BS EN 495-5:2013

BSI Standards Publication

Flexible sheets for waterproofing — Determination of foldability at low temperature

Part 5: Plastic and rubber sheets for roof waterproofing

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National foreword

This British Standard is the UK implementation of EN 495-5:2013. It supersedes BS EN 495-5:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/546, Flexible sheets for waterproofing and water vapour control.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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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

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Foreword

This document (EN 495-5:2013) 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of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

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 495-5:2000.

This document has been technically and editorially revised in order to:

— add the possibility of instrumented apparatus;

— add precision data of a Round Robin test.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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.

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: Plastic and rubber sheets*

3 Terms and definitions

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

3.1
top surface
upper side of the sheet, as used in situ

Note 1 to entry: It is usually the inside of the roll.

3.2
bottom surface
lower side of the sheet, as used in situ

Note 1 to entry: It is usually the outside of the roll.

3.3
overall thickness
thickness of the sheet excluding any surface profile

Note 1 to entry: See EN 1849-2.

4 Principle

The principle of the test is to place the looped test specimen in an adequate folding apparatus. Expose the looped test specimen to a specified low temperature for 1 h. Close the folding apparatus within 1 s and maintain this position for minimum 1 s. Allow the test specimen to warm to room temperature and examine 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 apparatus

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

5.2 Conditioning room

Cold chamber with air circulation, adjustable at temperatures down to − 45 °C with an accuracy of ± 2 °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 ageing, 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 ± 5) °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.

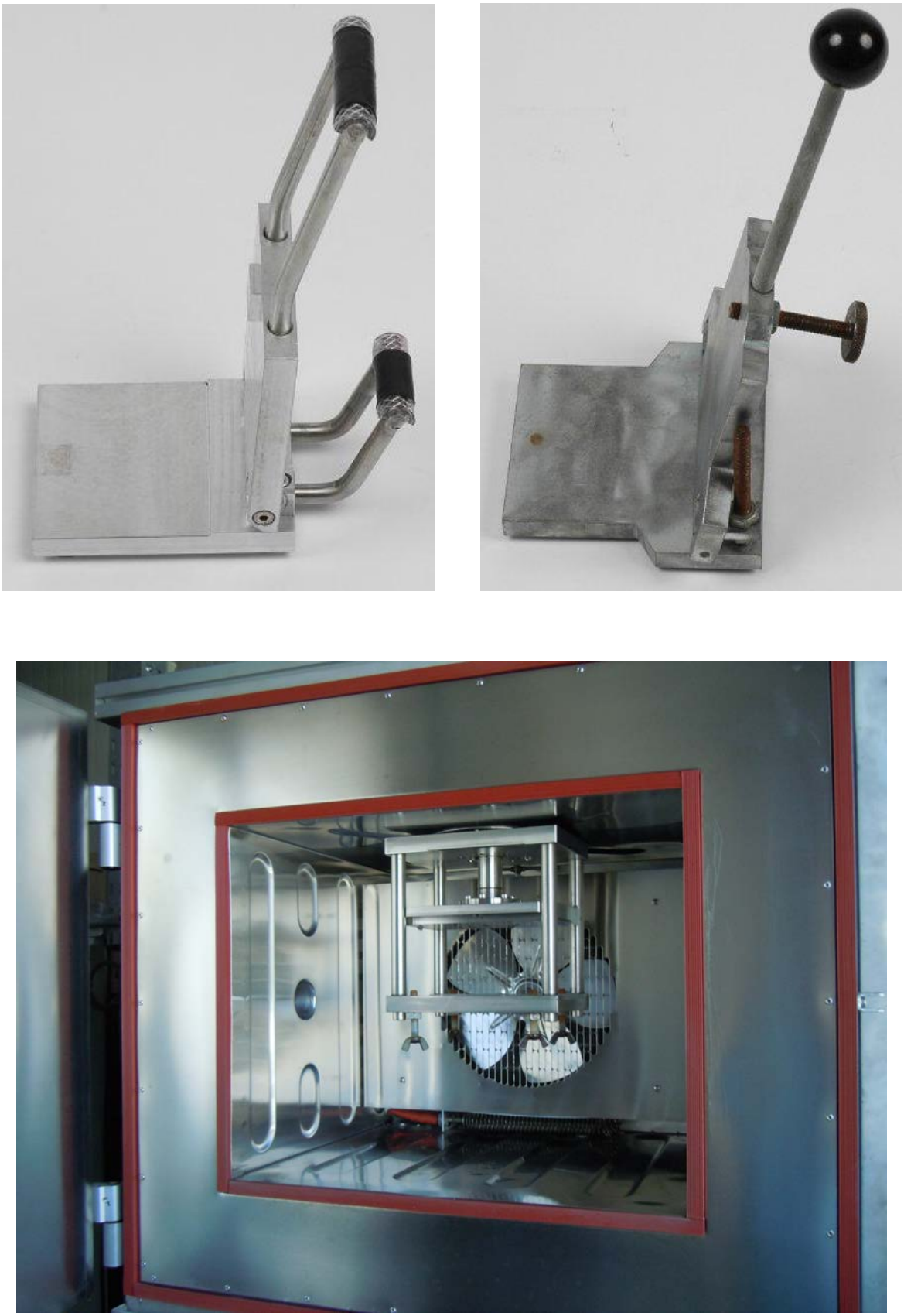

Figure 1 - Example of folding apparatus

8.3 Looping

Loop the test specimen lengthways and fix the ends together, for example with adhesive tape. 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's 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 the 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 within 1 s and maintain this position for minimum 1 s, for example from the vertical position through 90° to horizontal position. 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 ± 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 from 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 system), 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.

10 Precision of results

Precision data are based on a Round Robin test involving seven 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 EN 13416;

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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