BRITISH STANDARD

BS 3056-2: 1985

*Incorporating Amendment No. 1*

# Sizes of refractory bricks —

## Part 2: Specification for bricks for use in glass-melting furnaces

UDC 666.76-431:666.1.031.2/.6

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# Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Refractory Products Standards Committee (RPM/-) to Technical Committee RPM/4, upon which the following bodies were represented:

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

This British Standard, having been prepared under the direction of the Refractory Products Standards Committee was published under the authority of the Board of BSI and comes into effect on 29 November 1985

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# Contents


| | | Page |
|---|---|---|
| Committees responsible | | Inside front cover |
| Foreword | | ii |
| 1 | Scope | 1 |
| 2 | Nomenclature | 1 |
| 3 | Sizes | 1 |
| 4 | Designation and statement of dimensions | 1 |
| Appendix A Arch-brick formulae | | 10 |
| Appendix B Numbers of bricks needed in combining sizes to form circles of given diameters | | 11 |
| Appendix C Information to be supplied by a purchaser | | 26 |
| Figure 1 — Diagrams illustrating arch-brick calculations | | 10 |
| Table 1 — Dimensions of squares | | 2 |
| Table 2 — Dimensions of splits | | 2 |
| Table 3 — Dimensions of tiles | | 3 |
| Table 4 — Dimensions of blocks | | 4 |
| Table 5 — Dimensions of straights | | 5 |
| Table 6 — Dimensions of side arch bricks | | 6 |
| Table 7 — Dimensions of end arch bricks | | 7 |
| Table 8 — Dimensions of crown/key bricks | | 9 |
| Table 9 — Combinations of side arch bricks ($A$ mm × 114 mm × 76/$D$ mm) required to turn circles | | 12 |
| Table 10 — Combinations of side arch bricks ($A$ mm × 150 mm × 76/$D$ mm) required to turn circles | | 13 |
| Table 11 — Combinations of end arch bricks (230 mm × $B$ mm × 76/$D$ mm) required to turn circles | | 14 |
| Table 12 — Combinations of end arch bricks (300 mm × $B$ mm × 76/$D$ mm) required to turn circles | | 16 |
| Table 13 — Combinations of end arch bricks (345 mm × $B$ mm × 76/$D$ mm) required to turn circles | | 18 |
| Table 14 — Combinations of end arch bricks (375 mm × $B$ mm × 76/$D$ mm) required to turn circles | | 19 |
| Table 15 — Combinations of end arch bricks (450 mm × $B$ mm × 76/$D$ mm) required to turn circles | | 20 |
| Table 16 — Combinations of end arch bricks (375 mm × $B$ mm × 114/$D$ mm) required to turn circles | | 21 |
| Table 17 — Combinations of end arch bricks (450 mm × $B$ mm × 114/$D$ mm) required to turn circles | | 22 |
| Table 18 — Combinations of crown bricks (230 mm × 114/$C$ mm × 76 mm) required to turn circles | | 23 |
| Table 19 — Combinations of crown bricks (230 mm × 150/$C$ mm × 76 mm) required to turn circles | | 24 |
| Table 20 — Combinations of crown bricks (345 mm × 150/$C$ mm × 76 mm) required to turn circles | | 25 |
| Publications referred to | | Inside back cover |


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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 5187:1975 which is withdrawn. BS 3056:1973 has been superseded by BS 3056-1 covering multipurpose bricks. This Part of BS 3056 is one of a series of new Parts intended to cover bricks for a wide range of specific applications.

This Part is concerned with refractory bricks for glass-melting furnaces. It includes such sizes and shapes used within the glass industry that are already in BS 3056-1 as well as those which are more specialized and for the glass industry alone. It therefore provides a complete document for the glass industry.

This Part of BS 3056 has been prepared taking into account the views of both manufacturers and users of refractory bricks for the glass industry; it is therefore felt that it should find universal acceptance in this sector of British industry.

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.

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. To assist designers, 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 refractory bricks will not be available in other shapes, other sizes or other combinations of size and material.

The materials covered by this Part of BS 3056 have been extended from BS 5187, which dealt only with silica. Fireclay, high alumina, basic, zircon and insulating products are now included. In addition, to a limited extent, the use of fusion cast products, vacuum cast sillimanite and fused silica is covered.

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 and ii, pages 1 to 26, 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.


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## 1 Scope

This Part of BS 3056 specifies the sizes of the following shapes of refractory bricks for glass-melting furnaces:

a) squares;

b) splits;

c) tiles;

d) blocks;

e) straights;

f) side arch bricks;

g) end arch bricks;

h) 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 8.

