

SLOVENSKI STANDARD

SIST EN 13956:2013

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Nadomešča:

SIST EN 13956:2005

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Hidroizolacijski trakovi - Polimerni in elastomerni trakovi za tesnjenje streh - Definicije in lastnosti

Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing -
Definitions and characteristics

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Abdichtungsbahnen - Kunststoff- und Elastomerbahnen für Dachabdichtungen -
Definitionen und Eigenschaften

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Feuilles souples d'étanchéité - Feuilles d'étanchéité de toiture plastiques et élastomères
- Définitions et caractéristiques

Ta slovenski standard je istoveten z: EN 13956:2012

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EUROPEAN STANDARD

EN 13956

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing - Definitions and characteristics

Feuilles souples d'étanchéité - Feuilles d'étanchéité de toiture plastiques et élastomères - Définitions et caractéristiques

Abdichtungsbahnen - Kunststoff- und Elastomerbahnen für Dachabdichtungen - Definitionen und Eigenschaften

This European Standard was approved by CEN on 27 October 2012.

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Foreword

This document (EN 13956:2012) has been prepared by Technical Committee CEN/TC 254 "Flexible sheets for waterproofing", the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by June 2012, and conflicting national standards shall be withdrawn at the latest by June 2012.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 13956:2005.

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.

The main technical changes are:

- limitation of external fire performance to Class F;
- new extended mounting and fixing rules;
- introduction of indirect testing for factory production control.

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

EN 13956:2012 (E)**1 Scope**

This European Standard specifies the definitions and characteristics of plastic and rubber sheets including sheets made out of their blends and alloys (thermoplastic rubber) for which the intended use is roof waterproofing. It specifies the requirements and test methods and provides for the evaluation of conformity of the products with the requirements of this European Standard.

NOTE For typical materials and applications, see Annex E.

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 495-5, *Flexible sheets for waterproofing — Determination of foldability at low temperature — Part 5: Plastic and rubber sheets for roof waterproofing*

EN 1107-2, *Flexible sheets for waterproofing — Determination of dimensional stability — Part 2: Plastic and rubber sheets for roof waterproofing*

CEN/TS 1187, *Test methods for external fire exposure to roofs*

EN 1297:2004, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Method of artificial ageing by long term exposure to the combination of UV radiation, elevated temperature and water*

EN 1548, *Flexible sheets for waterproofing — Plastic and rubber sheets for roof waterproofing — Method for exposure to bitumen*

EN 1844, *Flexible sheets for waterproofing — Determination of resistance to ozone — Plastic and rubber sheets for roof waterproofing*

EN 1847, *Flexible sheets for waterproofing — Plastic and rubber sheets for roof waterproofing — Methods for exposure to liquid chemicals, including water*

EN 1848-2, *Flexible sheets for waterproofing — Determination of length, width, straightness and flatness — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 1849-2, *Flexible sheets for waterproofing — Determination of thickness and mass per unit area — Part 2: Plastic and rubber sheets*

EN 1850-2, *Flexible sheets for waterproofing — Determination of visible defects — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 1928, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of watertightness*

EN 1931, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of water vapour transmission properties*

EN 12310-2, *Flexible sheets for waterproofing — Determination of resistance to tearing — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12311-2, *Flexible sheets for waterproofing — Determination of tensile properties — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12316-2, *Flexible sheets for waterproofing — Determination of peel resistance of joints — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12317-2, *Flexible sheets for waterproofing — Determination of the shear resistance of joints — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12691 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to impact*

EN 12730, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to static loading*

EN 13416, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Rules for sampling*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using 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 roof tests*

EN 13583, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of hail resistance*

EN 13948, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of resistance to root penetration*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*

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3 Terms and definitions

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

3.1

waterproofing

action to prevent the passage of water from one plane to another

3.2

roof waterproofing system

assembly of roof waterproofing components in its applied and jointed form, which has certain performance characteristics, to be assessed as a whole

3.3

roofing

waterproofing used in the roof of a building including roofs used for parking of vehicles and for roof gardens

3.4

flexible sheet for roof waterproofing

factory made waterproofing sheet, which can be rolled up or folded for easy transport to the site

