

# Specification for ancillary components for masonry —

## Part 2: Lintels

The European Standard EN 845-2:2003 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 845-2:2003.

EN 845-2 is a candidate “harmonized” European Standard and fully takes into account the requirements of the European Commission mandate M116, Masonry and related products, given under the EU Construction Products Directive (89/106/EEC), and is intended to lead to CE marking. The date of applicability of EN 845-2 as a “harmonized” European Standard, i.e. the date after which this standard may be used for CE marking purposes, is subject to an announcement in the *Official Journal of the European Communities*.

The Commission in consultation with Member States have agreed a transition period for the co-existence of “harmonized” European Standards and their corresponding national standard(s). It is intended that this period will comprise a period, usually nine months, after the date of availability of the European Standard, during which any required changes to national regulations are to be made, followed by a further period, usually of 12 months, for the implementation of CE marking. At the end of this co-existence period, the national standard(s) will be withdrawn.

EN 845-2 is the subject of transitional arrangements agreed under the Commission mandate. In the UK, the corresponding national standard is:

— BS 5977-2:1983, *Lintels — Part 2: Specification for prefabricated lintels*; and based on this transition period of twenty-one months, the above mentioned national standard will be withdrawn in January 2005.

NOTE This date is approximate. Users of this standard should contact BSI Customer Services for confirmation of withdrawal.

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 international/European committee any enquiries on the interpretation, or proposals for change, and keep 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.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 16 September 2003

Amendments issued since publication

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EN 845-2:2003 has been prepared by CEN/TC 125, Masonry, and immediately supersedes EN 845-2:2001 which is withdrawn (but see also transitional arrangements above in relation to other British Standards).

EN 845-2 specifies the characteristics and performance requirements for lintels available throughout the CEN member countries. It aims to do so in product performance terms, avoiding as far as possible prescriptive requirements and all the traditional designations of lintels available throughout Europe. Current products, however, will continue to be manufactured, traded and used, even though they are not referred to by name in this European Standard.

EN 845-2 includes clauses covering initial type tests, factory production control, sampling for initial type testing and independent testing of consignments. These are similar in all masonry product specifications.

The UK National Annex NA attached to this standard provides an informative commentary on the differences between EN 845-2 and BS 5977-2. Nothing in this annex should be construed as specifying requirements other than those contained in the normative parts of this European Standard.

If CE marking is performed, the procedures in Annex ZA will apply. The significance of the CE marking is that the product manufacturer claims compliance with the “harmonized” requirements given in the normative text of the product standard. These relate to the essential requirements of the EU Construction Products Directive. Not all product characteristics need necessarily be given on the CE marking, but those product characteristics covered by regulations in force in each EU Member State, where the manufacturer intends that the product will be used, do need to be stated.

### **Cross-references**

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

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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### **Summary of pages**

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 43 and a back cover.

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English version

## Specification for ancillary components for masonry - Part 2: Lintels

Spécification pour composants accessoires de maçonnerie  
- Partie 2: Linteaux

Festlegungen für Ergänzungsbauteile für Mauerwerk - Teil  
2: Stürze

This European Standard was approved by CEN on 29 November 2002.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## Foreword

This document (EN 845-2:2003) has been prepared by Technical Committee CEN/TC125 'Masonry', the Secretariat of which is held by BSI, following initial preparation by Working Group 3.

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 October 2003, and conflicting national standards shall be withdrawn at the latest by January 2005.

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).

For relationship with EU Directives, see informative Annex ZA which is an integral part of this standard.

In this European Standard the Annexes A and B are informative and the Annexes C and D are normative.

This document supersedes EN 845-2:2001.

This Part has been modified, including the introduction of additional requirements, taking into account the detailed answer by CEN/TC 125 to EC mandate M116 for masonry as well as details of the relationship of this new harmonized European Standard with the EU Directives.

EN 845 "Specification for ancillary components for masonry" consists of the following Parts:

— *Part 1: Wall ties, tension straps, hangers and brackets.*

— *Part 2: Lintels.*

— *Part 3: Bed joint reinforcement of steel meshwork.*

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This European Standard specifies requirements for prefabricated lintels for spans over clear openings in a masonry wall up to a maximum of 4,5 m and made from steel, autoclaved aerated concrete, manufactured stone, concrete, fired clay units, calcium silicate units, natural stone units, or using a combination of these materials.

Prefabricated lintels can be either complete lintels or the prefabricated part of a composite lintel.

This European Standard is not applicable to:

- a) Lintels completely made on site;
- b) Lintels, the tensile parts of which are made on site;
- c) Timber lintels;
- d) Natural stone lintels, not reinforced.

Linear components spanning clear openings greater than 4,5 m in masonry walls and linear components intended for use independently in a structural role (e.g. beams) are not covered by this standard.

## 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 (including amendments).

EN 206-1: 2000, *Concrete — Part 1: Specifications, performance, production and conformity*.

EN 771-1, *Specification for masonry units — Part 1: Clay masonry units*.

