BRITISH STANDARD

BS EN
12316-1:2000

Flexible sheets for waterproofing — Determination of peel resistance of joints —

Part 1: Bitumen sheets for roof waterproofing

The European Standard EN 12316-1:1999 has the status of a British Standard

ICS 91.100.50

National foreword

This British Standard is the official English language version of EN 12316-1:1999.

The UK participation in its preparation was entrusted by Technical Committee B/546, Flexible sheets for waterproofing, to Subcommittee B/546/1, Bitumen sheets, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 7, and a back cover.

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Flexible sheets for waterproofing - Determination of peel resistance of joints - Part 1: Bitumen sheets for roof waterproofing

Feuilles souples d'étanchéité - Détermination de la résistance au pelage des joints - Partie 1: Feuilles d'étanchéité de toiture bitumineuses

Abdichtungsbahnen - Bestimmung des Schälwiderstandes der Fügenähte - Teil 1: Bitumenbahnen für Dachabdichtungen

This European Standard was approved by CEN on 13 August 1999.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

		Page
Foreword		**3**
Introduction		**3**
1	**Scope**	**3**
2	**Normative references**	**3**
3	**Definitions**	**3**
4	**Principle**	**4**
5	**Apparatus**	**4**
6	**Sampling and preparation of joint test pieces**	**4**
7	**Preparation test specimens**	**4**
8	**Procedure**	**6**
9	**Expression of results, evaluation and precision of test method**	**6**
10	**Test report**	**7**

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 March 2000, and conflicting national standards shall be withdrawn at the latest by March 2000.

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 the characterization of bitumen sheets as manufactured or supplied before use. The 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 Standards on product specifications for reinforced and unreinforced bitumen sheets for roofing.

1 Scope

This European Standard specifies a test method for determining the resistance to peeling of joints between two adjacent sheets of the same bitumen-based roofing sheets.

This test method is intended to be used for testing the joints in mechanically fastened single layer bitumen roofing.

The peeling characteristics of a joint between two widths of bitumen-based sheets vary considerably depending on the material, on the method of jointing (flame or heat welding, hot adhesive or bitumen, cold adhesive, etc.), the size of the overlap and the workmanship.

2 Normative references

This European Standard incorporates by dated or undated reference, 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 edition of the publication referred to applies.

EN 10002 - 2, Tensile testing of metallic materials - Part 2: Verification for the force measuring system of the tensile testing machine.

3 Definitions

For the purpose of this standard, the definitions indicated in 3.1 and the corresponding European Standard on product specifications apply.

3.1 peel resistance the tensile force required to completely separate a prepared joint test specimen by peeling

4 Principle

A test specimen of a joint is pulled at a constant speed until complete separation occurs. The tensile force is continuously recorded throughout the test.

5 Apparatus

Tensile testing machine equipped with a continuous recording of force and corresponding distance, capable of maintaining uniform rate of grip separation as specified below.

The tensile testing machine shall have a sufficient loading capacity (at least 2 000 N) and a sufficient distance of grip separation, with a grip separation speed of (100 ± 10) mm/min. The width of grips shall be not less than 50 mm.

The tensile testing machine shall be equipped with grips of a type which maintains or increases the gripping pressure as a function of the increase of the force applied to the test specimen. The test specimen should be held so that it does not slip in the grips more than 2 mm. To prevent slipping from the grips exceeding 2 mm it will be permitted to use cooled grips

The method of gripping shall not induce premature failure at or in the grips.

The force measuring system shall meet at least class 2 in accordance with table 2 of EN 10002 - 2 (i.e. ±2 %).

6 Sampling and preparation of joint test pieces

Samples shall be taken in accordance with the corresponding European Standard.

Joint test pieces to be used for providing test specimens should be previously conditioned for at least 20 h at (23 ± 2) °C and at a relative humidity between 30 % and 70 %.

Test pieces of the sheet are joined by the method(s) to be used for installation with the unbonded material left on one side of the joint (see figure 1).

Joint test pieces should be prepared representing all the ways of jointing.

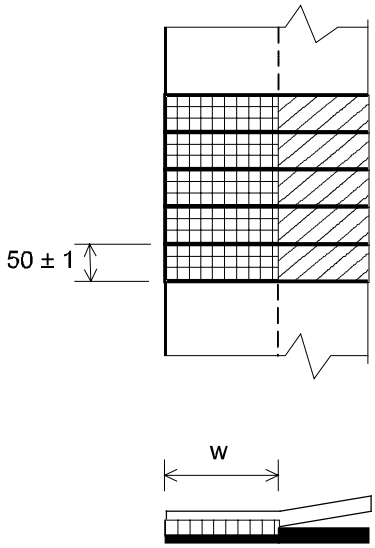
7 Preparation test specimens

From each of these joint test piece five rectangular test specimens (50 ± 1) mm wide shall be cut, perpendicular to the joint. They shall have such a length that the ends of the specimen fill the clamps and that the complete overlap can be tested (see figure 1 and figure 2).