3.5

sampling

procedure used to select or constitute a sample

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- 3.6
sample**
sheet from which a test piece is taken
- 3.7
test piece**
part of the sample from which test specimens are taken
- 3.8
test specimen**
piece of precise dimensions taken from the test piece
- 3.9
surface texture**
textured pattern on one or both surfaces of the sheet creating a difference between the effective and overall thickness not exceeding 0,1 mm
- 3.10
surface profile (surface structure)**
raised area on the surface of the sheet creating a difference between the effective and overall thickness exceeding 0,1 mm or a backing exceeding 80 g/m²
- 3.11
internal fabric**
layer of woven or non-woven fabric of synthetic or mineral fibres incorporated in the sheet
- Note 1 to entry: This layer may or may not constitute reinforcement.
- 3.12
backing**
layer of woven or non-woven fabric of synthetic or mineral fibres or other material fixed to the bottom of the sheet
- Note 1 to entry: This layer may or may not constitute reinforcement.
- 3.13
overall thickness**
 d
thickness of the sheet excluding any surface profile
- 3.14
effective thickness**
 d_{eff}
thickness of the sheet providing the waterproofing function including any surface texture or backing equal to or less than 80 g/m² but excluding any surface profile and backing greater than 80g/m²
- 3.15
welding**
process of jointing by softening the surfaces to be united, either by heat or with the aid of a solvent (solvent welding, solvent bonding), and then pressing the softened surfaces together
- 3.16
adhesive bonding**
process of jointing by applying adhesives to the surfaces to be united or by applying an adhesive tape, and then applying pressure

3.17**hot bonding**

process of bonding by vulcanising a non vulcanised rubber tape between the two sheets to be jointed by means of heat and pressure

3.18**manufacturer's limiting value****MLV**

value stated by the manufacturer to be met during testing

Note 1 to entry: The MLV can be a minimum or a maximum value according to statements made under product characteristics of this European Standard.

3.19**manufacturer's declared value****MDV**

value declared by the manufacturer accompanied by a declared tolerance

3.20**batch**

amount of product continuously manufactured to the same specification

4 Roofing system related characteristics

Testing shall be carried out according to Table A.1.

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5 Product characteristics

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5.1 General

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5.1.1 Where a tolerance is limited by this European Standard it does not have to be declared by the manufacturer.

5.1.2 When tested for purposes other than initial type testing or factory production control, the tests to determine product characteristics indicated in this European Standard shall be started within 1 month of delivery from the manufacturer.

5.2 General characteristics**5.2.1 Visible defects**

The product shall be free of visible defects in accordance with EN 1850-2.

5.2.2 Dimensions, tolerances and mass per unit area

The length, width, straightness and flatness shall be determined in accordance with EN 1848-2 and shall meet the requirements given in Table 1. The values for straightness and flatness only apply to sheets supplied in the form of rolls. The values for straightness and flatness do not apply to folded sheets.

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Table 1 — Length, width, straightness and flatness requirements

Length:	The measured length shall lie within the declared tolerance of the MDV. The tolerance of the MDV shall lie within -0% and $+5\%$.
Width:	The measured mean width shall lie within the declared tolerance of the MDV. The tolerance of the MDV shall lie within $-0,5\%$ and $+1\%$.
Straightness:	The deviation of the straightness g shall not exceed 50 mm.
Flatness:	The deviation of the flatness p shall not exceed 10 mm.

Thickness and mass per unit area shall be determined in accordance with EN 1849-2, except that where the surface structure is caused by the inner layer, the mechanical thickness measurement method shall be applied and the result shall meet the requirements given in Table 2. Terms and definitions of this European Standard shall have priority over those given in EN 1849-2.

Table 2 — Thickness and mass per unit area requirements

Effective thickness:	Thickness of the sheet providing the waterproofing function including any surface texture but excluding any surface profile and backing greater than 80 g/m^2 . The measured effective thickness shall lie within the declared tolerance of the MDV. The tolerance of the MDV shall lie within -5% and $+10\%$.
Single measurement:	Each single measurement value shall lie within the declared tolerance of the MDV. The tolerance of the MDV shall lie within $\pm 10\%$.
Mass:	The mass per unit area shall lie within the declared tolerance of the MDV. The tolerance of the MDV shall lie within -5% and $+10\%$.

