



**SLOVENSKI STANDARD**  
**oSIST prEN 1024:2017**  
**01-september-2017**

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**Opečni strešniki - Ugotavljanje geometrijskih značilnosti**

Clay roofing tiles for discontinuous laying - Determination of geometric characteristics

Tondachziegel für überlappende Verlegung - Bestimmung der geometrischen Kennwerte

Tuiles de terre cuite pour pose en discontinu - Détermination des caractéristiques géométriques

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**ICS:**

91.060.20	Strehe	Roofs
91.100.25	Gradbeni izdelki iz terakote	Terracotta building products

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**en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 1024**

June 2017

ICS 91.100.25

Will supersede EN 1024:2012

English Version

## Clay roofing tiles for discontinuous laying - Determination of geometric characteristics

Tuiles de terre cuite pour pose en discontinu -  
Détermination des caractéristiques géométriques

Tondachziegel für überlappende Verlegung -  
Bestimmung der geometrischen Kennwerte

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 128.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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<b>Contents</b>	<b>Page</b>
Foreword .....	3
<b>1 Scope</b> .....	<b>4</b>
<b>2 Normative references</b> .....	<b>4</b>
<b>3 Symbols</b> .....	<b>4</b>
<b>4 Test pieces</b> .....	<b>5</b>
<b>5 Tests methods</b> .....	<b>5</b>
<b>5.1 Determination of dimensional characteristics</b> .....	<b>5</b>
<b>5.1.1 Individual dimensions</b> .....	<b>5</b>
<b>5.1.2 Overlap dimensions (margins)<sup>1</sup></b> .....	<b>6</b>
<b>5.2 Cambers</b> .....	<b>8</b>
<b>5.2.1 Principle</b> .....	<b>8</b>
<b>5.2.2 Apparatus (Figure 9)</b> .....	<b>12</b>
<b>5.2.3 Procedure</b> .....	<b>13</b>
<b>5.2.4 Expression of results</b> .....	<b>13</b>
<b>5.3 Control of regularity of shape</b> .....	<b>13</b>
<b>5.3.1 Twist</b> .....	<b>13</b>
<b>5.3.2 Uniformity of transverse profiles</b> .....	<b>17</b>
<b>6 Test report</b> .....	<b>18</b>
<b>Annex A (informative) Example of twist measurement device for tiles with sidelock and headlock, tiles with sidelock only and overlapping tiles</b> .....	<b>19</b>

## Foreword

This document (prEN 1024:2017) has been prepared by Technical Committee CEN/TC 128 “Roof covering products for discontinuous laying and products for wall cladding”, the secretariat of which is held by NBN.

This document will supersede EN 1024:2012.

This European Standard is one of the series of standards dealing with clay roofing tiles as listed below:

- EN 1304, *Clay roofing tiles and fittings — Products definitions and specifications*
- EN 538, *Clay roofing tiles for discontinuous laying — Flexural strength test*
- EN 539, *Clay roofing tiles for discontinuous laying — Determination of physical characteristics*

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## 1 Scope

This European standard specifies the methods for determining the geometric characteristics of clay tiles as defined in EN 1304, *Clay roofing tiles and fittings — Product definitions and specifications*.

## 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 1304, *Clay roofing tiles and fittings — Product definitions and specifications*

## 3 Symbols

For the purposes of this document, the following symbols apply.

$L_1$	maximum distance when measuring covering dimensions (length) in millimetres (mm);
$L_2$	minimum distance when measuring covering dimensions (length) in millimetres (mm);
$l_1$	maximum distance when measuring covering dimensions (width) in millimetres (mm);
$l_2$	minimum distance when measuring covering dimensions (width) in millimetres (mm);
$L$	mean cover length in millimetres (mm);
$L_M$	maximum cover length in millimetres (mm);
$L_m$	minimum cover length in millimetres (mm);
$l$	mean cover width in millimetres (mm);
$l_M$	maximum cover width in millimetres (mm);
$l_m$	minimum cover width in millimetres (mm);
$L_{2T}$	minimum distance when measuring the overlapped dimensions in millimetres (mm);
$L_2$	minimal overlapped dimension in millimetres (mm);
$H$	difference in height from the measuring point at the support bar or height in relation to a reference plane in millimetres (mm);
$C$	twist coefficient in percent;
$A$	tile length as declared by the manufacturer in millimetres (mm);
$B$	tile width as declared by the manufacturer in millimetres (mm);
$h_d$	height of camber as declared by the manufacturer in millimetres (mm);
$h_m$	measured height of camber in millimetres (mm);
$R$	camber in percentage;
$\Delta h$	$ h_m - h_d $ absolute value in millimetres (mm);
$L_T$	total length of the tile in millimetres (mm);

