BRITISH STANDARD

BS EN
1443:2003

Chimneys — General requirements

The European Standard EN 1443:2003 has the status of a British Standard

ICS 91.060.40

National foreword

This British Standard is the official English language version of EN 1443:2003. It supersedes BS EN 1443:1999 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee B/506, Chimneys, to Subcommittee B/506/1, General requirements, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Chimneys - General requirements

Conduits de fumée - Exigences générales

Abgasanlagen - Allgemeine Anforderungen

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Contents

Foreword

This document (EN 1443:2003) 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of an identical text or by endorsement, at the latest by September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

This document supersedes EN 1443:1999.

A list of standards and draft standards produced by CEN/TC 166 is given in "Bibliography".

Annexes A and B are informative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The development of heating appliances which has progressed in the recent years due to the need of saving energy and protecting the environment was paralleled by technical development of chimneys. Therefore, new additional requirements for chimneys are necessary, e.g. operation with positive pressure, operation with the formation of condensate.

Chimneys consist of different components which can be assembled, e.g. either

– as system chimneys, that is installed using a combination of compatible chimney components, obtained or specified from one manufacturing source with product responsibility for the whole chimney, or

– as custom-built chimneys, that is installed or built on-site in accordance with an execution standard or local building regulations, using a combination of compatible chimney components that can be from one or more sources.

This European Standard covers both cases. Annex A lists the relevant performance requirements for system chimneys and custom-built chimneys.

This European Standard specifies a designation scheme for chimneys which considers combinations between heating appliance and chimney. This scheme takes into account for example different climatic conditions and different fuels.

The ability of a chimney to prevent ignition of adjacent combustible materials and to prevent the spread of fire to adjacent areas within a building is included.

The first edition of this standard was in June 1999. In the meantime the Mandate under the Construction Product Directive (CPD) for chimneys (M 105) was published and some European Standard concerning the test of fire spread are published. Therefore the standard has been revised.

1 Scope

This European Standard specifies general requirements and the basic performance criteria and specifies limit values where appropriate for chimneys (including connecting flue pipes and their fittings) used to convey the products of combustion from heating appliances to the outside atmosphere. It is intended to be used as a reference for product standards for chimneys, flues and specific products (elements, kits and terminals) used in the construction of chimneys. It also identifies minimum requirements for marking and evaluation of conformity.

It does not apply to structurally independent chimneys.

NOTE This European Standard can be used as a basis for the specifications of products covered by a European Technical Approval.

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 (including amendments).

EN 563, *Safety of machinery – Temperatures of touchable surfaces – Ergonomics data to establish temperature limit values for hot surfaces.*

prEN 13216-1, *Chimneys – Test methods for system chimneys – Part 1: General test methods.*

prEN 14297, *Chimneys – Freeze-thaw resistance test method.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
heating appliance
unit generating products of combustion which need to be conveyed to the outside atmosphere

3.2
flue
passage for conveying the products of combustion to the outside atmosphere

3.3
flue gas
gaseous portion of the products of combustion conveyed in a flue

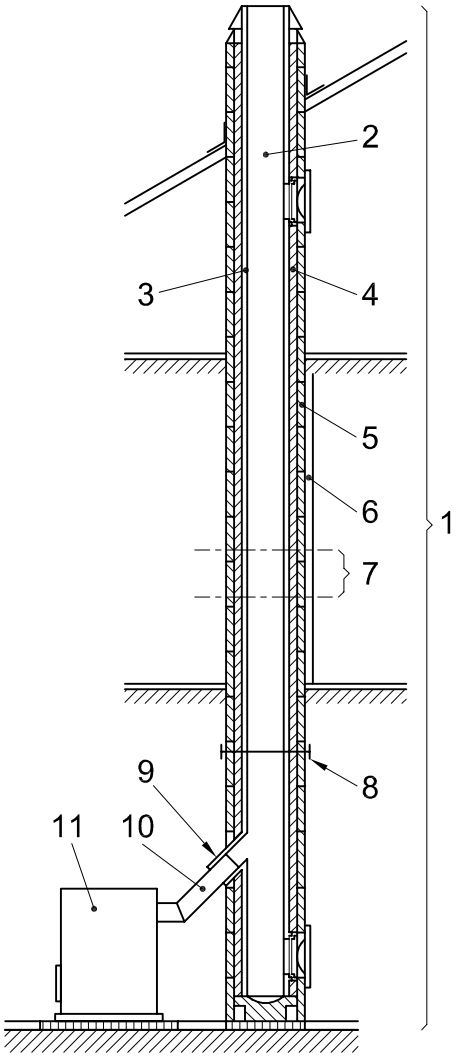
3.4
products of combustion
products resulting from the combustion of fuel (gaseous, liquid and solid constituents)

