

Agglomerated stone — Test methods —

Part 9: Determination of impact resistance

The European Standard EN 14617-9:2005 has the status of a
British Standard

ICS 91.100.15

National foreword

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Foreword

This document (EN 14617-9:2005) 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of an identical text or by endorsement, at the latest by September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

Test methods for agglomerated stones consist of the following:

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)*

prEN 14617-3, *Agglomerated stone - Test methods – Part 3: Determination of slipperiness*

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*

prEN 14617-7, *Agglomerated stone – Test methods – Part 7: Determination of ageing*

prEN 14617-8, *Agglomerated stone – Test methods – Part 8: Determination of resistance to fixing (dowel hole)*

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*

prEN 14617-14, *Agglomerated stone – Test methods – Part 14: Determination of surface hardness*

EN 14617-15, *Agglomerated stone – Test methods – Part 15: Determination of compressive strength*

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

prEN 14617-17, *Agglomerated stone – Test methods – Part 17: Determination of biological resistance*

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1 Scope

This document specifies a method for determining the impact resistance of agglomerated flat stone products.

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.

Not applicable.

3 Principle

The impact resistance is determined by the dropping of a spherical steel ball from given increasing heights until the specimen breaks.

4 Apparatus

- 4.1 A steel sphere with mass of $1,0 \text{ kg} \pm 0,1 \text{ kg}$ and diameter of about 6,3 cm.
- 4.2 An electromagnet with a ball bearing housing and a switch.
- 4.3 A vertical stick graduated at 5 cm intervals from 0 cm to 120 cm, along which the electromagnet can travel.
- 4.4 A box of minimum section 40 cm X 40 cm and no less than 30 cm high, containing a bed of dry sand at least 20 cm deep. The sand grain size distribution should be in the 1 mm – 1,5 mm range.

5 Preparation of the specimens

At least four specimens should be prepared with 20 cm X 20 cm sides. The sample thickness should be between 0,5 cm and 3 cm and should equal the one of the final product. The main faces must be parallel and with the finishing of the end product (sand blasted, gauged or polished surface) faced to the falling sphere but without any chemical surface treatment.

6 Test procedure

Lay the sample in the centre of the box on the bed of sand so that the whole thickness is buried. It should be placed so that the centre of the face with the larger size lies on the vertical passing through the vertical of the sphere. A spirit level should be used to check that the upper face of the sample lies horizontal. The electromagnet should be attached to the stick at a point corresponding to the 6 cm drop (from the bottom) of the sphere. Switch off the electromagnet and let the sphere fall. The drop height (h) should be measured between the lowest point of the sphere and the impact surface. Repeat the test by progressively increasing the drop height 5 cm at a time until the sample is broken. Any surface damage caused by the steel sphere drop will be visually noticed in comparison with reference specimens, recorded and reported in the test results.

7 Expression of results

The fracture work L in joule is expressed by the formula

$$L = M \times h \times g$$

where

M is the sphere mass in kg;

h is the drop height in meters of the sphere which causes the sample to break;

g is the gravity acceleration equal to $9,806 \text{ m/s}^2$

The final data must be obtained by averaging the results from at least four specimens.

8 Test report

The test report shall contain the following information:

- a) unique identification number of the report;
- b) number, title and date of issue of this document;
- 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:
 - name of the supplier;
 - name of the person or organization which carried out the sampling;
 - surface finish of the specimens (if relevant to the test);
 - nature of the binders
- f) date of delivery of the sample or of the specimens;
- g) date when the specimens were prepared and the date of testing;
- h) number, shape and size of the specimens in the sample;
- i) any observed damage for each specimen;
- j) fracture work value of each specimen and the average value on at least four specimens;
- k) all deviations from the standard and their justification;
- l) 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 be stated that the report shall not be partially reproduced without the written consent of the test laboratory.

Bibliography

EN 12440, *Natural stone - Denomination criteria*

EN 14618, *Agglomerated stone- Terminology and classification*

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