

Method of determination of unpolished and polished slip/skid resistance value

ICS 93.080.20

National foreword

This Draft for Development reproduces verbatim ENV 12633:2003.

This publication is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature because other CEN member states do not possess sufficient expertise in this area to support the preparation of a full European Standard. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the international organization responsible for the Technical Specification. A review of this publication will be initiated not later than 3 years after its publication by the international organization so that a decision can be taken on its status at the end of its 3-year life. Notification of the start of the review period will be made in an announcement in the appropriate issue of *Update Standards*.

According to the replies received by the end of the review period, the responsible BSI Committee will decide whether to support the conversion into an international standard, to extend the life of the Technical Specification for another 3 years or to withdraw it. Comments should be sent in writing to the Secretary of BSI Subcommittee B/507/4, Slip/skid resistance testing, at British Standards House, 389 Chiswick High Road, London W4 4AL, giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

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

Cross-references

The British Standards which implement international publications referred to in this document may be found in the BSI Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

Summary of pages

This document comprises a front cover, an inside front cover, the ENV title page, pages 2 to 25 and a back cover.

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English version

Method of determination of unpolished and polished slip/skid resistance value

Méthode de détermination de la valeur de résistance au dérapage/à la glissance des pavés polis ou non polis

Verfahren zur Bestimmung des Griffigkeitsbeiwertes vor und nach Polierung

This European Prestandard (ENV) was approved by CEN on 21 November 2002 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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Foreword

This document (ENV 12633:2003) has been prepared by Technical Committee CEN/TC 178 "Paving units and kerbs", the secretariat of which is held by BSI.

Annexes A, B and C are normative. Annex D is informative.

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

Introduction

Health and safety aspects

WARNING: The application of emery polishing agents during the course of the operations described in this European Prestandard can generate particles that could be injurious to health. It is essential to ensure that appropriate precautions are taken, e.g. the use of dust masks and/or dust extracting facilities. It is also essential to ensure that the equipment is electrically safe in wet test conditions.

1 Scope

This European Prestandard describes a laboratory method for determining the unpolished slip/skid resistance value (USRV) and the polished slip/skid resistance value (PSRV) of paving units using a flat-bed polishing machine in conjunction with pendulum test equipment.

2 Normative references

This European Prestandard 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 Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (Hardness between 10 IRHD and 100 IRHD)*.

ISO 3310, *Test sieves – Technical requirements and testing*.

ISO 4662, *Rubber — Determination of rebound resilience of vulcanizates*.

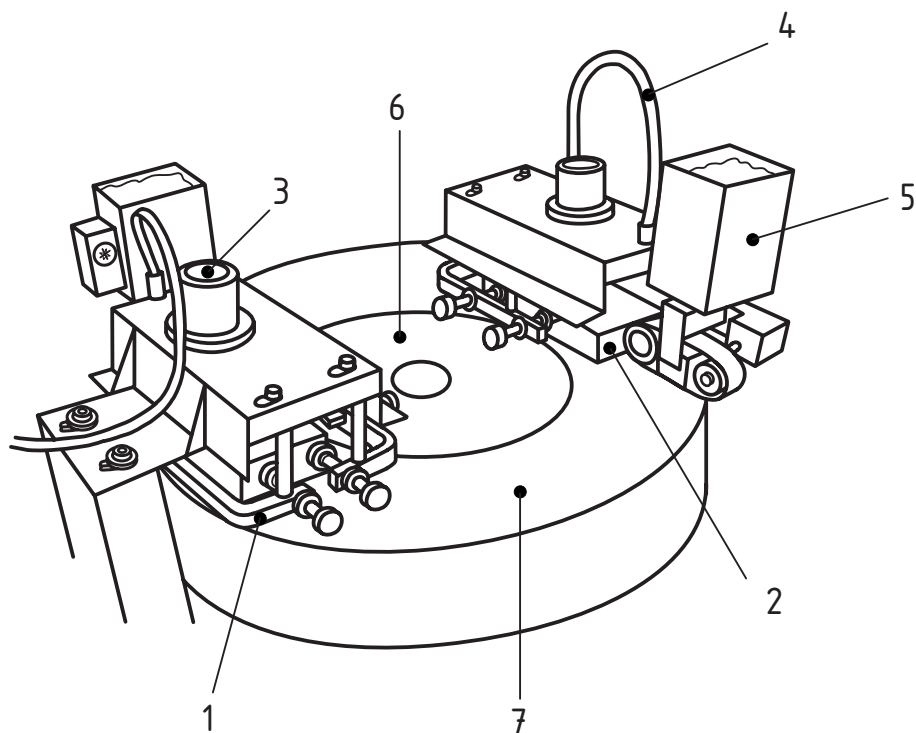
ISO 7619, *Rubber — Determination of indentation hardness by means of pocket hardness meters*.

