

BS EN 771-1:2011+A1:2015



BSI Standards Publication

Specification for masonry units

Part 1: Clay masonry units

bsi.

...making excellence a habit.™

This is a preview. [Click here to purchase the full publication.](#)

National foreword

This British Standard is the UK implementation of EN 771-1:2011+A1:2015. It supersedes BS EN 771-1:2011, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

EN 771-1:2011+A1:2015 is a “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 Regulation (Regulation (EU) No 305/2011).

EN 771-1 was the subject of transitional arrangements agreed under the Commission mandate. In the UK, the corresponding national standards were:

- BS 3921:1985, *Specification for clay bricks*;
- BS 6649:1985, *Specification for clay and calcium silicate modular bricks*;

which were withdrawn in 2007.

The UK participation in its preparation was entrusted by Technical Committee B/519, Masonry and associated testing, to Subcommittee B/519/1, Masonry units.

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

EN 771-1 specifies the characteristics and performance requirements for clay masonry units available throughout the CEN member countries. It aims to do so in product performance terms, avoiding as far as possible prescriptive requirements but permitting all the traditional designations of clay units available throughout Europe. The Standard distinguishes between clay masonry units for use in protected masonry (P units) and unprotected masonry (U units). The majority of clay bricks produced in the UK are U units. One particular variety widely available in the UK (in two classes) is the clay engineering brick; its characteristics are defined in terms of compressive strength, water absorption and net dry density that are tabulated later in the accompanying National Annex to this standard.

The UK National Annex NA attached to this standard provides an informative commentary on the differences between EN 771-1, BS 3921 and BS 6649.

Masonry units conforming to this standard need to be CE marked in accordance with the procedures in Annex ZA. 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 basic requirements for construction works given in the EU Construction Products Regulation. 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.

It cannot be assumed that the declared value of a performance characteristic given for a masonry unit conforming to one part of EN 771 can be directly compared with the same performance characteristic for a masonry unit conforming to another part of EN 771.

© The British Standards Institution 2016.
Published by BSI Standards Limited 2016

ISBN 978 0 580 79491 9

ICS 91.100.25

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

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

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2011.

Amendments/corrigenda issued since publication

Date	Text affected
31 March 2016	Implementation of CEN amendment 1:2015. National Foreword and National Annex NA also updated

English Version

Specification for masonry units - Part 1: Clay masonry units

Spécification pour éléments de maçonnerie - Partie 1:
Briques de terre cuite

Festlegungen für Mauersteine - Teil 1: Mauerziegel

This European Standard was approved by CEN on 3 March 2011 and includes Amendment 1 approved by CEN on 11 January 2015.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.







EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Materials and manufacture	9
5 Requirements for clay masonry units	10
5.1 General.....	10
5.2 \mathbb{A}_1 P units: intended to be used in protected masonry \mathbb{A}_1	10
5.2.1 Dimensions and tolerances (\mathbb{A}_1 P \mathbb{A}_1 units).....	10
5.2.2 Configuration (\mathbb{A}_1 P \mathbb{A}_1 units).....	13
5.2.3 Density (\mathbb{A}_1 P \mathbb{A}_1 units).....	14
5.2.4 Compressive strength (\mathbb{A}_1 P \mathbb{A}_1 units).....	15
5.2.5 Thermal properties (\mathbb{A}_1 P \mathbb{A}_1 units).....	16
5.2.6 Durability (\mathbb{A}_1 P \mathbb{A}_1 units).....	16
5.2.7 Water absorption (\mathbb{A}_1 P \mathbb{A}_1 units).....	16
5.2.8 Active soluble salts content (\mathbb{A}_1 P \mathbb{A}_1 units).....	16
5.2.9 Moisture movement (\mathbb{A}_1 P \mathbb{A}_1 units).....	16
5.2.10 Reaction to fire (\mathbb{A}_1 P \mathbb{A}_1 units)	17
5.2.11 Water vapour permeability (\mathbb{A}_1 P \mathbb{A}_1 units)	17
5.2.12 Bond strength (\mathbb{A}_1 P \mathbb{A}_1 units).....	17
5.2.13 Dangerous substances	17
5.3 \mathbb{A}_1 U units: intended to be used in unprotected masonry \mathbb{A}_1	18
5.3.1 Dimensions and tolerances (\mathbb{A}_1 U \mathbb{A}_1 units).....	18
5.3.2 Configuration (\mathbb{A}_1 U \mathbb{A}_1 units).....	19
5.3.3 Density (\mathbb{A}_1 U \mathbb{A}_1 units).....	20
5.3.4 Compressive strength (\mathbb{A}_1 U \mathbb{A}_1 units)	21
5.3.5 Thermal properties (\mathbb{A}_1 U \mathbb{A}_1 units).....	22
5.3.6 Durability (\mathbb{A}_1 U \mathbb{A}_1 units).....	22
5.3.7 Water absorption (\mathbb{A}_1 U \mathbb{A}_1 units).....	22
5.3.8 Initial rate of water absorption (\mathbb{A}_1 U \mathbb{A}_1 units).....	23
5.3.9 Active soluble salts content (\mathbb{A}_1 U \mathbb{A}_1 units).....	23
5.3.10 Moisture movement (\mathbb{A}_1 U \mathbb{A}_1 units)	23
5.3.11 Reaction to fire (\mathbb{A}_1 U \mathbb{A}_1 units)	23
5.3.12 Water vapour permeability (\mathbb{A}_1 U \mathbb{A}_1 units)	23
5.3.13 Bond strength (\mathbb{A}_1 U \mathbb{A}_1 units).....	24
5.3.14 Dangerous substances	24
6 \mathbb{A}_1 Description, designation, designation code and classification of clay masonry units \mathbb{A}_1	24
6.1 Description and designation	24
6.1.1 \mathbb{A}_1 P units \mathbb{A}_1	24
6.1.2 \mathbb{A}_1 U units \mathbb{A}_1	25
6.2 Designation code	26
6.3 Classification.....	30
7 Marking	30
8 \mathbb{A}_1 Assessment and verification of constancy of performance (AVCP) \mathbb{A}_1	30
8.1 General.....	30
8.2 \mathbb{A}_1 Product type determination \mathbb{A}_1	30
8.3 Factory production control.....	31

