



# SLOVENSKI STANDARD

## SIST EN 1341:2013

01-marec-2013

Nadomešča:

SIST EN 1341:2002

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**Plošče iz naravnega kamna za zunanje tlakovanje - Zahteve in preskusne metode**

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

Platten aus Naturstein für Außenbereiche - Anforderungen und Prüfverfahren

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

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**Ta slovenski standard je istoveten z: EN 1341:2012**

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93.080.20	Materiali za gradnjo cest	Road construction materials

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 1341**

November 2012

ICS 93.080.20

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English Version

## Slabs of natural stone for external paving - Requirements and test methods

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

Platten aus Naturstein für Außenbereiche - Anforderungen  
und Prüfverfahren

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

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN 1341:2012 (E)****Foreword**

This document (EN 1341:2012) 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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by August 2014.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 1341:2001.

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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- c) Annex A (Annex B in the 2001 version) has been extended to include safety factors specific to different uses.

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 slabs 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 slabs.

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

This European standard does not cover natural stone slabs for floors and stairs in buildings. In these cases EN 12058 [1] applies.

## 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 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 12372, *Natural stone test methods — Determination of flexural strength under concentrated load*

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

#### **external paving slab**

unit of natural stone obtained by cutting or splitting used as a paving material, used for external paving and road finishes in which the working width exceeds two times the thickness

**EN 1341:2012 (E)**

- 3.2  
upper face**  
surface of a slab intended to be seen when in use
- 3.3  
bed face**  
surface of a slab intended to be in contact with the bedding material when in use
- 3.4  
side face**  
surface of a slab perpendicular to upper face and intended to be vertical in use
- 3.5  
work dimension**  
dimension of a slab, specified for its manufacture, to which the actual dimension is to conform within specified permissible tolerances
- 3.6  
actual dimension**  
dimension of a slab as measured
- 3.7  
irregular plan form**  
slab of random plan dimensions
- 3.8  
thickness**  
distance between the upper face and the bed face of the slab
- 3.9  
overall length**  
longer side of the rectangle with the smallest length able to enclose the slab
- 3.10  
overall width**  
shorter side of the rectangle with the smallest area able to enclose the slab
- 3.11  
textured**  
slab face with a surface finish produced by secondary processing, from a saw or hewn surface
- 3.12  
fine textured**  
surface finish with a maximum difference of 1,0 mm between peaks and depressions (e.g. polished, honed or sawn with a diamond disc or blade)
- 3.13  
coarse textured**  
surface finish with more than 1,0 mm difference between peaks and depressions (e.g. dolly pointed, shot blasted or flame textured)
- 3.14  
hewn**  
slab face or edge with a rough surface finish, e.g. a riven or split face or edge
- 3.15  
tooled**  
coarse finish resulting from mechanical surface treatment and showing tool marks

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**3.16****arris**

edge produced by the meeting of two surfaces

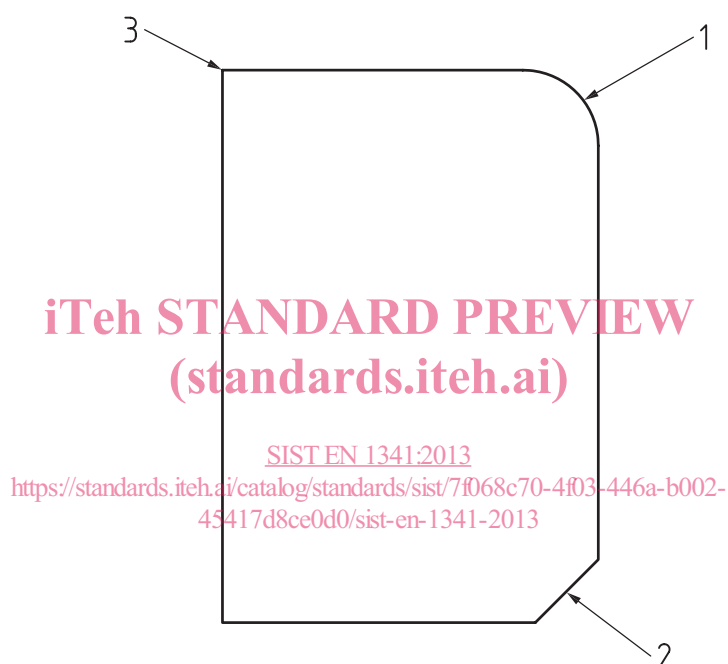
Note 1 to entry: Sharp, rounded and chamfered arrises are shown in Figure 1.

**3.17****lower expected value** $E_L$ 

value which corresponds to the 5 %-quantile of a logarithmic normal distribution for a confidence level of 75 %

**3.18****higher expected value** $E_H$ 

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

**Key**

- 1 rounded arris
- 2 chamfered arris
- 3 sharp arris

**Figure 1 — Illustration of types of arris**

## 4 Requirements and test methods for slabs of natural stone

### 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).

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## 4.1.2 Alteration of physical properties of the natural stone

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

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

## 4.2 Dimensions

## 4.2.1 General

The work dimensions of the slabs shall be declared unless they are being supplied in random lengths. Where supplied in random lengths, only the widths and thickness shall be declared.

