SLOVENSKI STANDARD
SIST EN 14617-10:2005

01-julij-2005

Aglomeriran kamen - Preskusne metode - 10. del: Ugotavljanje kemijske odpornosti

Agglomerated stone - Test methods - Part 10: Determination of chemical resistance

Künstlich hergestellter Stein - Prüfverfahren - Teil 10: Bestimmung der chemischen Beständigkeit

Pierre agglomérée - Méthodes d'essai - Partie 10: Détermination de la résistance chimique

Ta slovenski standard je istoveten z: **EN 14617-10:2005**

ICS:

91.100.15	Mineralni materiali in izdelki	Mineral materials and products

SIST EN 14617-10:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14617-10

March 2005

ICS 91.100.15

English version

Agglomerated stone - Test methods - Part 10: Determination of chemical resistance

Pierre agglomérée - Méthodes d'essai - Partie 10: Détermination de la résistance chimique

Künstlich hergestellter Stein - Prüfverfahren - Teil 10: Bestimmung der chemischen Beständigkeit

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.

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

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

Contents

Foreword

This document (EN 14617-10:2005) 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.

1 Scope

This document specifies a method for determination of the chemical resistance and the resistance to stains of agglomerated stones (see EN 14618) with polished surface after a prolonged contact with chemical materials.

NOTE It is reminded that the agglomerated stone containing calcium carbonate aggregates are sensitive to any acid attack.

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 resistance to a chemical attack is the characteristic which defines the behaviour of a floor/wall covering material in contact with chemically aggressive agents, that is potentially able, to react with the surface itself, corroding it, penetrating it permanently or anyway altering the visible aspect.

The deteriorating action of the chemical aggressive can generate two different effects:

- a real chemical action, according to which the alteration of the surface is due to the chemical reaction between the aggressive agent and some constituents of the surface itself;
- a physical absorbing action, in accordance to which the aggressive agent is able to penetrate the surface, so that the removal is extremely difficult or not possible.

Both these actions can involve a modification of the visible appearance of the surface of the chemical attacked material, but only in the first case the damage can introduce also a modification in the physical and mechanical properties of the material itself.

4 Determination of the chemical resistance

4.1 Chemical reagents

4.1.1 Water solution containing hydrochloric acid solution, 50 % (*V/V*), prepared from N hydrochloric acid solution;

4.1.2 Sodium hydroxide in a 50 % (*V/V*) water solution, prepared from a normal water sodium hydroxide not carbonated solution

4.2 Apparatus

Glossmeter able to measure with accuracy and precision of 10% the brightness degree of the surface.

The glossmeter shall measure the reflection of a light ray incident on a surface; the reflection degree is given by the amount of light specularly reflected in a point of the surface with relationship to the amount of light reflected by the

standard glass plate. A light source representing the average daylight shall be used, such as the source CIE[1] D 65, with the lighting intensity allowed by the glossmeter calibration.

The glossmeter shall, at least, be equipped with two optical systems placed at 60° and 20° angles.It allows an efficient measurement of the different reflection directions as the 60° angle covers a range of reflection degrees from low to high, while the 20° angle allows to measure with greater accuracy the higher reflection directions (see Annex A).

4.3 Preparation of the specimens

For each type of material to be tested four samples shall be prepared, with polished surface[2] (at least 70 mm x 70 mm) on which a containing ring (40 mm - 50 mm diameter) is glued. The ring is made by chemically resistant material, for example silicone.

The surface to be measured shall be flat in order to permit the positioning of the instrument sensor in contact with the material to be tested. Before testing the surface under test shall be cleaned from any possible wax or finishes treatment layers by ketone or other appropriate solvents.

4.4 Test procedure

The procedure consists of positioning the instrument sensor as much as possible in contact with the surface to be measured and of reading the number reported on the display which defines the reflection degree as reference value of the examined surface.

The test is carried out at ambient temperature (23 ± 5)°C.

On each of the four specimens is necessary to carry out the reflection measurement at least in five different points and calculate the average value (M_1) of each specimen.

On two specimens placed horizontally within the ring, pour 4 or 5 milliliters of hydrochloric acid solution (4.1.1), avoiding possible overflowing.

Repeat this operation on other two specimens using sodium hydroxide solution (4.1.2).

Keep the specimens, protected with a polyethylene film, on a table for all the time requested for the test.

After 1 hour ± 5 minutes draw one specimen containing hydrochloric acid and one containing sodium hydroxide respectively, wash them carefully with water and also remove the ring; at the end dry them with soft cellulose paper. After 8 hours ± 30 minutes draw the two other specimens and carry out the same washing and drying procedure.

Repeat the reflection measurement on the four specimens at least in 5 points and calculate the average value for each specimen and the standard deviation of the 5 values: the reflection measurements are carried out with the glossmeter under incident light at 60°.

4.5 Expression of the results

a) The effects of the chemical attack are expressed as loss of the reference reflection value.

This loss is calculated as percentage of reflection of the material tested with respect to the reference value.

A class of resistance to acids and alkali shall be attributed as follows:

---

[1] Commission Internationale de l'Eclairage (Central Bureau, Kagelpasse 27, A-1030 Vienna-AT)

[2] Obtained by polishing with abrasive grit grain size F500 according to ISO 8486-2, *Bonded abrasives – Determination and designation of grain size distribution: Part 2: monogrits F230 to F1200* (1996).

- C_4: materials, which keep at least 80% of the reflection reference value after 8 h ± 30 minutes of acid or basic attack (or if only in one specimen the attack is between 60% and 80%);
- C_3: materials, which keep between 60% and 80% of the reflection reference value after 8 h ± 30 minutes of acid attack and 1 h ± 5 minutes of basic attack;
- C_2: materials, which keep between 60% and 80% of the reflection reference value after 8 h ± 30 minutes of basic attack and 1 h ± 5 minutes of acid attack;
- C_1: materials, which keep less than 60% of the reflection reference values (after 8 h ± 30 minutes of basic or acid attack).

b) The values are calculated on the basis of 5 measurement and the dispersion declared.

4.6 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 (if relevant) and the date of testing;

h) number of specimens in the sample;

i) dimensions of the specimens;

j) water solutions preparation and concentration and chemical agents used;

k) type of glossmeter used and the kind and intensity of the light source;

l) reflection directions of the light;

m) results obtained, using the following table:

Chemical resistance	Sample N	Reference value	Class
- Hydrochloric acid solution			
- Sodium hydroxide solution			

n) statement on measurement uncertainty (where appropriate);

o) all deviations from the standard and their justification;

p) remarks.

The test report shall contain the signature(s) and role(s) of the person(s) 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 the written consent of the test laboratory.