

Specification for

Alumino-silicate refractories for use in coke ovens

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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/10, upon which the following bodies were represented:

- British Ceramic Research Ltd.
- British Coal
- British Metallurgical Plant Constructors' Association
- British Steel Industry
- Coke Oven Managers' Association
- Institute of Refractories Engineers
- Refractories Association of Great Britain

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Foreword

This British Standard has been prepared under the direction of the Refractory Products Standards Committee.

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 8, 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 British Standard specifies the chemical and physical requirements and dimensional tolerances for alumino-silicate refractories that in the fired state contain 30 % to 45 % alumina, and are for use in coke oven construction.

It specifies the methods of sampling, testing and analysis to be used for bricks and shapes of alumino-silicate material.

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

2 Definitions

For the purposes of this British Standard, the definitions given in BS 3446 apply together with the following.

surface crazing

a rectilinear network of fine hairline microcracks, generally intergranular and entirely confined to within 5 mm of the brick face

NOTE It is not usually visible to the naked eye on clean as-fired brick faces, but is revealed by a surface cover of dark powder or dust.

3 Classification

3.1 Three classes of alumino-silicate refractories are specified: CO 40, CO 35, and CO 30, defined by the properties given in Table 1, Table 2 and Table 3.

3.2 Three categories of brick are defined by differences in manufacturing processes and/or sizes; category 1 bricks are dry or semi-dry pressed, category 2 bricks are plastic moulded, and category 3 bricks are of large dimensions or mass (> 400 mm on any dimension or > 25 kg).

3.3 For the purposes of this British Standard, the faces of the bricks are classified as follows:

- class A: faces in contact with the coal;
- class B: faces in contact with the gases;
- class C: other faces.

NOTE Classification of the faces is designated by the customer and bricks may have a combination of classified faces.

4 Sampling

Sampling shall be carried out in accordance with a suitable sampling plan such as one of the methods described in BS 6065.

NOTE 1 Any other sampling plan should be agreed between the manufacturer and the purchaser.

NOTE 2 When a sampling plan from BS 6065 is used, it is necessary to state whether the acceptance is to be based on either a mean value with a standard deviation or a limiting value accompanied by an acceptable quality level (AQL).

NOTE 3 Guidance on the use of BS 6065 is given in BS 6434.

5 Inspection

An area illuminated to a minimum of 500 lx shall be provided for inspection purposes.

6 Chemical composition and physical properties

6.1 General

The composition and physical properties of alumino-silicate refractories shall be as given in Table 1 or Table 2 and Table 3, and in Table 4, when tested in accordance with the methods given in Appendix A.

6.2 Control properties

The control properties used for acceptance testing in accordance with BS 6065 (or other agreed plan) shall be selected from those shown in Table 1. The values of limit, designated upper limit T_s and lower limit T_i in Table 2, are based on an AQL of 4 % and shall be used in conjunction with the procedures in BS 6065.

NOTE 1 No statistical limit value is given for the cold crushing strength; for this test only, an actual test limit is given in Table 3.

NOTE 2 Wherever possible, a maximum of three control tests should be agreed. Bulk density and apparent porosity should not be selected as two separate control properties.

6.3 Additional relevant properties

NOTE 1 For each specific application of alumino-silicate refractories within the coke oven, additional properties are required.

Refractories for each of the applications listed in Table 4 shall comply with the requirements given for that application, when tested in accordance with the methods given in Appendix A.

NOTE 2 As the tests required for measuring these supplementary properties are either of long duration or otherwise expensive to perform, such tests may be carried out under reduced inspection procedures agreed between manufacturer and purchaser. Such reduced schedules may be taken from BS 6001 or BS 6002.

The appropriate limiting values shall be as given in Table 4, and shall be irrespective of the class or category of the brick as designated in Table 1, Table 2 and Table 3.