SLOVENSKI STANDARD
SIST EN 534:2006+A1:2010

01-julij-2010

Valovite bitumenske plošče - Specifikacije in preskusne metode

Corrugated bitumen sheets - Product specification and test methods

Bitumen Wellplatten - Produktfestlegungen und Prüfverfahren

Plaques ondulées bitumées - Spécifications des produits et méthodes d'essai

Ta slovenski standard je istoveten z: **EN 534:2006+A1:2010**

ICS:

75.140	Voski, bitumni in drugi naftni proizvodi	Waxes, bituminous materials and other petroleum products
91.060.20	Strehe	Roofs

SIST EN 534:2006+A1:2010 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 534:2006+A1

March 2010

ICS 91.100.50

Supersedes EN 534:2006

English Version

Corrugated bitumen sheets - Product specification and test methods

Plaques ondulées bitumées - Spécifications des produits et méthodes d'essai

Bitumen Wellplatten - Produktfestlegungen und Prüfverfahren

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 534:2006+A1:2010: E

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Foreword

This document (EN 534:2006+A1:2010) 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of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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This document supersedes ▌A1⟩ EN 534:2006 ⟨A1▌.

This document includes Amendment 1, approved by CEN on 2010-02-09

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌A1⟩ ⟨A1▌.

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.

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 United Kingdom.

1 Scope

This European Standard specifies the technical properties and establishes the test and inspection methods for finished corrugated bitumen sheets on leaving the factory. It also provides for the evaluation of conformity of products with the requirements of this standard.

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.

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*

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

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

ISO 7892, *Vertical building elements — Impact resistance tests — Impact bodies and general test procedures*

3 Symbols and abbreviations

L length of the sheet [mm]

w width of the sheet [mm]

H height of corrugations [mm]

f deflection of the sheet under stress [mm]

e nominal thickness [mm]

P mass of the sheet [kg/m^2]

F load [N]

p pitch of corrugations [mm]

E squareness [mm/m]

α thermal coefficient [1/K]

4 General

Corrugated bitumen sheets are produced using a homogeneous mixture of organic and/or inorganic fibres and bitumen. The shape and the structure of corrugated bitumen sheets and the quality of the raw materials guarantee the properties.

Corrugated bitumen sheets may be spun-dyed. They may also be supplied with a coloured or colourless adhesive surface coating, which in turn may or may not have a covering of granules or fine flakes.

Corrugated bitumen sheets may be manufactured as a mono-layer or a multi-layer product.

Corrugated bitumen sheets are divided into category R and category S depending on their mechanical properties. For category R, all mechanical properties have to pass the threshold values of that category.

For roofing applications, category R products are suitable for most climatic conditions, while Category S products may require special installation depending on the climatic conditions.

For cladding applications, both categories are suitable.

The manufacturer's installation guide shall be consulted to ensure that the product is installed in the correct manner for its category.

5 Requirements

5.1 Geometrical properties

5.1.1 Length

When tested according to 7.1.1, the tolerance on length L shall be + 1,0 %, – 0,2 %.

5.1.2 Width

When tested according to 7.1.2, the tolerance on width w shall be ± 2 %.

5.1.3 Thickness

When tested according to 7.1.3, the tolerance on thickness e shall be ± 10 %.

The thickness of the corrugated bitumen sheets shall be measured including any surface relief (surface pattern) on the upper and lower sides (see Figure 4).

NOTE Due to the fact that the relief of the surfaces may be very different (e.g. from one manufacturer to the other), the measurement of the thickness will give only some descriptive information and therefore cannot be directly compared between different products.

5.1.4 Height of corrugations

When tested according to 7.1.4, the tolerance on the height of corrugations H shall be ± 6 %.

For corrugated bitumen sheets with various corrugation heights, all the declared corrugation heights shall be measured.

5.1.5 Pitch of corrugations

When tested according to 7.1.5, the tolerance on the pitch of corrugations p shall be ± 3 %.

For corrugated bitumen sheets with various pitches and/or period of corrugation, all the declared pitches and/or periods shall be measured.

5.1.6 Squareness

When tested according to 7.1.6, the squareness E shall be less than or equal to 4 mm/m.

