



SLOVENSKI STANDARD

SIST EN 14617-6:2005

01-julij-2005

Aglomeriran kamen - Preskusne metode - 6. del: Ugotavljanje odpornosti proti temperaturnemu šoku

Agglomerated stone - Test methods - Part 6: Determination of thermal shock resistance

Künstlich hergestellter Stein - Prüfverfahren - Teil 6: Bestimmung der Temperaturwechselbeständigkeit

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Pierre agglomérée - Méthodes d'essai - Partie 6: Détermination de la résistance au choc thermique

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Ta slovenski standard je istoveten z: EN 14617-6:2005

ICS:

91.100.15 Mineralni materiali in izdelki Mineral materials and products

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 14617-6

March 2005

ICS 91.100.15

English version

Agglomerated stone - Test methods - Part 6: Determination of thermal shock resistance

Pierre agglomérée - Méthodes d'essai - Partie 6:
Détermination de la résistance au choc thermique

Künstlich hergestellter Stein - Prüfverfahren - Teil 6:
Bestimmung der Temperaturwechselbeständigkeit

This European Standard was approved by CEN on 3 February 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 14617-6:2005) 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*

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

EN 14617-6:2005 (E)**1 Scope**

This document specifies a method to assess possible modifications of agglomerated stones under the effect of sudden changes in temperature (thermal shock) by immersion in hot water.

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 14617-2:2004, *Agglomerated stone – Test methods – Part 2: Determination of flexural strength (bending)*

3 Principle

After drying at $(70 \pm 5)^\circ\text{C}$ until constant mass is attained, the specimens are subjected to successive cycles, each formed by drying at $(70 \pm 5)^\circ\text{C}$ followed by immediate immersion in water at $(15 \pm 5)^\circ\text{C}$. After 20 cycles the specimens are then visually inspected, compared with the reference specimen and all visible alterations recorded. Finally, the mass and flexural strength changes of specimens after 20 cycles will be determined in comparison with the values of the same quantities of reference specimens.

NOTE The selected test temperature of 70°C is for flooring and wall applications. The test temperature of 105°C is for kitchen tops and special uses (industries, laboratories, etc.).

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4 Symbols and definitions

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

m_0 Mass of the dried specimen before the test, g,

m_f Mass of the dried specimen after the test, g,

Δm % Change in the mass of the dried specimens, as a percentage,

R_f flexural strength average value of dried, reference specimens in MPa;

R_{sf} flexural strength average value of specimens after 20 cycles MPa;

$\Delta R_{f,20}$ coefficient of thermal shock resistance as change in flexural strength (% , after 20 cycles);

5 Apparatus

5.1 A ventilated oven capable of maintaining a temperature of $(70 \pm 5)^\circ\text{C}$.

5.2 A tank equipped with a cooling system capable of maintaining a temperature of $15^\circ\text{C} \pm 5^\circ\text{C}$ and a flat base comprising small non-oxidising and non-absorbent supports for the specimens.

5.3 A weighing instrument with an accuracy of at least 0,01% of the mass to be weighed.

5.4 A desiccator.

5.5 Demineralised water

5.6 A linear measuring device with an accuracy of 0,5 mm (for the flexural measurement).

6 Preparation of specimen

6.1 Sampling

Sampling is not the responsibility of the test laboratory except where specially requested.

Two sets of at least 7 test specimens which are considered representative of the body of agglomerated stone being tested shall be selected from a homogeneous batch. One specimen set is used as control by the determination of both mass and flexural strength according to EN 14617-2 before the thermal shock test, while on the other one both the mass and flexural strength according to EN 14617-2 shall be determined after the thermal shock cycles. The specimens should be carefully observed and all alterations, such as cracks, holes, etc., noticed before and after the thermal shock cycles.

6.2 Dimensions of the test specimens

The test specimens shall be randomly selected from a homogeneous batch, having surface finish, dimension and tolerances according to 6.2.2 of EN 14617-2:2004.

6.3 Drying the specimens

The specimens are dried at a temperature of $(70 \pm 5)^\circ\text{C}$ until a constant mass (m_0) is reached. This is attained when the difference in mass between two weighings performed at an interval of (24 ± 2) h is less than 0,1% of the first of these two masses. The dry mass is determined after the specimens have been cooled at room temperature in a desiccator. This is to be regarded as the initial value (m_0).

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7 Procedure

7.1 Control measurements before cycling

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The dried specimens are visually inspected and compared to the reference specimen. All alterations such as cracks, holes, etc. are recorded. Then, their mass (m_0) shall be measured and the flexural strength determined according to EN 14617-2. This is to be regarded as the initial value (R_f).

7.2 Description of the cycles

The dried specimens are subjected to changes of temperature according to the following procedure:

(18 ± 1) h in a ventilated oven at $(70 \pm 5)^\circ\text{C}$, followed immediately by $(6 \pm 0,5)$ h completely submerged in distilled or demineralised water whose temperature is $(15 \pm 5)^\circ\text{C}$.

Both in the oven and in the water container, the specimens are placed on the supports at a distance of at least 50 mm from one another and from the wall.

In the water container, the specimens are placed on supports located at the bottom of the container which has been filled with distilled or demineralised water to such a height that the water level above the specimens is (60 ± 10) mm.

The procedure described above constitutes one cycle and shall be repeated for 20 cycles.

EN 14617-6:2005 (E)**7.3 Control measurements after cycling**

After the 20th cycle the specimens are dried to constant mass at $(70 \pm 5)^\circ\text{C}$ according to 6.3 and weighed (m_f). Then they are visually inspected and compared to the reference specimen. All alterations are recorded. Finally, the mass (m_f) shall be measured and flexural strength determined according to EN 14617-2 (R_{sf}).

8 Expression of results

For each specimen:

8.1 Describe the modifications observed visually by comparison with the reference specimen, such as:

- change of colour, appearance of spots
- swelling
- cracking
- scaling or exfoliation

8.2 Calculate the change in mass to the nearest 0,01% according to the formula:

$$\Delta m\% = \frac{m_0 - m_f}{m_0} \times 100$$

8.3 Calculate the change in flexural strength to the nearest 0,1% according to the formula:

$$\Delta R_{f,20}\% = \frac{R_f - R_{sf}}{R_f} \times 100$$

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9 Test report

The test report shall contain the following information :

- a) unique identification number of this report;
- b) name and address of testing laboratory and the address where the test was carried out if it is different from the test laboratory;
- c) name and address of client;
- d) 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
- e) date of delivery of the samples;
- f) date when the specimens were prepared and the date of testing;
- g) number of specimens in the sample;
- h) dimensions of the specimens;

- i) selected test temperature (70°C)
- j) any observed alteration for each specimen;
- k) percentage change in mass for each specimen and the mean percentage change in mass;
- l) percentage change in flexural strength for each specimen and the mean percentage change in flexural strength;
- m) statement on measurement uncertainty (where appropriate);
- n) all deviation from the standard and their justification;
- o) remarks.

The test report shall contain the signatures and roles of those responsible for the testing and the date of issue of the report. It shall also state that the report shall not be partially reproduced without written consent of the test laboratory.

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