



SLOVENSKI STANDARD

SIST EN 15285:2008

01-junij-2008

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Agglomerated stone - Modular tiles for flooring and stairs (internal and external)

Künstlich hergestellter Stein - Fliesen für Fußbodenbeläge und Stufenbeläge (innen und außen)

Pierre reconstituée - Dalles modulaires pour revêtements de sol (intérieurs et extérieurs)

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ICS:

91.100.15 Mineralni materiali in izdelki Mineral materials and products

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English Version

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

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Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Requirements	5
4.1 Requirements for geometric characteristics	5
4.1.1 General	5
4.1.2 Dimensions	5
4.1.3 Size and shape	5
4.1.4 Surface finish	6
4.2 Requirements for flooring and stairs modular tiles made of agglomerated stones	6
4.2.1 General	6
4.2.2 Apparent density and water absorption	7
4.2.3 Flexural strength	7
4.2.4 Abrasion resistance	7
4.2.5 Chemical resistance	7
4.2.6 Visual appearance	8
4.2.7 Reference sample, visual inspection and acceptance criteria	8
4.2.8 Reaction to fire	8
4.2.9 Slipperiness	9
4.2.10 Thermal conductivity	10
4.2.11 Thermal shock resistance	10
4.2.12 Tactility/visibility	10
4.2.13 Linear thermal expansion coefficient	10
4.2.14 Electrical resistivity	10
4.2.15 Impact resistance	10
4.2.16 Frost resistance	10
4.2.17 Dimensional stability	11
5 Marking, labelling and packaging	11
6 Evaluation of conformity	11
6.1 General rules	11
6.2 Initial type testing (ITT)	11
6.3 Factory production control (FPC)	12
6.3.1 General	12
6.3.2 FPC requirements	13
6.3.3 Description of the records	13
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU	
Construction Products Directive	15
ZA.1 Scope and relevant characteristics	15
ZA.2 Procedures for the attestation of conformity of agglomerated stone modular tiles	17
ZA.2.1 Systems of attestation of conformity	17
ZA.2.2 EC certificate of conformity and EC declaration of conformity	20
ZA.3 CE marking and labelling	21
Bibliography	26

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SIST EN 15285:2008
<https://standards.iteh.ai/catalog/standards/sist/44bea400-25bc-497d-ba91-4736067d426/sist-en-15285-2008>

Foreword

This document (EN 15285:2008) has been prepared by Technical Committee CEN/TC 246 “Natural stones”, 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 August 2008, and conflicting national standards shall be withdrawn at the latest by November 2009.

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

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.

This European Standard is one of a series of standards for specifications of agglomerated stone products which includes the following:

- prEN 15286, *Agglomerated stones — Slabs and tiles for wall finishes (internal and external)*,
- prEN 15388, *Agglomerated stones — Slabs and cut to size products for vanity and kitchen tops*.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements and appropriate test methods for modular tiles of agglomerated stone which are made for use as flooring and stairs for internal and external uses, fixed by mortar or adhesives. It also provides for the evaluation of conformity and marking of the products to the requirements of this European Standard.

This European Standard is not applicable to terrazzo tiles covered by EN 13748-1 and EN 13748-2 (see Bibliography).

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 12524, *Building materials and products — Hygrothermal properties — Tabulated design values*

EN 12664, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Dry and moist products of medium and low thermal resistance*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN 14231, *Natural stone test methods — Determination of the slip resistance by means of the pendulum tester*

EN 14617-1, *Agglomerated stone — Test methods — Part 1: Determination of apparent density and water absorption*

EN 14617-2, *Agglomerated stone — Test methods — Part 2: Determination of flexural strength (bending)*

EN 14617-4, *Agglomerated stone — Test methods — Part 4: Determination of the abrasion resistance*

EN 14617-5, *Agglomerated stone — Test methods — Part 5: Determination of freeze and thaw resistance*

EN 14617-6, *Agglomerated stone — Test methods — Part 6: Determination of thermal shock resistance*

EN 14617-9, *Agglomerated stone — Test methods — Part 9: Determination of impact resistance*

EN 14617-10, *Agglomerated stone — Test methods — Part 10: Determination of chemical resistance*

EN 14617-11, *Agglomerated stone — Test methods — Part 11: Determination of linear thermal expansion coefficient*

EN 14617-12, *Agglomerated stone — Test methods — Part 12: Determination of dimensional stability*

EN 14617-13, *Agglomerated stone — Test methods — Part 13: Determination of electrical resistivity*

EN 14617-16, *Agglomerated stone — Test methods — Part 16: Determination of dimensions, geometric characteristics and surface quality of modular tiles*

EN 14618:2005, *Agglomerated stone — Terminology and classification*

EN ISO 9001:2000, *Quality management systems — Requirements (ISO 9001:2000)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14618:2005 and the following apply.

