



SLOVENSKI STANDARD

SIST EN 13216-1:2019

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Nadomešča:
SIST EN 13216-1:2004

Dimovodne naprave - Preskusne metode za sistemske dimovodne naprave - 1. del: Splošne preskusne metode

Chimneys - Test methods for system chimneys - Part 1: General test methods

Abgasanlagen - Prüfverfahren für System-Abgasanlagen - Teil 1: Allgemeine
Prüfverfahren

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Conduits de fumée - Méthodes d'essai pour les systèmes de conduits de fumée - Partie
1 : Méthodes d'essai générales

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EUROPEAN STANDARD

EN 13216-1

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Chimneys - Test methods for system chimneys - Part 1: General test methods

Conduits de fumée - Méthodes d'essai pour les
systèmes de conduits de fumée - Partie 1 : Méthodes
d'essai générales

Abgasanlagen - Prüfverfahren für System-
Abgasanlagen - Teil 1: Allgemeine Prüfverfahren

This European Standard was approved by CEN on 12 November 2018.

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European foreword

This document (EN 13216-1:2019) has been prepared by Technical Committee CEN/TC 166 “Chimneys”, the secretariat of which is held by ASI.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by month year of October 2019, and conflicting national standards shall be withdrawn at the latest by January 2021.

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 13216:2004.

System chimneys type tested prior to this revision need not be retested, if historical data covers the intended configuration for the relevant test.

In comparison to the previous edition the following changes were made:

- a) clarification of the scope;
- b) revision of terms and definitions;
- c) revision of the thermal test assembly and test structure to include options for alternative building insulation levels;
- d) revision of the test procedure; [SIST EN 13216-1:2019](https://standards.iteh.ai/catalog/standards/sist/90fb91e0-e038-494a-85a0-f751ee66e009/sist-en-13216-1-2019)
- e) incorporation of terminals; <https://standards.iteh.ai/catalog/standards/sist/90fb91e0-e038-494a-85a0-f751ee66e009/sist-en-13216-1-2019>
- f) incorporation of test for freeze–thaw resistance;
- g) incorporation of testing of concentric balanced flue systems;
- h) editorial changes.

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.

EN 13216-1:2019 (E)**Introduction**

CEN/TC 166 intends to publish the test methods for system chimneys as separate parts of a series of standards.

The first part of the series of EN 13216 includes material-independent test methods for system chimneys.

Further parts of the multi-part standard include material-specific test methods, each material used for the inner wall being decisive. The material-specific test methods are based on the general material-independent test methods. Considering the various characteristics, the material tests can be carried out on deviating specimens or can include other test procedures that however have correlation to those given in this document.

It is intended to prepare further parts if further material-specific standards are published.

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1 Scope

This document specifies material-independent general test methods for all system chimneys. It can be used for all flue gas carrying products.

NOTE The thermal performance tests for the determination of the distance to combustible material for accessories (draught regulators, access components, etc.) are included in different standards of CEN/TC 166.

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 1443, *Chimneys - General requirements*

EN 10088-1, *Stainless steels - Part 1: List of stainless steels*

EN 13384-1:2015, *Chimneys - Thermal and fluid dynamic calculation methods - Part 1: Chimneys serving one heating appliance*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

3 Terms and definitions

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

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>

3.1

test chimney

test sample necessary to enable the system chimney to be assessed for the performance criteria defined in the relevant product standard

3.2

test assembly

construction of all parts necessary to enable the specific performance criteria to be assessed, comprising test sample, test structures, and measuring equipment

3.3

test sample

assembly of chimney components necessary to enable the system chimney to be assessed for specific performance criteria

3.4

test structure

assembly of the additional materials (non-chimney components) to enable the test sample to be assessed for the specific performance criteria

EN 13216-1:2019 (E)**3.5****thermal performance test**

method to assess the temperature characteristics of the system chimney

3.6**heat stress test**

method to assess the temperature characteristics of the system chimney under normal operating conditions

3.7**sootfire resistance test**

method to assess the sootfire resistance characteristics of the system chimney (internal to external)

3.8**condensate resistance test (vapour phase)**

method to assess the system chimney's resistance to vapour and condensate

Note 1 to entry: This describes the vapour phase.

3.9**condensate penetration test (liquid phase)**

method to assess the components or sub-assemblies of system chimney's resistance to condensate in the liquid phase

Note 1 to entry: This describes the liquid phase.

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3.10**accuracy**

ability of the measuring instruments to give response in the specified range from the true value

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3.11**uncertainty of measurement**

combination of all parameters to give response in the specified range from the true result

Note 1 to entry: Parameters are e.g. accuracy, human parameter, or environmental parameters.

