

# Sizes of refractory bricks —

## Part 1: Specification for multi-purpose bricks

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# Committees responsible for this British Standard

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- British Ceramic Research Association
- British Gas Corporation
- British Metallurgical Plant Constructors' Association
- British Steel Industry
- Cement Makers' Federation
- Coke Oven Managers' Association
- Glass Manufacturers' Federation
- Institute of Refractories Engineers
- Refractories Association of Great Britain
- Society of Glass Technology
- Society of Industrial Furnace Engineers

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## Foreword

This Part of BS 3056 has been prepared under the direction of the Refractory Products Standards Committee. It supersedes BS 3056:1973 which is withdrawn. The first edition of this standard, issued in 1959, specified sizes in imperial units with metric equivalents. In the second edition, issued in 1973, metric units only were used and account was taken of the work in the International Organization for Standardization (ISO).

The purpose of preparing this third edition is, first, to bring up to date the sizes specified and the size/material combinations, in the light of experience since 1973; and secondly to divide the standard into Parts so that it may cover bricks for a wider range of applications than general purposes alone.

This Part is concerned with multi-purpose bricks, which are those that are widely used in many different applications of refractories. These should be considered by designers of refractory plant so that “specials” are only ordered after it has been ascertained that there is no brick size in this Part of BS 3056 that is suitable for the design.

Nevertheless, some applications of refractory bricks have to be recognized as requiring brick sizes that are not included in this Part of BS 3056. Certain of these sizes for particular purposes are detailed in other Parts of BS 3056, for use in conjunction with selected multi-purpose bricks taken from this Part (it is possible, of course, that designers of refractory plant may find a use for these sizes outside the sphere for which they have been developed). The remaining Parts of BS 3056 are:

- *Part 2: Specification for bricks for use in glass-melting furnaces;*
- *Part 3: Specification for bricks for rotary cement kilns;*
- *Part 4: Specification for bricks for electric arc furnace roofs;*
- *Part 5: Specification for bricks for blast furnace walls;*
- *Part 6: Specification for bricks for torpedo ladles<sup>1)</sup>;*
- *Part 7: Specification for basic bricks for steel-making;*
- *Part 8: Specification for bricks for ladles<sup>1)</sup>.*

Attention is drawn to the following British Standards which will be superseded by Parts 2 and 3 of BS 3056, respectively:

BS 5187, *Standard sizes of silica refractories for use in glass melting furnaces.*

BS 4982, *Standard sizes of refractory bricks for use in rotary cement kilns.*

BS 4982-1, *Basic refractories.*

BS 4982-2, *Fireclay and high alumina refractories.*

This Part of BS 3056 has been prepared taking into account the views of both manufacturers and users of multi-purpose refractory bricks; it is therefore felt that it should find universal acceptance in the many sectors of British industry in which refractory bricks are used.

The committee has carried out an extensive industrial survey which has been used as the basis for adopting the sizes specified in this Part of BS 3056. Wherever possible, they have tried to adhere to guidelines for standardization based on this survey. Only sizes of bricks which are used in large quantities in industry and have been commonly accepted in the UK have been included. A further requirement has been for simplicity of shape to permit economical production in mechanical brick press moulds. It is therefore intended that other shapes not included in this Part of BS 3056 will be referred to as special categories.

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<sup>1)</sup> In preparation.

With this in mind, furnace designers are urged to take full account of this Part of BS 3056; it is the designer of a furnace, rather than the manufacturer or purchaser of the refractories, who can play the greatest part in achieving rationalization and economy in the use of shaped refractory products. Furnace designers are particularly asked to see whether a still larger proportion of multipurpose refractories can be selected from the range of sizes now offered. To assist designers in this objective, appendices to this Part of BS 3056 provide formulae for the calculation of the number of tapered and circle refractory products required to form circles, and tables giving the combination of sizes to form circles of given diameters.

Nothing in this Part of BS 3056, however, should be taken to mean that multi-purpose refractory bricks will not be available in other shapes, other sizes or other combinations of size and material.

The materials covered have been extended from the fireclay, high alumina and basic qualities of BS 3056:1973 to include silica refractories and insulating products.

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.

**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 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.



## 1 Scope

This Part of BS 3056 specifies the sizes of the following shapes of multi-purpose refractory bricks:

- a) squares;
- b) splits;
- c) tiles;
- d) straights;
- e) side arch bricks;
- f) end arch bricks;
- g) crown bricks.

NOTE 1 Information is also given on the combinations of size and material/quality that may be expected to be available, on arch-brick formulae (see Appendix A), on the combinations of sizes required to form circles of various diameters (see Appendix B), and on, information to be supplied by a purchaser (see Appendix C).

