BRITISH STANDARD

BS EN
846-10:2000

Methods of test for ancillary components for masonry —

Part 10: Determination of load capacity and load deflection characteristics of brackets

The European Standard EN 846-10:2000 has the status of a British Standard

ICS 91.060.10; 91.080.30

National foreword

This British Standard is the official English language version of EN 846-10:2000 which is included in a package of new European Standards being prepared by CEN/TC 125 relating to ancillary components for masonry - ties, straps, hangers and brackets. Although the English language versions of these European Standards will be adopted as British Standards as they become available, the existing British Standards for brackets will be retained, but only until such time that the complete package of European Standards becomes available. Any residue(s) from British Standards affected by the package which need to be retained, will be drawn together to form a new BS. The original group of British Standards will then be withdrawn and this will be notified in *Update Standards*.

The UK participation in its preparation was entrusted by Technical Committee B/519, Masonry and associated testing, to Subcommittee B/519/3, Ancillary components, 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.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 8, an inside back cover and a back cover.

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This British Standard, having been prepared under the direction of the Sector Committee for Building and Civil Engineering, was published under the authority of the Standards Committee and comes into effect on 15 June 2000

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English version

Methods of test for ancillary components for masonry - Part 10: Determination of load capacity and load-deflection characteristics of brackets

Méthodes d'essai des composants accessoires de maçonnerie - Partie 10: Détermination de la résistance et de la rigidité des consoles

Prüfverfahren für Ergänzungsbauteile für Mauerwerk - Teil 10: Bestimmung der Tragfähigkeit und der Last-Verformungseigenschaften von Konsolen

This European Standard was approved by CEN on 4 December 1999.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 125, Masonry, 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 August 2000, and conflicting national standards shall be withdrawn at the latest by September 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.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports the essential requirements of the EU Construction Products Directive (89/106/EEC) and includes the performance requirements referred to in the Eurocode for masonry structures.

1 Scope

This European Standard specifies a method for determining the load capacity and load-deflection characteristics of brackets, used for the support of masonry, fixed to a backing wall or frame structure.

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.

prEN 772-1	Methods of test for masonry units - Part 1: Determination of compressive strength.
EN 772-10	Methods of test for masonry units - Part 10: Determination of moisture content of calcium silicate, and autoclaved aerated concrete masonry units.
prEN 845-1	Specification for ancillary components for masonry - Part 1: Ties, straps, hangers, brackets and support angles.

3 Principle

Specimen brackets are attached to a suitable backing material and subjected to vertically applied loads. Provision is made to determine strength, deflection and recovery.

4 Materials

4.1 Masonry backing walls

Masonry used to construct backing walls shall be as specified.

4.2 Concrete backing walls

Concrete used to construct backing walls may be cast in-situ or precast elements as specified.

4.3 Steel frame or stud elements

Representative sections of metal frame or stud elements shall be used as specified.

4.4 Screws, nails, grouts, plugs, slot sections or other fixing ancillary items

Fixing materials shall be normal production items, in a clean dry uncontaminated state, supplied by the manufacturer or supplier for use with the product.

5 Apparatus

5.1 Reaction frames, or other methods of preventing undue movement/rotation of the backing material.

5.2 Dial gauges or electrical linear displacement transducers, to measure movement of bracket relative to backing material accurate to 0,01 mm.

5.3 Test machine, or apparatus capable of applying the load without distortion such that the maximum load reading occurs above 20 % of the full scale reading. The load shall be measured using a load cell device having a digital or analogue readout with a resolution of 2 % of the full scale reading or better. The system shall apply an axial force to the specimen.

Where the load is to be applied using weights this should be without shock, and each increment in load and the failure load shall be measured to an accuracy of ±2 %.

6 Test specimens

6.1 Sampling

The method of sampling shall be in accordance with prEN 845-1. The minimum number of specimens shall be five.

