BS EN 14617-1:2013

BSI Standards Publication

Agglomerated stone — Test methods

Part 1: Determination of apparent density and water absorption

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National foreword

This British Standard is the UK implementation of EN 14617-1:2013. It supersedes BS EN 14617-1:2005 which is withdrawn.

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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Pierre agglomérée - Méthodes d'essai - Partie 1 : Détermination de la masse volumique apparente et du coefficient d'absorption d'eau

Künstlich hergestellter Stein - Prüfverfahren - Teil 1: Bestimmung der Rohdichte und der Wasseraufnahme

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Foreword

This document (EN 14617-1:2013) 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of an identical text or by endorsement, at the latest by October 2013, and conflicting national standards shall be withdrawn at the latest by October 2013.

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 supersedes EN 14617-1:2005.

Subclause 5.1 has been modified since the last edition of this European Standard.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This European Standard is one of a series of standards for test methods for agglomerated stones which includes the following parts:

— *Part 1: Determination of apparent density and water absorption*

— *Part 2: Determination of flexural strength (bending)*

— *Part 4: Determination of the abrasion resistance*

— *Part 5: Determination of freeze and thaw resistance*

— *Part 6: Determination of thermal shock resistance*

— *Part 8: Determination of resistance to fixing (dowel hole)*

— *Part 9: Determination of impact resistance*

— *Part 10: Determination of chemical resistance*

— *Part 11: Determination of linear thermal expansion coefficient*

— *Part 12: Determination of dimensional stability*

— *Part 13: Determination of electrical resistivity*

— *Part 15: Determination of compressive strength*

— *Part 16: Determination of dimensions, geometric characteristics and surface quality of modular tiles*

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1 Scope

This European Standard specifies a method for determining the apparent density and water absorption of agglomerated stone products.

2 Terms and definitions

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

2.1
apparent density
M_v
ratio between mass (expressed in kg) and apparent volume (expressed in m^3) situated within the external surface of the body

2.2
water absorption
C
maximum amount of water absorbed by the material when soaked in deionised water at room temperature and pressure according to the procedure described below, expressed as a percentage of the dry mass of the sample

3 Apparatus

3.1 A covered tank with a flat base comprising small non-oxidising and non-absorbent supports for the specimens.

3.2 A device able to maintain a constant water level in the tank, described in 4.1.

3.3 A time counter with an accuracy of one second.

3.4 A weighing instrument with an accuracy of 0,01 % of the sample mass.

3.5 A hydrostatic balance accurate to at least 0,01 % of the sample mass.

3.6 A ventilated oven capable of maintaining a temperature of (70 ± 5) °C.

4 Preparation of the specimens

4.1 Sampling

The sampling is not the responsibility of the test laboratory except where especially requested. At least six specimens selected from a homogeneous batch consisting of the same material mixture should be tested. The final finishing of the specimen should be the same as the end product (sand blasted, gauged or polished surface) but without chemical surface treatment. The dimensions of the sample are (100 x 100) mm length and width and (10 ± 2) mm thickness.

4.2 Specimen conditioning

The specimens should be dried in a stove at (70 ± 5) °C until the difference between two successive weighings at (24 ± 2) h intervals is less than 0,1 % of the sample mass. The specimens shall be kept in a desiccator until room temperature (20 ± 5) °C is attained.

5 Test procedure

After drying and weighing (M_o), place the specimens in a tank on two supports in order to reduce the support contact surface to a minimum.

Slowly pour the deionised water into a container until the specimens are completely immersed and covered by 2 cm of water. After (1 ± 0,25) h, (8 ± 0,5) h and (24 ± 1) h from the beginning of the tests, and later at regular intervals of (24 ± 1) h, take the specimens out of the water, wipe with a damp cloth and weigh them in air. Continue to immerse the specimens in water and repeat the tests until the weight variation specimens (M_t) in three successive weighings is less than 0,1 %.

Immediately after the final weighing of each sample, determine the apparent mass *(*M_a) by weighing the sample in water using a hydrostatic balance.

6 Expression of results

6.1 The apparent density M_v, in kg/ m^3 is given by:

$$M_v = \frac{M_o \times \rho_{H_2O}}{(M_t - M_a)} \quad (1)$$

where

M_o is sample mass weighed in air after drying, in kilograms;

M_t is sample mass soaked in water (6), wiped by a damp cloth and weighed in air, in kilograms;

M_a is sample mass soaked in water and weighed in water, in kilograms;

ρH_2O is the true density of water at the measuring temperature, in kilograms/ cubic metre.

6.2 Water absorption C in percentage (%) is given by:

$$C = \frac{100 \times (M_t - M_o)}{M_o} \quad (2)$$

6.3 For a more complete documentation of water absorption of a material, the amount of water absorbed relative to 1 h, 8 h, 24 h, 48 h, 72 h, etc. can be calculated. The amount of water absorbed (C_i in percent) at the generic time t_i is given by:

$$C_i = \frac{100 \times (M_i - M_o)}{M_o} \quad (3)$$

where

M_i is sample mass weighed in air after t_i time of water absorption.

Porosities (open and total) may be calculated according to EN 1936.

7 Test report

The test report shall contain the following information:

a) unique identification number of the report;

b) number and year of issue of this European Standard, i.e. EN 14617-1:2013;

c) name and address of the test laboratory and the address where the test was carried out if different from the test laboratory;

d) name and address of the client;

e) it is the responsibility of the client to supply the following information:

   1) name of the supplier;

   2) name of the person or organisation which carried out the sampling;

   3) surface finish of the specimens (if relevant to the test);

   4) nature of the binders;

f) date of delivery of the sample or of the specimens;

g) date when the test specimens were prepared (if relevant) and the date of testing;

h) number of specimens in the sample;

i) dimensions of the specimens;

j) apparent density values of each specimen and the average value;

k) water absorption value of each specimen and the average value;

l) all deviations from the standard and their justification;

m) remarks.

The test report shall contain the signature(s) and role(s) of the responsible(s) for the testing and the written consent of the test laboratory. It shall also state that the report shall not be partially reproduced without the written consent of the test laboratory.

Bibliography

[1] EN 1936, *Natural stone test methods — Determination of real density and apparent density, and of total and open porosity*

[2] EN 12440, *Natural stone — Denomination criteria*

[3] EN 14618, *Agglomerated stone — Terminology and classification*

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