BRITISH STANDARD

BS EN
12310-1:2000

Flexible sheets for waterproofing — Determination of resistance to tearing (nail shank) —

Part 1: Bitumen sheets for roof waterproofing

The European Standard EN 12310-1:1999 has the status of a British Standard

ICS 91.100.50

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National foreword

This British Standard is the official English language version of EN 12310-1:1999.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 6, an inside back cover and a back cover.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12310-1

September 1999

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English version

Flexible sheets for waterproofing - Determination of resistance to tearing (nail shank) - Part 1: Bitumen sheets for roof waterproofing

Feuilles souples d'étanchéité - Détermination de la résistance à la déchirure (au clou) - Partie 1: Feuilles d'étanchéité de toiture bitumineuses

Abdichtungsbahnen - Bestimmung des Weiterreißwiderstandes (Nagelschaft) - Teil 1: Bitumenbahnen für Dachabdichtungen

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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of an identical text or by endorsement, at the latest by March 2000, and conflicting national standards shall be withdrawn at the latest by September 2001.

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 characteristics on reinforced and unreinforced bitumen sheets for roof waterproofing.

1 Scope

This European Standard specifies a method for the determination of the resistance tearing (nail shank) of bitumen sheets for roofing.

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, Metallic materials - Tensile testing - Part 2: Verification of the force measuring system of the tensile testing machines.

3 Definitions

For the purposes of this standard the definitions indicated in 3.1 and in the corresponding European Standard on product characteristics apply.

3.1 resistance to tearing (nail shank) the tensile force required to tear a test specimen held by a nail shank

4 Principle

The test measures the force required to tear a test specimen pierced by a nail shank by a force applied to the product at right angles to the shank axis.

5 Apparatus

5.1 Tensile testing machine

Tensile testing machine equipped with a continuous recording of force and corresponding distance, capable of maintaining a uniform rate of grip separation as specified below. The tensile testing machine shall have a sufficient loading capacity (at least 2000 N) and a sufficient distance of grip separation, with a grip separation speed of (100 ± 10) mm per minute. The width of grip shall not be less than 100 mm.

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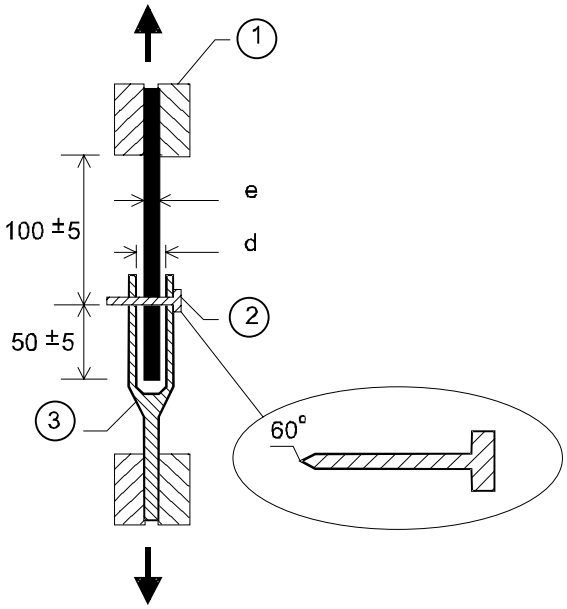
The tensile testing machine shall be equipped with grips of a type which maintain or increase the gripping pressure as a function of the increase of the force applied to the specimen. The test specimen shall be held so that it does not slip in the grips more than 2 mm. To prevent slippage from the grips exceeding 2 mm it will be permitted to use cooled grips. The grip system shall not provoke an early failure of the test specimen on or at the grips.

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

5.2 Stirrup assembly

The stirrup assembly shall provide a point of attachment to one grip of the tensile testing machine at one end and two arms to support the test specimen at the other. The arms shall be provided with locating holes for the nail shank, so positioned to allow the test described in clause 8 to be carried out (see figure 1).

Dimensions in millimetres



1 Grip
2 Nail shank (ϕ 2,5 $\pm$ 0,1)
3 Stirrup
e Sample thickness
d Stirrup gap ($e + 1 \leq d \leq e + 2$)

Figure 1 Nail shank tear testing

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6 Sampling

Test samples shall be taken in accordance with the corresponding European Standard.

7 Preparation of test specimens

Test specimens are to be cut at random from the test piece, but normally at least 100 mm from the edge of the sheet, with the aid of a template, or die cutter, to provide a rectangular test specimen measuring (100 ± 1) mm wide by at least 200 mm long. The longer dimension of the test specimen will correspond to the test direction. Test specimens shall be cut from the longitudinal and/or the cross direction of the test sample.

Sheets with reinforced edges for mechanical fastening shall be tested within the reinforced area.

Five test specimens of the material for testing are prepared in each of the chosen directions. Any non permanent surface layer shall be removed.

The test specimens shall be conditioned for at least 20 h at (23 ± 2) °C and relative humidity in the range 30 % to 70 % before testing.

8 Procedure

The test specimen is inserted between the arms of a close fitting stirrup, and a (2,5 ± 0,1) mm diameter sharpened nail shank is pushed through locating holes in the stirrup arms such that the shank pierces the specimen along the centre line at a distance of (50 ± 5) mm from the free end inside the stirrup (see figure 1).

The distance between upper grips and nail shall be (100 ± 5) mm.

The assembly is inserted into a tensile testing machine which grips the test specimen at one end and the stirrup at the other. The action of the tensile test machine is to pull the nail shank through the plane of the material towards the free end. A diagrammatic representation of the test apparatus is indicated in figure 1.

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

The tensile force required to tear the test specimen pierced by the nail shank is continuously recorded.

9 Expression of results, evaluation and precision of test method

9.1 Evaluation

The resistance to tearing (nail shank) of the test specimen is the maximum force recorded during the test. The maximum force is taken from the continuously recorded force.

List the individual values for each five test specimens. Calculate the mean value to the nearest 5 N, noting the test direction.

9.2 Precision of the test method

The precision of the test method is not specified

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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 12310-1) 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;

e) the test results in accordance with 9.1;

f) the date of the test.

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