5.2 Mechanical properties

5.2.1 Bending under downward load

When tested according to 7.2.1, the minimum load for a deflection of 1/200 of a span of 620 mm shall be:

— category R ≥ 1400 N/m^2

— category S > 700 N/m^2

NOTE For calculation of maximum permissible load in manufacturers' installation guides, other methods may be used particularly in case of sheet shapes that do not allow the distributed downward load described in 7.2.1 to be applied.

5.2.2 Impact strength

When tested according to 7.2.2, the falling height with a span of 620 mm shall be:

— category R = 400 mm;

— category S = 250 mm.

This requirement is not relevant for external wall finishing products.

5.2.3 Tearing strength

When tested according to 7.2.3, the tear threshold value shall be greater than:

— category R = 200 N;

— category S = 150 N.

Where, in the case of a corrugated bitumen sheet with various corrugation heights, the manufacturer defines which corrugation has to be used for fixing, only this corrugation has to be tested.

5.3 Physical properties

5.3.1 Water impermeability

When tested according to 7.3.1, no drop of water shall pass through the sheet after 48 h.

5.3.2 Proportion of bitumen

When tested according to 7.3.2, the bitumen content shall be equal to or greater than 40 %.

The properties are measured without any covering of granules or fine flakes.

5.3.3 Mass

When tested according to 7.3.3, the tolerance on the declared mass (expressed in kg/m^2) shall be ± 10 %.

5.3.4 Homogeneity of the product

When tested according to 7.3.4, there shall be no area larger than 1 cm^2 without bitumen.

5.3.5 Water absorption

When tested according to 7.3.5, the water absorption shall be less than 20 % of the mass of the sheet.

The properties are measured without any covering of granules or fine flakes.

5.3.6 Slip resistance

Due to their rough surfaces, corrugated bitumen sheets are not slippery products.

5.3.7 〚A1〛 Load bearing capacity on the roof 〚/A1〛

〚A1〛 Load bearing capacity depends on the method of support and fixing, which are not included in the scope of this product standard.

NOTE The load level, the levels of safety and permissible deflection are defined in EUROCODES and/or national building regulations. 〚/A1〛

5.4 Durability

5.4.1 Tearing strength after freeze/thaw ageing

When tested according to 7.4.1, the tearing strength shall not be lower than the initial threshold values (5.2.3).

5.4.2 Water impermeability after freeze/thaw ageing

When tested according to 7.4.2, no drop of water shall pass through the sheet after 48 h.

5.4.3 Thermal coefficient

When tested according to 7.4.3, the value of α shall be less than 100 x 10^{-6} 1/K.

5.5 Fire performance

5.5.1 Reaction to fire

This characteristic shall be declared when subject to regulatory requirements and may be declared when not subject to such requirements. Where the manufacturer wishes to make a declaration of the reaction to fire performance of his corrugated bitumen sheets (e.g. when they are subject to regulatory requirements), the sheets shall be tested and classified in accordance with 7.5.1.

5.5.2 External fire performance

This characteristic shall be declared when subject to regulatory requirements and may be declared when not subject to such requirements. Where the manufacturer wishes to make a declaration of the external fire performance of his corrugated bitumen sheets (e.g. when they are subject to regulatory requirements), the sheets shall be tested and classified in accordance with 7.5.2.

6 Sampling and conditioning

6.1 Sample preparation

Details of sampling and sample preparation for both type testing and factory production control testing are given in Table 1.

Table 1 — Sampling and conditions of test specimens

		Number of samples	Width of samples	Length of samples	Conditioning	Cutting of the sheet
7.1	**Geometrical properties**					
7.1.1	Length	3	Entire sheet	Entire sheet	Required A[a]	No
7.1.2	Width					No
7.1.3	Thickness	1	Entire sheet	Entire sheet	Required A[a]	Only if necessary
7.1.4	Height of corrugation					No
7.1.5	Pitch of corrugation					Only if necessary
7.1.6	Squareness					No
7.2	**Mechanical properties**					
7.2.1	Bending under downward load	5	Entire sheet		Required B	No
7.2.2	Impact strength	5	Entire sheet		Required B	No
7.2.3	Tearing strength	5	3 corrug.[b]	150 mm	Required B	See Figure 1
7.3	**Physical properties**					
7.3.1	Water impermeability	1	3 corrug[b]	150 mm	Required A[a]	See Figure 2
7.3.2	Proportion of bitumen	3	50 mm	100 mm	Required A[a]	See Figure 2
7.3.3	Mass	3	Entire sheet		Required B[a]	No
7.3.4	Homogeneity of the product	12	½ corrug[b]	200 mm	Required A[a]	See Figure 2
7.3.5	Water absorption	3	2 corrug[b]	200 mm	Required B[a]	See Figure 2
7.4	**Durability**					
7.4.1	Tearing strength after freeze/thaw ageing	5	3 corrug[b]	150 mm	Required A[a]	See Figure 1
7.4.2	Water impermeability after freeze/thaw ageing	1	3 corrug[b]	150 mm	Required A[a]	See Figure 1
7.4.3	Thermal coefficient	2	1 corrug.	250 mm	Required B[a]	See Figure 1

