

Insulating refractory products —

Part 2: Classification of shaped products

(ISO 2245:1990 modified)

The European Standard EN 1094-2:1998 has the status of a
British Standard

ICS 81.080

National foreword

This British Standard is the English language version of EN 1094-2:1998. It supersedes BS 7225-1.1:1989 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee RPI/1, Refractory products and materials, to Subcommittee RPI/1/1, Sampling and physical testing of refractory materials, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 4, an inside back cover and a back cover.

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English version

Insulating refractory products — Part 2: Classification of shaped products

(ISO 2245:1990 modified)

Produits réfractaires isolants —
Partie 2: Classification des produits façonnés
(ISO 2245:1990 modifiée)

Feuerfeste Erzeugnisse für Isolationszwecke —
Teil 2: Klassifizierung geformter Erzeugnisse
(ISO 2245:1990 modifiziert)

This European Standard was approved by CEN on 1 October 1998.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 187, Refractory products and materials, the Secretariat of which is held by BSI. This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 1999, and conflicting national standards shall be withdrawn at the latest by April 1999.

It is closely based on the corresponding International Standard, ISO 2245, *Shaped insulating refractory products — Classification*, published by the International Organization for Standardization (ISO). EN 1094, *Insulating refractory products*, consists of seven Parts:

Part 1, Terminology for ceramic fibre products.

Part 2, Classification of shaped products (ISO 2245:1990, modified).

Part 3, Classification of insulating products made from ceramic fibres (ENV).

Part 4, Determination of bulk density and true porosity.

Part 5, Determination of cold crushing strength.

Part 6, Determination of permanent change in dimensions of shaped products on heating (ISO 2477:1987, modified).

Part 7, Methods of test for ceramic fibre products (ENV).

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Endorsement notice

The text of the International Standard ISO 2245:1990 has been approved by CEN as a European Standard with the agreed common modifications, as given below.

1 Scope

Change the first sentence to read:

“This European Standard specifies a classification of shaped insulating refractory products, based on the determination of permanent change in dimensions on heating, with a secondary classification based on bulk density to cover lightweight products (Class L).”

— Delete the word “mainly” from the last sentence of the first paragraph.

— Delete the second paragraph.

2 Normative references

- Replace ISO 5016:1986 by EN 1094-4.
- Replace ISO 2477:1987 by prEN 1094-6.
- Delete ISO 1109:1975.

3 Definition

- Replace ISO 5016 by EN 1094-4 in the second paragraph.
- Delete the word “shall” in the third paragraph and make the paragraph a note.
- Delete the fourth paragraph.

4 Classification

— Change first bullet point to point a), and replace ISO 2477:1987 by prEN 1094-6.

— Change second bullet point to point b), and change wording to read:

“the bulk density, rounded to two decimal places, determined in accordance with EN 1094-4, to distinguish Class L products from those with the same grouping according to a) but with a higher porosity (see Table 2).”

— Delete the second paragraph.

— Replace ISO 5016:1986 by EN 1094-4 in the third paragraph.

5 Designation

— Table 1, include the values:

Group	°C
80	800
90	900
100	1000
115	1150
120	1200

— Table 2, include the values:

Group	g/cm ³
80	0,50
90	0,60
100	0,65
115	0,70
120	0,70

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a classification of shaped insulating refractory products, based on the determination of permanent change in dimensions on heating, with a secondary classification based on bulk density to cover lightweight products (Class L). Products composed of ceramic fibres are excluded.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1094-4, *Insulating refractory products — Part 4: Determination of bulk density and true porosity*.

prEN 1094-6, *Insulating refractory products — Part 6: Determination of permanent change in dimensions of shaped products on heating* (ISO 2477:1987 modified).

3 Definition

For the purposes of this European Standard the following definition applies.

shaped insulating refractory products

products with a total porosity of at least 45 % (V/V) determined in accordance with EN 1094-4

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

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 prEN 1094-6, is 2 % or less (see Table 1);
- the bulk density, rounded to two decimal places, determined in accordance with EN 1094-4, to distinguish Class L products from those with the same grouping according to a) but with a higher porosity (see Table 2).

For the determination of bulk density, the test pieces should be large enough for the desired accuracy to be attained. As opposed to EN 1094-4, the dimensions shall be measured to within $\pm 0,1$ mm using callipers.

5 Designation

A shaped insulating product shall be designated by:

- the group to which it belongs;
- an indication of its bulk density;
- the fact that it belongs to Class L (where applicable).

Example 1:

Shaped insulating product according to EN 1094-2, group to which it belongs (125), bulk density (0,8).

EN 1094-2 – 125 – 0,8

Example 2:

Shaped insulating product according to EN 1094-2, group to which it belongs (140), bulk density (1,2).

EN 1094-2 – 140 – 1,2

Example 3:

Shaped insulating product according to EN 1094-2, group to which it belongs (85), bulk density (0,55) and, if applicable, the fact that it belongs to Class L.

EN 1094-2 – 85 – 0,55 – L

Example 4:

Shaped insulating product according to EN 1094-2, group to which it belongs (140), bulk density (0,80) and, if applicable, the fact that it belongs to Class L.

EN 1094-2 – 140 – 0,80 – L

Table 1 — Classification by temperature

Group	Temperature at which the test of permanent change in dimensions is carried out, °C
75	750
80	800
85	850
90	900
95	950
100	1000
105	1050
110	1100
115	1150
120	1200
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 dimensions of the products are not necessarily the limits of temperature of use, as the behaviour of products in service depends not only on the temperature, but also on the conditions of use.

Table 2 — Classification by bulk density

Group	Upper limits of average bulk density¹⁾ of Class L products, g/cm^{3 2)}
75	0,40
80	0,50
85	0,55
90	0,60
95	0,65
100	0,65
105	0,65
110	0,70
115	0,70
120	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 bulk density is considered only as a distinguishing property and is given to two decimal places.

²⁾ 1 g/cm³ = 10³ kg/m³

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