3.5
flue liner
wall of a chimney consisting of components the surface of which is in contact with products of combustion

3.6
chimney
structure consisting of a wall or walls enclosing a flue or flues

3.7
chimney component
any part of a chimney

3.8
chimney section
straight chimney component conveying products of combustion



Key

1 Chimney
2 Flue
3 Flue liner
4 Thermal insulation
5 Outer wall
6 Enclosure or cladding
7 Chimney section
8 Multi-wall chimney
9 Chimney fitting
10 Connecting flue pipe
11 Heating appliance

Figure 1 — Chimney components and chimney accessories

3.9
chimney fitting
chimney component conveying products of combustion except a chimney section

3.10
chimney accessory
chimney component not conveying products of combustion

3.11
single-wall chimney
chimney where the flue liner is the chimney

3.12
multi-wall chimney
chimney consisting of a flue liner and at least one additional wall

3.13
system chimney
chimney that is installed using a combination of compatible chimney components, obtained or specified from one manufacturing source with product responsibility for the whole chimney

NOTE This product is understood to constitute a kit under the Mandate M 105.

3.14
custom-built chimney
chimney that is installed or built on-site using a combination of compatible chimney components that may be from one or different sources

3.15
outer wall
external wall of a chimney the surface of which comes in contact with ambient or external environment, or is within cladding or enclosure

3.16
enclosure
barrier that when built around a chimney will give additional safety in case of fire and may provide additional heat transfer resistance

3.17
cladding
additional non-structural outer wall around a chimney for protection against heat transfer or weathering, or for decorative purposes

3.18
flue block
factory-made single- or multi-wall chimney component with one or more flues

3.19
terminal
fitting installed at the outlet of a chimney

3.20
relining
process of restoring or replacing the flue liner of a chimney

3.21
negative pressure chimney
chimney designed to operate with the pressure inside the flue less than the pressure outside the flue

3.22
positive pressure chimney
chimney designed to operate with the pressure inside the flue greater than the pressure outside the flue

3.23
dry operating condition
condition when the chimney is designed to operate normally with the temperature of the inner surface of the flue liner above the water dew point

3.24
wet operating condition
condition when the chimney is designed to operate normally with the temperature of the inner surface of the flue liner at and below the water dew point

3.25
sootfire
combustion of the flammable residue deposited on the flue liner

3.26
sootfire resistant chimney
chimney that is capable of withstanding a specified high temperature thermal exposure

3.27
condensate
liquid products formed when the flue gas is at or below the water dew point

3.28
thermal resistance of a chimney
resistance to heat transfer through the wall or walls of the chimney

3.29
joint
connection between two components

3.30
resistance to fire of a chimney
the ability of the chimney to prevent ignition of adjacent combustible materials and to prevent the spread of fire to adjacent areas

3.31
connecting flue
component or components connecting the heating appliance outlet and the chimney

3.32
nominal working temperature
average flue gas temperature obtained during the nominal output test for the maximum temperature level

3.33
freeze-thaw resistant chimney
chimney that is capable of withstanding freeze-thaw exposure

3.34
flow resistance of a chimney
pressure loss in a flue due to the flow of the flue gas at a given temperature and velocity

4 Classification and designation and other essential information

4.1 General

Chimneys shall be classified in accordance with the following performance characteristics:

— temperature;

— pressure;

— condensate resistance;

— corrosion resistance;

— sootfire resistance and distance to combustibles.

In addition the chimney manufacturer shall give information on the following characteristics:

— thermal resistance;

— flow resistance;

— duration in minutes to resistance to fire, external to external;

— freeze-thaw resistance.

