



# SLOVENSKI STANDARD

## kSIST FprEN 495-5:2012

01-december-2012

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### Hidroizolacijski trakovi - Ugotavljanje upogljivosti pri nizki temperaturi - 5. del: Polimerni in elastomerni trakovi za tesnjenje streh

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

Abdichtungsbahnen - Bestimmung des Verhaltens beim Falzen bei tiefen Temperaturen  
- Teil 5: Kunststoff- und Elastomerbahnen für Dachabdichtungen

Feuilles souples d'étanchéité - Détermination de la pliabilité à basse température - Partie  
5 : Feuilles d'étanchéité de toiture plastiques et élastomères

**Ta slovenski standard je istoveten z: FprEN 495-5**

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#### **ICS:**

91.060.20	Strehe	Roofs
91.100.50	Veziva. Tesnilni materiali	Binders. Sealing materials

**kSIST FprEN 495-5:2012**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**FINAL DRAFT**  
**FprEN 495-5**

September 2012

ICS 91.100.50

Will supersede EN 495-5:2000

English Version

## Flexible sheets for waterproofing - Determination of foldability at low temperature - Part 5: Plastic and rubber sheets for roof waterproofing

Feuilles souples d'étanchéité - Détermination de la pliabilité à basse température - Partie 5 : Feuilles d'étanchéité de toiture plastiques et élastomères

Abdichtungsbahnen - Bestimmung des Verhaltens beim Falzen bei tiefen Temperaturen - Teil 5: Kunststoff- und Elastomerbahnen für Dachabdichtungen

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 254.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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## Foreword

This document (FprEN 495-5:2012) has been prepared by Technical Committee CEN/TC 254 “Flexible sheets for waterproofing”, the secretariat of which is held by NEN.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 495-5:2000, which has been technically and editorially revised in order to:

- add the possibility of instrumented apparatus;
- add precision data of a Round Robin test.

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## Introduction

This European Standard is intended for characterisation of plastic and rubber sheets as manufactured or supplied before use. This test method relates 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 Standards for plastic and rubber sheets for waterproofing.

## 1 Scope

This European Standard specifies a method for the determination of the behaviour of plastic and rubber sheets for waterproofing to folding after exposure at a low temperature.

## 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 13416 *Flexible sheets for waterproofing – Bitumen, plastic and rubber sheets for roof waterproofing – Rules for sampling*

EN 1849-2 *Flexible sheets for waterproofing – Determination of thickness and mass per unit area – Part 2: Thermoplastic and elastomeric sheets*

## 3 Terms and definitions

For the purpose of this standard, the following terms and definitions apply:

### 3.1

#### **top surface**

upper side of the sheet, as used in situ. It is usually the inside of the roll

### 3.2

#### **bottom surface**

lower side of the sheet, as used in situ. It is usually the outside of the roll

### 3.3

#### **overall thickness (e)**

thickness of the sheet excluding any surface profile (see EN 1849-2)

## 4 Principle

The principle of the test is to place the looped test specimen in an adequate folding apparatus. Exposure of the looped test specimen to a specified low temperature for 1 h. Closure of the folding apparatus within 1 s and maintain this position for 1 s. Allow the test specimen to warm to room temperature and examination of the folded area under 6 x magnification.

## 5 Apparatus

The testing equipment consists of parts indicated in 5.1 to 5.3

### 5.1 Folding plates

Metal folding apparatus or instrumented apparatus with adjustable parallel plates. (Figure 1 gives examples of such apparatuses).

### 5.2 Conditioning room

Cold chamber with air circulation, adjustable at temperatures down to  $-45^{\circ}\text{C}$  with an accuracy of  $\pm 2^{\circ}\text{C}$

### 5.3 Inspection tool

Magnifying glass with six times magnification

## 6 Sampling

Samples shall be taken in accordance with EN 13416.

## 7 Preparation of test specimens

Take four test specimens of 100 mm x 50 mm, two in the longitudinal (L) direction and two in the transversal (T) direction of the sheet for each temperature interval.

Note For testing after artificial aging it is possible to reduce the amount of tested material. In this case take two test specimens of 50 mm x 25 mm in one direction of the sheet for each temperature interval.

## 8 Procedure

### 8.1 Temperature

All operations of this procedure outside the cold chamber shall be performed at a temperature of  $(23 \pm 5)^{\circ}\text{C}$ .

### 8.2 Thickness

Measure the overall thickness of each test specimen according to EN 1849-2. If the effective thickness is within the declared tolerance the declared thickness of the product or the measured thickness of the specimen can be used to adjust the plates.



