SLOVENSKI STANDARD
SIST EN 1052-1:1999

01-januar-1999

Metode preskušanja za zidovje - 1. del: Ugotavljanje tlačne trdnosti

Methods of test for masonry - Part 1: Determination of compressive strength

Prüfverfahren für Mauerwerk - Teil 1: Bestimmung der Druckfestigkeit

Méthodes d'essai de la maçonnerie - Partie 1: Détermination de la résistance a la compression

Ta slovenski standard je istoveten z: **EN 1052-1:1998**

ICS:

91.080.30 Zidane konstrukcije Masonry

SIST EN 1052-1:1999 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1052-1

September 1998

ICS 91.080.30

Descriptors: masonry work, structural members, mechanical tests, determination, compressive strength

English version

Methods of test for masonry - Part 1: Determination of compressive strength

Méthodes d'essai de la maçonnerie - Partie 1: Détermination de la résistance à la compression

Prüfverfahren für Mauerwerk - Teil 1: Bestimmung der Druckfestigkeit

This European Standard was approved by CEN on 4 September 1998.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 1052-1:1998 E

Contents Page

Foreword

This European Standard 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of an identical text or by endorsement, at the latest by March 1999, and conflicting national standards shall be withdrawn at the latest by September 2000.

This European standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports the essential requirements of the EU Construction Products Directive (89/106/EEC) and includes the performance requirements referred to in the Eurocode for masonry Structures.

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

1 Scope

This European Standard specifies a method for determining the compressive strength of masonry. Guidance is given on the preparation of the specimens, the conditioning required before testing, the testing machine, the method of test, the method of calculation and the contents of the test report.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 772-1	Methods of test for masonry units - Part 1: Determination of compressive strength
prEN 772-10	Methods of test for masonry units - Part 10: Determination of moisture content of calcium silicate and autoclaved aerated concrete masonry units
prEN 998-2	Specification for mortar for masonry - Part 2: Masonry mortar
prEN 1015-3	Methods of test for mortar for masonry - Part 3: Determination of consistence of fresh mortar (by flow table)
prEN 1015-7	Methods of test for mortar for masonry - Part 7: Determination of air content of fresh mortar
prEN 1015-11	Methods of test for mortar for masonry - Part 11: Determination of flexural and compressive strength of hardened mortar

3 Principle

The compressive strength of masonry perpendicular to the bed joints is derived from the strength of small masonry specimens, tested to destruction. The materials, construction and bonding pattern should correspond to those used in practice

The specimens are loaded uniformly in compression. The maximum load (F_{max}) achieved is recorded. The characteristic compressive strength of the masonry is derived from the strengths of the individual specimens.

If the units, or the mortar, do not achieve the exact strengths specified, then it is permissible to adjust the measured values in accordance with **Annex A** within the specified range. Any such adjustment should be clearly indicated in the test report.

4 Definitions and symbols

4.1 Definitions

For the purpose of this standard the following definitions apply:

4.1.1 masonry: An assemblage of masonry units laid in a specified bonding pattern and jointed together with mortar

4.1.2 compressive strength of masonry: The strength of masonry in compression without the effects of loading restraint, slenderness or eccentricity of loading

4.2 Symbols

A_i	is the loaded cross-section of an individual masonry specimen, (mm^2)
E	is the mean modulus of elasticity, (N/mm^2)
E_i	is the modulus of elasticity of an individual masonry specimen, (N/mm^2)
$F_{i,\,max}$	is the maximum load reached on an individual masonry specimen, (N)
f	is the mean compressive strength of the masonry, (N/mm^2)
f_i	is the compressive strength of an individual masonry specimen, (N/mm^2)
$f_{i,\,min}$	is the smallest compressive strength of an individual masonry specimen, (N/mm^2)
f_{id}	is the adjusted individual masonry compressive strength, (N/mm^2)
$f_{id,\,min}$	is the smallest adjusted compressive strength of an individual masonry specimen, (N/mm^2)
f_k	is the characteristic compressive strength of the masonry, (N/mm^2)
f_b	is the mean compressive strength of masonry units at the time of the masonry test, (N/mm^2)
f_{bd}	is the specified mean compressive strength of the masonry units, (N/mm^2)
f_d	is the mean adjusted compressive strength of the masonry, (N/mm^2)
f_m	is the mean compressive strength of the mortar at time of the masonry test, (N/mm^2)
f_{md}	is the specified mean compressive strength of the mortar, (N/mm^2)
h_s	is the height of the specimen, (mm)
h_u	is the height of the masonry unit, (mm)
l_s	is the length of the specimen, (mm)

