

Precast concrete masonry units —

Part 1: Specification for precast concrete masonry units

ICS 91.100.30

Committees responsible for this British Standard

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- Autoclaved Aerated Concrete Products Association
- Brick Development Association
- British Ceramic Research Ltd.
- British Civil Engineering Test Equipment Manufacturers' Association
- British Precast Concrete Federation Ltd.
- Concrete Block Association
- District Surveyors Association
- Local Authority Organizations
- Mortar Industry Association
- National House-Building Council
- Office of the Deputy Prime Minister — Building Regulations Division
- Office of the Deputy Prime Minister — represented by the Building Research Establishment
- Stone Federation

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Foreword

This part of BS 6073 has been prepared by Subcommittee B/519/1, Masonry units. Together with Part 2, it supersedes BS 1180:1972 and BS 2028, 1364:1968, which are therefore withdrawn.

This part is a specification for precast concrete masonry units giving criteria for materials, minimum performance levels and maximum permissible dimensional deviations for solid, cellular or hollow units. BS 6073-2 is a method of specifying concrete masonry units, which gives guidance on items that should be considered when specifying precast concrete masonry units.

When revising BS 2028, 1364:1968, the committee carried out a survey of block sizes in common use. It was found that no particular thicknesses predominated and hence there was no possibility of specifying a standard range. Furthermore, forthcoming changes in legislation relating to energy conservation made it probable that new sizes of block would be developed in the near future. Similarly, no one strength was in general use. It also became clear that similar minimum performance criteria were also applicable to concrete bricks so the opportunity was taken to extend this revision to replace BS 1180:1972.

The former classification of blocks as types A, B and C in BS 2028, 1364 has not been perpetuated, as it has proved misleading. The alternative of classifying blocks by compressive strength was discussed but rejected in favour of specifying a minimum average compressive strength for all blocks not less than 75 mm in thickness and a minimum average transverse strength for blocks of thickness less than 75 mm.

The committee decided that the method of mortar capping blocks should continue to be used for verifying block strengths when required for independent testing. The fibre board method, which is suitable for routine quality control by the manufacturer, is described in Appendix B of BS 6073-2:1981.

The test procedures for determining drying shrinkage given in BS 2028, 1364 have been found to have certain drawbacks but have been included in Appendix D pending research by various organizations represented on the committee. If necessary, an amendment to Appendix D will be issued.

In the light of recent research, the specification given in BS 1180:1972 has been updated to include special purpose bricks, which have a specified minimum cement content and strength. The definitions of types of brick have been retained pending general agreement throughout industry on new definitions applicable to all British Standards for bricks.

The structural design and performance of brick and block masonry are covered by BS 5628-1 and BS 5628-3, which include guidance on use of blocks below damp-proof course and in other situations.

A common criterion for the permissible variation in compressive strength has replaced the different criteria for blocks, bricks and fixing units, which were taken from BS 2028, 1364 and BS 1180.

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 does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 20, an inside back cover and a back cover.

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1 Scope

This part of BS 6073 specifies materials, tolerances and minimum performance levels for precast concrete masonry units. It covers solid (including autoclaved aerated concrete), cellular and hollow units not exceeding 650 mm in any work size dimension.

Units in which the height¹⁾ exceeds the length or six times the thickness are outside the scope of this standard.

Precast concrete paving blocks are outside the scope of this standard.

NOTE Reconstructed stone masonry units are covered by BS 6457.

2 References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3 Definitions

For the purposes of this part of BS 6073 the following definitions apply.

3.1 masonry unit

a block, a brick or a fixing unit

3.1.1

block

a masonry unit which when used in its normal aspect exceeds the length or width or height¹⁾ specified for bricks (see)

3.1.2

brick

a masonry unit not exceeding 337.5 mm in length, 225 mm in thickness²⁾ or 112.5 mm in height¹⁾

3.1.3

fixing unit

a masonry unit of the same dimensions as a brick which permits the easy driving of, and provides a good purchase for, nails or screws

3.2 Types of block

NOTE 1 Formed holes do not include transverse slots to facilitate cutting.

NOTE 2 Formed holes or cavities include those filled with structural insulant.

