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**Refractory products — Sampling of raw materials and
unshaped products —**

**Part 1:
Sampling scheme**

*Produits réfractaires — Échantillonnage des matières premières et des matériaux non
façonnés préparés —*

Partie 1: Schéma d'échantillonnage

Reference number
ISO 8656-1:1988 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8656-1 was prepared by Technical Committee ISO/TC 33, *Refractories*.

ISO 8656 consists of the following parts, under the general title *Refractory products — Sampling of raw materials and unshaped products*:

- *Part 1: Sampling scheme*
- *Part 2: Determination of the coefficient of variation*

Annex A forms an integral part of this part of ISO 8656.

Refractory products — Sampling of raw materials and unshaped products —

Part 1: Sampling scheme

1 Scope

This part of ISO 8656 specifies methods and conditions of sampling for raw materials and prepared unshaped refractory products, in order to indicate the mean values of a consignment and the interval of sampling.

It does not apply to products in the form of large static quantities or cargoes from which reliable samples cannot be taken.

The type of sampling equipment, and the preparation and reduction of the samples, which should not alter the properties to be tested, are to be agreed between the interested parties.

NOTE — Difficulties may be encountered when sampling certain types of unshaped products, for example mouldables.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 8656. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8656 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3534 : 1977, *Statistics — Vocabulary and symbols*.

ISO 8656-2 : —¹⁾, *Refractory products — Sampling of raw materials and unshaped products — Part 2: Determination of the coefficient of variation*.

3 Definitions

NOTE — See also ISO 3534.

3.1 lot: Defined quantity of a particular material manufactured or produced in conditions which can be considered as being uniform.

3.2 consignment: Quantity of material supplied at one time. A consignment may consist of one or several lots or parts of a lot.

3.3 test lot: Specific quantity subjected to inspection (checking), manufactured normally by a supplier in conditions which can be assumed to be uniform.

3.4 packaged unit: Packaged part of a lot (for example, in a sack or small container).

3.5 sample: Quantity of material taken from a consignment or a lot, intended to supply information, and possibly serve as a basis for a decision concerning the consignment or lot or the process by which it has been produced.

3.6 increment: Quantity of material taken at one time from a larger quantity of material.

3.7 standard deviation of sampling: Standard deviation of the random variations introduced into the measurement of a chosen property by sampling.

3.8 bulk sample: The aggregation of the increments.

3.9 partial sample: Sample obtained by dividing the bulk sample.

3.10 laboratory sample: Sample intended to be used for an inspection or for laboratory tests.

3.11 test sample; final sample, analytical sample: Sample taken from the laboratory sample and prepared in a suitable manner for subjection to particular tests (for example, determination of grain size distribution, humidity, chemical composition, physical or other properties).

3.12 coefficient of variation: Ratio of the standard deviation to the absolute value of the arithmetic mean (this ratio may be expressed as a percentage).

1) To be published.

4 General rules

Because of the diversity of ceramic raw and unshaped materials, the method of delivery and packaging and the conditions and circumstances under which sampling and sample preparation are carried out, rigid rules for sampling cannot be specified in all cases (see annex A), and interested parties should agree on the preferred sampling plan.

4.1 The sampling and sample preparation procedures shall be performed under the supervision of a person having adequate experience of sampling.

4.2 Where required, the consignment may be sub-divided into individual test lots, for example, if it is clear that the consignment consists of various lots or should be treated in separate partial quantities.

4.3 Sampling should preferably be carried out on material in movement during loading or unloading of the consignment or while filling the packaged units.

4.4 In the case of certain prepared unshaped materials (for example, concrete) delivered in sacks which may, at the time of packaging, have been filled with successive layers of unmixed components, or where materials have become separated to some extent during transportation, it is necessary to take the increment(s) after mixing the various components. This sampling method is expensive as it results in large quantities of materials being handled. For this reason the sampling method described in 4.3 shall be preferred.

4.5 The increment shall be taken on the basis of a periodic systematic sampling method with a random starting point and a systematic procedure, on the basis of time, or on the basis of uniform intervals between samplings and/or on the basis of mass.

4.6 The minimum mass of the increment shall be determined, taking account of the maximum grain size of the material in order to avoid systematic errors during sampling (see table 1).

4.7 The number of increments to be taken from a test lot shall be determined taking account of deviations in the properties of the material and the desired precision of sampling (β_1) (see table 2).

4.8 During sampling, sample division, and preparation and storage of the samples, the samples shall be protected against any changes in the properties to be tested.

4.9 The use of a sample to determine several properties is allowed, provided that the result(s) of the test is (are) not changed by the test or the preceding tests.

5 Sampling and sample preparation

5.1 Procedure

5.1.1 Identify the test lot, i.e. of the consignment or part of the consignment to be sampled (nature of product, mass, transport conditions, etc.).

5.1.2 Estimate the maximum grain size of the material.

5.1.3 Determine the mass of the increment in accordance with table 1, taking account of the minimum quantities required for the tests provided for (see note 3 to table 1).

5.1.4 Classify the test lot in a quality variation class (see table 2, 5.3 and 5.4).

5.1.5 Determine the number of increments to be taken (in accordance with table 2).

5.1.6 Calculate the minimum mass of the bulk sample and verify that it is in conformity with the tests provided for (see 5.5).

5.1.7 Determine the sampling point(s) and the methods for sampling and combining increments.

5.1.8 Take the required number of increments in accordance with 5.5.

5.1.9 If necessary, before making up the bulk sample, the increment(s) may be divided in order to have a reserve sample which may be used in case of dispute.

5.1.10 Make up laboratory samples, as agreed between the interested parties, from the increments or bulk sample in accordance with the sampling and sample preparation plan.

NOTE — Care should be exercised not to alter the material when testing properties in the "as-received" condition.

5.1.11 Make up the test samples necessary to carry out the specified programme.

5.2 Mass of the increment

5.2.1 The minimum mass of the increment is determined in accordance with table 1 from the maximum grain size of the material.