



# SLOVENSKI STANDARD SIST EN 491:2005

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## Betonski strešniki in fazonski kosi za prekrivanje streh in oblaganje sten - Preskusne metode

Concrete roofing tiles and fittings for roof covering and wall cladding - Test methods

Dach- und Formsteine aus Beton für Dächer und Wandbekleidungen - Prüfverfahren

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Tuiles et accessoires en béton pour couverture et bardage - Méthodes d'essais

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Ta slovenski standard je istoveten z: [EN 491:2004](#)

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 491**

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English version

## Concrete roofing tiles and fittings for roof covering and wall cladding - Test methods

Tuiles et accessoires en béton pour couverture et bardage  
- Méthodes d'essais

Dach- und Formsteine aus Beton für Dächer und  
Wandbekleidungen - Prüfverfahren

This European Standard was approved by CEN on 20 October 2004.

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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 Central Secretariat has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN 491:2004 (E)****Foreword**

This document (EN 491:2004) 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 IBN.

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of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by September 2006.

This document supersedes EN 491:1994.

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

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## 1 Scope

This document specifies test methods for concrete roofing tiles and fittings conforming to EN 490, for assembly into pitched roof covering or external wall cladding or internal wall lining cladding.

## 2 Normative references

The following referenced documents are indispensable for the application 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 490:2004, *Concrete roofing tiles and fittings for roof covering and wall cladding — Product specifications*.

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 490:2004 apply.

## 4 Symbols and abbreviations

$l_1$	hanging length of a tile as defined in Figure 1a) and 1c), in millimetres;
$l_2, l_3$	hanging edge lengths of a tile as defined in Figure 1.b), in millimetres;
$c_w$	nominal cover width of one tile, in millimetres;
$c_{wc}$	cover width closed up value of 10 tiles, in millimetres;
$c_{wd}$	cover width drawn out value of 10 tiles, in millimetres;
$d$	profile depth of a tile, in millimetres;
$x$	angle at which test tiles are hung as defined in Figure 1a), in degrees.

## 5 Test methods

### 5.1 General

Where other test methods are used for factory production control (FPC) a satisfactory statistical correlation with the test methods specified in this document shall be demonstrated.

### 5.2 Hanging length and squareness of regular front edge tiles

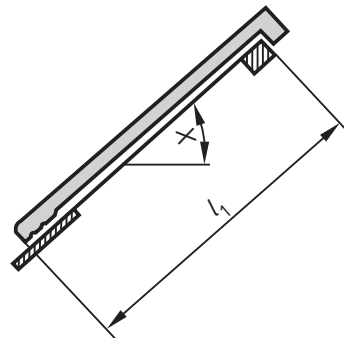
#### 5.2.1 Principle

Tiles are hung from steel battens and measured to establish hanging length and also the squareness of regular front edge tiles.

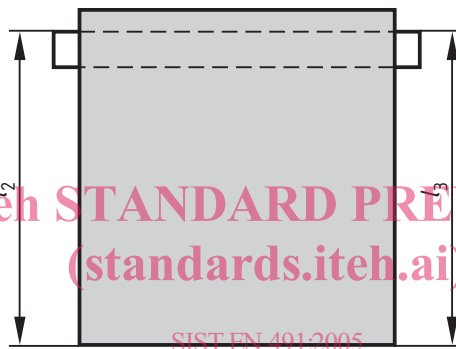
## EN 491:2004 (E)

## 5.2.2 Apparatus

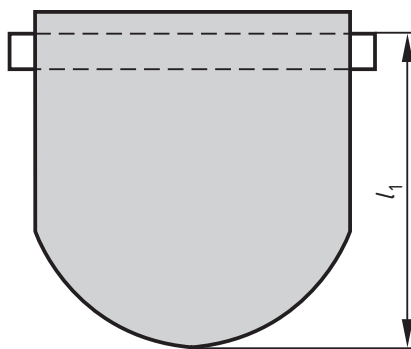
Steel battens to support the tile (see Figure 1).



a)  $x = 20^\circ$  to  $70^\circ$



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 b) Tiles with nominally constant hanging length  $l_1 = (l_2 + l_3)/2$



c) Tiles with regularly varying hanging length  $l_1 =$  Hanging length measured at lowest point

Figure 1 — Test method for hanging length

## 5.2.3 Procedure

## 5.2.3.1 Tiles with nominally constant hanging length

Hang the tile at an angle of  $20^\circ$  to  $70^\circ$  on a steel batten (see Figure 1a)). After physically removing any burrs and/or other irregularities, measure from the top face of the batten to the lower front edge of the tile at the sides (see Figure 1b)), excluding the interlocking sections in the case of tiles with sidelocks.