Dimensions shall be measured in accordance with EN 13373.

## 4.2.2 Permissible tolerances

## 4.2.2.1 Plan dimensions (excluding slabs with irregular plan form)

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

Table 1 — Tolerances on plan dimension

	Tolerances on plan dimension of slabs <sup>a</sup> for:		
	Class 0	Class 1	Class 2
Marking designation	P0	P1	P2
Sawn edges	No requirement	± 4 mm	± 2 mm
Hewn and tooled edges		± 10 mm	± 10 mm

<sup>a</sup> For natural stone slabs with regular plan form only.

The two diagonals of a rectangular slab shall be measured in accordance with EN 13373:2003, 5.2, and the maximum difference between them shall not exceed the values given in Table 2.

Table 2 — Tolerances on diagonals

	Tolerances on diagonals of slabs <sup>a</sup> for:		
	Class 0	Class 1	Class 2
Marking designation	D0	D1	D2
Sawn edges	No requirement	6 mm	3 mm
Hewn and tooled edges		15 mm	10 mm

<sup>a</sup> For natural stone slabs with regular plan form only.

Tolerances stricter than P2 and D2 may be declared.

#### 4.2.2.2 Thickness

The thickness of a slab shall be measured in accordance with EN 13373:2003, 5.2, and the deviations from the declared thickness shall conform to tolerances given in Table 3.

**Table 3 — Tolerances on thickness**

	Tolerances on thickness of slabs for:		
	Class 0	Class 1	Class 2
Marking designation	T0	T1	T2
≤ 30 mm thick	No requirement <sup>a</sup>	± 3 mm	± 10 %
30 mm < thickness ≤ 80 mm		± 4 mm	± 3 mm
> 80 mm thick		± 7 mm	± 4 mm
<sup>a</sup> Manufacturers are encouraged to declare deviations measured in accordance with EN 13373:2003, 5.2.			

Dimensions between faces may be declared as a range of nominal minimum-maximum thicknesses, e.g. 30 – 60 mm and a tolerance declared on the limits of the range. This is particularly applicable to hewn slabs.

Tolerances stricter than T2 may be declared.

#### 4.2.2.3 Face irregularities

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The face irregularities on hewn slabs, measured in accordance with EN 13373:2003, 5.3, shall never be greater than 20 mm above the work thickness and not below the work thickness (i.e. (+20/-0) mm) and the greatest measured value shall be declared.

#### 4.2.2.4 Flatness and straightness

##### 4.2.2.4.1 Arrises

The straightness along the arrises of textured slabs plan dimensions shall be measured in accordance with EN 13373:2003, 5.4, and the deviations from the declared straightness shall conform to tolerances given in Table 4.

**Table 4 — Tolerances on straightness along arrises**

	Tolerances on straightness along arrises of slabs		
	0,5 m	1 m	1,5 m
Longest test straight edge	0,5 m	1 m	1,5 m
Fine textured face	± 2 mm	± 3 mm	± 4 mm
Coarse textured face	± 3 mm	± 4 mm	± 6 mm

##### 4.2.2.4.2 Faces

Flatness and bow shall be measured in accordance with EN 13373:2003, 5.4, and the deviations from the declared flatness and bow shall conform to tolerances given in Table 5 unless the surface is riven in which case information on the deviations shall be declared.

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The vertical faces of hewn or tooled slab shall be undercut relative to the top arrise by no more 12 mm for a slab 80 mm thick or less and by no more 15 mm for slab greater than 80 mm thick. The vertical faces shall not be overcut by more than the permitted dimensional tolerance.

Table 5 — Tolerance on flatness for faces

Tolerance on flatness for faces for		
a) Fine textured face		
Gauge length mm	Max. convex tolerance mm	Max. concave tolerance mm
300	2,0	1,0
500	3,0	2,0
800	4,0	3,0
1 000	5,0	4,0
b) Coarse textured face		
Gauge length mm	Max. convex tolerance mm	Max. concave tolerance mm
300	3,0	2,0
500	4,0	3,0
800	5,0	4,0
1 000	8,0	6,0

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## 4.2.2.5 Arrises

Arrises described as square or sharp may have a bevel with horizontal or vertical dimensions not exceeding 2 mm at the manufacturer's discretion.

When slabs are supplied with a chamfered or rounded arris, the dimensions shall be declared and the vertical and horizontal dimension shall be within  $\pm 2$  mm of the declared dimensions.

## 4.2.2.6 Angles and special shapes

Each slab angle shall be in accordance with the agreed geometry. Pieces of special or irregular shape shall be checked for compliance with the required shape by use of a specified template, the permissible tolerance at any point shall be in accordance with Table 1.

Deviations stricter than in Table 1 may be declared.

Deviations may not be added to each other, e.g. deviations on thickness and flatness.

## 4.3 Freeze/thaw resistance

## 4.3.1 Freeze- thaw under normal conditions

When the slabs are intended to be used in areas subjected to 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 flexural strength after 56 cycles of freeze/thaw (technological test).