

Guide to

The use of BS 6065 “Methods for sampling and acceptance testing of shaped refractory products”

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Committees responsible for this British Standard

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- British Ceramic Research Association
- British Metallurgical Plant Constructors' Association
- British Steel Industry
- Cement Makers' Federation
- Refractories Association of Great Britain

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Foreword

This standard has been prepared under the direction of the Refractory Products Standards Committee at the request of the Refractories Association of Great Britain as a guide to the use of BS 6065 “*Methods for sampling and acceptance testing of shaped refractory products*” which is identical with ISO 5022:1979 published by the International Organization for Standardization (ISO).

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 10, 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.

Section 1. General

0 Introduction

This British Standard aims to examine under what conditions technical specifications and acceptance procedures for shaped refractory products should be agreed by the user and the manufacturer. The main aim of any acceptance inspection is to see that the customer gets the quality required as economically as possible; inevitably the cost of inspection has to be reflected in the final cost of the product.

Generally an acceptance scheme comprises:

- a) technical specifications giving values for the properties deemed necessary;
- b) acceptance test terms indicating the procedure for declaring the goods to be in conformity or not.

1 Scope

This British Standard guide expands on the instructions and provides a number of examples to clarify the method of sampling inspection described in BS 6065.

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, statistical terminology and symbols given in BS 6065 apply.

Section 2. Technical specifications and acceptance testing

3 Technical specifications

3.1 Test methods. Values obtained from a given test piece may depend on the method, apparatus or the size of the test piece used.

To avoid any dispute at the time of delivery, it is therefore important that the method used to indicate each property should be accurately defined. It is also important that the property should be determined using a British Standard, ISO, or other defined and agreed test method.

When agreeing on the specifications, it is important that the chosen standard deviation reflects both the heterogeneity of the refractory product and variation in results obtained with the agreed test method when it is correctly applied.

3.2 Choice of properties. When technical conditions for special contracts are drawn up, a certain number of properties will be chosen to ensure consistent quality.

As far as possible, these properties should be related to the envisaged conditions in use (e.g. porosity is related to corrosion). Efforts should be made to choose those properties that can be controlled by simple and inexpensive tests so that the necessary number of measurements for an effective control can be made.

It should also be remembered that the properties of a refractory have to be regarded as a whole. Individual properties depend on the raw materials and the shaping and firing methods. Thus it could be dangerous to ask for, or try to obtain, a better value for a particular property of a given product, as this could have disadvantageous repercussions on other properties which may prove more important in use than envisaged. For example, in some circumstances a lower apparent porosity than required may adversely affect the thermal shock resistance (which may also have been specified or included). Properties that are too closely related may not necessarily be the best choice for control properties as they would yield only limited information about the quality of the batch. For example, bulk density and relative density would not usually be considered appropriate when used together.

As many of the properties of refractory materials call for destructive test methods, evaluation of a consignment can only be achieved by using statistical sampling plans to take a number of individual items and considering their operating characteristic curves. An operating characteristic curve (OC curve) is a graph showing what any particular sampling plan can be expected to do in terms of accepting and rejecting batches.

A specific sampling plan can be operated without reference to the properties of its OC curve. A clear understanding of the implications of the OC curve is, however, essential to the intelligent application of acceptance sampling and for such tasks as setting the inspection level (and, if so, what limits) to permitted batch sizes etc.

An explanation of the principles etc., of operating characteristic curves is given in clause 15 of BS 6000:1972.

These operating characteristic curves will show whether it is desirable to have the assurance that a batch complies with the declared value for a certain property by carrying out a large number of tests. It may be seen that control tests may be ineffective if only a few tests on each property are carried out.