3.1

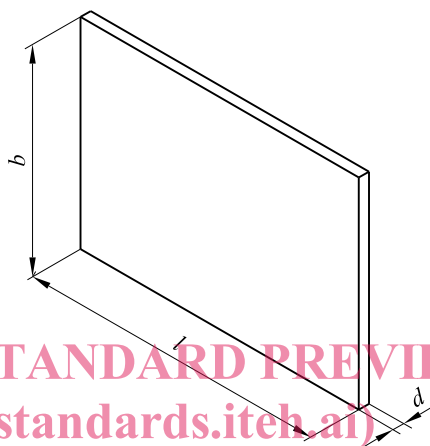
modular tile

piece of agglomerated stone in standard sizes, with dimensions (≤ 600 mm) \times (≤ 600 mm) and nominal thickness from 6 mm to 20 mm

3.2

dimensions of modular tiles

length l , width b and thickness d of a modular tile. The dimensions are given in the stated sequence in millimetres (see Figure 1)



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 Figure 1 — Dimensions of a modular tile
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4 Requirements

4.1 Requirements for geometric characteristics

4.1.1 General

All measurements of geometrical characteristics of modular tiles as given in the following clauses shall be carried out in accordance with EN 14617-16.

4.1.2 Dimensions

The dimensions of modular tiles shall always be declared (see 3.2).

4.1.3 Size and shape

The tolerances for size and shape of modular tiles shall be as given in Table 1.

Stricter tolerances than those given in Table 1 may be declared by the manufacturer. This is particularly important when tiles are to be fixed with adhesive.

4.1.4 Surface finish

4.1.4.1 General

Surface finishes shall extend uniformly to the edges of the modular tiles.

Table 1 — Tolerances on dimensions and shape of modular tiles

Characteristic	Tolerances on dimensions or shape
Dimensions: – length and width	$\pm 0,5$ mm
Thickness	$\pm 0,7$ mm
Straightness of sides	$\pm 0,3$ mm
Rectangularity	$\pm 0,9$ mm
Flatness: – centre curvature – edge curvature – warping	± 2 % referred to length

If the tile is required to be bevelled (when no other specification is made), the angle of the bevel shall be 45° and the width of the bevel shall be 1,0 mm with a tolerance of $\pm 0,7$ mm.

4.1.4.2 Surfaces after finishing

Surfaces of modular tiles shall have a regular appearance as a function of the finishing process and shall be worked to meet the finish declared (e.g. by submission of samples beforehand between the manufacturer and purchaser).

Examples of the surface finishes are:

- a) surfaces with texture in relief obtained by copying the design of the mould (e.g. hand-splitting or artistic design);
- b) fine ground surfaces, obtained e.g. by means of a grinding disk of grain size F 220;
- c) matt finished surfaces, obtained e.g. by means of a polishing disk with grain size F 400;
- d) highly polished surfaces, obtained e.g. by means of a polishing disk or felt.

4.2 Requirements for flooring and stairs modular tiles made of agglomerated stones

4.2.1 General

The values for the characteristics in 4.2.2 to 4.2.17 shall be declared for flooring and stairs modular tiles made of agglomerated stones when subject to regulatory requirements and may be declared otherwise with reference to the intended end use conditions.

The classification of flooring and stairs tiles according to water absorption, flexural strength, abrasion resistance and chemical resistance shall be expressed with letters corresponding to their values as indicated in Table 2.

Contractual specifications can be used to establish reference values, e.g. in design or manufacturer's data sheet, due account being taken of any regulatory requirements applicable.

4.2.2 Apparent density and water absorption

The values for apparent density and water absorption of modular tiles shall be declared and determined using the test method in EN 14617-1, and the results expressed accordingly.

The water absorption of the tile shall be classified in accordance with Table 2.