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 3446-1.

## 3 Sizes

The sizes of refractory bricks for glass-melting furnaces shall be as given in Table 1 to Table 8.

NOTE 1 The symbols used in Table 1 to Table 8 are shown in the figure accompanying each table. These symbols 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 8. 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. 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 | fired insulating refractories; |
| Z | zircon refractories; |
| F/S | fused silica refractories; |
| AZS | fusion cast refractories; |
| VC | vacuum cast sillimanite refractories. |

## 4 Designation and statement of dimensions

**4.1** The designations of the sizes, where available, shall be as given in Table 1 to Table 8.

NOTE These designations have been retained from the previous edition of BS 3056 for reference purposes.

They are unsuitable for the more complicated sizes and it is envisaged that they will be phased out or modified in a 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 8.

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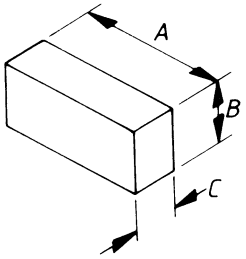
## Table 1 — Dimensions of squares

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



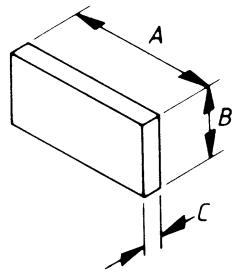

$A \times B \times C$

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

[a] These sizes are included in ISO 5019-1:1984.
[b] Non-preferred size.

## Table 2 — Dimensions of splits

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




$A \times B \times C$

| Size designation | Dimensions | | | Quality | | | | | | Volume |
|---|---|---|---|---|---|---|---|---|---|---|
| | *A* | *B* | *C* | F | HA | B | S | I | Z | |
| | mm | mm | mm | | | | | | | L |
| 1–25 | 230 | 114 | 25 | | × | | | | | 0.66 |
| 1–32[a] | 230 | 114 | 32 | | × | | | × | | 0.84 |
| 1–38[a] | 230 | 114 | 38 | | × | | | × | | 1.00 |
| 1–52 | 230 | 114 | 52 | | × | | | × | | 1.36 |

[a] These sizes are included in ISO 5019-1:1984.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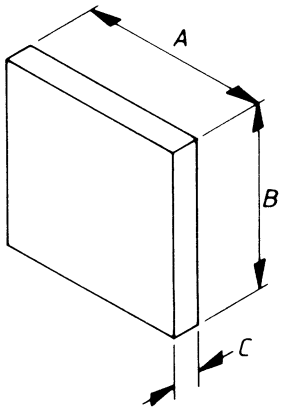
## Table 3 — Dimensions of tiles

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




$A \times B \times C$

| Size designation | Dimensions | | | Quality | | | | | | | | Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *A* | *B* | *C* | F | HA | B | S | I | Z | AZS | VC | |
| | mm | mm | mm | | | | | | | | | L |
| 1D–76[a] | 230 | 230 | 76 | × | × | × | × | × | × | | | 4.02 |
| 3TD–76 | 300 | 230 | 76 | × | × | × | × | × | | | | 5.24 |
| 8TD–76 | 450 | 230 | 76 | × | × | × | × | × | | | | 7.87 |
| | 600 | 500 | 75 | | | | | × | | × | | 22.5 |
| | 600 | 500 | 100 | | | | | × | | × | | 30.0 |
| | 600 | 500 | 120 | | | | | × | | × | | 36.0 |
| | 600 | 500 | 150 | | | | | × | | | | 45.0 |
| | 550 | 500 | 150 | | | | | × | | × | | 41.3 |

[a] This size is included in ISO 5019-1:1984.

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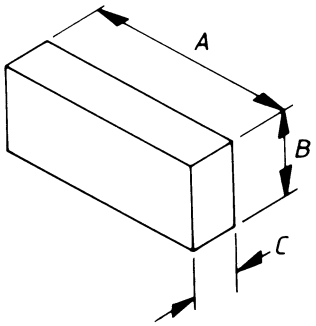
## Table 4 — Dimensions of blocks