EN 771-2, *Specification for masonry units — Part 2: Calcium silicate masonry units*.

prEN 771-3, *Specification for masonry units — Part 3: Aggregate concrete masonry units. (Dense and light-weight aggregates)*

prEN 771-4, *Specification for masonry units — Part 4: Autoclaved aerated concrete masonry units*.

prEN 771-5, *Specification for masonry units — Part 5: Manufactured stone*.

prEN 771-6, *Specification for masonry units — Part 6: Natural stone masonry units*.

EN 772-1, *Methods of test for masonry units — Part 1: Determination of compressive strength*.

EN 772-11, *Methods of test for masonry units — Part 11: Determination of water absorption of aggregate concrete, manufactured stone and natural stone masonry units due to capillary action and the initial rate of water absorption of clay masonry units*.

EN 772-22, *Methods of test for masonry units — Part 22: Determination of freeze/thaw resistance of clay masonry units.*

EN 846-9, *Methods of test for ancillary components for masonry — Part 9: Determination of flexural resistance, and shear resistance of lintels.*

EN 846-11, *Methods of test for ancillary components for masonry — Part 11: Determination of dimensions and bow of lintels.*

EN 846-13, *Methods of test for ancillary components for masonry — Part 13: Determination of resistance to impact, abrasion and corrosion of organic coatings.*

EN 990: 2002, *Test methods for verification of corrosion protection of reinforcement in autoclaved aerated concrete and lightweight aggregate concrete with open structure.*

EN 998-2, *Specification for mortar for masonry — Part 2: Masonry mortar.*

EN 1745 *Masonry and masonry products - Methods for determining design thermal values.*

EN 10025, *Hot rolled products of non-alloy structural steels; Technical delivery conditions.*

prEN 10080, *Steel for the reinforcement of concrete — Weldable reinforcing steel.*

EN 10088-1, *Stainless steels - Part 1: List of stainless steels.*

EN 10088-2, *Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip for general purposes.*

EN 10088-3, *Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes.*

EN 10111, *Continuously hot rolled low carbon steel sheet and strip for cold forming — Technical delivery conditions.*

EN 10130, *Cold rolled low carbon steel flat products for cold forming — Technical delivery conditions.*

prEN 10138, *Prestressing steels.*

EN 10142, *Continuously hot-dip zinc coated low carbon steels strip and sheet for cold forming — technical delivery conditions.*

EN 10147, *Continuously hot-dip zinc coated structural steels strip and sheet — Technical delivery conditions.*

prEN 12602, *Prefabricated reinforced components of autoclaved aerated concrete.*

EN 12620, *Aggregates for concrete*

prEN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests excluding ventilation services.*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods ISO 1461:1999.*

ISO 1463, *Metallic and oxide coatings. Measurement of coating thickness — Microscopical method.*

### 3 Terms, definitions and symbols

#### 3.1 Terms and definitions

For the purposes of this European Standard the following terms and definitions apply.

NOTE 1 Examples of lintel types are shown in Figures 1 to 3. The figures are only for illustration of lintel types. Other details such as bearings, thermal insulation systems and damp proof courses are not shown.

NOTE 2 General dimensions defined in clause 3 are illustrated in Figures 3 and 4.

##### 3.1.1

##### **bearing length**

length of the end of a lintel which bears on its support

##### 3.1.2

##### **clear opening**

clear distance between lintel supports

##### 3.1.3

##### **combined lintel**

lintel consisting of two or more structural elements each one acting with compression and tension zones

##### 3.1.4

##### **composite lintel**

lintel comprising a prefabricated part and a complementary element of in-situ masonry or concrete above, acting together

##### 3.1.5

##### **composite lintel height**

overall height of the tension and compression zones of a composite lintel

##### 3.1.6

##### **concrete lintel**

lintel manufactured using reinforced or prestressed concrete or manufactured stone or autoclaved aerated concrete

##### 3.1.7

##### **declared value**

value for a product property, determined in accordance with this standard, that a manufacturer is confident of achieving bearing, in mind the variability of the manufacturing process

##### 3.1.8

##### **effective span**

distance between the centres of the bearing of a lintel, or the clear opening spanned by the lintel plus the overall height of the lintel including any complementary element, whichever is the lesser

##### 3.1.9

##### **flexural resistance**

mean uniformly distributed load at which failure of a sample of lintel specimens occurs (or a lower load at which tests are stopped in accordance with the recommendations of the manufacturer of the lintel)

##### 3.1.10

##### **flexural load at the stated deflection**

total of the uniformly distributed load which can be sustained by a lintel without resulting in a deflection greater than the stated deflection

**3.1.11**

**lintel**

lineal element supporting load over an opening in a masonry wall

**3.1.12**

**lintel height**

overall height of the prefabricated part of a lintel

**3.1.13**

**lintel length**

overall length of the prefabricated lintel

**3.1.14**

**load bearing capacity**

mean value for a sample of lintels of the total of the uniformly distributed load at failure or at an extreme deflection, whichever is the lesser