The volume of each standard size brick is given as supplementary information, in Table 1 to Table 7.

NOTE 2 The tolerances on the sizes are not specified in this Part of BS 3056, and may be the subject of agreement between manufacturer and purchaser.

NOTE 3 The titles of the publications referred to in this standard are listed on the inside back cover.

## 2 Nomenclature

The names given to the various shapes of brick are as given in BS 3446, with the exception of straights (see Table 4).

## 3 Sizes

The sizes of multi-purpose refractory bricks shall be as given in Table 1 to Table 7.

NOTE 1 The letter references used in Table 1 to Table 7 are shown in the figure accompanying each table. These letters do not necessarily apply to any other tables or figures in this or any other standard.

NOTE 2 Information on the material or qualities in which each of the sizes may be expected to be available is given in Table 1 to Table 7. It is emphasized that this information is included only as general guidance for the benefit of a user of this Part of BS 3056, and it is not to be interpreted as meaning that all of these combinations will be available, let alone available from any one supplier, or that no other combinations will be available. Information of this nature would normally be included in a British Standard in an appendix, but it is included in the tables as a matter of convenience. In the tables, the symbols in the column headings have the following significance:

- F fireclay refractories (containing less than 45 % (m/m) alumina);
- HA high alumina refractories (containing 45 % (m/m) or more alumina);
- B basic refractories;
- S silica refractories;
- I insulating refractory products.

## 4 Designation and statement of dimensions

4.1 The designations of the sizes shall be as given in Table 1 to Table 7.

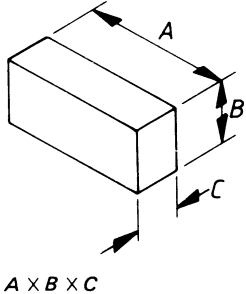
NOTE These designations have been retained from the previous edition of BS 3056 for reference purposes. It is envisaged that they will be phased out or modified in any future revision. They should not be used for sole reference unless it is known that the recipients of the communication are conversant with them.

It is recommended that, if there is any doubt whether the designations will be understood, the dimensions should be stated, either in conjunction with or instead of the appropriate size designations.

4.2 The dimensions of a brick, where stated, shall be given in the order given in Table 1 to Table 7.

Table 1 — Dimensions of squares

NOTE The symbols designating the dimensions relate only to the diagram in this table.

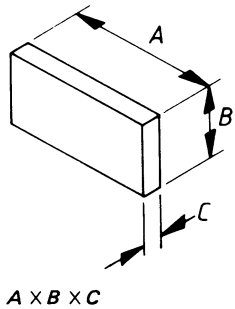


| Size designation    | Dimensions |     |    | Quality |    |   |   |   | Volume |
|---------------------|------------|-----|----|---------|----|---|---|---|--------|
|                     | A          | B   | C  | F       | HA | B | S | I |        |
|                     | mm         | mm  | mm |         |    |   |   |   | L      |
| 1-64 <sup>ab</sup>  | 230        | 114 | 64 | ×       | ×  | × | × | × | 1.68   |
| 1-76 <sup>a</sup>   | 230        | 114 | 76 | ×       | ×  | × | × | × | 1.99   |
| 1LBQ-76             | 230        | 150 | 76 | ×       | ×  | × | × | × | 2.62   |
| 1B-64 <sup>ab</sup> | 230        | 172 | 64 | ×       | ×  | × | × | × | 2.53   |
| 1B-76 <sup>a</sup>  | 230        | 172 | 76 | ×       | ×  | × | × | × | 3.01   |

<sup>a</sup> These sizes are included in ISO 5019-1:1984.<sup>b</sup> Non-preferred sizes.

Table 2 — Dimensions of splits

NOTE The symbols designating the dimensions relate only to the diagram in this table.



| Size designation   | Dimensions |     |    | Quality |    |   |   |   | Volume |
|--------------------|------------|-----|----|---------|----|---|---|---|--------|
|                    | A          | B   | C  | F       | HA | B | S | I |        |
|                    | mm         | mm  | mm |         |    |   |   |   | L      |
| 1-25               | 230        | 114 | 25 | ×       | ×  | × |   | × | 0.66   |
| 1-32 <sup>ab</sup> | 230        | 114 | 32 |         |    |   |   | × | 0.84   |
| 1-38 <sup>a</sup>  | 230        | 114 | 38 | ×       | ×  | × |   | × | 1.00   |
| 1-52               | 230        | 114 | 52 | ×       | ×  | × | × | × | 1.36   |

<sup>a</sup> These sizes are included in ISO 5019-1:1984.<sup>b</sup> Non-preferred size.