3.2.1

solid block

a block which contains no formed holes or cavities other than those inherent in the material

NOTE The definition of solid block covers autoclaved aerated blocks.

3.2.2

cellular block

a block which has one or more formed holes or cavities which do not wholly pass through the block

3.2.3

hollow block

a block which has one or more formed holes or cavities which pass through the block

¹⁾ The height is taken to be the vertical dimension perpendicular to the base when the unit is used in its normal aspect.

²⁾ Termed width in BS 3921.

3.3 Types of brick

3.3.1
solid brick
a brick in which small holes passing through, or nearly through, the brick do not exceed 25 % of its volume, or in which frogs (depressions in the bed faces of a brick) do not exceed 20 % of its volume

NOTE For the purposes of this definition small holes are defined as being less than 20 mm wide or less than 500 mm² in area. Up to three larger holes, not exceeding 3 250 mm² each, may be incorporated as aids to handling, within the total of 25 %.

3.3.2
perforated brick
a brick in which small holes (as defined in the note to **3.3.1**) passing through the brick exceed 25 % of its volume. Up to three larger holes, not exceeding 3 250 mm² each, may be incorporated as aids to handling

3.3.3
hollow brick
a brick in which holes passing through the brick exceed 25 % of its volume and the holes are not small, as defined in the note to **3.3.1**

3.3.4
cellular brick
a brick in which holes closed at one end exceed 20 % of the volume of the brick

3.4 Sizes

3.4.1
co-ordinating size
the size of a co-ordinating space allocated to a masonry unit, including allowances for joints and tolerances

3.4.2
work size
the size of a masonry unit specified for its manufacture, to which its actual size should conform within specified permissible deviations

3.5
compressive strength
the average value of the crushing strengths of ten masonry units tested in accordance with Appendix B

4 Binders and binder constituents

| *Text deleted*

5 Aggregates

| *Text deleted*

6 Admixtures

| *Text deleted*

7 Chloride content

The equivalent anhydrous calcium chloride content shall not exceed 0.2 % by mass of the masonry units when measured in accordance with the method given in BS 1881-6, except when it does not exceed 1.5 % by mass of the cement used in their manufacture.

8 External shell thickness of blocks

The minimum thickness of the external shell of hollow and cellular blocks, measured in accordance with **A.1.5**, shall be not less than 15 mm or 1.75 times the nominal maximum size of the aggregate, whichever is the greater.

9 Dimensional deviations

The maximum dimensional deviations for masonry units measured in accordance with Appendix A shall be as follows.

Dimension	Maximum dimensional deviation for blocks	Maximum dimensional deviation for bricks
Length	+3 mm –5 mm	+4 mm –2 mm
Height	+3 mm –5 mm	+2 mm –2 mm
Thickness	+2 mm –2 mm average +4 mm –4 mm at any individual point	+2 mm –2 mm

Within these dimensional deviations the bedding surfaces and, for plain ended masonry units, the ends, shall be perpendicular to adjacent faces.

10 Strength

10.1 When sampled in accordance with Clause 13 and tested for compressive strength in accordance with Appendix B, the average crushing strength of 10 masonry units of thickness 75 mm or greater shall be:

- a) not less than G ;
- and
- b) not less than $0.9 G + 0.62 S$.

where

$G = 2.8 \text{ N/mm}^2$ for blocks and fixing bricks or 7.0 N/mm^2 for bricks;

S is the standard deviation for the sample.

10.2 When sampled in accordance with Clause 13 and tested in accordance with Appendix C, the average transverse strength of five blocks of thickness less than 75 mm shall be not less than 0.65 N/mm^2 .

11 Drying shrinkage

The average drying shrinkage of a sample of masonry units other than fixing units tested in accordance with Appendix D shall not exceed 0.06 %, except for autoclaved aerated concrete blocks, for which the maximum permissible value shall be 0.09 %.

NOTE In practice, the extremes of drying shrinkage given above do not occur in finished masonry. For guidance, see BS 5628-3.

12 Certificate of compliance

If requested, the manufacturer or supplier shall provide the purchaser with a certificate of compliance with the specification.

This certificate shall state that the manufacturer has made arrangements for his products to be sampled and tested at regular intervals.