**3.1.15**

**load ratio**

the ratio of inner leaf load to outer leaf load on a lintel supporting a double-leaf or cavity wall

**3.1.16**

**masonry lintel**

lintel comprising one or more shell casing units completed by the incorporation within the shell casing of reinforced or prestressed concrete

**3.1.17**

**shear resistance**

mean shear load at which failure of a sample of lintel specimens occurs (or a lower load at which tests are stopped in accordance with the recommendations of the manufacturer of the lintel)

**3.1.18**

**shell casing unit**

preformed component with one or more channels into which is incorporated either reinforced or prestressed concrete

**3.1.19**

**single lintel**

prefabricated lintel acting alone

**3.1.20**

**stated deflection**

manufacturer's chosen value of deflection that is not to be exceeded in the intended use of the lintel

**3.1.21**

**steel lintel**

lintel manufactured from steel

**3.1.22****structural shell casing unit**

shell casing unit which is made of a material with a compressive strength not less than that of the infill concrete

**3.2 Symbols**

NOTE General dimensions are illustrated in Figures 3 and 4.

$B$  is the smallest width of a structural shell casing unit specimen, in mm, (see Figure 5);

$b$  is the bearing length, in mm;

$d_c$  is the composite lintel height, in mm;

$d_l$  is the lintel height, in mm;

is the deflection at the flexural load  $P$ , in mm;

$\delta$  is the stated deflection, in mm;

$H$  is the cut length of a structural shell casing unit specimen, in mm, (see Figure 5);

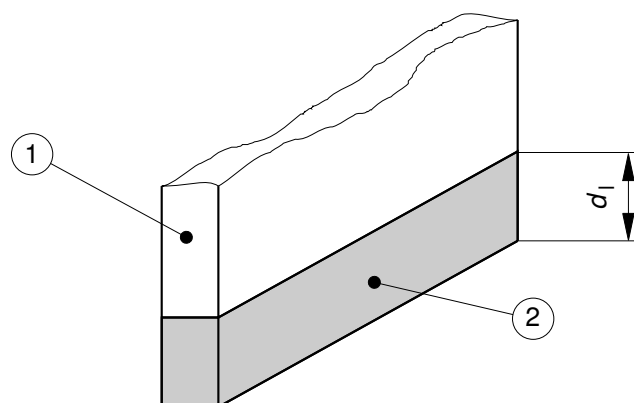
$l$  is the lintel length, in mm;

$l_o$  is the clear opening, in mm;

$l_e$  is the effective span, in mm;

$P$  is the flexural load at the deflection , in kN or kN/m;

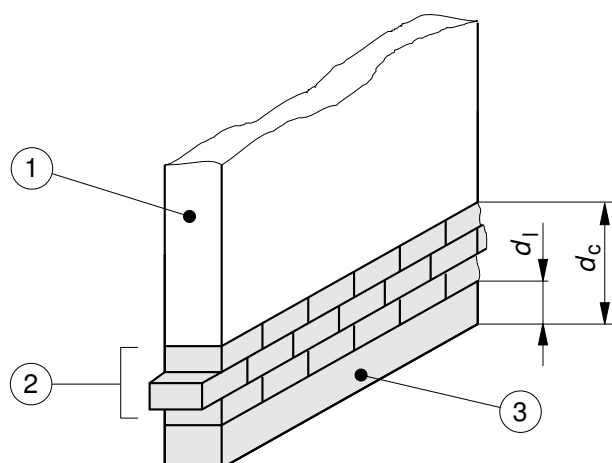
$P_d$  is the declared value of flexural load at the stated deflection  $\delta$ , in kN or kN/m;



**Key**

- 1 Supported masonry
- 2 Single lintel

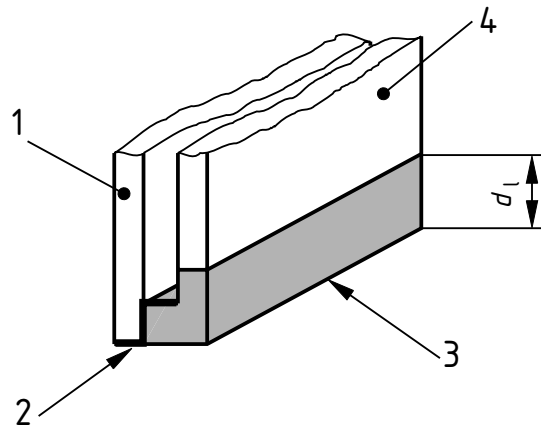
**Figure 1 — Example of a single lintel (see 3.1.19)**



**Key**

- 1 Supported masonry
- 2 Complementary element (masonry or concrete)
- 3 Prefabricated part

**Figure 2 — Example of a composite lintel (see 3.1.4)**



### Key

- |                                  |                                  |
|----------------------------------|----------------------------------|
| 1 supported masonry - outer leaf | 3 Inner leaf lintel              |
| 2 Outer leaf lintel              | 4 Supported masonry – inner leaf |

**Figure 3 — Example of a combined lintel (see 3.1.3)**