



SLOVENSKI STANDARD SIST EN 1847:2001

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Hidroizolacijski trakovi - Polimerni in elastomerni trakovi za tesnjenje streh - Metode izpostavljanja tekočim kemikalijam, vključno vodi

Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing -
Methods for exposure to liquid chemicals, including water

Abdichtungsbahnen - Kunststoff- und Elastomerbahnen für Dachabdichtungen -
Bestimmung der Einwirkung von Flüssigchemikalien, einschließlich Wasser

Feuilles souples d'étanchéité - Feuilles d'étanchéité de toiture plastiques et élastomères
- Méthodes d'exposition aux produits chimiques liquides, y compris l'eau

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EUROPEAN STANDARD

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Flexible sheets for waterproofing - Plastic and rubber sheets for
roof waterproofing - Methods for exposure to liquid chemicals,
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Feuilles souples d'étanchéité - Feuilles d'étanchéité de
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Dachabdichtungen - Bestimmung der Einwirkung von
Flüssigchemikalien, einschließlich Wasser

This European Standard was approved by CEN on 2 December 2000.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 254 "Flexible sheets for waterproofing" the secretariat of which is held by BSI.

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 July 2001, and conflicting national standards shall be withdrawn at the latest by July 2002.

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

Introduction

This European Standard is intended for characterisation and /or classification of plastic and rubber sheets as manufactured or supplied before use. This test method relates exclusively to products, or to their components where appropriate, and not to waterproofing membrane systems composed of such products and installed in the works.

This test is intended to be used in conjunction with European Standard "Definitions and Characteristics" for plastic and rubber sheets for roof waterproofing.

1 Scope

This European Standard specifies a method of exposing test specimens of plastic and rubber sheets for roofing, free from all external restraint, to liquid chemicals (including water), and methods for determining the changes in properties resulting from such exposure.

Only testing by immersion of the entire surface of the test specimen is considered.

The methods for determination of changes in properties are specified as follows:

- a) changes in mass immediately after immersion or after immersion and drying;
- b) changes in dimensions immediately after immersion or after immersion and drying;
- c) changes in appearance immediately after immersion or after immersion and drying; and
- d) changes in physical properties immediately after immersion or after immersion and drying;

Tests immediately after immersion are used when it is required to ascertain the state of the material while still acted upon by the liquid.

Tests after immersion and drying are used when it is required to ascertain the state of the material after the liquid, if it is volatile, has been eliminated.

2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest editions of the publication referred to apply (including amendments).

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

- prEN 1849-2:2000 Flexible sheets for waterproofing - Determination of thickness and mass per unit area – Part 2: Plastic and rubber sheets for roof waterproofing
- prEN 13416:1998 Flexible sheets for waterproofing – Bitumen, plastic and rubber sheets for roof waterproofing – Rules for sampling
- EN ISO 175:2000 Plastics – Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175:1999).
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3 Terms and definitions

For the purpose of this standard no additional terms and definitions are required.

4 Principle

Complete immersion of the test specimens in a specified quantity of a test liquid for a specified time and at a specified temperature. Determination of the properties before and after immersion and, if applicable, after drying. In the latter case the determinations are made, if possible, one after the other on the same specimens.

5 Apparatus

5.1 Container

Beakers of suitable dimensions and fitted with lids (airtight, if necessary, and fitted with condensers in the case of volatile liquids or those which give off vapours).

5.2 Enclosure

Enclosure which is thermostatically controlled at the test temperature.

5.3 Thermometer

Thermometer of suitable range and accuracy. [SIST EN 1847:2001
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5.4 Weighing bottle

5.5 Balance

Balance which is accurate to within 0,001 g in the case of specimens of mass equal to or greater than 1 g.

5.6 Dial micrometer

Dial micrometer with flat anvils, accurate to 0,01 mm.

5.7 Caliper gauge

Caliper gauge, capable of measuring to an accuracy of 0,1 mm.

5.8 Ventilated oven

The temperature calibration procedure is described in Annex A.1 and details on the air flow are given in Annex A.2. For drying purposes, the oven shall be controlled at (50 ± 2) °C.

6 Sampling

Samples shall be taken in accordance with prEN 13416:1998.

7 Preparation of test specimens

Depending on the proposed test after exposure (mass, dimensions, physical properties) and the nature of the plastic or rubber roof waterproofing sheet, the specimens will be of very diverse shapes and dimensions.

The number of specimens to be used will be specified by the methods to determine the properties before and after exposure. In the absence of any other instructions, at least three specimens shall be tested.

Condition the test specimens, prior to testing, for at least 24 h in a standard atmosphere of (23 ± 2) °C and (50 ± 5) % relative humidity.

8 Procedure

8.1 Test liquids

If information is required about the behaviour of the sheet in contact with a specific liquid, that liquid shall, as a rule, be used.

The test shall be carried out with defined chemical products, used on their own or as a mixture; the test should be as representative as possible of the effect on the waterproofing sheets.

For general evaluations of materials behaviour exposed to aqueous liquids the specimens shall be stored in aqueous solutions as shown in table 1.

Table 1 - Standard aqueous solutions

Test liquid		Notes
1	10 % sodium chloride (NaCl) solution (salt water)	as specified in table A..1 of EN ISO 175:2000
2	Milk of lime, $\text{Ca}(\text{OH})_2$	saturated solution with deposit
3	5 % to 6 % sulfurous acid, H_2SO_3	

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If other liquids need to be agreed on for exposure listings of laboratory chemicals are available, e.g. EN ISO 175:2000

8.2 Temperature

The preferred immersion temperatures are (23 ± 2) °C and (50 ± 2) °C.

