



SLOVENSKI STANDARD

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Tlakovci iz naravnega kamna za zunanje tlakovanje - Zahteve in preskusne metode

Setts of natural stone for external paving - Requirements and test methods

Pflastersteine aus Naturstein für Außenbereiche - Anforderungen und Prüfverfahren

Pavés de pierre naturelle pour le pavage extérieur - Exigences et méthodes d'essai

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English Version

Setts of natural stone for external paving - Requirements and
test methodsPavés de pierre naturelle pour le pavage extérieur -
Exigences et méthodes d'essaiPflastersteine aus Naturstein für Außenbereiche -
Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 6 October 2012.

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EN 1342:2012 (E)**Foreword**

This document (EN 1342:2012) has been prepared by Technical Committee CEN/TC 178 "Paving units and kerbs", 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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by August 2014.

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

This document supersedes EN 1342:2001.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

The following changes have been made in this new edition:

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- a) Where possible the requirements refer to separate test methods prepared by CEN/TC 246, "Natural stones". The change was made to allow those placing the products on the market to use the same test results for a number of products.
- b) The values to be declared have been clarified and where applicable the declared values are now 'lower expected values'.
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According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies the performance requirements and the corresponding test methods for all natural stone setts used for external paving and road finishes.

External paving use includes all pavements typical of road works, such as pedestrian and trafficked areas, outdoor squares and similar to be used in an outdoor condition that are subject to the weathering agents, such as temperature changes, rain, ice, wind, etc.

This European Standard provides also for the evaluation of conformity and for marking of the natural stone setts.

This European Standard also covers characteristics that are of importance to the trade.

2 Normative references

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

EN 1926, *Natural stone test methods — Determination of uniaxial compressive strength*

EN 1936, *Natural stone test methods — Determination of real density and apparent density, and of total and open porosity*

EN 12371, *Natural stone test methods — Determination of frost resistance*

EN 12407, *Natural stone test methods — Petrographic examination*

EN 12440, *Natural stone — Denomination criteria*

EN 13373:2003, *Natural stone test methods — Determination of geometric characteristics on units*

EN 13755, *Natural stone test methods — Determination of water absorption at atmospheric pressure*

EN 14157, *Natural stone test methods — Determination of the abrasion resistance*

EN 14231, *Natural stone test methods — Determination of the slip resistance by means of the pendulum tester*

3 Terms and definitions

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

3.1

sett

unit of natural stone obtained by cutting or splitting used as a paving material, in which the working width does not exceed two times the thickness, and the length does not exceed two times the width

Note 1 to entry: The minimum working thickness is 40 mm.

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- 3.2
work dimension**
dimension of a sett specified for its manufacture to which the actual dimension should conform within specified permissible tolerances
- 3.3
actual dimension**
dimension of a sett as measured
- 3.4
overall length**
L
longer side of the rectangle with the smallest length able to enclose the sett
- 3.5
overall width**
W
shorter side of the rectangle with the smallest area able to enclose the sett
- 3.6
thickness**
T
distance between the upper face and the bedface of the sett
- 3.7
upper face**
surface of a sett intended to be seen when in use
- 3.8
bed face**
surface of a sett intended to be in contact with the bedding material when in use
- 3.9
side face**
surface of a sett intended to be vertical when in use
- 3.10
textured**
sett with a surface finish produced by secondary processing, from a saw or hewn surface
- 3.11
fine textured**
surface finish with a maximum difference of 1,0 mm between peaks and depressions (for example polished, honed or sawn with a diamond disc or blade)
- 3.12
coarse textured**
surface finish with more than 1,0 mm difference between peaks and depressions (for example dolly pointed, shot blasted or flame textured)
- 3.13
hewn**
sett with a rough surface finish, for example a riven or split face
- 3.14
lower expected value**
 E_L
value which corresponds to the 5 %-quantile of a logarithmic normal distribution for a confidence level of 75 %

3.15

higher expected value

E_H

value which corresponds to the 95 %-quantile of a logarithmic normal distribution for a confidence level of 75 %

4 Requirements

4.1 General

4.1.1 Denomination

The denomination shall always be declared in accordance with EN 12440 (meaning traditional name, petrological family, typical colour and place of origin as precisely as possible for example geo coordinates).