[a] In case of testing during production, the corrugated bitumen sheet may be tested without conditioning (A or B). If the test cannot be performed immediately, the corrugated bitumen sheet shall be stored right away at laboratory conditions.

[b] If the corrugated bitumen sheet has a flat part, this shall be considered as one corrugation.

A The test pieces shall be stored at laboratory conditions for at least 7 days.

B The test pieces shall be conditioned at (23 ± 2) °C and (50 ± 10) % relative humidity for at least 7 days.

For reaction to fire and external fire performance, the number of samples and the conditioning shall be according to the requirements of EN 13501-1 and EN 13501-5 respectively.

6.2 Cutting of the corrugated bitumen sheet

Figures 1 and 2 show the positions from which samples shall be taken, with the numbers referring to the test subclause in the standard. Samples shall not be taken within the area of 200 mm from either end.

Dimensions in millimeters

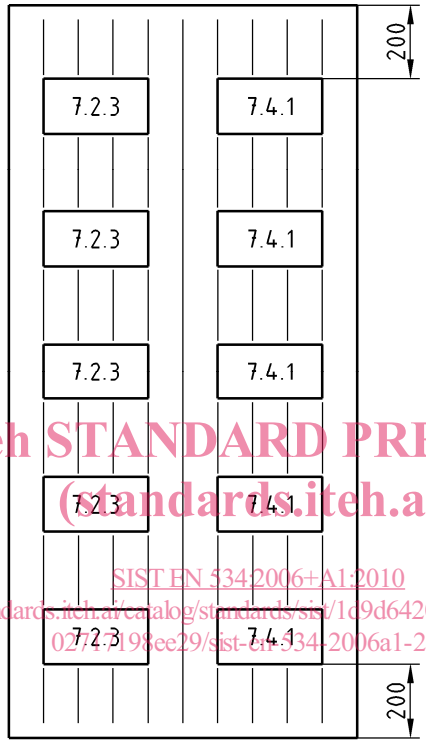

Figure 1 — Positions from which samples are taken

Dimensions in millimetres

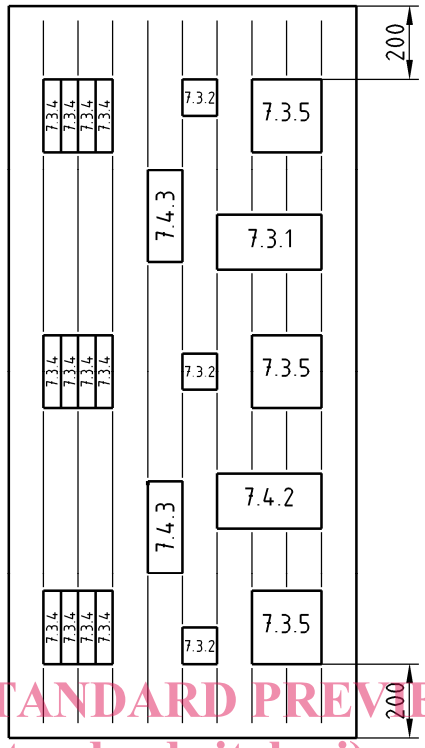

Figure 2 — Positions from which samples are taken

7 Test methods

7.1 Geometrical properties

7.1.1 Length

7.1.1.1 Equipment

The test equipment is shown in Figure 3 and consists of a precision ruler with 0,5 mm divisions and a stable flat plane.

7.1.1.2 Procedure

The measurement shall be taken while the sheet is supported on a stable flat plane.

The length shall be measured either at the crown of the corrugation or in the valley of the corrugation on the second and penultimate corrugations.

The test is carried out on 3 different corrugated bitumen sheets.

7.1.1.3 Results

The result is the mean of the three mean values of the two measured values of each corrugated bitumen sheet.