



SLOVENSKI STANDARD

SIST EN 13069:2006

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Chimneys - Clay/ceramic outer walls for system chimneys - Requirements and test methods

Abgasanlagen - Keramik-Außenschalen für Systemabgasanlagen - Anforderungen und Prüfungen

ITeH STANDARD PREVIEW

Conduits de fumée - Enveloppes extérieures en terre cuite/céramique pour systèmes de conduits de fumée - Prescriptions et méthodes d'essai

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English Version

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This European Standard was approved by CEN on 27 October 2004.

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.

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

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Foreword

This document (EN 13069:2005) has been prepared by Technical Committee CEN/TC 166 “Chimneys”, 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of an identical text or by endorsement, at the latest by January 2006, and conflicting national standards shall be withdrawn at the latest by April 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 89/106/EEC.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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.

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1 Scope

This European Standard specifies the performance requirements for factory-made clay/ceramic chimney outer wall elements used to form the outer walls of chimneys and which are used in combination with flue liners in site. It applies to clay/ceramic chimney outer wall elements with solid walls or walls with vertical perforations (see Figure 1) which have square, rectangular or circular passages. Testing, making and inspection requirements are covered by this standard.

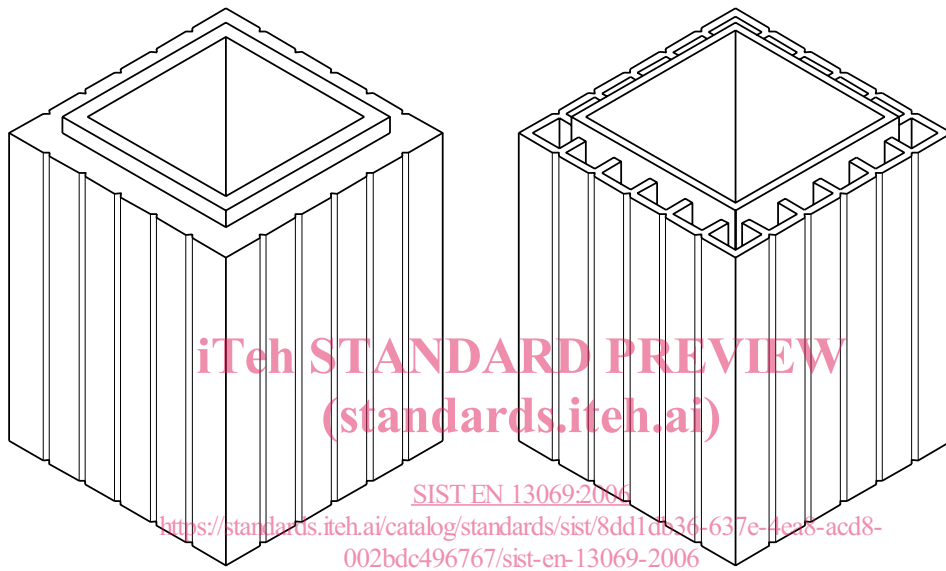


Figure 1 - Examples of clay/ceramic chimney outer wall elements with and without vertical perforations

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 312, *Particleboards - Specifications*.

EN 1443:2003, *Chimneys - General requirements*.

EN 14297: 2004, *Chimneys – Freeze-thaw resistance test method for chimney products*.

EN ISO 7500-1, *Metallic materials - Verification of static uniaxial testing machines - Part 1: Tension/compression testing machines -- Verification and calibration of the force-measuring system (ISO 7500-1:2004)*.

ISO 2859-1, *Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptable quality limit (AQL) for lot-by-lot inspection*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1443:2003 and the following apply.

3.1

Nominal size

numerical designation of size which is a convenient round number equal to or approximately equal to either:

- the internal diameter in millimetres of the circular flue passage, or
- the internal width in millimetres of blocks with square section flues, or
- the internal width and breadth in millimetres of the internal transverse dimensions of outer walls with rectangular flueways

3.2

Nominal height

numerical designation of the height in millimetres of a standard outer wall excluding any projecting spigot, which is a convenient round number.

4 Materials

4.1 Outer walls

Clay/ceramic outer walls elements shall be manufactured from suitable clay/ceramic materials which, when fired, meet the performance requirements given in this standard.

5 Tolerances on dimensions

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5.1 Internal transverse dimensions

When tested in accordance with 14.1, the internal diameter of outer walls with circular flues measured on any diameter shall not deviate more than ± 3 % of the manufacturer's stated nominal internal diameter. For outer walls with square and rectangular passages, the tolerances on the internal widths and breadths shall not deviate more than ± 3 % of the manufacturer's stated nominal internal dimension of the side.

NOTE Corners of the passages may be rounded.

5.2 Height

When tested in accordance with 14.2, the height of an outer wall shall not deviate more than ± 3 % of the manufacturer's stated nominal height subject to a maximum value of 10 mm.