The temperature for the determination of changes in properties is (23 ± 2) °C. If the immersion temperature is different, bring the specimens to ambient temperature by transferring them into a fresh quantity of test liquid at room temperature for 15 min to 30 min.

8.3 Exposure durations

Any practicable exposure duration, representative of the phenomenon to be evaluated, may be applied.

The preferred exposure durations for comparison tests are:

- a) Short duration test: 24 h
- b) Standard duration test: 1 week (particularly at 23 °C)
- c) Long duration test: 16 weeks

8.4 Immersion procedure

8.4.1 Quantity of test liquid

The quantity of test liquid used shall be at least 8 ml per square centimetre of the total surface area of the specimen in order to avoid a concentration of the extracted product in the liquid during the course of the test. The test liquid shall cover the specimen completely.

8.4.2 Positioning of specimens

Place each set of test specimens in a given container and completely immerse them in the test liquid (using a weight if necessary).

When several materials of the same composition are to be tested, it is permissible to put several sets of specimens into the same container.

In all cases, no significant proportion of the surfaces of the specimens shall make contact with the surface of other specimens, the walls of the container, or any weight that is used. During the test, stir the liquid, for example by rotating the containers, at least once a day.

If the test lasts longer than seven days, replace the liquid with an equal amount of the original liquid every seventh day. If the liquid is unstable, replace the liquid more frequently.

If light is likely to have influence on the action of the test liquid, it is recommended to operate either in darkness or in defined illumination conditions.

It may be necessary in certain cases (for example if there is risk of oxidation) to specify the height of the liquid level above the specimens.

8.4.3 Rinsing and wiping

At the end of the period of immersion, bring the temperature of the specimens back to ambient temperature if necessary, by transferring them quickly into fresh quantity of test liquid at room temperature, for a period of 15 min to 30 min.

Remove the specimens from the test liquid and rinse them with a product which has no effect on the material under test and which is chosen to suit the nature of the test liquid.

Wipe the specimens dry with filter paper or a lint free cloth.

8.5 Determination of changes in mass

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8.5.1 Test specimen

The test specimen shall have the shape and dimensions specified in prEN 1849-2: 2000 for the determination of mass per unit area.

Prepare the number of specimens to determine the mass per unit area according to prEN 1849-2: 2000.

If elevated temperature is used during the exposure, prepare additional specimens to serve as a control of any temperature influence. Control of other influences need additional quantities of specimens.

8.5.2 Initial value

Determine the initial mass M_1 of each specimen to the nearest 0,001g in the case of specimens of mass greater than or equal to 1 g following prEN 1849-2: 2000.

8.5.3 Exposure

Immerse the test specimens in the test liquid at the chosen temperature for the chosen period, following the immersion procedure clause 8.4.

8.5.4 Measurement of mass**8.5.4.1 Measurement immediately after immersion (wet)**

Place each rinsed and wiped specimen in a tared weighing bottle, stopper it and determine the mass M_2 to the nearest 0,001 g.

If the liquid used for the test is volatile at ambient temperature, the time during which the specimen is exposed to the air shall not exceed 30 s. If it is necessary to continue the test after weighing (test as a function of time), immediately replace the specimens in the test liquid and put the containers back in the thermostatically controlled enclosure.

8.5.4.2 Measurement after immersion and drying (dry)

Remove the specimens from the weighing bottles and dry them in the ventilated oven, controlled at the specified temperature, for the specified time (usually for (24 ± 1) h at (50 ± 2) °C) to constant mass. Allow the specimens to cool and recondition them in accordance with clause 7 and determine the mass M_3 to the nearest 0,001 g of each specimen.

8.6 Determination of changes in dimensions

8.6.1 Test specimen

The test specimen shall have the shape and dimensions specified in EN 1107-2 for the determination of dimensions.

Prepare the number of specimens to determine dimensions according to EN 1107-2.

If elevated temperature is used during the exposure, prepare additional specimens to serve as a control of any temperature influence. Control of other influences need additional quantities of specimens.

8.6.2 Initial value

8.6.2.1 Circular specimens

Mark and measure two mutually perpendicular diameters to the nearest 0,1 mm by means of the caliper gauge. Record the mean, L_1 .

Measure the thickness of the specimen at four reference points to the nearest 0,01 mm by means of the dial micrometer. Record the mean, E_1 .

These points shall be situated at least 10 mm from the edges of the specimen.

8.6.2.2 Square specimens

Mark and measure the lengths of four sides of the specimen to the nearest 0,1 mm by means of the caliper gauge. Record the mean, L_1 .

Measure the thickness of the specimen at four reference points to the nearest 0,01 mm by means of the dial micrometer. Record the mean, E_1 .

These points shall be situated at least 10 mm from the edges of the specimen.

8.6.3 Exposure

Immerse the test specimens in the test liquid at the chosen temperature for the chosen period, following immersion procedure described in 8.4.

8.6.4 Measurement of dimensions

8.6.4.1 Measurement immediately after immersion (wet)

Make the same measurements on each specimen as in 8.6.2. Record the mean values of L_2 and E_2 , as appropriate.

8.6.4.2 Measurement after immersion and drying (dry)

Dry the specimens in the ventilated oven, at the temperature prescribed and for the specified time (usually for (24 ± 1) h at (50 ± 2) °C). Allow the specimens to cool, recondition them in accordance with clause 7, then make the same measurements on each specimen as in 8.6.2. Record the mean values of L_3 and E_3 as appropriate.