4.1.2 Alteration of physical properties of the natural stone

If during production the natural stone setts have been subjected to a treatment process that physically alters the properties of the stone (for example chemical treatment, patching, or filling or other similar products for natural holes, faults or cracks) then the use of such a treatment shall be stated.

In addition, specimens for testing shall be representative of the product and any processes that the stone is subjected to.

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4.2 Dimensions

4.2.1 General

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The work dimensions of the setts shall be declared.

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Dimensions between faces shall be stated as a unitary nominal dimension or as a range of nominal minimum-maximum dimensions, e.g. (100 - 200) mm.

Dimensions of each shall be measured in accordance with EN 13373.

4.2.2 Tolerances

4.2.2.1 Plan dimensions and thickness

Plan dimensions and thickness of a sett shall be measured in accordance with EN 13373:2003, 5.2 and 5.3 and the deviations from the declared plan dimensions and thickness shall conform to tolerances given in Table 1.

Different deviations may be declared for plan dimensions and thickness.

Unless stated otherwise, a consignment of setts shall be intended to be laid in rectilinear patterns and all setts within a consignment, when measured in accordance with EN 13373:2003, 5.4, shall conform with the tolerances from the plan and thickness dimensions described in Table 1.

Table 1 — Tolerances on nominal plan dimensions and thickness

Nominal dimension		Class 0	Class 1	Class 2
≤ 60 mm	Textured	No requirements	± 7 mm	± 5 mm
	Hewn		± 10 mm	± 7 mm
> 60 mm ≤ 120 mm	Textured		± 10 mm	± 5 mm
	Hewn		± 15 mm	± 10 mm
> 120 mm	Textured		± 10 mm	± 7 mm
	Hewn		± 15 mm	± 12 mm

Where a consignment of setts is specifically designated for being laid in radial or arch patterns then it may include a proportion of the total agreed by the specifier, that are bigger, smaller and trapezoidal setts not varying from the dimensions allowed by the stated tolerance by more than 10 %.

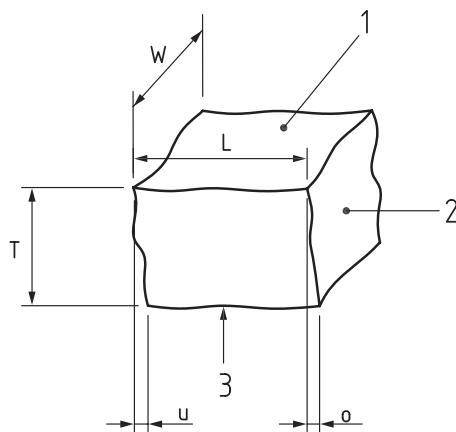
When dimensions between faces are declared as a range of nominal minimum – maximum thickness, the deviation shall be declared on the limits of the range. This is particularly applicable to hewn setts.

In all cases the thickness of the setts shall be observed.

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4.2.2.2 Undercut of sides

When measured in accordance with EN 13373:2003, 5.5, deviations of the undercut of a side shall not exceed the tolerances given in Table 2 with respect to the perpendicularity of the upper face (see Figure 1).



Key

- 1 = upper face
- 2 = side face
- 3 = bed face
- u = undercut of side face
- o = overcut of side face
- T = thickness
- W = overall width

Figure 1 — Tolerances on under and overcut faces

Table 2 — Tolerances on the undercut of sides

Nominal Dimension	Class 0	Class 1		Class 2	
		Maximum one side	Maximum sum	Maximum one side	Maximum sum
≤60 mm	No requirement	10 mm	20 mm	5 mm	10 mm
>60 mm ≤ 120 mm		15 mm	25 mm	10 mm	15 mm
>120 mm		25 mm	30 mm	15 mm	20 mm

4.2.2.3 Hewn and coarse textured face irregularities

When measured in accordance with EN 13373:2003, 5.3, deviations of upper and side face cavity and protrusions shall not exceed the tolerances given in Table 3.