5.3 Straightness

When tested in accordance with 14.3, the permissible deviation from straightness of straight outer walls shall be ± 1 % of the test length.

5.4 Squareness of ends

When tested in accordance with 14.4, the permissible deviation from square of the ends of straight clay/ceramic outer wall elements shall be not greater than an angle of slope 30 mm/m.

5.5 Squareness of corners and flatness of walls

When tested in accordance with 14.5, the permissible deviation from square of the corners and flatness of walls for square or rectangular shape straight clay/ceramic outer wall elements, shall be not greater than 5 % of the manufacturer's stated nominal internal width or breadth.

5.6 Joints

The design and dimensions of the joints shall be as specified by the manufacturer to provide an adequate joint.

6 Compressive strength

6.1 Straight outer walls

When tested in accordance with 14.6 and 14.7.3.2.2, straight outer walls shall withstand an intensity of loading of 10 MN/m².

6.2 Minimum load for outer wall elements with inspection opening sections

When tested in accordance with 14.6, the minimum load shall be as given in Table 1.

Table 1 — Minimum load
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Height of chimney (m)	Minimum load (kN)
H ≤ 12,5	25
12,5 < H ≤ 25	50
25 < H ≤ 50	100

For chimneys with area greater than 0,04 m² the following equation shall be used:

$$F = \chi \cdot H \cdot G / 100 \tag{1}$$

F = minimum load (kN)

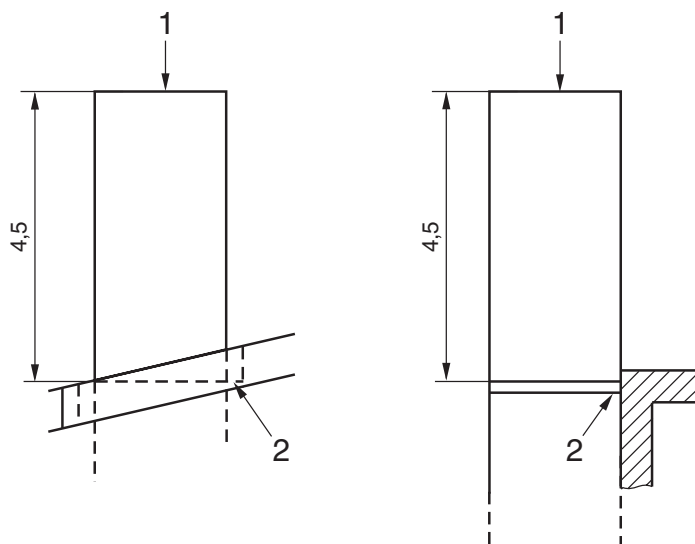
χ = safety factor = 5

H = height of chimney (m)

G = mass per metre (kg/m)

7 Flexural strength under wind loading

Outer wall elements to this standard are not tested for stability under wind loading. The maximum free standing height of outer wall elements to this standard shall be 4,5 times the least lateral overall external dimension of the outer wall element from the last point of lateral support (see Figure 2). The manufacturer shall declare the smallest lateral dimension.

**Key**

- 1 Top of chimney excluding any terminal or chimney pot
- 2 Last point of support

Figure 2 — Explanation of last point of support
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8 Thermal shock

When tested in accordance with 14.7.3.2, clay/ceramic straight outer wall elements shall withstand an intensity of loading of 10 MN/m².
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9 Resistance to fire**9.1 External to external**

The performance criteria of integrity and insulation are declared as EI for the exposure outside to outside.

Examples are given in Table 2.

NOTE For fire classification see EN 13501-2 clause 7.5.11.

Table 2 — Fire resistance performance classes

Fire resistance performance classes	Duration in minutes
EI 000	$0 \leq EI\ 000 < 30$
EI 030	$30 \leq EI\ 030 < 60$
EI 060	$60 \leq EI\ 060 < 90$
EI 090	$90 \leq EI\ 090 < 120$
EI 120	$120 \leq EI\ 120$

10 Thermal resistance

The values of thermal resistance of outer walls shall be declared by the manufacturer for a flue temperature of 200°C or calculated by the methods given in Annex A for the same temperature.

11 Water absorption and bulk density

11.1 General

The outer wall body shall be tested for either water absorption or bulk density for production control.

11.2 Water absorption

When tested in accordance with 14.8, the mean water absorption of five test specimens from new production of outer walls shall not vary more than $\pm 2,5\%$ from the mean value obtained for five test specimens taken from outer walls which have been subjected to the thermal type test.

11.3 Bulk density

When tested in accordance with 14.9, the mean bulk density of five test specimens from new production of outer walls shall not vary more than $\pm 100\text{ kg/m}^3$ from the mean value obtained for five test specimens taken from outer walls which have been subjected to the thermal type test.

12 Resistance to freeze-thaw

The manufacturer shall declare the freeze/thaw resistance in accordance with EN 14297. The product shall not present any damage of type 7, 8, 9 and 10 in accordance with EN 14297, Table 1.