### 5.2.3.2 Tiles with regularly varying hanging length

Hang the tile at an angle of 20° to 70° on a steel batten (see Figure 1a)). After physically removing any burrs and/or other irregularities, measure from the top face of the batten to the lowest point of the tile (see Figure 1c)).

## 5.2.4 Expression of results

### 5.2.4.1 Tiles with nominally constant hanging length

Record the values  $l_2$  and  $l_3$  to the nearest millimetre and calculate the average per tile  $l_1$  to the nearest millimetre.

### 5.2.4.2 Tiles with regularly varying hanging length

Record the measured value  $l_1$  to the nearest millimetre.

## 5.2.5 Test report

### 5.2.5.1 Tiles with nominally constant hanging length

The test report shall include the following:

- a) value  $l_2$  to the nearest millimetre;
- b) value  $l_3$  to the nearest millimetre;
- c) the average per tile.  $l_1$ . to the nearest millimetre;
- d) reference to this document, i.e. EN 491.

### 5.2.5.2 Tiles with regularly varying hanging length

The test report shall include the following:

- a) value  $l_1$  to the nearest millimetre;
- b) reference to this document, i.e. EN 491.

## 5.3 Cover width

### 5.3.1 Principle

Tiles are hung or laid on a steel batten to determine their cover width.

### 5.3.2 Apparatus

*Steel batten* to support the tile (see Figure 1).

### 5.3.3 Procedure

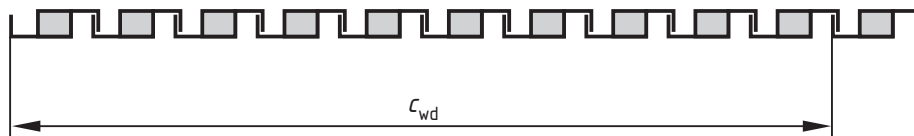
#### 5.3.3.1 Interlocking tiles

Hang or lay 11 tiles of the same nominal cover width with their locks engaged, following the manufacturer's recommendations.

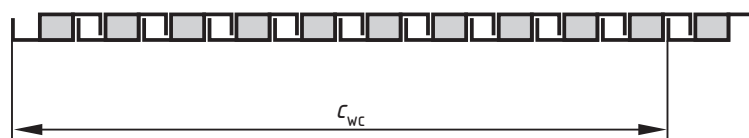
## EN 491:2004 (E)

Taking care that the interlocking parts of the tiles do not lift or disengage, pull the tiles apart to their maximum coverage. Measure the drawn-out value  $c_{wd}$  over 10 tiles to the nearest millimetre (see Figure 2a)).

Taking care that the interlocking parts of the tiles do not lift or disengage, push the tiles together to their minimum coverage. Measure the closed up value  $c_{wc}$  over 10 tiles to the nearest millimetre (see Figure 2b)).



a)  $c_{wd}$  = cover width of 10 tiles drawn out



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b)  $c_{wc}$  = cover width of 10 tiles closed up

Figure 1 — Testing interlocking tiles

### 5.3.3.2 Non-interlocking tiles

Hang or lay 10 tiles of the same nominal cover width on a batten following the manufacturer's recommendations.

Push the tiles together. Measure the width of the 10 tiles to the nearest millimetre.

### 5.3.4 Expression of results

#### 5.3.4.1 Interlocking tiles

Calculate to the nearest millimetre either:

- the mean drawn out value  $c_{wd}/10$  and the mean closed up value  $c_{wc}/10$ ; or
- the mean cover width  $(c_{wd} + c_{wc})/20$ .

#### 5.3.4.2 Non-interlocking tiles

Calculate the mean cover width  $c_{wc}/10$  to the nearest millimetre.

### 5.3.5 Test report

#### 5.3.5.1 Interlocking tiles

The test report shall include the following:

- a) the mean drawn out value  $c_{wd}/10$  and the mean closed up value  $c_{wc}/10$  to the nearest millimetre; or
- b) the mean cover width  $(c_{wd} + c_{wc})/20$  to the nearest millimetre; and
- c) reference to this document, i.e. EN 491.

#### 5.3.5.2 Non-interlocking tiles

The test report shall include the following:

- a) the mean cover width  $c_w$  to the nearest millimetre;
- b) reference to this document, i.e. EN 491.

### 5.4 Flatness

#### 5.4.1 Principle

Tiles are laid on a flat plate to determine their flatness.

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