Prior to fixing the brackets, all relevant dimensions and thicknesses shall be measured.

6.2 Construction and storage

Test walls shall be built with masonry units representative of the types for which the manufacturer claims that the bracket to be tested are intended. Fix the bracket in accordance with the manufacturer's instructions for the type being tested.

Determine the compressive strength of a sample of the masonry units using the method given in prEN 772-1.

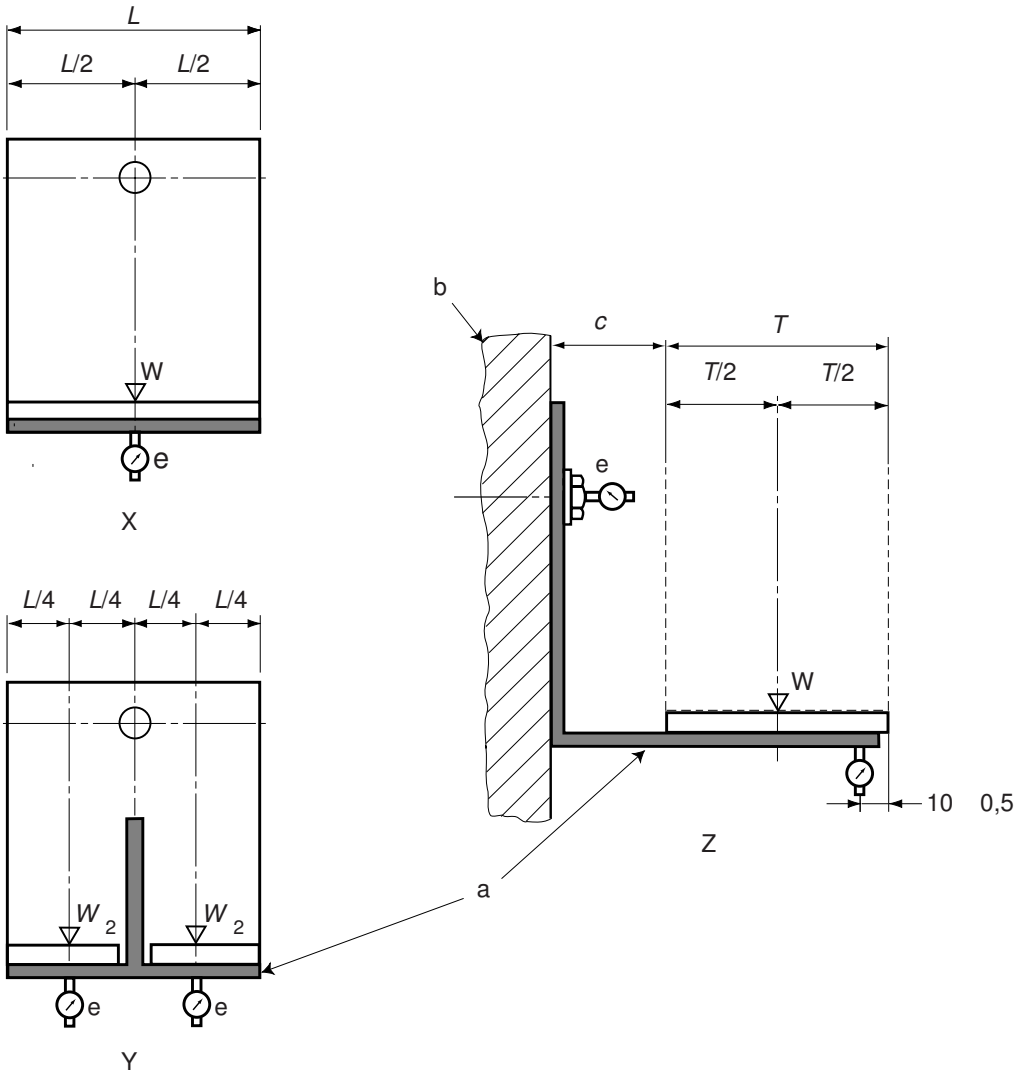
The conditioning of masonry units shall as specified. Measure the moisture content by mass of autoclaved aerated concrete and calcium silicate masonry units in accordance with EN 772-10. For other types of masonry unit record the method of conditioning the units prior to laying. Record the age of non-autoclaved concrete units at the time of testing the masonry specimens.