13 Evaluation of conformity

13.1 General

The conformity of the outer wall elements to the requirements of this standard and with the stated values (including classes) shall be demonstrated by:

- initial type testing
- factory production control by the manufacturer, including product assessment.

For the purposes of testing, the outer wall element may be grouped into families, where it is considered that the selected property/properties is/are common to all the outer wall elements within that family.

13.2 Initial type testing

Type tests relating to material composition shall be performed initially together with factory production control tests as given in Table 3. One test shall be carried for each requirement.

All thermal testing shall be carried out on one size of outer walls for each geometrical configuration, e.g. circular, square, rectangular. For circular outer walls the size to be tested shall be 200mm \pm 50mm internal diameter. For other geometric configurations the outer walls shall have an equivalent cross section area range.

13.3 Further type tests

Type tests shall be performed when a change is made either in material composition, processing technique or to the design or method of manufacture of the outer wall, but they may be performed more frequently by incorporation into a plant for monitoring the consistency of manufacture (see Table 3).

Table 3 — Factory production control, initial type testing and type tests

Item	Relevant requirements clauses	
	Factory production control 13.1 and 13.4	Initial type testing and type tests 13.1, 13.2 and 13.3
Straight Outer walls	5.1, 5.2, 5.4, 5.5 and 11	6.1, 7, 8, 9, 10 and 12

13.4 Factory production control

To achieve compliance with this standard the manufacturer shall establish and maintain an effective documented quality system.

Factory production control tests are carried out following manufacture to monitor the quality of product (see Table 3).

Sampling and testing of any batch shall be completed prior to removal from the works and shall be in accordance with ISO 2859-1 at an AQL of 10 % and inspection level S2. Isolated batches of units shall be assessed in accordance with tightened inspection procedures, with a maximum batch size of 1200 (see Annex B).

Batches rejected under the sampling procedure specified in 16.2 may be resubmitted once, after removal of units with previously undetected visible defects, under the tightened inspection procedures, in respect only of the defect that caused initial rejection.

NOTE A quality system assessed by a certification body which complies with the requirements of EN 45012 can be applied to ensure that the requirements of EN ISO 9001 and Clause 16 are complied with.

14 Test methods

14.1 Internal transverse dimensions

For square and rectangular outer walls the maximum and minimum width/breadth shall be those calculated from the tolerances given in 5.1.

For circular section outer walls, whether the maximum and minimum diameters shall be those calculated from the tolerances given in 5.1 or the test also may be carried out using two gauges whose diameters are set at the minimum and maximum diameters. The minimum gauge shall be able to be turned through 360° within the ends of the flue. The maximum gauge shall not be able to enter the flue when tested through a rotation of 360°.

Both ends of the outer walls shall be measured.

14.2 Height

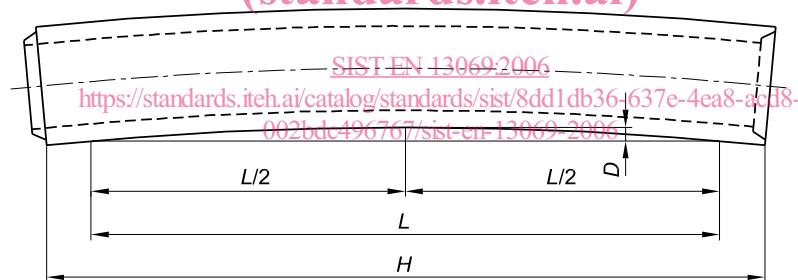
The maximum and minimum internal heights of a clay/ceramic outer wall shall be those calculated from the tolerances given in 5.2. If direct measurement is to be carried out, take two measurements at the maximum and minimum heights.

The test may also be carried out by using two gauges whose heights are set at the minimum and maximum internal heights. The minimum gauges shall not be able to fit over the internal height of the outer wall. The maximum gauge shall be able to fit over the internal height of the outer wall.

14.3 Straightness

The deviation from straightness of an outer wall is the maximum distance from the centre of a straight line equal to the test length spanning any concave curve on the outside of the outer wall to the outer wall surface (D) as shown in Figure 3. It is permissible to test for straightness using any suitable apparatus.

The test length shall be 50 mm less than the nominal height of the outer wall to allow for clearance at the shoulder of any socket.



Key

H is the nominal height of the outer wall in millimetres

L is the test length in millimetres

D is the deviation from straightness, in millimetres

$H-L = 50$ mm

Figure 3 — Terms for deviation from straightness

14.4 Squareness of ends

14.4.1 Gauge test

The test gauge as shown in Figure 4 with one arm set at a slope of 30 mm/m to the other shall be provided with two pairs of supports at (50 ± 5) mm centres. The end support shall be positioned so that there is a recess of (30 ± 5) mm from the inside of the angled arm. The slope of the supports shall be such as to provide a clearance of at least 5 mm under the test gauge. The angled arm shall be of such a length as to span the outside diameter/width of the outer wall.