

Methods of test for (dense) shaped refractory products -
Part 6: Determination of modulus of rupture at ambient
temperature

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 993-6:2018 sisaldab Euroopa standardi EN 993-6:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 993-6:2018 consists of the English text of the European standard EN 993-6:2018.
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ICS 81.080

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English Version

Methods of test for (dense) shaped refractory products -
Part 6: Determination of modulus of rupture at ambient
temperature

Méthodes d'essai pour produits réfractaires façonnés
(denses) - Partie 6 : Détermination du module de
rupture par flexion à température ambiante

Prüfverfahren für (dichte) geformte feuerfeste
Erzeugnisse - Teil 6: Bestimmung der Biegefestigkeit
bei Raumtemperatur

This European Standard was approved by CEN on 5 October 2018.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 993-6:2018) 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of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 993-6:1995.

Reproducibility and repeatability data are available only for a limited number of testing methods and materials, but may be complemented in subsequent edition.

The series of standards EN 993 'Methods of test for dense shaped refractory products' consists of 20 Parts, some of which have been withdrawn and replaced by equivalent standards:

- *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 of rupture, elevated temperatures*
- *Part 8: Determination of refractoriness-under-load – withdrawn – replaced by EN ISO 1893*
- *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) – withdrawn – replaced by EN ISO 8894-1*
- *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)*

- *Part 19: Determination of thermal expansion by a differential method*
- *Part 20: Determination of resistance to abrasion at ambient temperature – withdrawn – replaced by EN ISO 16282*

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1 Scope

This document specifies a method for the determination of the modulus of rupture of dense and insulating shaped refractory products at ambient temperature, under conditions of a constant rate of increase of stress.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13385-1, *Geometrical product specifications (GPS) — Dimensional measuring equipment — Part 1: Callipers; Design and metrological characteristics*

EN ISO 7500-1, *Metallic materials - Calibration and verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Calibration and verification of the force-measuring system (ISO 7500-1)*

ISO 5022, *Shaped refractory products — Sampling and acceptance testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

modulus of rupture

σ_F

maximum stress that a prismatic test piece of specified dimensions can withstand when it is bent in a three-point bending device

3.2

three-point bending

means of bending a beam test piece whereby the test piece is supported on bearings near its ends, and a central force is applied

3.3

dense shaped refractory product

product with specific dimensions, having a true porosity of less than 45 % by volume, when measured in accordance with EN 993-1

3.4

shaped insulating refractory

shaped refractory having a true porosity of not less than 45% by volume, when measured in accordance with EN 1094-4

3.5

sample

representative collection of items that can be obtained by sampling in accordance with ISO 5022