Test specimens should be conditioned for at least 20 h before the test at (23 ± 2) °C and at a relative humidity between 30 % and 70 %.

When cold adhesives are used for jointing it may be necessary to increase the conditioning time according to the manufacturer's information

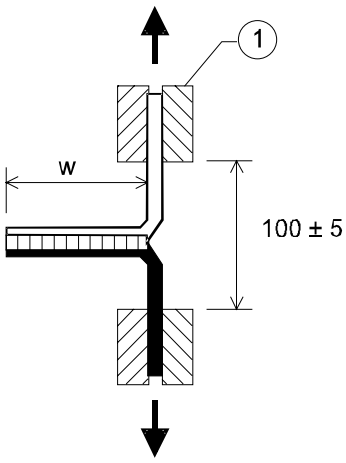
Dimensions in millimetres



w - width of joint

Figure 1 Preparation of test specimen from specially made joint test pieces of side and end laps

Dimmensions in millimetres



1 - grip;
w - width of joint

Figure 2 Peel strength testing of side and end laps

8 Procedure

The test specimen shall be firmly held in the grips of the tensile testing machine, taking care that the longitudinal axis of the test specimen, the axis of the tensile testing machine and the grips are correctly aligned.

The clear distance between the grips shall be (100 ± 5) mm. No preload shall be applied.

The test shall be carried out at (23 ± 2) °C with a constant speed of grip separation of (100 ± 10) mm/min.

The applied force, in N, shall be recorded continuously until the test specimen separates.

The mode of failure of the joint shall be noted.

9 Expression of results, evaluation and precision of test method

9.1 Evaluation

A force distance record shall be drawn up for each test specimen.

9.1.1 Maximum peel resistance

Record the maximum force as the maximum peel resistance of the specimen expressed in N per 50 mm.

9.1.2 Average peel resistance

The first and last quarter of the recorded data shall not be included when calculating the average peel resistance in N per 50 mm of the specimen. The average peel resistance value is calculated on the remaining section by considering 10 equidistant values (see figure 3).

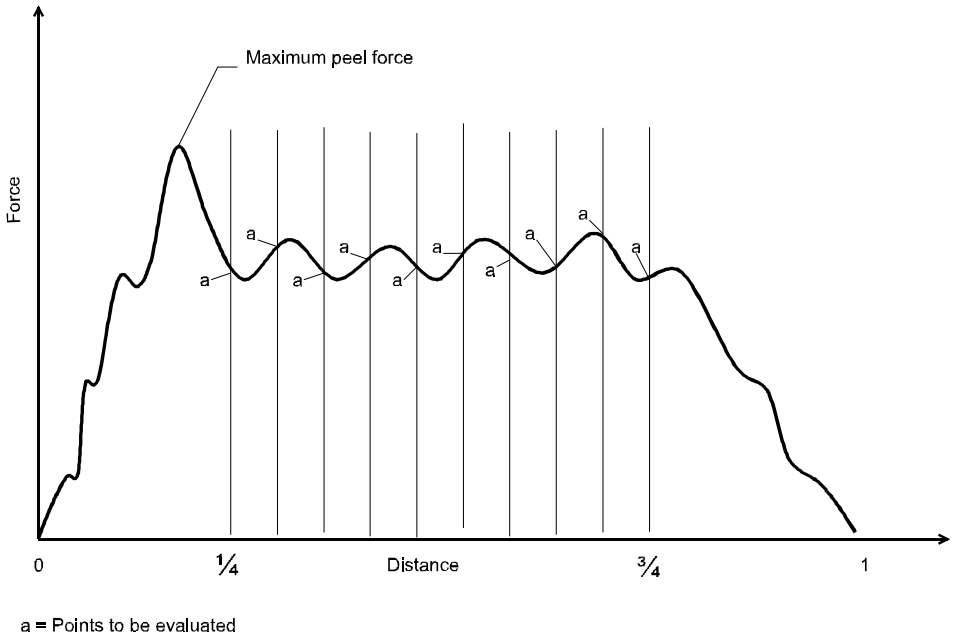


Figure 3 Graph for calculating the peel resistance (example)

NOTE: The purpose of the evaluation method specified here is to calculate an average peel resistance value which corresponds to the mean value of the forces acting on the test specimen at certain specified times during testing. This method also permits an evaluation to be carried out if the graphs do not feature any distinctive peaks. This can occur when testing some bonded materials. It should be noted that the results can vary, depending on the direction in which the specimens are taken.

9.2 Calculations

From the results for each set of five test specimens both the mean value of maximum peel resistance and average peel resistance shall be calculated and rounded to the nearest 5 N.

9.3 Precision of the test method

No information is available at this time.

10 Test report

The test report shall include at least the following information:

a) all details necessary to identify the product tested;

b) a reference to this European Standard (EN 12316-1) and any deviation from it;

c) information of sampling in accordance with clause 6;

d) details of preparation of the test specimens in accordance with clause 7 and a detailed description of the method of jointing;

e) the test results in accordance with clause 9;

f) the date of the test.

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