BRITISH STANDARD

BS EN
15388:2008

Agglomerated stone — Slabs and cut-to-size products for vanity and kitchen tops

ICS 91.100.15

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee B/545, Natural stone.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 May 2008

ISBN 978 0 580 56304 1

Amendments/corrigenda issued since publication

Date	Comments

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15388

March 2008

ICS 91.100.15

English Version

Agglomerated stone - Slabs and cut-to-size products for vanity and kitchen tops

Pierre reconstituée - Plaques et produits coupés sur mesure pour tables de toilette et plans de travail de cuisine

Künstlich hergestellter Stein - Platten und auf Maß geschnittene Produkte für Sanitärbereichs- und Küchenarbeitsflächen

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Ref. No. EN 15388:2008: E

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Foreword

This document (EN 15388:2008) 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

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

— EN 15285, Agglomerated stone – Modular tiles for flooring and stairs (internal and external),

— prEN 15286, Agglomerated stone – Slabs and tiles for wall finishes (internal and external).

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 for slabs and cut-to-size products of agglomerated stone which are made for use as vanity and kitchen tops, or other similar use in furnishing.

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

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 14617-6, *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 14617-13, *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

NOTE In addition to the European Standards for test methods mentioned in clause 2, there exist further test method standards which can be used for scientific examinations, but which are not relevant for the application in practice according to this standard.

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
slab for vanity and kitchen tops
flat slab which can be obtained from the sawing of a block, directly from moulding or cut-to-size which form a covering for use in furnishing, fixed to a structure either mechanically or by means of specific adhesives

NOTE Rough products are obtained from the sawing of a block, directly from moulding, refining the edges and finishing the surface.

The products cut-to-size can be subsequently used to manufacture composites whose tolerances and performances do not fall under the responsibility of the producer of the agglomerated stone slab

3.2
dimensions of slab for vanity and kitchen tops
length *l*, width *b* and thickness *d* of a slab for use in furnishing. The dimensions are given in the stated sequence in millimetres (see Figure 1)

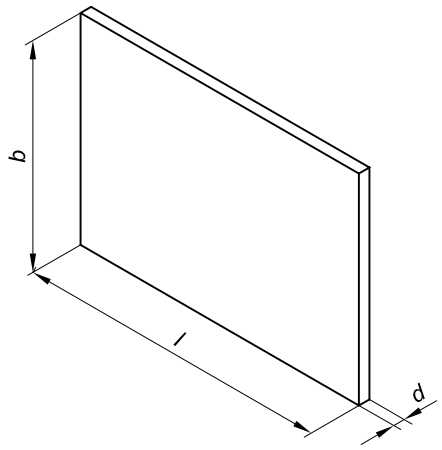

Figure 1 — Dimensions of the slab

4 Requirements

4.1 Requirements for geometric characteristics

4.1.1 General

All measured values of individual units shall fall within the required tolerances. The measurement shall be performed by a Venier calliper or other suitable apparatus for linear measurements to the nearest 0,1 mm.

4.1.2 Requirements for thickness

The thickness shall not deviate from the nominal thickness by more than ± 1,2 mm.

The thickness shall result from an analysis which takes into account the whole size of the slab. The nominal thickness shall be the result of 3 measurements for each meter of the slab length.

Stricter tolerances may be declared by the manufacturer. This is particularly important when the edges of the slabs will be visible.

4.1.3 Requirements for flatness

The deviation from flatness of the surface shall not exceed 4 mm over the slab length and shall not exceed 2 mm over the slab width.

Flatness shall be measured in the middle of the slab using the full length and width (not the diagonals) when the slab is horizontal.

4.1.4 Requirements for length and width of rough products

The length and width shall not deviate from the nominal size by more than given in Table 1.

Stricter tolerances may be declared by the manufacturer.

Table 1 — Tolerances for length and width

Nominal length/width in mm	Tolerances
From 1850 to 3060 (nominal length)	-20 mm / +10 mm
From 1250 to 1400 (nominal width)	-15 mm / +10 mm
For other nominal lengths and widths tolerances shall be calculated proportionally.	

4.1.5 Requirements for special shapes (only for cut-to-size products)

Pieces of special or irregular shapes shall be checked for compliance with the required shape. The permissible tolerance at any point shall be ± 1,2 mm, which may be measured by using a suitable template.

Stricter tolerances may be declared by the manufacturer.

4.2 Requirements for surface finish

4.2.1 General

Surface finishes shall extend uniformly to the edges of the slab. The uniformity shall be guaranteed on at least 90 % of the total surface of the element

Stricter values may be declared by the manufacturer.

