tester and carrying out five swings on a dry surface with a friction value above 40 on the C scale.



key

1 rubber slider

2 aluminium backing

3 striking edge

4 worn width

5 Section A-B (2:1)

Figure 3 — Slider assembly illustrating the maximum wear on striking edge

4.2.10 The slider shall be discarded when the width of the striking edge as shown in Figure 3 exceeds 3 mm or becomes excessively scored or burred. The slider can be reversed to expose a new edge, which will need to be conditioned.

4.3 Calibration

The apparatus shall be recalibrated at least annually.

4.4 Sampling

Obtain a representative sample of 10 specimens of the same surface family.

Each specimen shall permit a test area of (136 mm ± 1 mm) × (86 mm ± 1 mm) which is representative of the whole specimen. This area shall be tested using the 76 mm wide slider over a nominal swept length of 126 mm, readings being taken on the C scale.

In the case of large specimen, representative samples shall be cut from them for test.

4.5 Conditioning

Specimens shall be conditioned during 2 weeks at (23 ± 2) °C and (50 ± 5) % of relative humidity.

4.6 Procedure

Keep the friction test equipment and slider in a room at a temperature of (23 ± 2) °C for at least 30 min before the test begins.

Place the friction tester upon a firm level surface and adjust the levelling screws so that the pendulum support column is vertical. Then raise the axis of suspension of the pendulum so that the arm swings freely and adjust the friction in the pointer mechanism so that when the pendulum arm and pointer are released from the right-hand horizontal position the pointer comes to rest at the zero position on the test scale.

Before using the slider, condition it making 5 swings on the surface representative of the measured surface.

Discard any slider exceeding the requirements stipulated in 4.2.7 and 4.2.10.

Rigidly locate the test specimen with its longer dimension lying in the track of the pendulum and centrally with respect to the rubber slider and to the axis on the suspension of the pendulum. Ensure that the track of the slider is parallel to the long axis of the specimen across the sliding distance.

Adjust the height of the pendulum arm so that in traversing the specimen, the rubber slider is in contact with it over the whole width of the slider and over the specified swept length. Release the pendulum and pointer from the horizontal position and catch the pendulum arm on its return swing. Record the position of the pointer on the scale (the pendulum test value). Perform this operation 3 times on each sample and record the average of the three readings.

4.7 Calculation of test results

The slip resistance value is the mean pendulum value obtained on the 10 specimens recorded to the nearest 1 unit.

4.8 Test report

The test report shall contain the following information:

— the name and address of the laboratory;

— the name and address of the company ordering the test;

— the sampling procedure and the identification of the sample;

— the date of delivery;

— the date of period of test;

— the material tested: finishing of the product, coating;

— the conditioning applied to the elements prior to testing;

— the mean pendulum test value of each specimen;

— the mean slip resistance value described in this European Standard;

— any change with the procedure described in this European Standard.

Annex A
(informative)

Measurement on wet surface

For testing on wet surface apply the same procedure as for dry surface but:

— wet the surfaces of the specimen and the rubber slider with a copious supply of water, being careful not to disturb the slider from its set position, just after adjusting the height of pendulum arm and before releasing this pendulum;

— perform this operation 3 times on each sample, rewetting the specimen each time;

— record the average of the 3 readings.

Bibliography

[1] ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

[2] ISO 4662, *Rubber — Determination of rebound resilience of vulcanizates*

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