- $l_T$  total width of the tile in millimetres (mm);
- $L_A$  measurement base in longitudinal direction in millimetres (mm);
- $L_B$  measurement base in transverse direction in millimetres (mm);
- $E_1$  distance between the internal edges of an over - and under- tile at one of its extremities in millimetres (mm);
- $E_2$  distance between the internal edges of an over - and under- tile at the other extremity in millimetres (mm).

## 4 Test pieces

The measurement of geometric characteristics are carried out on 10 test pieces, each of which constitutes a whole tile, except for the measurement of cover dimensions, which requires 24 tiles.

## 5 Tests methods

### 5.1 Determination of dimensional characteristics

#### 5.1.1 Individual dimensions<sup>1</sup>

##### 5.1.1.1 Apparatus

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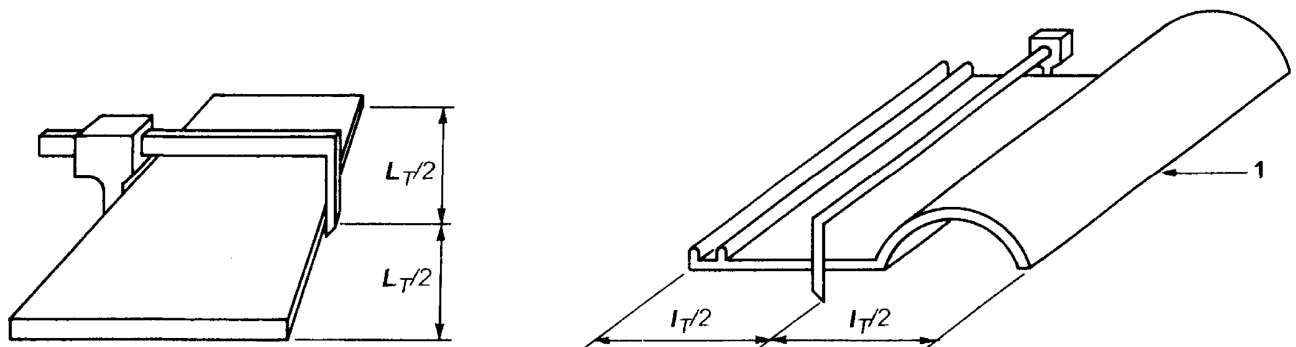
The tests are made with a measuring apparatus with a precision of at least one millimetre.

##### 5.1.1.2 Procedure

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After removing any surplus clay from the edges, the measurements shall be taken, both transversely and longitudinally along the centre of the tile unless another measuring position has been specified by the manufacturer (see Figure 1). The dimensions are expressed to the nearest whole millimetre.



Key

1 tile

Figure 1 — Principle for measuring individual dimensions

<sup>1</sup> EN 1304 specifies to which type of tiles these measurements apply.

## prEN 1024:2017 (E)

## 5.1.1.3 Expression of results

The arithmetic means of the lengths and widths of the 10 tested tiles and the differences expressed as a percentage of these mean values in relation to the values A and B declared by the manufacturer shall be calculated and noted in the test report.

