

KERAAMILISED PLAADID. MÄÄRATLUSED,
LIIGITAMINE, OMADUSED, TOIMIVUSE PÜSIVUSE
HINDAMINE JA KONTROLLIMINE NING MÄRGISTAMINE

Ceramic tiles - Definition, classification, characteristics,
assessment and verification of constancy of
performance and marking

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 14411:2016 sisaldab Euroopa standardi EN 14411:2016 ingliskeelset teksti.	This Estonian standard EVS-EN 14411:2016 consists of the English text of the European standard EN 14411:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 13.07.2016.	Date of Availability of the European standard is 13.07.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 91.100.23

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Ceramic tiles - Definition, classification, characteristics,
assessment and verification of constancy of performance
and marking**

Carreaux céramiques - Définitions, classification,
caractéristiques, évaluation et vérification de la
constance de performance et marquage

Keramische Fliesen und Platten - Definitionen,
Klassifizierung, Eigenschaften, Konformitätsbewertung
und Kennzeichnung

This European Standard was approved by CEN on 13 May 2016.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Classification of ceramic tiles	10
5 Requirements	11
5.1 General.....	11
5.2 Characteristics	11
6 Assessment and verification of constancy of performance (AVCP)	13
6.1 General.....	13
6.2 Type testing.....	13
6.2.1 General.....	13
6.2.2 Test samples, testing and compliance criteria.....	14
6.2.3 Test reports.....	14
6.2.4 Shared other party results.....	14
6.3 Factory production control (FPC)	14
6.3.1 General.....	14
6.3.2 Requirements.....	15
6.3.3 Product specific requirements.....	18
6.3.4 Procedure for modifications	18
6.3.5 One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity	19
7 Designation	19
8 Marking	19
Annex A (normative) Requirements for extruded ceramic tiles of Group AI_b (0,5 % < E_b ≤ 3 %)	21
Annex B (normative) Requirements for extruded ceramic tiles of Group AII_{a-1} (3 % < E_b ≤ 6 %)	25
Annex C (normative) Requirements for extruded ceramic tiles of Group AII_{a-2} (3 % < E_b ≤ 6 %)	29
Annex D (normative) Requirements for extruded ceramic tiles of Group AII_{b-1} (6 % < E_b ≤ 10 %)	33
Annex E (normative) Requirements for extruded ceramic tiles of Group AII_{b-2} (6 % < E_b ≤ 10 %)	37
Annex F (normative) Requirements for extruded ceramic tiles of Group AIII (E_b > 10 %)	41
Annex G (normative) Requirements for dry-pressed ceramic tiles with low water absorption of Group BI_a (E_b ≤ 0,5 %)	45
Annex H (normative) Requirements for dry-pressed ceramic tiles with low water absorption of Group BI_b (0,5 % < E_b ≤ 3 %)	49

Annex J (normative) Requirements for dry-pressed ceramic tiles of Group BII_a (3 % < E_b ≤ 6 %)	53
Annex K (normative) Requirements for dry-pressed ceramic tiles of Group BII_b (6 % < E_b ≤ 10 %)	57
Annex L (normative) Requirements for dry-pressed ceramic tiles of Group BIII (E_b > 10 %)	61
Annex M (normative) Requirements of extruded ceramic tiles with low water absorption of Group AI_a (E_b ≤ 0,5 %)	65
Annex N (informative) Classification of glazed ceramic tiles for floorings according to their resistance to surface abrasion	69
Annex O (informative) Additional information on applicability of certain characteristics	70
0.1 General	70
0.2 Characteristics	70
Annex P (informative) Symbols for indication of intended use and of performances of some characteristics of ceramic tiles	71
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation	73
Bibliography	84

European foreword

This document (EN 14411:2016) has been prepared by Technical Committee CEN/TC 67 "Ceramic tiles", the secretariat of which is held by UNI.

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 January 2017, and conflicting national standards shall be withdrawn at the latest by April 2018.

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 14411:2012.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

The changes with respect to the previous edition include:

Errors (editorial):

- Skipping Annex I, because ceramic tiles that comply with the requirements of EN 14411, have to include specific marking on the boxes. One of the requirements of this marking is to indicate the reference to the standard and the annex it complies with. Previous editions of EN 14411 all skipped the reference to Annex I, and only the 2012 edition included it by error. This also affects the numbering of annexes which go after I (J, K, L,...) since these all shift one letter downwards. If this is not corrected, manufacturers will need to update the marking and change all the boxes. Furthermore, the letter of the annex has traditionally been connected with a specific group or type of ceramic tile, and the change will create confusion. In order to avoid all these unnecessary consequences, and increased costs, it is requested, like it has been done in the past with previous editions, to skip Annex I, and adapt the successive annexes accordingly.
- Renumbering of Annexes J to P (previous I to O)
- Annex C – dimensional tolerance limits for surface flatness were incorrect (see EN 14411:2006)
- Annex K – Eliminated note 'o' since it was duplicated (same as note 'n')
- Updated references to annexes throughout the text

Changes (technical):

- Exclusion of ceramic decorative pieces, trims and accessories (not included in mandate)
- Exclusion of meshed backed products (these are considered systems or kits, involving other non-ceramic materials, thus not covered by this standard)
- New Clause 6 on assessment and verification of the constancy of performance (previous evaluation of conformity clause) according to Doc. TF N 548 Rev 1 Guidance document.