4.2.2 Requirements for surfaces after surface finishing

Surfaces 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 purchaser and supplier).

The surface roughness of the visible face can be directly obtained by moulding and to present an aspect structured with relief.

Example of the surface finishes are:

- sandblasted surfaces (obtained for example by means of a sandblasting action),
- fine ground surfaces (obtained for example by means of a grinding disk of grain size F 200),
- honed finished surfaces (obtained for example by means of a polishing disk with grain size F 400),
- highly polished surfaces (obtained for example by means of a polishing disk or felt),
- structured aspect (obtained by catch of print or artistic creation).

If other types of surface finishes are used, these shall be declared by the manufacturer.

For finely ground surfaces, honed surfaces and highly polished surfaces, it falls under the responsibility of the manufacturer to declare, according to the colour of the product, the minimum degree of gloss to be expected.

4.2.3 Requirements for the unexposed surface

The unexposed surface shall have a regular appearance. Small cracks or cuts are permitted within 10 cm from the sides of the slabs.

When the finishing process for the unexposed surface foresees a calibrated surface, the maximum surface roughness shall not exceed 0,5 mm.

5 Characteristics of agglomerated stones for vanity and kitchen tops

5.1 General

The following characteristics shall be declared when subject to regulatory requirements and may be declared otherwise with reference to the conditions of the end usage.

Contractual specifications may be used to establish reference values e.g. stated in design or supplier data sheet, due account taken of any regulatory requirements applicable.

5.2 Denomination

The denomination shall always be declared.

The denomination is the indication of the commercial family of the product, commercial type, binders and type of aggregate, see EN 14618.

5.3 Visual appearance

This characteristic shall always be declared.

The colour, surface finish, etc. of the agglomerated stone shall be identified visually e.g. by a range of samples selected in agreement by supplier and purchaser.

Any aesthetic visual variation is permissible provided that it is a declared aspect of the relevant type of agglomerated stone and provided that it does not adversely affect the performance of the slabs.

5.4 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 m^2 (typical values are between 0,01 and 0,25 m^2 in face area but may be more) and shall indicate the range of general appearance regarding the colouring, the physical structure and the surface finish.

The reference sample does not imply strict uniformity between the sample itself and the actual supply (e.g. variations in tonality may always occur due to natural raw materials). All the differences in aesthetical pattern between the slabs 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 slab and reference sample shall be carried out by placing the reference sample in a vertical position against the production slab and 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.

NOTE The pieces should be analysed under similar conditions: for example, wet/dry, light, etc.

According to this method, the difference in tonality and the gloss value (in the case of finely ground, honed or highly polished surfaces) measured at six different points of the slab shall be evaluated.

5.5 Reaction to fire

This characteristic shall always be declared when the slabs are 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 homogeneously distributed organic materials) are considered reaction to fire Class A1 following the Decision 96/603/EEC, as amended.

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

5.6 Apparent density and water absorption

These characteristics shall always be declared.

The apparent density and the water absorption shall be determined according to EN 14617-1 and the results expressed accordingly.

5.7 Flexural strength

This characteristic shall always be declared.

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

5.8 Thermal conductivity

Where the manufacturer so wishes (e.g. where subject to regulatory requirements), this characteristic shall be declared.

The thermal conductivity shall be declared either by declaring the density of the material or by declaring the thermal conductivity.

The density shall be determined using test methods indicated in 5.6 and the thermal conductivity shall be taken from EN ISO 10456 or tested in accordance with EN ISO 13787 and the results expressed accordingly.

5.9 Thermal shock resistance

Where subject to regulatory requirements or where the product is expected to be subject to critical thermal cycles, this characteristic shall be declared.

The resistance to thermal cycles shall be determined using the test method in EN 14617-6 and the results expressed accordingly.

5.10 Impact resistance

This characteristic shall always be declared.

The impact resistance shall be determined using the test method in EN 14617-9 and the results expressed accordingly.

5.11 Chemical resistance

This characteristic shall always be declared.

The resistance to chemical attack (or the stain resistance) shall be determined using the test method in EN 14617-10, and the results expressed accordingly.

5.12 Linear thermal expansion coefficient

Where subject to contractual request or where the product is expected to be subject to relevant dimensional variations due to thermal actions, this characteristic shall be declared.

The linear thermal expansion coefficient shall be determined using the test method in EN 14617-11 and the results expressed accordingly.

5.13 Electrical resistivity

This characteristic shall always be declared.