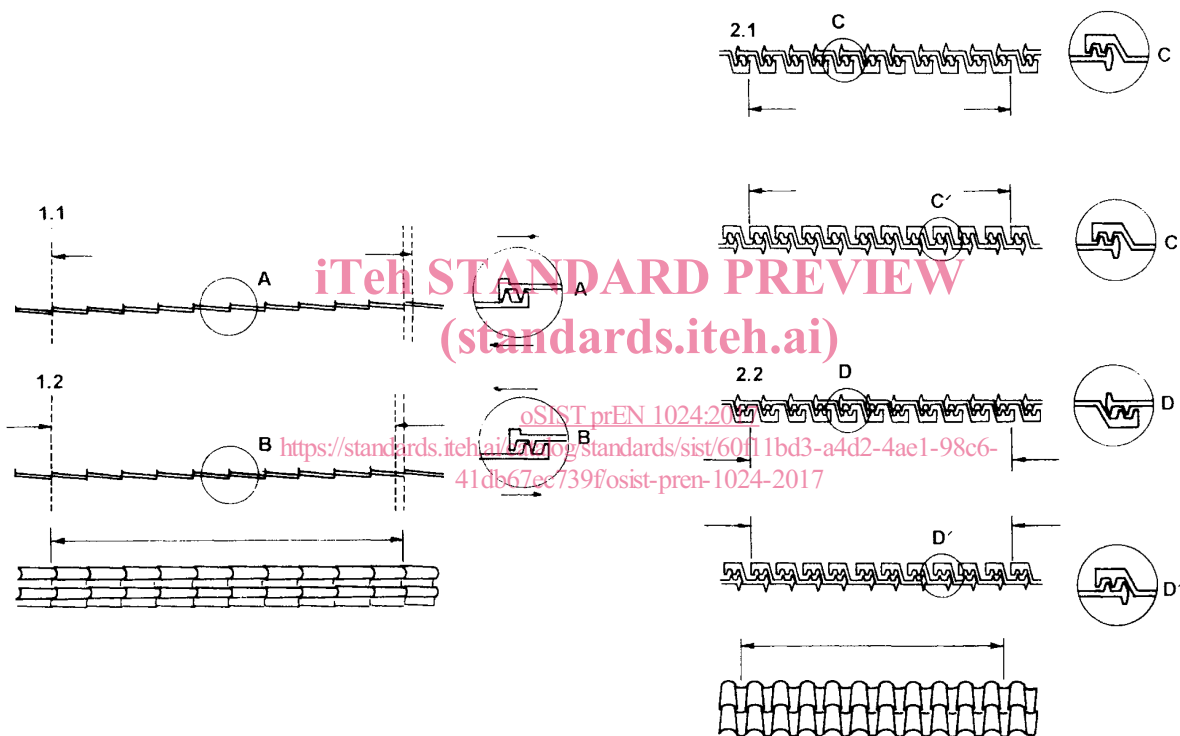
5.1.2 Overlap dimensions (margins)<sup>1</sup>

## 5.1.2.1 Principle

The mean overlap dimensions are determined longitudinally and/or transversely.

They are measured as indicated in Figure 2.

NOTE Certain tile models can only be measured in one direction.



## Key

- 1 mean cover length
- 1.1 open position
- 1.2 closed position
- 2 mean cover width
- 2.1 open position
- 2.2 closed position

Figure 2 — Principle for measuring cover dimensions

## 5.1.2.2 Number of test pieces

24 tiles are required for the measurements.



### 5.1.2.3 Apparatus

The tests are carried out with a measuring apparatus with a precision of at least 1 mm.

### 5.1.2.4 Procedure

#### 5.1.2.4.1 Interlocking tiles

The tiles are laid upside down in two rows on a flat surface, and interlocked with one another so as to form a stable unit. Certain types of tiles may require laying the right way up.

The tiles are interlocked longitudinally and pulled apart individually to measure the maximum distance between two corresponding points on the first and the eleventh tile, i.e.  $L_1$ , the maximum length.

Following this, the tiles are taken up, then relaid and interlocked. They are pushed together individually as closely as possible **without lifting the upper tile** to carry out the measurement of the minimum distance ( $L_2$ ) following the procedure described above.

Take again the same measurements, but this time, transversely in order to obtain the values  $l_1$  and  $l_2$ .

With regard to tiles with a variable overlap, determine the measurement of cover in the open position,  $L_1$  (longitudinally),  $l_1$  (transversely).

With regard to tiles with a variable overlap, determine the measurement of cover in the closed position,  $L_2$  (longitudinally),  $l_2$  (transversely), when relevant.