- Clause 8 on marking: addition of text for special consideration of marking on small size tiles
- Table 2, clause *B.10d*): elimination of 'mortar' in the bond strength characteristic (the reference to test standard EN 1015-12 is not appropriate since it is not used to determine the adhesion properties of ceramics but of renders and plastering mortars on substrates). Eliminated references throughout the text.
- New Annex ZA according to CPR (including Delegated Regulation EU 157/2014 relative to DoP on websites and Delegated Regulation EU 574/2014 relative to model of DoP).

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard defines terms and specifies characteristics for ceramic tiles, including mosaics (i.e. any piece that can fit into a square area of 49 cm²) produced by extrusion or dry-pressing techniques, used for internal and/or external floorings (including stairs) and/or walls. Furthermore, it provides the level of requirements for these characteristics and references to the test methods applied as well as provisions for the assessment and verification of the constancy of performance.

This European Standard is not applicable to:

- meshed backed products;
- ceramic decorative accessories or trims (such as edges, corners, skirting, capping, coves, beads, curved tiles and other accessory pieces);
- ceramic tiles made by processes other than extrusion or dry-pressing;
- dry-pressed unglazed ceramic tiles with water absorption greater than 10 %;
- ceramic tiles used for floorings on external road finishes;
- ceramic tiles used in ceiling finishes or suspended ceilings.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12004:2007+A1:2012, *Adhesives for tiles - Requirements, evaluation of conformity, classification and designation*

CEN/TS 15209, *Tactile paving surface indicators produced from concrete, clay and stone*

CEN/TS 16165, *Determination of slip resistance of pedestrian surfaces - Methods of evaluation*

EN ISO 10545-1, *Ceramic tiles - Part 1: Sampling and basis for acceptance (ISO 10545-1)*

EN ISO 10545-2, *Ceramic tiles - Part 2: Determination of dimensions and surface quality (ISO 10545-2)*

EN ISO 10545-3, *Ceramic tiles - Part 3: Determination of water absorption, apparent porosity, apparent relative density and bulk density (ISO 10545-3)*

EN ISO 10545-4, *Ceramic tiles - Part 4: Determination of modulus of rupture and breaking strength (ISO 10545-4)*

EN ISO 10545-5, *Ceramic tiles - Part 5: Determination of impact resistance by measurement of coefficient of restitution (ISO 10545-5)*

EN ISO 10545-6, *Ceramic tiles - Part 6: Determination of resistance to deep abrasion for unglazed tiles (ISO 10545-6)*

EN ISO 10545-7, *Ceramic tiles - Part 7: Determination of resistance to surface abrasion for glazed tiles (ISO 10545-7)*

EN ISO 10545-8, *Ceramic tiles - Part 8: Determination of linear thermal expansion (ISO 10545-8)*

EN ISO 10545-9, *Ceramic tiles - Part 9: Determination of resistance to thermal shock (ISO 10545-9)*

EN ISO 10545-10, *Ceramic tiles - Part 10: Determination of moisture expansion (ISO 10545-10)*

EN ISO 10545-11, *Ceramic tiles - Part 11: Determination of crazing resistance for glazed tiles (ISO 10545-11)*

EN ISO 10545-12, *Ceramic tiles - Part 12: Determination of frost resistance (ISO 10545-12)*

EN ISO 10545-13, *Ceramic tiles - Part 13: Determination of chemical resistance (ISO 10545-13)*

EN ISO 10545-14, *Ceramic tiles - Part 14: Determination of resistance to stains (ISO 10545-14)*

EN ISO 10545-15, *Ceramic tiles - Part 15: Determination of lead and cadmium given off by glazed tiles (ISO 10545-15)*

EN ISO 10545-16, *Ceramic tiles - Part 16: Determination of small colour differences (ISO 10545-16)*

ISO 1006:1983, *Building construction — Modular coordination — Basic module*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1006:1983 and the following apply.

3.1

ceramic tile

tile made from clays and/or other inorganic raw materials

3.2

porcelain ceramic tile

fully vitrified ceramic tile with water absorption of 0,5 % or less

3.3

glaze

vitrified covering on ceramic tile

3.4

engobed surface

clay-based covering with a matt finish which can be permeable or impermeable

3.5

polished surface

surface of a glazed or unglazed ceramic tile which has been given a glossy finish by mechanical polishing carried out after firing

3.6

extruded ceramic tile

ceramic tile whose body is shaped in the plastic state in an extruder, the column obtained being cut into tiles of pre-determined dimension