The electrical resistivity shall be determined using the test method in EN 14617-13 and the results expressed accordingly.

6 Marking, labelling and packaging

As a minimum of identification, each consignment shall specify on a label and/or packaging and/or accompanying documents the denomination of the agglomerated stone (see EN 14618).

The slabs shall be clean before packaging and transporting.

Packing and tapes which are likely to stain shall not be used.

Sensitive polished surfaces shall be protected by appropriate means; slabs which are susceptible to stains shall get special attention.

The manufacturer shall provide information concerning packaging.

7 Evaluation of conformity

7.1 Evaluation for conformity – General rules

The compliance with the requirements of this standard and with the stated values shall be demonstrated by initial type testing and additionally the manufacturer shall exercise a permanent factory production control and register the results.

For particular products or upon request, an approved body may be involved in assessment and surveillance of the production control or of the product itself.

7.2 Initial type testing of the agglomerated stone material properties

Initial type testing of an agglomerated stone product shall be carried out (see Table 2):

— to demonstrate compliance with of this standard test method or at the beginning of production of a new agglomerated stone product,

— when significant variations occur in the production process, determined visually or by significant changes in FPC results.

Tests previously performed in accordance with the provisions of this standard (same material/product, same characteristic measured with same test method, same sampling procedure) may be taken into account. The evaluation of the values may be supported by a "test report" supplied with the slabs, provided that the tests have been performed according to the requirements and test methods of this standard.

The results of the selected tests shall be expressed as referred to in clauses 4 and 5.

Table 2 — List of properties for initial type testing

Reference sub-clause for applicability	Characteristics	Test method
4.1	Geometric characteristics	EN 14617-16
5.2	Denomination	EN 14618
5.3	Visual appearance	Visual
5.5	Reaction to fire (only for agglomerated stone containing more than 1% by mass or volume, whichever is the most onerous, of homogenously distributed organic material)	EN 13501-1
5.6	Apparent density and water absorption	EN 14617-1
5.7	Flexural strength	EN 14617-2
5.8	Thermal conductivity	EN ISO 10456, EN 14617-1 or EN ISO 13787
5.9	Thermal shock resistance	EN 14617-6
5.10	Impact resistance	EN 14617-9
5.11	Chemical resistance	EN 14617-10
5.12	Linear thermal expansion coefficient	EN 14617-11
5.13	Electrical resistivity	EN 14617-13
Reference shall be made to clause 5 in order to decide which characteristics need to be declared.		

7.3 Factory production control – Tests to be carried out by the manufacturer

7.3.1 Sampling for FPC shall be carried out by a proper and careful procedure. An adequate number of samples has to be taken to obtain a good estimation of the batch. A representative sample of adequate size and characteristic of the agglomerated stone slabs shall be taken from the batch to be tested, taking into account the intended use of the product.

7.3.2 The tests to be carried out by the manufacturer are part of the factory production control. The manufacturer shall exercise a permanent internal production control. Control frequencies shall be in accordance with Table 3.

The results of the tests carried out during FPC shall demonstrate the conformity to the requirements declared in accordance with clauses 4 and 5.

Table 3 — Control frequencies for factory production control

Reference sub-clause for applicability	Characteristics	Control frequency	Test method

4.1.3	Dimensions, flatness, …	Every production lot[1)]	EN 14617-16
4.2	Surface finish		Visual
5.2	Denomination		description
5.3	Visual appearance		Visual
5.6	Water absorption	At least every year	EN 14617-1
5.7	Flexural strength		EN 14617-2
	All other characteristics	All other characteristics are controlled by FPC checks on raw materials and the production process, at a frequency sufficient to ensure that all slabs and tiles remain the same as those submitted for initial type testing. This frequency of such checks shall be recorded in the manufacturer's FPC manual.	
[1)] The dimension or amount of production lot shall be determined by the manufacturer having as reference a daily production quantity, the number of deliveries and the final destination of the considered quantity of slabs.			

7.3.3 Manufacturers' records shall include at least the following:

a) identification of the product tested,

b) information on sampling:

   1) place of sampling,

   2) identification of the production lot sampled,

   3) frequencies of sampling,

   4) size and number of samples,

c) test methods applied,

d) results of the test carried out,

e) calibration records of apparatus.

Bibliography

[1] EN ISO 10456, *Building materials and products – Hygrothermal properties –Tabulated design values and procedures for determining declared and design thermal values (ISO 10456:2007)*

[2] EN ISO 13787, Thermal insulation products for building equipment and industrial installations – Determination of declared thermal conductivity (ISO 13787:2003)

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