#### 5.1.2.4.2 Under and over tiles with lugs to fix the headlap

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The tiles are laid upside down in two rows on a flat surface, and interlocked with one another so as to form a stable unit.

The tiles are interlocked longitudinally and pushed apart individually to measure the minimum distance between two corresponding points on the first and the eleventh tile, i.e.  $L_2$ , the minimum length.

NOTE This method is not relevant to some types of tiles designed to be laid broken jointed.

### 5.1.2.5 Expression of results

#### 5.1.2.5.1 General

The calculated values as recorded are rounded to the nearest whole millimetre.

The percentage difference of these cover dimensions compared with those declared by the manufacturer are calculated and stated in the test report.

#### 5.1.2.5.2 Interlocking tiles

The mean cover length ( $L$ ) is obtained from the following formula:

$$L = (L_1 + L_2) / 20 \quad (1)$$

The maximum cover length ( $L_M$ ) (tiles with a variable overlap) is obtained from the following formula:

$$L_M = L_1 / 10$$

The minimum cover length ( $L_m$ ) (tiles with a variable overlap) is obtained from the following formula:

$$L_m = L_2 / 10 \quad (2)$$

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The mean cover width ( $l$ ) is calculated from the following formula:

$$l = (l_1 + l_2) / 20 \quad (3)$$

The maximum cover width ( $l_M$ ) (of tiles with a variable overlap) is calculated from the following formula:

$$l_M = l_1 / 10$$

The minimum cover width ( $l_m$ ) (of tiles with a variable overlap) is calculated from the following formula:

$$l_m = l_2 / 10 \quad (4)$$

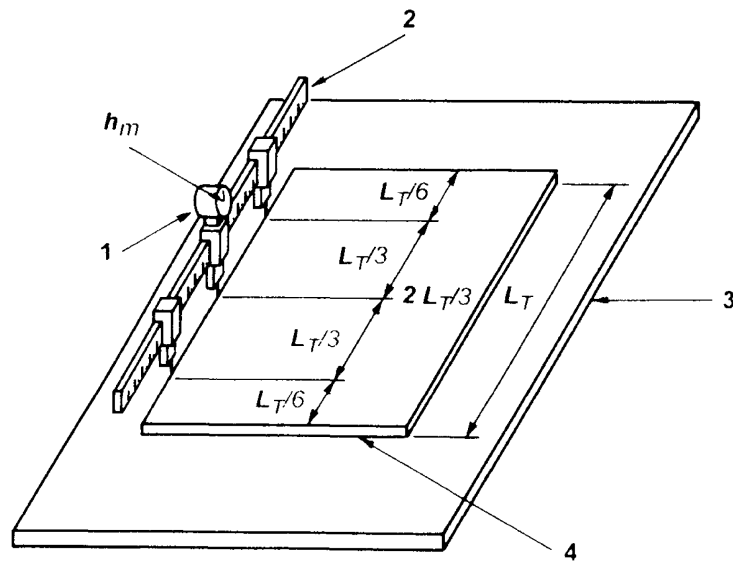
**5.1.2.5.3 Under and over tiles with lugs to fix the head lap**

The minimal overlapped dimension ( $L_2$ ) is obtained from the following formula:

$$L_2 = L_{2T} / 10$$

**5.2 Cambers****5.2.1 Principle**

Measure height of camber longitudinally and transversely for plain tiles (see Figures 3, 4 and 5) and longitudinally only for all other types of tile (see Figures 6, 7 and 8). The height of camber for a curvature whose concavity is located on the outer surface of the tile are given a minus sign and a plus sign is given in the opposite case. The measurement is taken to a precision of at least 0,5 mm on each outside edge of the tile, with the most unfavourable value being selected. Take as measurement bases  $L_A$  and  $L_B$  equal to 2/3 of the total length ( $L_T$ ) and width ( $l_T$ ) of the tile. Where this is not possible, the measurement base may be reduced to the largest dimension that is compatible with the shape of the tile.

**Key**

- 1 dial gauge
- 2 rule
- 3 metal plate
- 4 tile

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Figure 3 — Measurement of longitudinal camber on a plain tile

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