SLOVENSKI STANDARD

SIST EN 490:2005

01-marec-2005

Nadomeġļa:

SIST EN 490:1998

Betonski strešniki in fazonski kosi za prekrivanje streh in oblaganje sten – Specifikacije za izdelek

Concrete roofing tiles and fittings for roof covering and wall cladding - Product specifications

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

Tuiles et accessoires en béton pour couverture et bardage - Spécifications des produits

Ta slovenski standard je istoveten z: **EN 490:2004**

ICS:

91.060.20

91.100.30

SIST EN 490:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 490

December 2004

ICS 91.100.30

Supersedes EN 490:1994

English version

Concrete roofing tiles and fittings for roof covering and wall cladding - Product specifications

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This European Standard was approved by CEN on 27 October 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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Ref. No. EN 490:2004: E

Contents

Foreword

This document (EN 490:2004) 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of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by September 2006.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 490:1994.

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) 89/106.

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

This edition extends the scope of the standard to cover an increased range of fittings, and incorporates minor technical changes.

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.

1 Scope

This document specifies requirements for concrete roofing tiles and fittings for pitched roof coverings and wall cladding and lining.

Although concrete roofing tiles and fittings may incorporate surface coating, the specification of any surface coating is not included in this document.

NOTE 1 Information on surface characteristics is given in Annex A.

NOTE 2 Information on the performance of roof and wall assemblies is given in Annex B.

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 491:2004, *Concrete roofing tiles and fittings for roof covering and wall cladding — Test methods*

ENV 1187, *Test methods for external fire exposure to roofs*

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

prEN 13501-5, *Fire classification of construction products and building elements — Part 5: Classification using test data from external fire exposure to roof tests*

EN ISO 9001, *Quality management systems — Requirements (ISO 9001:2000)*

3 Terms and definitions

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

3.1
aggregate
concrete component consisting of uncrushed and/or crushed natural and/or artificial mineral substances with particle sizes and shapes suitable for the production of concrete

3.2
additive
finely divided material that may be added to concrete in order to improve certain properties or to achieve special properties

3.3
pigment
additive intended to add colour to the concrete

3.4
admixture
material which is added in small quantities relative to the mass of the cement before or during mixing or during an additional mixing operation, causing required modifications to the properties

3.5
cement
hydraulic binder, i.e. finely ground inorganic material, which, when mixed with water, forms a paste which sets by means of hydration reactions and processes and which, after hardening, retains its strength and stability

3.6
fitting
component, of concrete, that is complementary to the tiles and has a special function

NOTE Fittings may contain inserts of other materials.

3.6.1
coordinated fitting
fitting that is intended to align or interlock with the tiles with which it is to be laid (e.g. interlocking verge tile, interlocking ventilation tile, tile-and-a-half, aligning valley tile, interlocking or aligning angle tiles)

3.7
valley tile
fitting for use at a meeting of two roof pitches forming a re-entrant angle

3.8
interlocking tile
profiled or flat tile which has a side lock, with or without a head lock feature

3.9
non-interlocking tile
profiled or flat tile without interlocks

3.10
tile with a regular front edge
tile (interlocking or non-interlocking) which, by design, has a constant or regularly varying hanging length across the width

3.11
tile with an irregular front edge
tile (interlocking or non-interlocking), which, by design, has an irregular varying hanging length across the width

4 Symbols and abbreviations

l_1	hanging length of a tile
l_2, l_3	hanging edge length of a tile, as defined in EN 491:2004, Clause 4.
c_w	nominal cover width of one tile
c_{wc}	cover width closed up value of 10 tiles
c_{wd}	cover width drawn out value of 10 tiles
d	profile depth of a tile
F_{min}	minimum transverse strength of all tiles
F_i	transverse strength of an individual tile
IL	interlocking
NL	non-interlocking
RF	regular front edge
IF	irregular front edge
/	not applicable or not declared characteristic for designation system

5 Requirements

5.1 Materials

The concrete used in the manufacture of tiles and fittings shall be formed by mixing cement, aggregate and water and produced by the hardening of the cement paste (cement and water).

