



**SLOVENSKI STANDARD
SIST-TS CEN/TS 15209:2022**

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**Nadomešča:
SIST-TS CEN/TS 15209:2008**

Taktilni indikatorji tlakovane površine iz betona, opeke in kamna

Tactile paving surface indicators produced from concrete, clay and stone

Taktile Bodenindikatoren gefertigt aus Beton, Ton und Stein

Surfaces tactiles d'indication au sol en béton, terre cuite et pierre naturelle

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Ta slovenski standard je istoveten z: CEN/TS 15209:2021

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ICS:

11.180.30	Pripomočki za slepe in slabovidne	Aids for blind or partially sighted people
93.080.10	Gradnja cest	Road construction

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English Version

**Tactile paving surface indicators produced from concrete,
clay and stone**

Surfaces tactiles d'indication au sol en béton, terre
cuite et pierre naturelle

Taktile Bodenindikatoren gefertigt aus Beton, Ton und
Stein

This Technical Specification (CEN/TS) was approved by CEN on 29 November 2021 for provisional application.

The period of validity of this CEN/TS 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 CEN/TS can be converted into a European Standard.

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

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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CEN/TS 15209:2021 (E)**European foreword**

This document (CEN/TS 15209:2021) has been prepared by Technical Committee CEN/TC 178 “Paving units and kerbs”, the secretariat of which is held by BSI.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TS 15209:2008.

In comparison with the previous edition, the following technical modifications have been made:

a) Introduction

The introduction has been extended to cover the measurement of light reflectance values (LRVs) of units to enable designers to implement adequate visual contrast between tactile units and adjacent surfaces in accordance with standards in the place of use.

This introduction confirms that the given default values should be used where no standards exist.

b) Scope

The scope covers the method and acceptance criteria for the dimensions of the surface and profile features for tactile paving units. It does not specify requirements for profile and dimensions of a single tactile paving unit but proposes ranges within which these dimensions should fall. These properties are decided by the designer taking into account the regulations, codes of practice, and guidance in the place of use of the units.

c) Definitions

Generally updated to include light reflectance value, visual contrast and designer. Requirements for tactile paving surface indicators.

Dimensions and tolerances restated. Consolidated layouts and profiles added with ranges and default values given.

Light reflectance value (LRV) of paving surface indicators. Methods for determining light reflectance values defined.

d) Annex A

Use of the value specified in place of use replaces guides to the various specifications of tactile surfaces in a number of European countries.

e) Annex B

Guide to the preferred dimensions for tactile paving surface indicator profiles for use in a number of European countries deleted and replaced with old Annex C (Measurement of the dimensions of a single tactile paving unit).

f) Annex C

Measurement of the dimensions of a single tactile paving unit moved to Annex B.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

The nature and extent of visual impairment varies considerably among individuals and are very different from person to person. Generally, the result of different eye conditions can lead to the following types of impairment:

- a limited field of vision, being unable to see to the sides or up and down;
- some loss of central vision limiting the ability to see fine detail;
- acute short-sightedness, seeing the world as a continuous blur;
- uncontrollable oscillations of the eyeball leading to an inability to see objects clearly;
- night blindness, a sensitivity to light and a tendency to be dazzled by glare;
- disease can also lead to vision loss and blindness.

Visually impaired people detect information about the environment by the use of non-visual features, for example, audible and tactile features. A loss of sight is not accompanied by an increase in the effectiveness of other non-visual senses. However, visually impaired people generally place more emphasis on information received via other senses, for example the sense of touch.

The use of tactile information: when moving around the pedestrian environment, visually impaired people, using a range of mobility equipment including the long cane, will actively seek and make use of tactile paving surface information, particularly detectable contrasts in surface texture.

The ability to detect contrasts in texture underfoot varies from one individual to another. For example, older visually impaired people and people who have lost their sight through certain medical conditions, such as diabetes, can have reduced sensitivity in their feet.

It is important that tactile warnings of potential hazards, e.g. a road crossing or a stair, are rigorous enough to be detectable by most people but without constituting a trip hazard or causing extreme discomfort.

Considering the walking speed and the length of one step by a visually impaired pedestrian, the width of any warning surface is a critical parameter.

Visually impaired people who have some residual vision will make use of the luminance contrast between surfaces for orientation and guidance, in addition to tactile information. To provide visual and tactile guidance as well as to accentuate the presence of hazards and amenities, luminance contrast between tactile paving units and the adjacent surface needs to be considered by designers, planners, engineers and others involved in the design of the built and pedestrian environments.

Whereas this document covers the measurement of light reflectance values of individual units, it does not cover the required criteria necessary to enable designers to implement adequate luminance contrast since this relies on the difference between adjacent surfaces, which do not both need to be tactile surfaces. However, manufacturers should be aware of this issue in considering the range of colour and tones they provide in their tactile products. Methods for measurement of light reflectance values and the colour of individual units are proposed in this document.

