



SLOVENSKI STANDARD

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Preskušanje naravnega kamna - Ugotavljanje odpornosti proti staranju s temperaturnim šokom

Natural stone test methods - Determination of resistance to ageing by thermal shock

Prüfverfahren für Naturstein - Bestimmung des Widerstandes gegen Alterung durch Wärmeschock

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ICS:

73.020	Rudarstvo in kamnolomsko izkopavanje	Mining and quarrying
91.100.15	Mineralni materiali in izdelki	Mineral materials and products

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ICS 73.020; 91.100.15

Will supersede EN 14066:2003

English Version

Natural stone test methods - Determination of resistance to ageing by thermal shock

Prüfverfahren für Naturstein - Bestimmung des Widerstandes gegen Alterung durch Wärmeschock

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 246.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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Foreword

This document (prEN 14066:2007) has been prepared by Technical Committee CEN/TC 246 “Natural stones”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14066:2003.

This draft standard is one of the series of draft standards for tests on natural stone.

Test methods for natural stone consist of the following parts:

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 crystallisation*

EN 12372, *Natural stone test methods – Determination of flexural strength under concentrated load*

EN 12407, *Natural stone test methods – Petrographic examination*

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 13755, *Natural stone test methods – Determination of water absorption at atmospheric pressure*

EN 13373, *Natural stone test methods – Determination of geometric characteristics on units*

EN 13919, *Natural stone test methods – Determination of resistance to ageing by SO₂ action in the presence of humidity*

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 14205, *Natural stone test methods – Determination of Knoop hardness*

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*

No existing European Standard is superseded.

1 Scope

This European Standard specifies a method to assess possible modifications of natural stones under the effect of sudden changes in temperature (thermal shock).

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 14146, *Natural stone test methods - Determination of the dynamic modulus of elasticity (by measuring the fundamental resonance frequency)*.

3 Principle

After drying at (105 ± 5) °C until constant mass is attained, the specimens are subjected to successive cycles, each formed by drying at (105 ± 5) °C followed by immediate immersion in water at (20 ± 5) °C.

4 Symbols and abbreviations

m_0 - Mass of the dried specimen before the test, in grams,

m_f - Mass of the dried specimen after the test, in grams,

Δm % - Change in mass of the dried specimen, expressed as a percentage,

Ed_0 - Dynamic elastic modulus before the test, in Megapascals,

Ed_f - Dynamic elastic modulus after the test, in Megapascals,

ΔEd % - Change in dynamic elastic modulus of the dried specimen, expressed as a percentage.

5 Apparatus

5.1 A ventilated oven capable of maintaining a temperature of (105 ± 5) °C.

5.2 A covered tank with 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 device for measuring dynamic elastic modulus in accordance with EN 14146.

6 Preparation of specimens

6.1 Sampling

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

At least 13 specimens shall be selected from an homogeneous batch. One specimen is used as reference specimen and is not subjected to any tests. Carefully observe the specimens and note all alterations, such as cracks, holes, etc. In cases where the final use of the stone is known the major faces of the specimens shall have the same orientation of the face as in use.

6.2 Dimensions of the test specimens

The test specimens shall be $(70 \times 280 \times 20 \text{ mm}) \pm 2\text{mm}$. In cases where changes in visual appearance are important other specimen sizes may be used.

At least one of the faces shall be either polished or at least finished as smoothly as can be achieved in normal processing if polishing is not possible. The surface finish of the other face and sides shall be sawn, honed or polished.

6.3 Putting reference marks on the specimens

To ensure that the measurements of the dynamic elastic modulus performed before and after the thermal shock test are done at the same points, indelible marks in the form of points are made on the relevant faces of the specimens, to show the location of emitter and receiver.

Indelible lines are traced to show the location of the axis of the two supports on which the specimens will be placed during the determination of the dynamic elastic modulus.

6.4 Drying the specimens

The specimens are dried at a temperature of $(105 \pm 5) ^\circ\text{C}$ until a constant mass (m_0) is reached. This is attained when the difference in mass between two successive weighings performed at an interval of $(24 \pm 2) \text{ h}$ 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).

7 Test procedure

7.1 Control measurements before cycling

The dried specimens are visually inspected and compared to the reference specimen. All differences between specimens such as cracks, holes, etc. are recorded. Then the dynamic elastic modulus of each specimen is measured according to EN 14146. This is to be regarded as the initial value (Ed_0).

7.2 Description of the cycles

The dried specimens are subjected to changes of temperature according to the following procedure: $(18 \pm 1) \text{ h}$ in a ventilated oven at $(105 \pm 5) ^\circ\text{C}$; immediately followed by $(6 \pm 0,5) \text{ h}$ completely submerged in distilled or demineralised water, whose temperature before the immersion of the specimens is $(20 \pm 5) ^\circ\text{C}$.

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 $(60 \pm 10) \text{ mm}$. The procedure described above constitutes