NOTE In addition to the basic components the concrete may also contain pigments, admixtures and/or additives.

5.2 Dimensions

5.2.1 Hanging length and squareness

The tile hanging length shall be declared in the manufacturer's technical specification. For tiles with a regular front edge, the values of l_1 shall be ± 4 mm of the manufacturer's declared value when tested in accordance with EN 491:2004, 5.2.2.1 and 5.2.2.2.

The squareness for tiles with nominally constant hanging length, when tested in accordance with EN 491:2004, 5.2.2.1, shall be calculated as the difference between values l_2 and l_3 and shall be not greater than 4 mm.

This sub-clause does not apply for tiles that are designed, for example for aesthetic reasons, with an irregular front edge.

5.2.2 Cover width

5.2.2.1 General

The tile cover width c_w shall be declared in the manufacturer's technical specification.

NOTE The cover width shunts may also be declared in the manufacturer's technical specification.

This sub-clause does not apply for tiles that are designed, for example for aesthetic reasons, with a randomly varying cover width.

5.2.2.2 Interlocking tiles

When tiles with cover width shunts declared by the manufacturer are tested in accordance with EN 491:2004, 5.3.3.1, the cover width shall conform to the following:

— $c_{wd}/10 \geq c_w$ + declared "plus cover width shunt".

— $c_{wc}/10 \leq c_w$ - declared "minus cover width shunt".

When tiles without cover width shunts, and tiles with cover width shunt but not declared by the manufacturer, are tested in accordance with EN 491:2004, 5.3.3.1, the mean cover width shall be ± 5 mm of the manufacturer's declared cover width.

5.2.2.3 Non-interlocking tiles

When non-interlocking tiles are tested in accordance with EN 491:2004, 5.3.3.2, the mean cover width shall be ± 3 mm of the manufacturer's declared value.

5.2.3 Flatness

When tiles are tested in accordance with EN 491:2004, 5.4, the gap between any designed contact point and the flat surface shall not exceed 3 mm or $c_w/100$ mm to the nearest millimetre, whichever is the greater.

This sub-clause does not apply where the manufacturer declares that:

— tiles are designed to have less than four contact points to a flat surface; and/or

— tiles are designed to be irregular in flatness.

5.2.4 Fittings

The manufacturer shall identify and declare the dimensions and tolerances and method of measurement of the fitting relevant to its use. Where relevant, the tile element of a coordinated fitting shall conform to 5.2.1, 5.2.2 and 5.2.3.

5.3 Mass

The mass of tiles and fittings shall be declared in the manufacturer's technical specification.

When tiles are tested in accordance with EN 491:2004, 5.5, the mean mass shall be:

a) manufacturer's declared mass ± 0,2 kg for tiles with a declared mass not greater than 2 kg;

b) manufacturer's declared mass ± 10 % for tiles with a declared mass greater than 2 kg.

5.4 Fixing holes (where provided)

Fixing holes, where provided, shall be arranged so that an intended connection between the tiles and/or fittings and the batten can be achieved. Details of the size and position of the fixing holes shall be given in the manufacturer's technical and/or commercial literature.

NOTE Information on fasteners and fixings is given in Annex C.

5.5 Mechanical resistance (transverse strength)

When tiles are tested in accordance with EN 491:2004, 5.6:

a) value of F_{min} shall be not less than the appropriate value given in Table 1; or

b) number of individual tiles with transverse strength values (F_i) less than the appropriate value in Table 1, shall be not more than the appropriate acceptance value in 7.3.

Tiles tested prior to 28 days after manufacture shall be deemed to conform if they reach at least 80 % of the values specified in Table 1 and the manufacturer can demonstrate statistically that the values given in Table 1 are achieved at 28 days.

Fittings shall conform to 5.2.4 and 5.7.2 (and 5.7.3 in the case of valley tiles).