This document is not intended to set requirements for the layout of tactile paving units, but to allow manufacturers to place their products on the market with a CE marking. It is intended that layouts and the specific layout of individual tactile profiles within units will be set locally taking into account regulations, codes of practice, standards and guidance at the place of use and be within the ranges given in this document. Where no local guidance is available default values are given which should be used.

1 Scope

This document specifies the method of measurement and acceptance criteria for the dimensions for surface profile features and patterns for the surface of pedestrian paving units, used to convey information for visually impaired people. It applies to paving units made of concrete, clay and stone where the tactile profiles are monolithic with the unit.

The surface profiles are intended to be applied to units manufactured to EN 1338, EN 1339, EN 1341, and EN 1344 which can be square or rectangular as specified by the designer.

It does not specify dimensions of a single tactile paving layout or profile but proposes ranges within which these dimensions should fall. Default dimensions are given in the absence of a national requirement.

This document proposes methods of measurement of profiles, light reflectance and colour but does not specify requirements for these characteristics. These properties will be decided by the designer taking into account the regulations, codes of practice, and guidance in the place of use of the units.

It does not specify material characteristics.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1338, *Concrete paving blocks - Requirements and test methods*

EN 1339, *Concrete paving flags - Requirements and test methods*

EN 1341, *Slabs of natural stone for external paving - Requirements and test methods*

EN 1344, *Clay pavers - Requirements and test methods*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1 General terms and definitions

3.1.1

visually impaired

completely or partially blind, including those with some vision loss or residual sight

3.1.2

profile feature

single component of a tactile paving surface indicator

EXAMPLE dome, flat-topped dome, cylinder, bar or cuboid

CEN/TS 15209:2021 (E)**3.1.3****tactile paving surface indicator**

profiled paving finish used to convey information to visually impaired pedestrians about hazards and amenities

3.1.4**light reflectance value****LRV**

proportion of visible light reflected (Y) by a surface, weighted for the sensitivity to light of the human eye

Note 1 to entry: The LRV is measured under a D65 illumination.

Note 2 to entry: This is equivalent to CIE Tristimulus Y10 when viewed under luminant D65 and when measured with the appropriate specimen and measurement geometry. Further details of the CIE Tristimulus values are given in CIE 15:2004 and further details of the measurement of reflection are given in CIE 130:1998.

3.1.5**visual contrast**

perception of a difference visually between one surface or element and another by reference to their LRV

3.1.6**designer**

body or person that specifies the layout, details and dimensions of the tactile paving units

3.2 Types of tactile paving surface indicators**3.2.1****blister surface layout**

layout of paving finish comprising raised rows of domes, pyramids, lozenges or cylinders

Note 1 to entry: Types BL1-BL4 [https://standards.iteh.ai/catalog/standards/sist/57e1f597-](https://standards.iteh.ai/catalog/standards/sist/57e1f597-b777-41d7-a7ca-05ee7eae264b/sist-ts-cen-ts-15209-2022)

3.2.2**blister surface profile**

profile of domes, pyramids, lozenges or cylinders used for tactile paving surface indicators

Note 1 to entry: Types B1-B3.

3.2.3**rib surface layout**

layout of paving finish comprising parallel bars or sine-like waves running across the width on the unit

Note 1 to entry: Types RL1-RL5.

3.2.4**rib surface profile**

profile of parallel bars or sine-like waves running across the width on the unit

Note 1 to entry: Types R1-R4.

3.2.5**central delineator strip**

kerb detail used to separate rib surface profiles

Note 1 to entry: Type CD1.

3.2.6**complementary fitting**

dark or light coloured paving unit to provide a luminance contrast strip for use with warning units of light or dark colours and tones

4 Requirements for tactile paving surface indicators**4.1 General**

Units shall satisfy the requirements of EN 1338, EN 1339, EN 1341 or EN 1344.

In the absence of a national requirement for skid resistance, the results of units of similar non-profiled construction shall be applicable to the profiled units.

Tactile layouts and profiles are detailed in Figures 1 to 19. The dimensions of the layouts and profiles shall fall within the ranges given in the Figure keys. The designer shall specify the dimensions to be used (taking into account the regulations, codes of practice, and guidance in the place of use). In the absence of a national requirement default dimensions should be used by referring to the Figure keys.

4.2 Profile feature arrangement**4.2.1 General**

The dimensions to be used shall be determined for the place of use. Dimensions shall be measured in accordance with and conform to the acceptance criteria in Annex B.

4.2.2 Spacing of profiles

The profile features shall be laid out to take account of the overall dimensions of the unit. The dimension of the spacing (S) should allow for a whole number of profiles to be incorporated into the length/width of a unit and provide a uniform pattern of features within an area of laid units.