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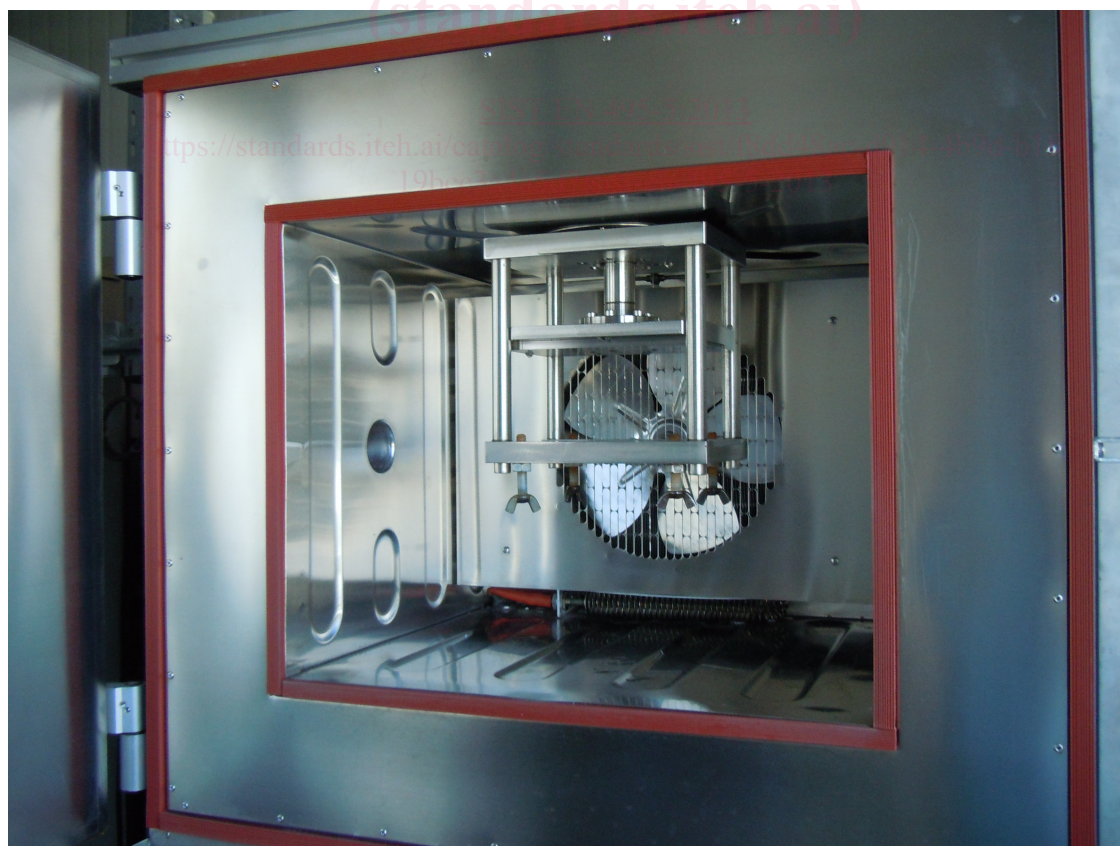


Figure 1 - Example of folding apparatus



### 8.3 Looping

Loop the test specimen lengthways and fix the ends together, for example with adhesive tape, see figure 1. Fold one L and one T test specimen so that the top surface of the sheet forms the outside of the loop. Similarly fold the other two L and T test specimens so that the top surface of the sheet forms the inside of the loop.

### 8.4 Plate distance

Adjust the distance between the plates of the folding apparatus at a value of three times the test specimen overall thickness (see 8.2). Check the distance between the plates in four points as indicated in Figure 1.

### 8.5 Position of test specimen

Place the looped test specimen in the apparatus with the taped edges parallel to hinge of the folding plate as indicated in Figure 1. Place the open folding apparatus with the test specimen in the cold chamber regulated at the specified temperature.

### 8.6 Folding

After 1 h exposure, close the folding apparatus from the vertical position through 90° to horizontal position within 1 s and maintain this position for 1 s. This closing procedure takes place in the cold chamber. The temperature of the folding apparatus should not change more than 2°C within these 2 s.

### 8.7 Conditioning

Remove the test specimen from the apparatus and allow warming to room temperature ( $23 \pm 5$ )°C.

### 8.8 Inspection

Examine the test specimen for cracks or fractures in the folded area with the six times magnifying glass.

### 8.9 Determination of cold folding temperature

The folding procedure shall be repeated at 5°C steps. Fresh test specimens shall be used for each test temperature.

### 8.10 Testing of sheets with backing

The samples for sheets with backing have to be taken of the uncoated area e.g. the area used for welding. Sheets with backing are only tested in machine direction.

If there is no uncoated area (e.g. testing of sheets after uses within a waterproofing systems) only the top area should be tested. To adjust the plate the overall thickness according to EN 1849-2 should be used.

## 9 Expression of results

When applying the step by step procedure described in 8.9 the cold folding temperature of the sheet is the lowest 5°C temperature step where none of the test specimens have cracks or fractures.

**FprEN 495-5:2012 (E)****10 Precision of results**

Precision data are based on a round-robin test involving 7 European laboratories. Two types of PVC-p membranes were tested a PES-reinforced 1,5 mm and a homogeneous bitumen compatible 1,5 mm membrane. All test pieces were prepared and distributed by one laboratory. All laboratories determined the same values within the 5°C steps.

**11 Test report**

The test report shall at least include the following information:

- a) reference to this European Standard (EN 495-5) and any deviation from it;
- b) all details necessary to identify the product tested;
- c) information on sampling in accordance with clause 6;
- d) details of preparation of the test specimen in accordance with clause 7;
- e) test results in accordance with clause 9 ;
- f) any peculiarities in the method employed or encountered during the test;
- g) date of the test(s).

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