



SLOVENSKI STANDARD

SIST EN 772-18:2011

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Nadomešča:
SIST EN 772-18:2000

Metode preskušanja zidakov - 18. del: Ugotavljanje zmrzlinke odpornosti apeno peščenih zidakov

Methods of test for masonry units - Part 18: Determination of freeze-thaw resistance of calcium silicate masonry units

Prüfverfahren für Mauersteine - Teil 18: Bestimmung des Frostwiderstandes von Kalksandsteinen

Méthodes d'essai des éléments de maçonnerie - Partie 18: Détermination de la résistance au gel/dégel des éléments de maçonnerie en silico-calcaire

Ta slovenski standard je istoveten z: EN 772-18:2011

ICS:

91.100.15 Mineralni materiali in izdelki Mineral materials and products

SIST EN 772-18:2011

en,fr,de

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EUROPEAN STANDARD

EN 772-18

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English Version

Methods of test for masonry units - Part 18: Determination of freeze-thaw resistance of calcium silicate masonry units

Méthodes d'essai des éléments de maçonnerie - Partie 18:
Détermination de la résistance au gel/dégel des éléments
de maçonnerie en silico-calcaire

Prüfverfahren für Mauersteine - Teil 18: Bestimmung des
Frostwiderstandes von Kalksandsteinen

This European Standard was approved by CEN on 25 December 2010.

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.

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

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Foreword

This document (EN 772-18:2011) has been prepared by Technical Committee CEN/TC 125 "Masonry", the secretariat of which is held by BSI.

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 November 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

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

This document supersedes EN 772-18:2000.

Annex A provides details of significant technical changes between this European Standard and the previous edition.

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

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EN 772-18:2011 (E)**1 Scope**

This European Standard specifies a method of determining the freeze-thaw resistance of calcium silicate masonry units.

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 771-2:2003, *Specification for masonry units — Part 2: Calcium silicate masonry units*

EN 772-1, *Methods of test for masonry units — Part 1: Determination of compressive strength*

3 Principle

Calcium silicate masonry units are conditioned by immersion in water in a prescribed way and are then subjected to repeated cycles of freezing and thawing. Damage is assessed visually. For samples where visual damage is apparent the compressive strength of the units can be compared with similar samples that have not been subjected to the freeze-thaw regime.

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4 Symbols

- R_c is the reduction in strength (%); [SIST EN 772-18:2011](https://standards.iteh.ai/catalog/standards/sist/cec680bb-954a-4e64-a84b-9a5b190c/sist-en-772-18-2011)
<https://standards.iteh.ai/catalog/standards/sist/cec680bb-954a-4e64-a84b-9a5b190c/sist-en-772-18-2011>
- f_n is the compressive strength of the sample that is set aside, (N/mm²);
- f_f is the compressive strength of the sample that is subjected to the freeze-thaw cycling, (N/mm²);
- N is the total number of freeze-thaw cycles.

5 Apparatus

Freezing cabinet, of net effective volume at least five times that of the volume of the samples to be tested and which is capable of developing an even air temperature of -15 °C in between 3 h and 5 h.

6 Sampling**6.1 Sampling**

The method of sampling shall be stated in the test report. The minimum number of specimens shall be as given in 6.2 below, but a larger minimum number may be specified in the product specification, in which case that larger number shall be used.

6.2 Specimens for freeze-thaw testing

For units with a length \geq 500 mm and/or height \geq 300 mm, a total of three units is required from which representative portions may be cut in accordance with B.3 of EN 771-2:2003.

For units with a length < 500 mm and a height < 300 mm, the test shall be carried out on at least six whole units or on six specimens each of which is obtained by cutting in accordance with B.3 of EN 771-2:2003.

6.3 Specimens for compressive strength testing

Sufficient specimens of either type, in accordance with EN 772-1, shall be set aside and stored for compressive strength testing.

7 Procedure

Mark any damage that may have been sustained by the specimens prior to the test.

Immerse the specimens in water at $20\text{ °C} \pm 5\text{ °C}$ oriented so that the longest dimension of each is in the vertical plane. Initially immerse to about one quarter of their height and in such a way that water can circulate freely on all sides.

After 1 h, immerse the specimens to about half the height of the specimens and after a further 1 h to three-quarters of their height.

After 24 h, immerse the specimens fully in water. After a further 24 h remove them from the water or drain the water and then commence the freezing cycle with the specimens in the same position.

Regulate the air temperature in the freezing cabinet so that it drops gradually in 3 h to 5 h to -15 °C . Maintain this temperature for at least 2 h. After the freezing cycle, thaw the specimens by immersing them fully in water at a temperature of $20\text{ °C} \pm 5\text{ °C}$ for at least 1 h.

Subject the specimens to the number of freeze-thaw cycles corresponding to the freeze-thaw category specified by the manufacturer, as described above.

Note any visible damage to the specimens under the following categories:

- loss of flatness, e.g. bulging of the surface of the specimens;
- cavities in excess of 5 mm diameter;
- cracking of the specimen (e.g. surface cracking).

Ignore all previously marked damage. Evaluation of damage due to freezing and thawing shall be done only on the sides of the specimens that were not created by cutting.

If the specimens do not exhibit any damage in any of the above-mentioned categories the testing may be terminated.

When damage is noted, determine the compressive strength of the specimens that have been subjected to the freeze-thaw cycles and of those which have been set aside (see Clause 6) in accordance with EN 772-1.

8 Evaluation of results

Report any visual damage following the freeze thaw cycling. Calculate the reduction in compressive strength caused by the freeze-thaw cycling of the specimens where some or all were damaged from the untreated specimens set aside (see 6.2) as follows:

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$$R_c = \frac{f_n - f_f}{f_n} \times 100(\%)$$

If the specimens do not exhibit any damage in any of the above mentioned categories and the testing is terminated R_c may be taken as $R_c < 20\%$ (by proxy visual assessment of damages, without calculation)

9 Test report

The test report shall include:

- a) name, title and date of issue of this European Standard;
- b) name of the organization that carried out the sampling and the method used;
- c) date of testing;
- d) type, origin and designation of the masonry unit by reference to EN 771-2 including whether facing or non-facing;
- e) number of specimens in the sample;
- f) date of delivery of the specimens to the testing laboratory;
- g) date of preparation of the specimens and the date of test;
- h) the total number of freeze –thaw cycles to which the specimens were subjected;
- i) a description of any visual damage, after freeze-thaw cycling, in accordance with Clause 7 or a statement that no damage has occurred;
- j) mean compressive strength of the specimens that have been subjected to freeze- thaw cycling, if necessary;
- k) mean compressive strength of the specimens that were set aside, if necessary;
- l) reduction in mean compressive strength, expressed as a percentage, to the nearest percent and whether the result was achieved by calculation or by proxy visual assessment of damages;
- m) remarks, if any.