

Natural stone test methods - Determination of sensitivity to changes in appearance produced by thermal cycles

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Natural stone test methods - Determination of sensitivity to changes in appearance produced by thermal cycles

Méthodes d'essai pour pierres naturelles -
Détermination de la sensibilité aux changements
d'aspect induits par des cycles thermiques

Prüfverfahren für Naturwerkstein - Bestimmung der
Empfindlichkeit gegen Änderungen des äußeren
Erscheinungsbildes durch thermische Zyklen

This European Standard was approved by CEN on 19 November 2018.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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Contents

Page

European foreword	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Symbols and abbreviations	5
5 Principle	5
6 Apparatus	5
7 Preparation of specimens	5
7.1 Sampling	5
7.2 Test specimens	6
7.2.1 Surface finish	6
7.2.2 Dimensions	6
8 Test procedures	6
8.1 Control measurements before cycling	6
8.2 Description of the cycles	6
8.3 Control measurements after cycling	6
9 Expression of results	9
10 Test report	9
Annex A (informative) Examples of evaluation codes for changes of aspect	11
Annex B (informative) Adapted thermal shock test	17

European foreword

This document (EN 16140:2019) 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of an identical text or by endorsement, at the latest by July 2019, and conflicting national standards shall be withdrawn at the latest by July 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document will supersede EN 16140:2011.

In comparison with the previous edition, the changes concern essentially the interpretation of the modification of aspect after the thermal cycles.

In Annex A, the figures are completed and clarified.

This European Standard is one of the series of standards for tests on natural stone.

Test methods for natural stone consist of the following standards:

- EN 1925, *Natural stone test methods — Determination of water absorption coefficient by capillarity*;
- EN 1926, *Natural stone test methods — Determination of uniaxial compressive strength*;
- EN 1936, *Natural stone test methods — Determination of real density and apparent density, and of total and open porosity*;
- EN 12370, *Natural stone test methods — Determination of resistance to salt crystallization*;
- EN 12371, *Natural stone test methods — Determination of frost resistance*;
- EN 12372, *Natural stone test methods — Determination of flexural strength under concentrated load*;
- EN 12407, *Natural stone test methods — Petrographic examination*;
- EN 12440, *Natural stone — Denomination criteria*;
- EN 12670, *Natural stone — Terminology*;
- EN 13161, *Natural stone test methods — Determination of flexural strength under constant moment*;
- EN 13364, *Natural stone test methods — Determination of the breaking load at dowel hole*;
- EN 13373, *Natural stone test methods — Determination of geometric characteristics on units*;
- EN 13755, *Natural stone test methods — Determination of water absorption at atmospheric pressure*;
- EN 14066, *Natural stone test methods — Determination of resistance to ageing by thermal shock*;
- EN 14146, *Natural stone test methods — Determination of the dynamic modulus of elasticity (by measuring the fundamental resonance frequency)*;

- EN 14147, *Natural stone test methods — Determination of resistance to ageing by salt mist*;
- EN 14157, *Natural stone test methods — Determination of the abrasion resistance*;
- EN 14158, *Natural stone test methods — Determination of rupture energy*;
- EN 14231, *Natural stone test methods — Determination of the slip resistance by means of the pendulum tester*;
- EN 14579, *Natural stone test methods — Determination of sound speed propagation*;
- EN 14580, *Natural stone test methods — Determination of static elastic modulus*;
- EN 14581, *Natural stone test methods — Determination of linear thermal expansion coefficient*;
- EN 16301, *Natural stone test methods — Determination of sensitivity to accidental staining*.

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

1 Scope

This document specifies a method to assess possible alterations of natural stones (mainly visible sensitivity to oxidation processes) under the effect of sudden changes in temperature (thermal shock).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 ISO 11664-2, *Colorimetry - Part 2: CIE standard illuminants (ISO 11664-2)*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Symbols and abbreviations

e Thickness of the test specimens, in mm

5 Principle

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 $(20 \pm 5) ^\circ\text{C}$.

6 Apparatus

- 6.1 A ventilated oven capable of maintaining a temperature of $(70 \pm 5) ^\circ\text{C}$.
- 6.2 A covered tank with a flat base, comprising small non-oxidising and non-absorbent supports for the specimens.
- 6.3 A digital camera of a minimum 2,5 MPixels, uncompressed or a scanner, with a sufficient resolution.
- 6.4 Daylight or artificial light D65 (6 500 K) according to EN ISO 11664-2.
- 6.5 A magnifying glass of at least five increases.

7 Preparation of specimens

7.1 Sampling

The sampling is not the responsibility of the test laboratory except where specially requested. At least seven specimens shall be selected from a homogeneous batch. One of these specimens is used as reference specimen and is not subjected to any tests.

The samples shall be representative of the stone and avoid irrelevant particularities.