

**Tihedate tulekindlate profiiltoodete
katsemeetodid. Osa 13:
Laborikasutuseks ette nähtud
püromeetriliste etalonkoonuste
kirjeldus**

Methods of test for dense shaped refractory
products - Part 13: Specification for pyrometric
reference cones for laboratory use

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 993-13:2000 sisaldab Euroopa standardi EN 993-13:1995 ingliskeelset teksti. Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 993-13:2000 consists of the English text of the European standard EN 993-13:1995. This document is endorsed on 11.01.2000 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.
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Käsitlusala: See standard määrab kindlaks standardsete püromeetriliste etalonkoonuste iseloomulikud tunnused, mida kasutatakse tulekindlate materjalide püromeetrilise ekvivalendi (tulekindluse) määramiseks temperatuurivahemikus 1500 °C kuni 1800 °C. Kirjeldatud püromeetrilised etalonkoonused sobivad kasutamiseks mooduses, mis on kirjeldatud standardis EN 993-12, välja arvatud määramine temperatuuril 1500 °C ja 1800 °C.	Scope:
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ICS 81.080

Võtmesõnad: kindlaksmääramine, laborikatsed, märgistus, püromeetrilised koonused, teimid, tihedad tulekindlad profiiltooted, tulekindlad materjalid, tulekindlad profiilmaterjalid, tulekindlus

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Descriptors: Refractory products, pyrometric cone, laboratory equipment.

English version

Methods of test for dense shaped refractory products

**Part 13: Specification for pyrometric reference
cones for laboratory use**

Méthodes d'essai pour produits
réfractaires façonnés denses. Partie 13:
Spécifications pour cônes pyroscopiques
de référence pour emploi en laboratoire

Prüfverfahren für dichte geformte feuer-
feste Erzeugnisse. Teil 13: Festlegungen
für Referenz-Brennkegel für den Labo-
ratoriumsgebrauch

This European Standard was approved by CEN on 1995-02-15.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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 the Technical Committee CEN/TC 187 "Refractory products and materials", the secretariat of which is held by BSI.

It is closely based on the corresponding International Standard, ISO 1146 "Pyrometric reference cones for laboratory use - Specification", published by the International Organization for Standardization (ISO).

EN 993 'Methods of test for dense shaped refractory products' consists of 18 Parts:

- Part 1 : Determination of bulk density and porosity
- Part 2 : Determination of true density
- Part 3 : Test methods for carbon-containing refractories
- Part 4 : Determination of permeability to gases
- Part 5 : Determination of cold crushing strength
- Part 6 : Determination of modulus rupture, ambient temperatures
- Part 7 : Determination of modulus rupture, elevated temperatures
- Part 8 : Determination of refractoriness-under-load
- Part 9 : Determination of creep in compression
- Part 10 : Determination of permanent change in dimensions on heating
- Part 11 : Determination of resistance to thermal shock (ENV)
- Part 12 : Determination of pyrometric cone equivalent
- Part 13 : Specification for pyrometric cones
- Part 14 : Determination of thermal conductivity (hot wire, cross-array)
- Part 15 : Determination of thermal conductivity (hot wire, parallel)
- Part 16 : Determination of resistance to acids
- Part 17 : Determination of bulk density of granular material (mercury method)
- Part 18 : Determination of bulk density of granular material (water method)

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 August 1995, and conflicting national standards shall be withdrawn at the latest by August 1995.

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

1 Scope

This Part of EN 993 specifies the characteristics of a standard series of pyrometric reference cones, which are used for determining the pyrometric cone equivalent (refractoriness) of refractory materials, over the temperature range 1500 to 1800 °C.

The pyrometric reference cones specified are suitable for use in the procedure described in EN 993-12, excluding determination of 1500 and 1800 °C.

2 Normative reference

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 993-12 : Methods of test for dense shaped refractory products - Part 12 :
Determination of pyrometric cone equivalent (refractoriness).

3 Definitions

For the purposes of this Part of EN 993, the following definitions apply:

3.1 pyrometric reference cone: A blunt-tipped skew triangular pyramid with sharp edges, of specified shape and dimensions and of such composition that, when mounted and heated under specified conditions, it bends in a known manner with reference to the temperature (see 3.2).

3.2 reference temperature; temperature of collapse: The temperature at which the tip of a pyrometric reference cone reaches the level on which the base of the cone is mounted when the cone is heated at a specified rate under specified conditions.

4 Dimensions and shape of cones

4.1 The nominal dimensions of a cone shall be as shown in figure 1.

4.2 The shape of a cone shall be as indicated in figure 2.

4.3 The cone shall lean in the direction of an edge, as in figure 2. The angle to the vertical to be made by the leading edge or face when the cone is mounted, shall be $8^\circ \pm 1^\circ$.