



SLOVENSKI STANDARD

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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

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

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ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products
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EUROPEAN STANDARD

EN 491

NORME EUROPÉENNE

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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

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

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EN 491:2011 (E)

Foreword

This document (EN 491:2011) 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 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of an identical text or by endorsement, at the latest by March 2012, and conflicting national standards shall be withdrawn at the latest by March 2012.

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 491:2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard 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*

EN 13162:2008, *Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification*

EN 13238:2010, *Reaction to fire tests for building products — Conditioning procedures and general rules for selection of substrates*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

EN 13823:2010, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

3 Terms and definitions

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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 Figures 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	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.

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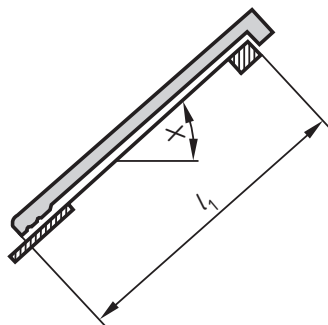
5.2 Hanging length and squareness of regular front edge tiles

5.2.1 Principle

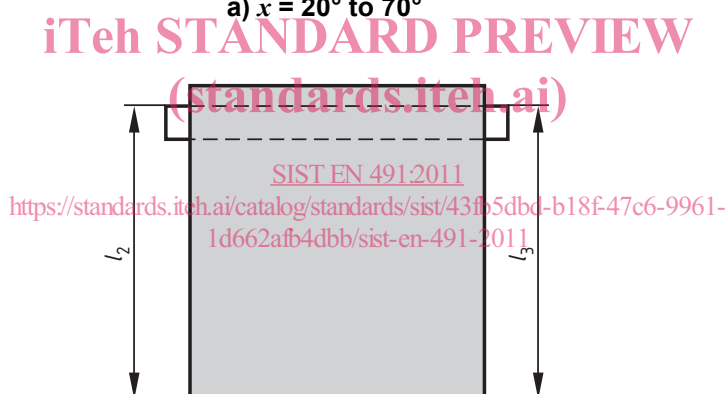
Tiles are hung from steel battens and measured to establish hanging length and also the squareness of regular front edge tiles.

5.2.2 Apparatus

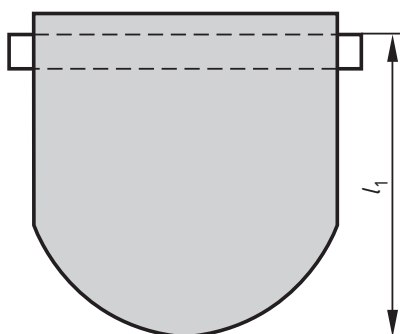
5.2.2.1 **Steel battens** to support the tile (see Figure 1).



a) $x = 20^\circ$ to 70°



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° 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 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:

- value l_2 to the nearest millimetre;
- value l_3 to the nearest millimetre;
- the average per tile. l_1 . to the nearest millimetre;
- 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:

- value l_1 to the nearest millimetre;
- 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.

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5.3.2 Apparatus

5.3.2.1 Steel batten to support 11 tiles.

This may be horizontal or pitched up to 70°.

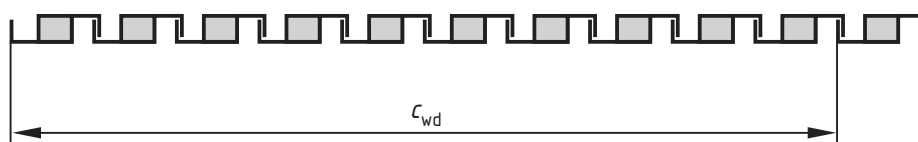
5.3.3 Procedure

5.3.3.1 Interlocking tiles

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

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)).



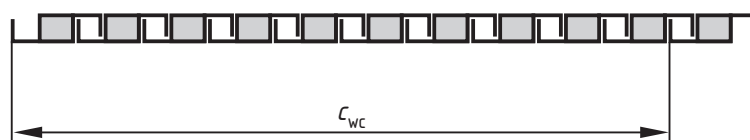
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a) c_{wd} = cover width of 10 tiles drawn out



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

Figure 2 — Testing interlocking tiles for cover width

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:

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

5.3.5.2 Non-interlocking tiles

The test report shall include the following: [SIST EN 491:2011
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- the mean cover width $c_{wc}/10$ to the nearest millimetre;
- 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.

5.4.2 Apparatus

- Flat metal surface or two co-planer flat metal plates** (see Figure 3).