l_u is the length of the masonry unit, (mm)

t_s is the thickness of the specimen, (mm)

t_u is the width of the masonry unit, (mm)

ε_i is the mean strain in an individual masonry specimen at one third of the maximum strength achieved.

5 Material

5.1 Masonry units

5.1.1 Sampling

All of the masonry units for individual tests and for making the masonry specimens shall be taken from the same consignment.

5.1.2 Conditioning of the units

The conditioning of masonry units shall be as specified:

Record the method of conditioning the units prior to laying. Record the age of non autoclaved concrete units at the time of testing the masonry specimens. Measure the moisture content by mass of autoclaved aerated concrete and calcium silicate masonry units in accordance with **prEN772-10**.

5.1.3 Testing

Determine the compressive strength of a sample of masonry units, using the method given in **prEN 772-1**.

> NOTE: Where the strength of the masonry units will change with time, the compressive strength test should be carried out on the same day as the masonry test.

5.2 Mortar

The mortar, its mixing procedure and its flow value shall conform with the requirements of **prEN 998-2**, unless otherwise specified, and these shall be reported in the test report.

Take samples of mortar from the mason's board to make mortar specimens and determine the flow value of fresh mortar in accordance with **prEN 1015-3**, the air-content of the fresh mortar in accordance with **prEN 1015-7** and the compressive strength of mortar in accordance with **prEN 1015-11** at the time of testing the masonry specimens

6 Apparatus

A **testing machine** that will apply load to a specimen such that displacements are uniform across the loaded surfaces. If the platens of the testing machine are shorter than the specimen to be tested, loading beams having a length greater than the length of the specimen and a depth greater than or equal to the length beyond the edge of the platens shall be used. The testing machine shall be fitted with a self-locking ball-seating.

Table 1: Requirements for testing machines

Maximum permissible repeatability of forces as percentage of indicated force %	Maximum permissible mean error of forces as percentage of indicated force %	Maximum permissible error of zero force as percentage of maximum force of range %
2,0	± 2,0	± 0,4

7 Preparation of specimens

7.1 Masonry specimens

Use at least three specimens having the sizes given in **table 2** and **figure 1**

Table 2: Small specimen sizes for testing the compressive strength of masonry

<table>
<tr><th colspan="2">Face size of unit</th><th colspan="5">Masonry specimen size</th></tr>
<tr><th></th><th></th><th>Length</th><th colspan="2">Height</th><th>Thickness</th></tr>
<tr><th>l_u (mm)</th><th>h_u (mm)</th><th>l_s</th><th colspan="2">h_s</th><th>t_s</th></tr>
<tr><td rowspan="2">≤300</td><td>≤150</td><td rowspan="2">≥ (2 x l_u)</td><td>≥ $5h_u$</td><td rowspan="4">≥3 t_s and ≤ $15t_s$ and ≥ l_s</td><td rowspan="4">≥t_u</td></tr>
<tr><td>> 150</td><td>≥ $3h_u$</td></tr>
<tr><td rowspan="2">> 300</td><td>≤150</td><td rowspan="2">≥ (1,5 x l_u)</td><td>≥ $5h_u$</td></tr>
<tr><td>> 150</td><td>≥ $3h_u$</td></tr>
</table>

If the expected height of the specimen in accordance with **table 2** is greater then 1000 mm, it is allowable to reduce the dimensions of the specimen (except for those made with units having perforations perpendicular to the direction of loading) by cutting the units used to make the bottom and the top courses provided that:

a) l_s ≥400 mm and $l_s \geq l_u$