Table 2 — Classification of flooring and stairs modular tiles to their characteristics

Sub-clause	Characteristics	Values			
4.2.2	Water absorption (%)	$W_1 > 2,0$	$2,0 \geq W_2 > 0,5$	$0,5 \geq W_3 > 0,05$	$W_4 \leq 0,05$
4.2.3	Flexural strength (MPa)	$F_1 < 12,0$	$12,0 \leq F_2 < 25,0$	$25,0 \leq F_3 < 40,0$	$F_4 \geq 40,0$
4.2.4	Abrasion resistance (mm)	$A_1 > 36,5$	$36,5 \geq A_2 > 33,0$	$33,0 \geq A_3 > 29,0$	$A_4 \leq 29,0$
4.2.5	Chemical resistance	C ₁	C ₂	C ₃	C ₄
C1: Agglomerated stones which keep below 60 % of the reference reflection values (see EN 14617-10) after 8 h of alkali or acid attack. C2: Agglomerated stones which keep between 60 % and 80 % of the reference reflection value (see EN 14617-10) after 8 h of alkali attack and 1 h of acid attack. C3: Agglomerated stones which keep between 60 % and 80 % of the reference reflection value (see EN 14617-10) after 8 h of acid attack and 1 h of alkali attack. C4: Agglomerated stones which keep at least 80 % of the reference reflection value (see EN 14617-10) after 8 h of acid or alkali attack (or in one case, see EN 14617-10, is between 60 % and 80 %).					

4.2.3 Flexural strength

The values for flexural strength of modular tiles shall always be declared.

The flexural strength shall be determined using the test method in EN 14617-2 and the results expressed accordingly.

The classification of flexural strength of modular tiles is given in Table 2.

4.2.4 Abrasion resistance

Where subject to contractual request or where the product is expected to be subject to aggressive abrasion actions, the values for abrasion resistance of modular tiles shall be declared.

The resistance to abrasion shall be determined using the test method in EN 14617-4 and the results expressed accordingly.

The classification of abrasion resistance of modular tiles is given in Table 2.

4.2.5 Chemical resistance

Where subject to contractual request or where the product is expected to be subject to aggressive chemical actions, chemical resistance of modular tiles shall be declared.

The chemical resistance of modular tiles shall be determined using the test method in EN 14617-10 and the results expressed accordingly.

The classification of chemical resistance of modular tiles is given in Table 2.

4.2.6 Visual appearance

Visual appearance of modular tiles shall always be declared.

The colour, roughness etc. of the agglomerated stone shall be identified visually (see 4.2.7) e.g. by a range of samples selected in agreement by manufacturer and purchaser following the criteria given in EN 14617-16.

Any visual variations, for example inclusions and veins, are permissible provided that they are characteristic of the relevant type of agglomerated stone and provided that they do not adversely affect the performance of the tiles.

Reference samples are described in 4.2.7.

4.2.7 Reference sample, visual inspection and acceptance criteria

A reference sample shall be an adequate number of pieces of agglomerated stone of sufficient size to indicate the general appearance of the finished work. The dimensions of individual pieces shall be at least 0,01 m² (typical values are between 0,01 m² and 0,25 m² in face area but may be more) and shall indicate the range of appearance regarding the colouring, the vein pattern, the physical structure and the surface finish.

Evaluation of the reference sample does not imply strict uniformity between the sample itself and the actual supply; natural variations in tonality can always occur due to natural raw materials.

All the differences in aesthetical pattern between the tiles and the reference sample shall be considered typical of the agglomerated stone and not as flaws. Therefore they shall not become a reason for rejection, unless their presence exceeds 15% of the surface and the typical pattern of the agglomerated stone is lost.

Any comparison between production tile and reference sample shall be carried out by placing the reference sample in a vertical position against the production tile, viewing them at a distance of about two metres under normal daylight conditions and recording any visible differences in the characteristics of the agglomerated stone (see Figure 2). According to this method the shading tolerance and the gloss value (in the case of fine ground, honed or highly polished surfaces) measured at six different points of the tile shall be evaluated.

Any features of tiles which are likely to adversely affect the flexural strength and the structural stability of the agglomerated stone, such as cracks, hairline cracks, cavities, soft inclusions or similar, are not permitted if the modular tiles are intended to be mechanically fixed.

The name and address of the manufacturer or supplier of the agglomerated stone, shall also be indicated on the reference test sample.