4.2.3 Dimensions and tolerances

The dimensions of profile features within a single paving unit shall be set for the place of use and within the values given in the Figure keys. The designer shall specify the tolerances to be used (taking into account the regulations, codes of practice, guidance and advice in the place of use). Where no tolerances are set the default values shall be:

- for tactile paving units with a warning function:

Permitted tolerance of ± 1 mm for the profile dimensions and the spacing dimension between profiles except for the dimension of profile height (PH), where the tolerance shall be $\pm 0,5$ mm or except where specifically stated in this document.

- for tactile paving units used for guidance, delineator/orientation strips:

Permitted tolerance is ± 5 mm for the profile dimensions and ± 10 mm for the spacing dimension between profiles except for the dimension of profile height (PH) where the tolerance shall be $\pm 0,5$ mm or except where specifically stated in this document.

NOTE The profile height (PH) is the distance of the top of the raised profile above the upper face of the unit, as given in EN 1338, EN 1339, EN 1341 or EN 1344.

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4.2.4 Edge details

The top edge of a profile with a vertical face should be formed with a radius of 2 mm to 4 mm or with a minimum chamfer of 2 mm \times 2 mm to reduce the risk of tripping or the spalling of arises where units are butt jointed.

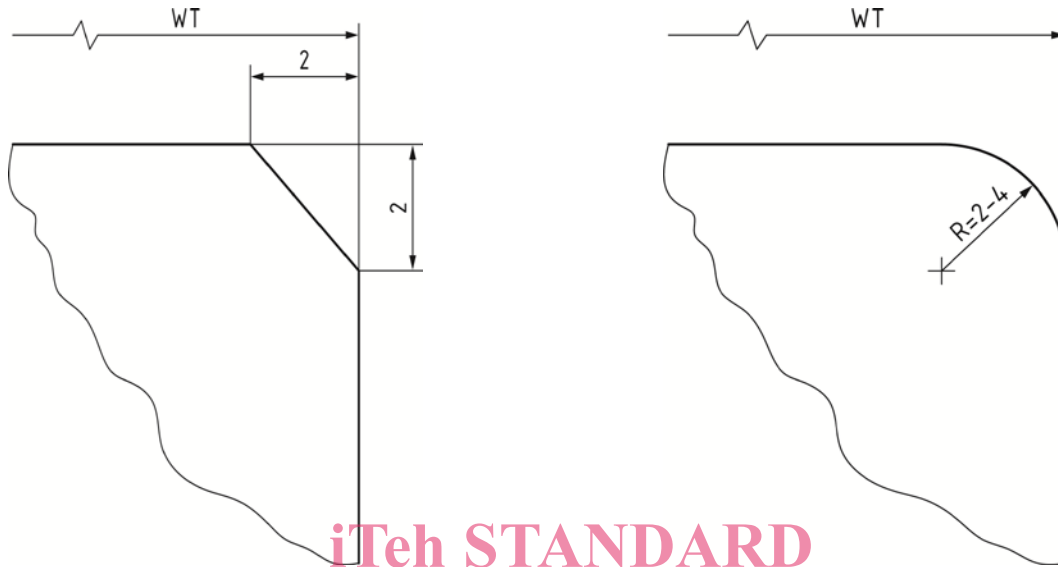


Figure 1 — Profile edge details

4.2.5 Continuity of finished surface

Tactile paving units should be manufactured so that the profile of the tactile paving surface indicator can be maintained across individual units (see Figure 2).

Where possible, profiled paving units should be manufactured in such a way that the profile of the whole finished surface has the same dimensions as the profile of the individual units including any joints, i.e. spacing (S) is maintained between the centre of profile features at the edges of adjoining units.

To maintain continuity of the spacing (S) of profiles with adjacent tactile units the dimension S1 shall be the same as spacing (S).

The width of the joint may be zero.

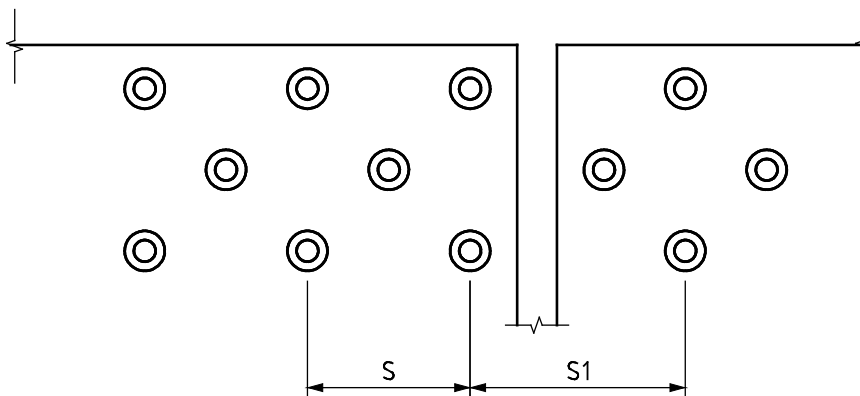


Figure 2 — Continuity of adjacent profiles