Table 3 — Tolerances on hewn and coarse textured face irregularities

	Class 0	Class 1	Class 2
Hewn	No Requirements	± 10 mm	± 5 mm
Coarse Textured		± 5 mm	± 3 mm

4.3 Freeze/thaw resistance

4.3.1 Freeze- thaw under normal conditions

When the setts are intended to be used in areas subjected to freeze and thaw freeze-thaw requirements, the freeze/thaw resistance shall be determined using the test method in EN 12371. The results shall be expressed and declared as the mean compressive strength before and after 56 cycles of freeze/thaw (technological test).

The frost damage, which a natural stone may suffer when installed, depends on the climatic conditions of the place of use, the relative position in the works (which determines the degree of saturation) and the predicted service life of the works. This number of cycles is appropriate to a specific project and may help to provide guidance for the interpretation of the test results. The selection of the stones is subjected to climatic zones and/or to codes of practice.

For some specific uses, for example in locations that are subject to temperatures below - 12 °C, it may be appropriate to use different test cycles, e.g. freezing in water, freezing to a lower temperature, or testing specimens embedded in non-porous siliceous granules or a different number of cycles, e.g. the identification test as defined in EN 12371.

4.3.2 Freeze-thaw in the presence of de-icing salts

Where required, freeze-thaw resistance with the effect of de-icing salts shall be determined and declared. In the absence of a European test method, freeze-thaw resistance with the effect of de-icing salts shall be determined and declared according to national provisions valid in the place of use of the product.

4.4 Breaking strength — Compressive strength

The compressive strength shall be determined using the test method in EN 1926 and the lower expected value (E_L) shall be declared.

4.5 Abrasion resistance

The abrasion resistance shall be determined using the test method in EN 14157 and the higher expected value (E_H) shall be declared.

EN 1342:2012 (E)**4.6 Slip and skid resistance****4.6.1 Slip resistance**

The slip resistance shall be declared when the intended use of the setts is subject to regulatory requirements, or upon request, and, in any case, when the roughness of the surface, measured following EN 13373:2003, 5.3, is less than 1,0 mm.

The slip resistance shall be determined and the results expressed in accordance with the test procedure for both wet conditions in EN 14231.

Coarse textured and hewn setts are assumed to give satisfactory slip resistance. They cannot be reliably tested.

It should also be noted that the performance of setts when laid may have a different slip resistance value to that determined on individual setts or test specimens.

NOTE 1 The unpolished slip resistance value relates to setts as manufactured and helps to ensure adequate slip/skid resistance on installation.

NOTE 2 Experience has indicated that a USRV measurement made using a wide slider / full swing on a pendulum in wet conditions that is greater than 35 can usually be considered acceptable for surfaces that are horizontal or sloping at less than 6 %.

4.6.2 Skid resistance

Where required, skid resistance shall be declared.

In the absence of a European test method, skid resistance may be determined and declared according to national provisions valid in the place of use of the product.

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4.6.3 Durability of slip or skid resistance

When required, durability of slip and skid resistance shall be declared.

In the absence of European test methods, durability of slip and skid resistance shall be determined and declared according to national provisions valid in the place of use of the product.

4.7 Appearance**4.7.1 General**

The colour, veining, texture, etc. of the stone shall be identified visually, typically by a reference sample of the same stone suitable for providing a general description of visual appearance.

A reference sample shall be provided by the supplier in accordance with 4.7.2.

4.7.2 Reference sample, visual inspection and acceptance criteria

A reference sample shall be an adequate number of setts of natural stone of sufficient size to indicate the general appearance of the finished work. They shall indicate the range of appearance regarding the colouring, the vein pattern, the physical structure and the surface finish. In particular the reference sample shall show specific characteristics of the stone, such as specific holes, glass seams, spots, crystalline veins and rusty spots.

The reference samples does not imply strict uniformity between the sample itself and the actual supply; natural variations may always occur.