3.12**tolerance**

range in which a parameter has to be met

3.13**distance to combustible material**

declared distance to combustible material verified in the thermal performance test

3.14**test apparatus**

equipement used to perform a test

3.15**conditioning**

stabilisation of the sample in ambient air as specified in product standard

3.16**pit**

damage in form of superficial fault consisting of a fraction of material detached from the body of the test-sample with a mean dimension of over 7 mm

3.17**hair crack**

damage which is deemed to be harmless in form of superficial crack having a width of not more than 0,15 mm

3.18**nascent crack**

damage which is deemed to be harmless in form of crack formation at the edge, only crack penetrating slightly into the interior of the test sample

3.19**surface crack**

damage caused by crack of more than 0,15 mm width which does not pass through the test sample

3.20**scaling**

damage caused by surface raising, nascent chipping or crack, which initiates damage

3.21**peeling**

damage characterised by the loss of part of the superficial layer of the test sample

3.22**surface damage**

damage caused by breaking off (detachment) a part of the surface of the test sample; the surface area of the test sample remains unchanged

3.23**flaking**

damage characterised by a progressive loss of material affecting the whole, or part of the thickness of the sample

3.24**structural crack**

structural damage consisting of a more or less regular crack running throughout the entire thickness of the test sample and visible to the naked eye

3.25**break**

structural damage consisting of a separation of the test sample into two or more fragments

3.26**delamination**

damage in the form of lamellar flaking in a succession of parallel layers

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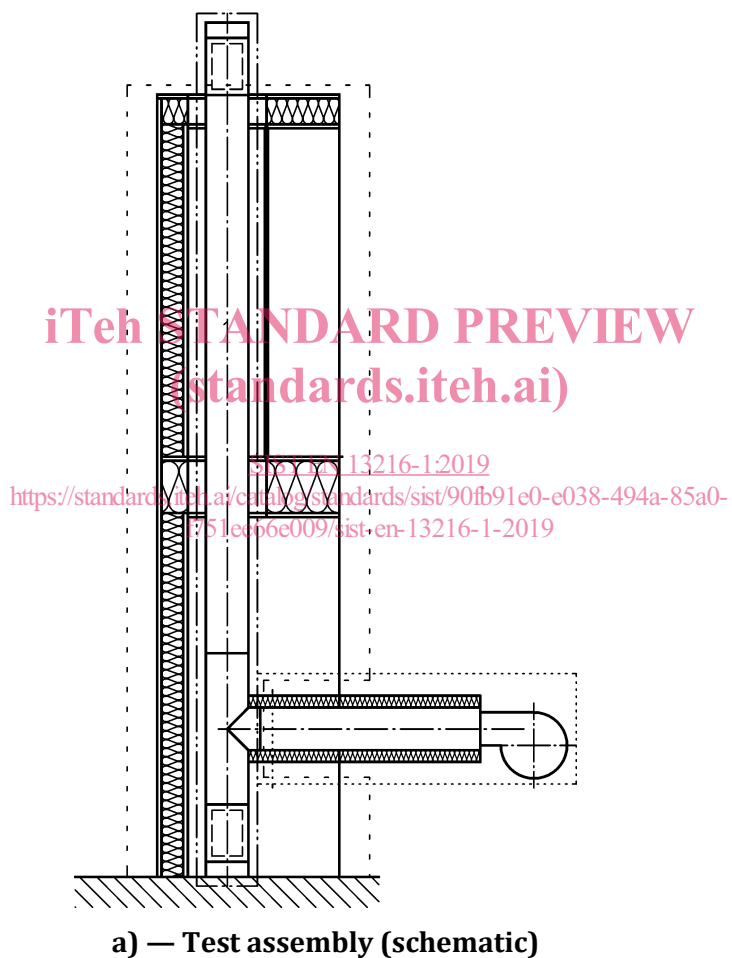
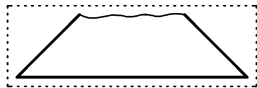
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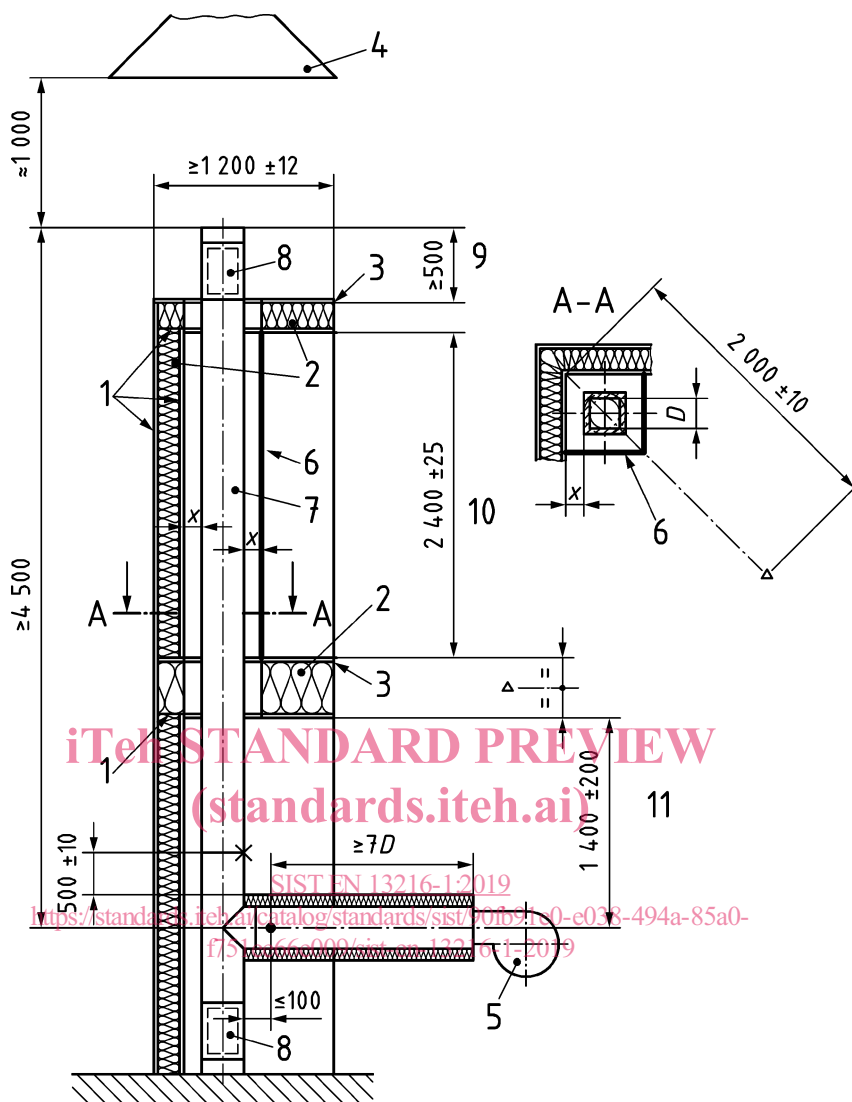
4 Test environment