5.2.3 Watertightness

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The watertightness shall be determined in accordance with EN 1928 using method B at an applied water pressure of 10 kPa (0,1 bar) and shall give a pass result.

5.2.4 Effects of liquid chemicals including water

Information on the effect of liquid chemicals on plastics and rubber is given in Annex C. When further information on resistance to liquid chemicals is required, tests shall be conducted according to EN 1847 at a temperature of $23\text{ }^{\circ}\text{C}$ for 28 days.

5.2.5 Fire performance**5.2.5.1 External fire performance**

The classification of the product in accordance with EN 13501-5 is limited to class F.

NOTE It is currently considered that there are no national requirements specific to flexible sheets for roof waterproofing alone on external fire performance. The external fire performance of a roof is dominated by its build up.

5.2.5.2 Reaction to fire

Where required, the product shall be tested and classified in accordance with EN 13501-1, Table 1. According to EN ISO 11925-2, the test is required to be undertaken on the exposed surface of the delivered flexible sheet (surface or edge exposure) free hanging without any substrate in one direction only, and the reinforcement shall be stated by the manufacturer as "organic" or "inorganic".

a) Test results from EN ISO 11925-2 for a given product shall apply to all colours (including black, white).

- b) Test results from EN ISO 11925-2 for a given product without an inner layer (homogenous) shall apply to a comparable product with an additional organic inner layer (lower than 150g/m²) or any additional inorganic layer.
- c) Test results from EN ISO 11925-2 for a given product with a thickness of above 1 mm, shall apply to any comparable product with a higher thickness up to a limit of 3 mm.
- d) Test results from EN ISO 11925-2 for a given product with a backing shall apply to a comparable product with a backing of the same type of lower mass per unit area or no backing.

NOTE It is currently considered that the Euroclasses Classification system at Classes D and above requires investigation to determine its appropriateness to the products covered by this European Standard (the SBI test may be inappropriate for products covered by the European Standard). Pending results of such an investigation and discussions in the Fire Regulators Group, products covered by this European Standard are tested to EN ISO 11925-2.

If and when a new fire test scenario and test method are developed for the products, this European Standard will be amended to refer to them.

5.2.6 Hail resistance

Where required, the hail resistance of the sheet shall be determined in accordance with EN 13583 and shall be greater than or equal to the manufacturer's limiting value (MLV).

5.2.7 Joint strength

Where required, the peel resistance of joints shall be determined in accordance with EN 12316-2. The peel resistance shall be greater than or equal to the manufacturer's limiting value (MLV). Where required, the shear resistance of joints shall be determined in accordance with EN 12317-2. The shear resistance shall be greater than or equal to the manufacturer's limiting value (MLV). If no result can be obtained due to too great an elongation, the grip distance may be reduced.

5.2.8 Water vapour properties

If necessary, the moisture resistance factor μ of plastic and rubber sheets may be determined in accordance with EN 1931 and the result shall lie within the declared tolerance of the MDV. The tolerance of the MDV shall lie within $\pm 30\%$.

5.2.9 Tensile properties (strength and elongation)

The tensile properties for homogenous sheets and sheets with a non-woven inner layer (e.g. fibre glass mat) of less than or equal to 80 g/m² shall be determined in accordance with Method B of EN 12311-2. For all other sheets Method A of EN 12311-2 shall be used to determine tensile properties. The tensile force (Method A) or the tensile stress (Method B) shall be greater than or equal to the manufacturer's minimum limiting value (MLV) for the longitudinal and transverse direction of the sheet. The mean of the elongation at maximum tensile force (Method A) or the mean of the elongation at break (Method B) shall be greater than or equal to the manufacturer's limiting value (MLV) for the longitudinal and transverse direction of the sheet.

5.2.10 Resistance to impact

Where required, the resistance to impact shall be determined in accordance with EN 12691 and shall be greater than or equal to the manufacturer's limiting value (MLV).

5.2.11 Resistance to static loading

Where required, the resistance to static loading of the sheet shall be determined in accordance with either method A or method B of EN 12730 and shall be greater than or equal to the manufacturer's limiting value (MLV). If method A is used, the depth of the penetrating tool shall not exceed 10 mm.