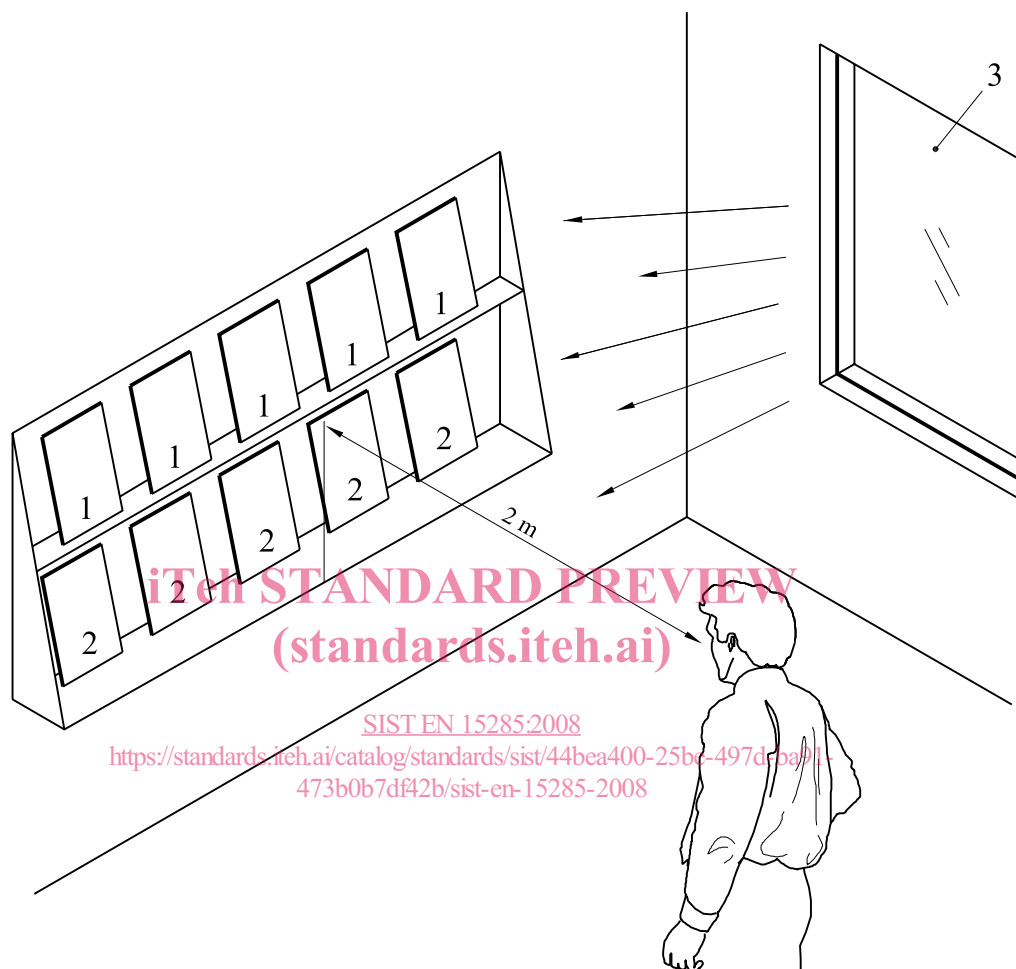
NOTE The pieces of agglomerated stone should be analysed under similar conditions: e.g. wet/dry, light.

4.2.8 Reaction to fire

Reaction to fire performance shall always be declared when the modular tiles are intended to be used in areas subjected to reaction to fire regulation and may be declared otherwise.

Agglomerated stones (except those containing more than 1 % by mass or volume, whichever is the most onerous, of organic materials), may be classified without testing (CWT) as reaction to fire Class A1_{fl}¹⁾.

For agglomerated stones containing more than 1 % by mass or volume, whichever is the most onerous, of organic materials, and having an end use subject to reaction to fire regulatory requirements shall be tested and classified in accordance with EN 13501-1.



Key

- 1 reference sample
- 2 production sample
- 3 daylight

Figure 2 — Comparison between production sample and reference sample of the modular tile

4.2.9 Slipperiness

The value for slipperiness of modular tiles shall be declared when subject to regulatory requirements and may be declared otherwise.

The slipperiness shall be determined using tests methods in EN 14231 and the results expressed accordingly.

1) See Decision of the Commission 96/603/EC of 1996-10-04 (see OJEC L267 of 1996-10-19), as amended twice by 2000/605/EC of 2000-09-26 (see OJEC L258 of 2000-10-12) and 2003/424/EC of 2003-06-06 (see OJEC L144 of 2003-06-12).