4.1 Location of test assembly

The distance between the test assembly as shown in Figure 1 a) to 1 c) and other structures (e.g. test room walls) shall be sufficient to not influence the test results; a distance of at least 1,0 m is deemed to satisfy this requirement.

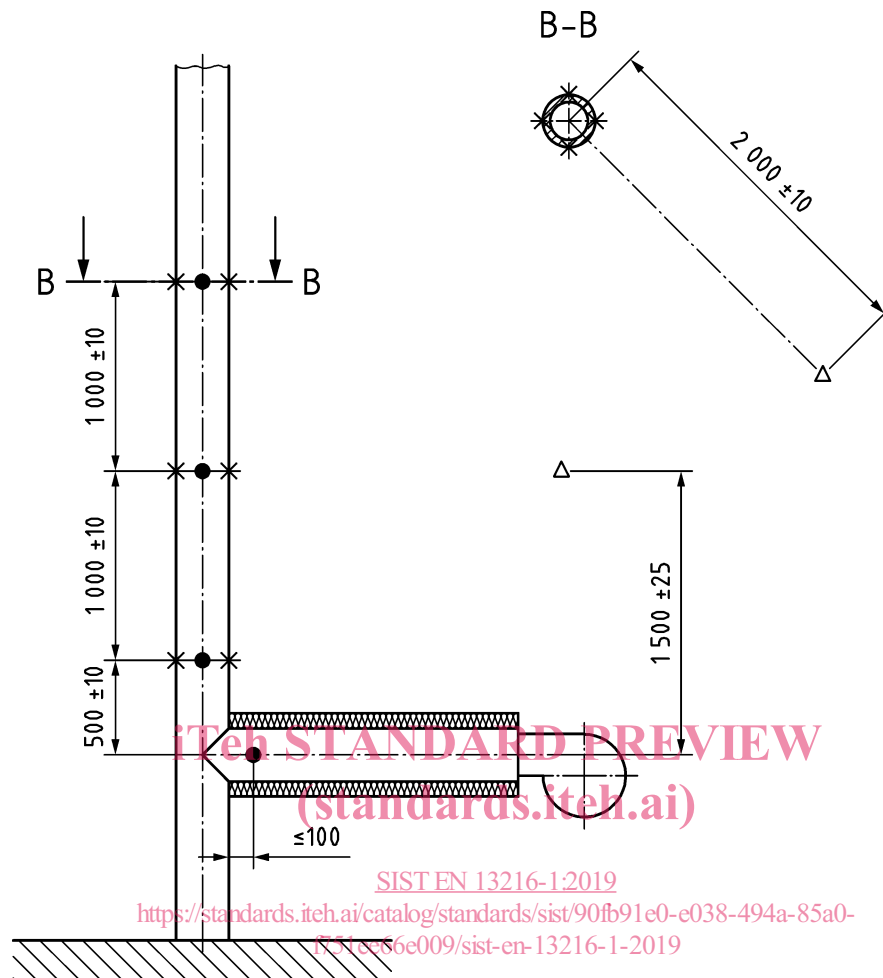


Dimensions in millimetres



b) — Test assembly (detailed)

Dimensions in millimetres



c) — Example of free standing test assembly

NOTE Figure 1 c) illustrates the principle of test assembly and does not represent any specific test assembly.

Key

.....	test apparatus		
- - - - -	test structure		
-----	test chimney		
1	plywood	9	zone C
2	insulation	10	zone B
3	plywood	11	zone A
4	extract provisions	x	distance to combustibile
5	hot gas generator	D	inner diameter of the test chimney
6	enclosure	×	measuring point for human contact (Figure 1b)
7	test chimney	△	ambient air temperature
8	opening	●	hot gas temperature
△	ambient air temperature		
●	hot gas temperature		
×	surface temperature, test chimney (Figure 1c)		

Figure 1 — Test assemblies

4.2 Conditions of the test environment

The ambient air temperature in the test room shall not vary during the heat stress test by more than 5 K and shall remain in the temperature range of 15 °C up to 30 °C.

The ambient air temperature in the test room shall not vary during the sootfire resistance test by more than 15 K and shall remain in the temperature range of 15 °C up to 35 °C.

The test environment shall consist of a ventilated space not subject to air movement greater than 0,5 m/s measured at the ambient thermocouple position. This requirement is deemed fulfilled in a closed test room.

The humidity shall be controlled between 30 % to 70 % RH.

4.3 Measurement of ambient air temperature and atmospheric pressure

The ambient air temperature shall be measured at a position diagonally from the free corner of the test assembly ($2 \pm 0,1$) m away from the inside corner of the test rig at the level in the centre of the first floor ($\pm 0,1$ m), see Figure 1 b).

Shield a calibrated thermocouple by placing it centrally within a length of aluminium painted metal tube, (150 ± 2) mm long and 50 mm nominal diameter, open at each end. The metal tube shall be placed vertically to avoid direct radiation to the thermocouple.

The atmospheric pressure has to be measured.

4.4 Accuracy of measurement

The ambient air temperature shall be measured with an accuracy of $\pm 1,5$ K.

The velocity of the ambient air shall be measured with an accuracy of $\pm 0,1$ m/s.

The atmospheric pressure shall be measured with an accuracy of ± 1 %.

5 Performance tests for system chimneys

5.1 General

Annex A gives a recommended test sequence.

5.2 Abrasion resistance test

5.2.1 Test apparatus

A tight fitting metal sleeve attached to a guide funnel shall be fitted into the top opening of the flue of the test chimney (see Figure 2). The alternative test sample from chimney sections may be tested as shown in Figure 3. A tight fitting metal sleeve attached to a plate which has an opening matching the area of the opening to the flue shall be fitted into the bottom opening of this test sample.

The bottom plate supported directly over a collection box is positioned to collect any material which is dislodged during the test, and which is sufficiently deep to allow the brush to pass through the complete length of the test sample.

The brush shall be attached either to a rod or to a sweeping equipment as shown in Figure 4.

Use a sweeping brush having flat spring-steel bristles of stainless steel in accordance with EN 10088-1, grade X10CrNi18-8, steel number 1.4310, with a cross section of ($2,0 \pm 0,2$) mm x ($0,25 \pm 0,05$) mm with the ends cut square. The bristles shall be arranged so that there are 5 per 10 mm length of the perimeter of the plan area of the brush. The brush may be a combination of single brushes.