EN 13956:2012 (E)**5.2.12 Tear resistance**

Where required, the tear force shall be determined in accordance with EN 12310-2. The mean of the tear resistance (maximum tensile force of pre-cut test specimen) shall be greater than or equal to the manufacturer's limiting value (MLV) for the longitudinal and transverse direction of the sheet.

5.2.13 Resistance to root penetration

The resistance to root penetration shall only be determined for products used as root barriers. Where required, the resistance to root penetration determined in accordance with EN 13948 shall give a pass result.

5.2.14 Dimensional stability

Dimensional stability shall be determined in accordance with EN 1107-2. The mean of the dimensional change in length (ΔL) and width (ΔT) shall be less than or equal to the manufacturer's limiting value (MLV).

5.2.15 Foldability at low temperature

Foldability at low temperature shall be determined in accordance with EN 495-5. Only the top surface (the upper side of the sheet as used in-situ) shall be tested. The cold folding temperature shall be less than or equal to the manufacturer's limiting value (MLV).

5.2.16 Behaviour following exposure to UV radiation, elevated temperature and water

Where required, when the product is subjected to exposure according to EN 1297, the duration of exposure to UV shall be 1 000 h.

Following exposure, the change in visual aspects shall be determined according to EN 1297:2004, Annex B. Surface cracks according to EN 1297:2004, Table B.1, Grades 0, 1 and 2 will give a pass result for the visual examination. Grade 3 will give a fail result.

The purpose of testing in accordance to EN 1297 is to characterise the long-term ageing behaviour of plastic and rubber sheets. The test does not give results corresponding to the service conditions in practice. Results should only be used to compare products of similar thickness, construction and composition, and they cannot be used for general durability classification. The chosen exposure duration for artificial ageing in accordance to EN 1297 has no relevance to a real product lifetime.

NOTE Sheets passing ETAG 006 requirements are considered to comply with the criteria for behaviour following exposure to UV radiation, elevated temperature and water.

5.2.17 Resistance to ozone

Where required, the sheet shall be tested according to EN 1844 and the sheet shall show no cracks. This test is only required for sheets made of rubber materials.

5.2.18 Exposure to contact with bitumen

Where required, the behaviour of the sheet where it may come in contact with bitumen shall be determined in accordance with EN 1548. The sheet is compatible with bitumen if:

- a) for sheets with an inner layer, the percentage loss in mass is less than or equal to 5 %;
- b) for sheets without an inner layer or backing, the change in Young's Modulus is less than or equal to 50 %.

Results obtained by this test method from sheets without an inner layer or backing can be applied to sheets manufactured with same chemical formulation but having inner reinforcement layers or backing. The results obtained on a given thickness apply to any product of the same formulation with greater thickness. By

experience, sheets with a non-woven backing of at least 150 g/m² or equivalent, which prevents any contact of the waterproofing membrane with bitumen, are considered as bitumen compatible.

5.3 Dangerous substances

For products placed on the market within the European Economic Area see ZA.1. Outside the EEA products shall conform to any applicable provisions related to dangerous substances valid in the place of use (see also [3] and [4]).

6 Evaluation of conformity

6.1 General

The compliance of the product with the requirements of this European Standard and with the stated values (including classes) shall be demonstrated by:

- initial type testing;
- factory production control by the manufacturer, including product assessment.

Test specimens shall be prepared from the sample taken in accordance with EN 13416.

For the purposes of testing, products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for all products within that same family (a product may be in different families for different characteristics).

6.2 Type testing

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6.2.1 General

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Initial type testing shall be performed to show conformity with this European Standard. Tests previously performed in accordance with the provisions of this European Standard (same product, same characteristic(s), test method, sampling procedure, system of attestation of conformity, etc.) may be taken into account. In addition, initial type testing shall be performed at the beginning of the production of a new product type (unless a member of the same family) or at the beginning of a new method of production (where this may affect the stated properties).

All characteristics in Clause 5 shall be subject to initial type testing, where relevant.

Whenever a change occurs in the product design, the raw material or supplier of the components, or the production process (subject to the definition of a family), which would change significantly one or more of the characteristics, the type tests shall be repeated for the appropriate characteristic(s).

6.2.2 Sampling

Samples shall be taken according to EN 13416. The minimum number of tests to show compliance for type testing shall be one for all characteristics.

6.3 Factory production control (FPC)

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market conform with the stated performance characteristics. The FPC system shall consist of