8.3.1	General	31
8.3.2	Testing and measuring equipment.....	32
8.3.3	Production equipment	32
8.3.4	Raw materials	32
8.3.5	Production process	32
8.3.6	Finished product testing.....	32
8.3.7	Statistical techniques.....	33
8.3.8	Marking and stock control of products.....	33
8.3.9	Traceability.....	33
8.3.10	Nonconforming products	33
Annex A (normative)  Sampling for product type determination tests and for independent testing of consignments 		34
A.1	General	34
A.2	Sampling procedure	34
A.2.1	General	34
A.2.2	Random sampling	34
A.2.3	Representative sampling	34
A.2.4	Dividing the sample.....	35
A.2.5	Number of units required for testing.....	36
Annex B (informative) Additional information.....		38
B.1	Use of clay masonry units	38
B.2	Durability	39
B.3	Freeze/thaw resistance	39
B.3.1	General	39
B.3.2	Masonry subjected to severe exposure	39
B.3.3	Masonry subjected to moderate exposure	40
B.3.4	Masonry subjected to passive exposure	40
B.4	Sulfate action on mortars and plasters.....	40
B.5	Efflorescence and staining.....	41
B.6	General guidance on the appearance of facing clay masonry units	41
Annex C (informative) Guidelines for test frequencies for designing a FPC system to demonstrate conformity of finished products with the requirements of the standard and the declaration of the manufacturer		42
Annex ZA (informative)  Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation 		44
ZA.1	Scope and relevant characteristics	44
ZA.2	Procedure for AVCP of clay masonry units.....	47
ZA.2.1	System(s) of AVCP	47
ZA.2.2	Declaration of performance (DoP)	48
ZA.3	CE marking and labelling.....	54
Bibliography.....		57

European foreword

This document (EN 771-1:2011+A1:2015) 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 February 2016, and conflicting national standards shall be withdrawn at the latest by May 2017.

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 A1 EN 771-1:2011 A1.

This document includes Amendment 1 approved by CEN on 2015-01-11.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

A1 This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports basic requirements for construction works of the EU Construction Products Regulation (Regulation (EU) No 305/2011).

For relationship with EU Regulation/Directive(s), see informative Annex ZA, which is an integral part of this document. A1

This European Standard also takes into account the general rules for unreinforced and reinforced masonry in Eurocode 6.

EN 771, *Specification for masonry units* consists of:

- *Part 1: Clay masonry units*
- *Part 2: Calcium silicate masonry units*
- *Part 3: Aggregate concrete masonry units (Dense and light weight aggregates)*
- *Part 4: Autoclaved aerated concrete masonry units*
- *Part 5: Manufactured stone masonry units*
- *Part 6: Natural stone masonry units*

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

1 Scope

A1 This European Standard specifies the characteristics and performance requirements for masonry units manufactured from clay for which the main intended uses are protected or unprotected masonry structure (see definitions 3.3 and 3.4) (e.g. facing and rendered masonry, loadbearing or non-loadbearing masonry structures, including internal linings and partitions, for building and civil engineering). **A1**

A1 *deleted text* **A1**

This European Standard includes those clay masonry units of an overall non-rectangular parallelepiped shape.

It defines the performance related to e.g. dimensional tolerances, strength, density measured according to the corresponding test methods contained in separate European Standards.

A1 It provides for the assessment and verification of constancy of performance (AVCP) of the product to this European Standard. **A1**

The marking requirement for products covered by this European Standard is included.

This European Standard does not specify standard sizes for clay masonry units, nor does it specify standard work dimensions, angles and radii of specially shaped clay masonry units. **A1** This European Standard does not include method of measurement of angles and radii characteristics of specially shaped clay masonry units. **A1**

This European Standard does not cover requirements for the following: units for paving, flue liners and storey height clay masonry units and clay masonry units with an incorporated thermal insulation material bonded to the faces of the unit susceptible to be exposed to fire. It does, however, include clay masonry units for external chimney masonry.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

EN 772-3, *Methods of test for masonry units — Part 3: Determination of net volume and percentage of voids of clay masonry units by hydrostatic weighing*

EN 772-5, *Methods of test for masonry units — Part 5: Determination of the active soluble salts content of clay masonry units*

EN 772-7, *Methods of test for masonry units — Part 7: Determination of water absorption of clay masonry damp proof course units by boiling in water*

EN 772-9, *Methods of test for masonry units — Part 9: Determination of volume and percentage of voids and net volume of clay and calcium silicate masonry units by sand filling*

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

EN 772-13, *Methods of test for masonry units — Part 13: Determination of net and gross dry density of masonry units (except for natural stone)*