Tihedate tulekindlate profiiltoodete katsemeetodid. Osa 1: Tiheduse, näivpoorsuse ja tegeliku poorsuse määramine

Methods of test for dense shaped refractory products - Part 1: Determination of bulk density, apparent porosity and true porosity

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 993-1:1999 sisaldab Euroopa standardi EN 993-1:1995 ingliskeelset teksti. Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 993-1:1999 consists of the English text of the European standard EN 993-1:1995. This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: See standardi osa esitab tihedate tulekindlate profiiltoodete tiheduse, näivpoorsuse ja tegeliku poorsuse määramise meetodi. MÄRKUS. Tulekindlate profiiltoodete tihedus ja tegelik poorsus on määratud vastavuses Euroopa standardiga EN 1094-4.	**Scope:**

ICS 81.080

Võtmesõnad: kindlaksmääramine, poorsus, tihedad tulekindlad profiiltooted, tihedus (mahumass), tulekindlad materjalid, tulekindlad profiilmaterjalid

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 993-1

February 1995

ICS 81.080

Descriptors: Refractory products, bulk density, porosity, testing.

English version

Methods of test for dense shaped refractory products

Part 1: Determination of bulk density, apparent porosity and true porosity

Méthodes d'essai pour produits réfractaires façonnés denses. Partie 1: Détermination de la masse volumique apparente, de la porosité ouverte et de la porosité totale

Prüfverfahren für dichte geformte feuerfeste Erzeugnisse. Teil 1: Bestimmung der Rohdichte, offenen Porosität und Gesamtporosität

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

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Contents

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 5017 "Dense shaped refractory products - Determination of bulk density, apparent porosity and true porosity", published by the International Organization for Standardization (ISO).

Reproducibility and repeatability data are not available, but may be given in a subsequent edition.

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 a method for the determination of the bulk density, apparent porosity and true porosity of dense shaped refractory products.

NOTE: For shaped insulating refractory products, the bulk density and true porosity are determined in accordance with EN 1094-4.

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 993-2 : Methods of test for dense shaped refractory products
Part 2 : Determination of true density.

ISO 758 : Liquid chemical products for industrial use - Determination of density at 20 °C.

3 Definitions

For the purpose of this Part of EN 993, the following definitions apply.

3.1 bulk density (ρ_b): The ratio of the mass of the dry material of a porous body to its bulk volume, expressed in grams per cubic centimetre or in kilograms per cubic metre.

3.2 bulk volume (*Vb*): The sum of the volumes of the solid material, the open pores and the closed pores in a porous body.

NOTE : The roughness of the surface limits the accuracy of definition of the bulk volume and, in consequence, of the bulk density. Also, the concept of bulk density becomes less precise when the volume of the sample diminishes below certain limits or when its texture (size of pores and grains) is too coarse.

3.3 true density (ρ_t): The ratio of the mass of the material of a porous body to its true volume, expressed in grams per cubic centimetre or in kilograms per cubic metre.

3.4 true volume: The volume of the solid material in a porous body.

3.5 open pores: Those pores that are penetrated by the immersion liquid in the test described.

NOTE : These pores are, in principle, all those that are connected with the atmosphere, either directly or via one another. Here also the roughness of the surface imposes a limit to the accuracy of the definition of the volume of the open pores.

3.6 closed pores: Those pores that are not penetrated by the immersion liquid in the test described.