3 Principle

The test methodology for determining the slip/skid resistance values of paving units consists of measuring the pendulum value of a sample, before and/or after polishing with a flat-bed polishing machine, using the pendulum test equipment.

4 Apparatus

- 4.1 Straight-edge.
- 4.2 Set of feeler gauges with a width of (6 ± 1) mm capable of measuring with an accuracy to 0,05 mm.
- 4.3 Pendulum test equipment conforming to A.2.
- 4.4 Flat-bed polishing machine (see Figure 1) comprising the following:



Key

- | | |
|-------------------|---|
| 1 Sample holder | 5 Emery hoppers with adjustable conveyors |
| 2 Sample | 6 Polishing lap |
| 3 Adjustable mass | 7 Rubber annulus |
| 4 Water supply | |

Figure 1 — Flat-bed polishing machine

- a) a machined, flat circular cast iron or steel grinding/polishing lap not less than (600 ± 3) mm in diameter, which can be rotated in a horizontal plane at a speed of (29 ± 1) r/min;
- b) a flat smooth-surfaced styrene butadiene rubber annulus of (600 ± 3) mm external diameter, approximately (320 ± 3) mm internal diameter and (9 ± 1) mm thickness, attached to the upper surface;

The rubber annulus shall have an initial hardness of (69 ± 3) IRHD in accordance with ISO 48. It shall be covered by a certificate of conformity from the manufacturer which includes the date of manufacture. It shall be stored in the dark at a temperature in the range $5\text{ }^{\circ}\text{C}$ to $25\text{ }^{\circ}\text{C}$ and shall be conditioned by bringing to a uniform temperature of $(20 \pm 5)\text{ }^{\circ}\text{C}$ before attaching to the grinding plate. After attachment, the grinding plate and annulus shall be kept in the dark at a temperature in the range $(20 \pm 5)\text{ }^{\circ}\text{C}$. The annulus shall not be used after three years from the date of manufacture or after testing 500 specimens.

If glue is used to attach the annulus to the grinding plate, care shall be taken to ensure it does not affect the hardness of the rubber.

- c) two adjustable metal holders capable of loosely holding in place the (150 ± 2) excluding at least one 5-8 mm chamfer) mm (85 ± 2) excluding at least one 5-8 mm chamfer) mm specimens;
- d) means of locating two specimens within the two holders according to the following configuration:
 - $\frac{3}{4}$ with the centre points of their outer edges (270 ± 1) mm from the centre of the lap;

- ¾ positioned diametrically opposite to each other;
- ¾ with their long sides lying in the direction of rotation of the lap.

The specimens shall be free to move in a vertical plane but be restrained from moving in the horizontal plane.

- e) means to ensure that the required load can be applied evenly at the centre of each test specimen and which can move in a vertical direction;
- f) weights which permit uniform loading of the test specimen against the surface of the rubber annulus and which, including test specimen, tray (if used) and adjustable weight, will provide a contact stress of $(2\,250 \pm 50)$ Pa over the area of the final prepared contact surface;

NOTE This stress corresponds to a total mass of 2,924 kg for an area of 150 mm 85 mm.

- g) separate mechanisms to feed corn emery and emery flour and a means to feed water.

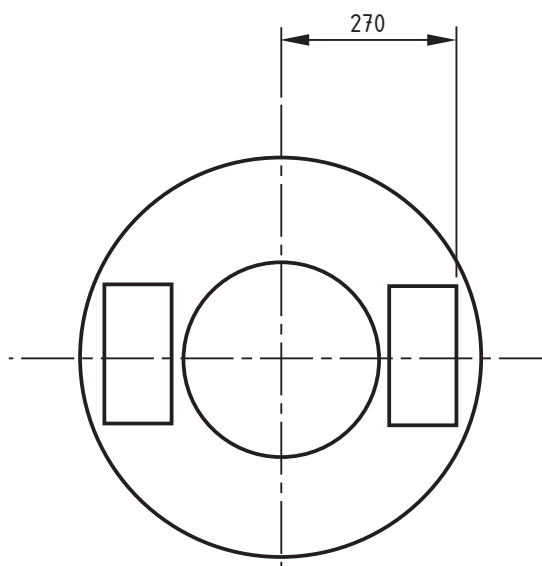


Figure 2 — Position of the paving units onto the Flat-bed polishing machine

4.5 Polishing media, consisting of the following:

- a) unused natural corn emery, of a grading that conforms to Table 1;

Table 1 — Grading requirements for corn emery

Nominal aperture size of sieve	total passing
m	%
600	98 to 100
500	70 to 100
425	30 to 90
355	0 to 30
300	0 to 5

- b) fresh air-floated or water-washed emery flour which passes through a 50 m test sieve.