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Shaped insulating refractory products — Classification

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Reference number
ISO 2245:1990(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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 2245 was prepared by Technical Committee ISO/TC 33, *Refractories*.

This second edition cancels and replaces the first edition (ISO 2245:1972), of which it constitutes a technical revision.

Shaped insulating refractory products — Classification

1 Scope

This International Standard establishes a classification of shaped insulating refractory products based on the determination of permanent change in dimensions (ISO 2477). However, products composed mainly of fibres are excluded from this classification.

It concerns products complying with the classification criteria for refractory products defined in ISO 1109.

2 Normative references

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

ISO 1109:1975, *Refractory products — Classification of dense shaped refractory products.*

ISO 2477:1987, *Shaped insulating refractory products — Determination of permanent change in dimensions on heating.*

ISO 5016:1986, *Shaped insulating refractory products — Determination of bulk density and true porosity.*

3 Definition

For the purposes of this International Standard, the following definition applies.

shaped insulating refractory products: Products with a total porosity of at least 45 % determined in accordance with ISO 5016.

This conventional definition results from the fact that thermal insulating refractory products shall have a low thermal conductivity and a small thermal capacity, properties which are related to the total porosity of the product.

The bulk density, which for a given material is directly linked with the porosity, and which is easily determined, can therefore be chosen as a criterion for classification.

4 Classification

Shaped insulating refractory products are subdivided into groups according to

- the temperature at which the permanent change in dimensions, determined in accordance with ISO 2477, is 2 % or less (see table 1);
- the bulk density, rounded to two decimal places determined in accordance with ISO 5016, and considered as a distinguishing property for Class L products (see table 2).

Products with a bulk density lower than the values given in table 2 belong to Class L.

For the determination of bulk density, the test pieces should be large enough for the desired accuracy to be attained. As opposed to ISO 5016, the dimensions shall be measured to within ± 0.1 mm using calipers.

5 Designation of a shaped insulating product

A shaped insulating product shall be designated by the group to which it belongs, an indication of its bulk density, and, where applicable, the fact that it belongs to Class L.

EXAMPLES

125	0,8
140	1,2
085 L	0,50
140 L	0,80

Table 1

Group	Temperature at which the test of permanent change in dimensions is carried out
	°C
75	0750
85	0850
95	0950
105	1050
110	1100
125	1250
130	1300
135	1350
140	1400
150	1500
160	1600
170	1700
180	1800

NOTE — The temperatures given as limits for the groups according to the permanent change in dimension of the products are not necessarily the limit temperatures of use, as the behaviour of products in service depends not only on the temperature, but also on the conditions of use.

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Table 2

Group	Upper limits of bulk density ¹⁾ of class L products
	g/cm ³ ²⁾
75	0,40
85	0,55
95	0,65
105	0,65
110	0,70
125	0,75
130	0,80
135	0,85
140	0,90
150	0,95
160	1,15
170	1,35
180	1,60

1) In each group of Class L, the density is considered as a distinguishing property and is given to two decimal places.

2) 1 g/cm³ = 10³ kg/m³

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Descriptors: refractory materials, shaped refractories, thermal expansion, bulk density, classification, designation.

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