Table 1 — Minimum transverse strength F_{min} of tiles

Property	Interlocking tiles						Non-interlocking tiles
	Profiled				Flat		
Profile depth	d > 20mm		20 mm ≥ d ≥ 5 mm		d < 5mm		
c_w (mm)	≥ 300	≤ 200	≥ 300	≤ 200	≥ 300	≤200	
F_{min} (N)	2 000	1 400	1 400	1 000	1 200	800	550

The profile depth (d) shall be declared by the manufacturer and, if d < 20 mm, shall be measured in accordance with EN 491:2004, 5.6.4.1.

For interlocking tiles between 200 mm and 300 mm cover width, the minimum transverse strength shall be determined by linear interpolation between the values given in Table 1.

5.6 Water impermeability

When tested in accordance with EN 491:2004, 5.7 the underside of the tiles and/or valley tiles may show drops of water but no drops shall fall before the completion of the test (20 h).

Fittings, other than valley tiles, are not required to be tested for water impermeability, provided they conform to 5.2.4 and 5.7.2.

5.7 Durability (freeze-thaw resistance)

5.7.1 Tiles

When tested in accordance with EN 491:2004, 5.8, the tiles shall conform to the requirements for impermeability (see 5.6) and transverse strength (see 5.5).

5.7.2 Fittings

Fittings, other than valley tiles, when tested in accordance with EN 491:2004, 5.8, shall not be broken, separated into parts or cracked.

5.7.3 Valley tiles

When tested in accordance with EN 491:2004, 5.8, valley tiles shall conform to the requirements for impermeability (see 5.6).

5.8 Nib support

Tiles with nib(s) shall be tested in accordance with EN 491:2004, 5.9. The tile nib(s) shall support the tile in the test position so that the tile does not fall.

5.9 Fire performance

5.9.1 External fire performance

5.9.1.1 Requirements

Where subject to regulatory requirements, the external fire performance of the products shall be declared according to the provisions of 5.9.1.2.

5.9.1.2 Test and assessment methods

5.9.1.2.1 Products satisfying the requirements for external fire performance, without the need for testing

Tiles and fittings covered by this document meet the requirements for external fire performance without the need for testing, provided that they satisfy the definitions given in Commission Decision 2000/553/EC [1], i.e. that:

— they satisfy the provisions of Commission Decision 96/603/EC [2]; and

— any external coating shall be inorganic or have a gross calorific potential (PCS) ≤ 4,0 MJ/m^2 or a mass ≤ 200 g/m^2.

For this purpose the calorific value or mass of the organic coating shall be measured over the coated area only.

NOTE Member States may have national 'deemed to satisfy' lists, which include more products than those given in Decision 2000/553/EC.

5.9.1.2.2 Other products

Products not meeting the provisions of 5.9.1.2.1 shall be tested and classified in accordance with prEN 13501-5 using the classification(s) relevant for the country of destination of the products. The products to be tested shall be installed, in addition to the general provisions given in ENV 1187, in a manner representative of their intended use.

NOTE This requirement will not be applicable until prEN 13501-5 (or EN 13501-5) becomes available.

5.9.2 Reaction to fire performance

5.9.2.1 Requirements

Where subject to regulatory requirements, the reaction to fire of the products shall be declared, according to the provision of 5.9.2.2.

5.9.2.2 Testing and assessment methods

5.9.2.2.1 Products satisfying the requirements for the fire reaction Class A1, without the need for testing

Tiles and fittings are classified Class A1 of the characteristic reaction to fire, in accordance with the provisions of Commission Decision 96/603/EC [2], as amended, without the need for testing, provided that:

— for tiles and fittings made by gluing one or more concrete components together, the organic content of the hardened glue is ≤ 0,1% by weight or volume (whichever is the lower); and

— they contain ≤ 1,0 % by weight or volume (whichever is the lower) of homogeneously distributed organic material (other than glue).

5.9.2.2.2 Other products

Products not meeting the requirements of 5.9.2.2.1 shall be tested and classified in accordance with EN 13501-1.

5.10 Release of dangerous substances

For products used within the European Economic Area, see Annex ZA, Note to ZA.1.

6 Evaluation of conformity

6.1 General

The compliance of a concrete roofing tile or fitting with the requirements of this document shall be demonstrated by:

— initial type testing; and

— factory production control (FPC).