Build the walls on a flat horizontal surface. Strike off the mortar flush with the faces of the specimen. Normal masonry mortar joints shall be between 8 mm and 15 mm thick. Thin layer mortar joints shall be between 1 mm and 3 mm thick. Take appropriate steps to prevent the test specimen from drying out during the first 3 d after construction, e.g. by covering with polyethylene sheets, and then leave uncovered in a laboratory environment until tested. Unless otherwise specified, leave to cure for at least 28 d before testing.

Concrete backing walls shall be supported in a vertical position; other elements, e.g. floor slabs, shall be oriented as they would in a building.

Fix the brackets in accordance with the manufacturer's instructions for the type being tested using fixings/fastenings of the size and type specified by the manufacturer.

Dimensions in millimetres



Key

X	Face of plain bracket
Y	Face of bracket with strengthening gusset
Z	Elevation showing disposition of load
a	Bracket
b	Backing material, e.g. concrete, masonry, etc.
c	Designated cavity width
e	Deflection gauge or transducer
T	Thickness of the masonry
L	Length of the bracket
W	Applied load

Figure 1 - Typical specimen layout and loading configuration

6.3 Loading geometry

When testing, a series of point loads, equal in total to the required distributed load, may be employed.

For brackets intended to be used only with a single fixing, the resultant load shall be applied in line with the fixing.

The load shall be applied on the centre line of area of the bracket on which the masonry is designed to be supported.

Note: Suitable loading arrangements are shown in Figure 1.

6.4 Deflection monitoring

Vertical deflections shall be monitored at 10 mm ± 0,5 mm from the free edge of the bracket or support angle and under load points along the length as shown in Figure 1. Additionally the fixing shall be monitored and failures due to pull-out of fixings shall be reported in the test report.

7 Procedure

7.1 Loading

Apply a preload of 1 kN to the test specimen and hold for a period of 1 min.

Remove the load and proceed as follows.

Apply load continuously or in not less than six increments up to the maximum expected test load. Use any convenient loading rate such that failure occurs at between 15 min and 30 min after commencing the test. Apply load until either failure occurs, defined as:

- the load at which further deflection occurs without increase in test load; or

- to a deflection of 10 mm when the load corresponding to that deflection shall be taken to be the failure load.

Record the load-deflection data, the failure load and the mode of failure.

8 Expression of results

Record the failure load of each specimen, to the nearest 10 N, and note any visible signs of distress in specimen, fixings or supporting member at all stages of the test.

9 Evaluation of results

Calculate the load capacity as the mean failure load and express it to the nearest 10 N.

10 Test report

Test reports shall include the following information:

a) the number, title and date of issue of this European Standard;

b) name of test laboratory;

c) description of the bracket to the relevant European Standard prEN 845-1 including material and dimensions;

d) type, size and position of fixings and manufacturer's reference;

e) a description of the supporting member including a specification for concrete, steel, or masonry units and mortar used, to the relevant European Standards;

f) age of non-autoclaved concrete units at the time of testing the masonry;

g) moisture content by mass of autoclaved aerated concrete and calcium silicate units or, for other types of unit, the method of conditioning prior to the time of laying;

h) a description of the method and location of fixing the bracket;

i) the date of load testing the specimens;

j) loading arrangement and positions at which deflection was monitored;

k) a graph giving the load-deflection curve for each individual specimen in the test;

l) individual values of the load capacity, to the nearest 10 N;

m) the mode of failure of each individual specimen;

n) the mean value of the load capacity to the nearest 10 N.

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