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




$A \times B \times C$

| Dimensions | | | Quality | | | | | | | Volume |
|---|---|---|---|---|---|---|---|---|---|---|
| *A* | *B* | *C* | F | HA | B | S | I | Z | VC | |
| mm | mm | mm | | | | | | | | L |
| 900 | 450 | 300 | | | | | | | × | 121.5 |
| 900 | 600 | 300 | | | | | | | × | 162.0 |
| 1 000 | 400 | 200 | | | | | | | × | 80.0 |
| 1 000 | 500 | 200 | | | | | | | × | 100.0 |
| 1 000 | 400 | 300 | | | | | | | × | 120.0 |
| 1 000 | 500 | 300 | | | | | | | × | 150.0 |
| 1 000 | 600 | 300 | | | | | | | × | 180.0 |
| 1 000 | 450 | 300 | | | | | | | × | 135.0 |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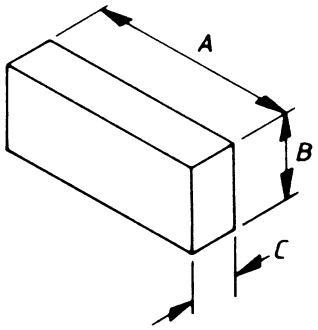
## Table 5 — Dimensions of straights[a]

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




$A \times B \times C$

| Size designation | Dimensions | | | Quality | | | | | | Volume |
|---|---|---|---|---|---|---|---|---|---|---|
| | *A* | *B* | *C* | F | HA | B | S | I | Z | |
| | mm | mm | mm | | | | | | | L |
| 3SQ | 300 | 114 | 76 | × | × | × | × | × | × | 2.60 |
| 3 | 300 | 150 | 64 | × | × | × | | | | 2.88 |
| 3–76 | 300 | 150 | 76 | × | × | × | × | × | × | 3.42 |
| 3LB–76 | 300 | 172 | 76 | | × | | × | | | 3.92 |
| 4L[b] | 345 | 114 | 64 | × | × | × | | | | 2.52 |
| 4L–76[b] | 345 | 114 | 76 | × | × | × | × | × | | 2.99 |
| 4LBQ–76 | 345 | 150 | 76 | × | × | | × | | | 3.93 |
| 4LB–76 | 345 | 172 | 76 | × | × | × | | | | 4.51 |
| 6T–76 | 375 | 114 | 76 | | | | × | | | 3.25 |
| 6TB–76 | 375 | 150 | 76 | | | | × | | | 4.28 |
| — | 375 | 230 | 76 | | × | | | | × | 6.56 |
| — | 375 | 114 | 64 | × | × | × | | | | 2.74 |
| 8T–76 | 450 | 114 | 76 | × | × | × | × | | | 3.90 |
| 8TB–76 | 450 | 150 | 76 | | | × | × | | | 5.13 |
| | 450 | 172 | 76 | | | × | × | | | 5.88 |
| — | 520 | 150 | 76 | × | | | | | | 5.93 |

[a] In BS 3446 this shape of brick is termed a “whelp”.

[b] These sizes are included in ISO 5019-1:1984.

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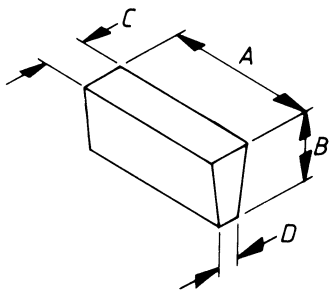
## Table 6 — Dimensions of side arch bricks

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




$A \times B \times C/D$

| Size designation | Dimensions | | | | Quality | | | | | | Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *A* | *B* | *C* | *D* | F | HA | B | S | I | Z | |
| | mm | mm | mm | mm | | | | | | | L |
| 1SA–24[a] | 230 | 114 | 76 | 52 | × | | | | | | 1.68 |
| 1SA–19[b] | 230 | 114 | 76 | 57 | × | | | | | | 1.76 |
| 1SA–12[a] | 230 | 114 | 76 | 64 | × | × | × | | | | 1.84 |
| 1SA–6[a] | 230 | 114 | 76 | 70 | × | × | × | | | | 1.91 |
| 1SAL–12 | 230 | 150 | 76 | 64 | | × | | | | | 2.42 |
| 1SAL–6 | 230 | 150 | 76 | 70 | | × | | | | | 2.52 |
| 3SA–12 | 300 | 114 | 76 | 64 | | × | | | | | 2.39 |
| 3SA–6 | 300 | 114 | 76 | 70 | | × | | | | | 2.50 |
| 3SAL–12 | 300 | 150 | 76 | 64 | | | | × | | | 3.15 |
| 3SAL–6 | 300 | 150 | 76 | 70 | | | | × | | | 3.29 |

[a] These sizes are included in ISO 5019-2:1984.
[b] Non-preferred size.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