4.2 Temperature classes

Temperature classes for chimneys are given in Table 1.

Table 1 — Temperature classes

Temperature class	Nominal working temperature °C
T 080	≤ 80
T 100	≤ 100
T 120	≤ 120
T 140	≤ 140
T 160	≤ 160
T 200	≤ 200
T 250	≤ 250
T 300	≤ 300
T 400	≤ 400
T 450	≤ 450
T 600	≤ 600

4.3 Pressure classes

Pressure classes as well as test pressures are given in Table 5:

— For negative pressure chimneys

N 1

N 2

— For positive pressure chimneys

P 1

P 2

— For high positive pressure chimneys

H 1

H 2

4.4 Condensate resistance classes

Condensate resistance classes:

W for chimneys operating under wet conditions[1)]

D for chimneys operating under dry conditions[1)]

4.5 Corrosion resistance classes

Corrosion resistance classes for chimneys which convey products of combustion from various fuels are given in Table 2.

Table 2 — Corrosion resistance classes

Corrosion resistance class	1 possible fuel types	2 possible fuel types	3 possible fuel types
- gas	gas: sulphur-content ≤ 50 mg/m³, natural gas L + H	gas natural gas L + H	gas natural gas L + H
- liquid	kerosene: sulphur-content ≤ 50 mg/m³	oil: sulphur-content ≤ 0,2 mass % kerosene: sulphur-content ≥ 50 mg/m³	oil: sulphur-content > 0,2 mass % kerosene: sulphur-content ≥ 50 mg/m³
- wood	-	wood in open fire places	wood in open fire places wood in closed stoves
- coal	-	-	coal
- peat	-	-	peat

Table 2 does not categorize process gases or liquids.

4.6 Sootfire resistance classes

Sootfire resistance classes:

O for chimneys without sootfire resistance

G for chimneys with sootfire resistance

4.7 Distance to combustible material

The designation of the distance of the outer surface of the chimney to combustible material shall be given as xx, where xx is the value in whole millimetres.

4.8 Thermal resistance

The thermal resistance shall be given by the manufacturer in m²K/W. It shall be determined at least by the designation temperature[2)].

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1) An execution standard is under preparation.

2) It is recommended to declare the thermal resistance of the chimney dependent on a common bases i.e. across the whole temperature range for which the product can be used.

4.9 Freeze-thaw resistance

The freeze-thaw resistance shall be declared where applicable.

4.10 Resistance to fire

4.10.1 Internal to external

The performance criteria for resistance to fire (internal to external) for a chimney shall be declared as G or O followed by the distance to combustible material in mm (xx).

4.10.2 External to external

The performance criteria of integrity and insulation shall be declared as EI for the exposure outside to outside. Examples are given in Table 3.

NOTE For fire classification see prEN 13501-2.

Table 3 — Fire resistance performance classes

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

4.11 Designation

The designation of a chimney shall consist of e.g.:

Chimney EN 1443 – T 400 P1 W 1 Gxx

Number of corresponding standard

Temperature class (see Table 1)

Pressure class N or P or H (see 4.3)

Resistance to condensate class (see 4.4)

Corrosion resistance class (see Table 2)

Sootfire resistance class G or O (see 4.6), followed by a distance to combustible materials

4.12 Essential additional information

The following essential additional information shall be provided:

— the manufacturer shall declare the distance to combustible material, see 4.7 in mm. This distance shall satisfy both requirements given in 6.3.3.2 and 6.3.3.3 as appropriate;

— thermal resistance: R in $m^2 \cdot K/W$;

— resistance to fire: EI xxx in minutes;

— flow resistance.

For the calculation of the pressure loss use the mean value of roughness for the material of the flue: r in mm and the coefficient of flow resistance due to a dimensional and / or cross sectional and / or mass flow change in the flue: ζ in:

— freeze-thaw resistance;

— resistance to wind load;

— reaction to fire (only for plastic liners).

The manufacturer may declare the characteristics NPD (no performance declared), except for distance to combustible material.

5 Dimensions, shapes and tolerances

The dimensions, shapes and tolerances of components should be validated in accordance with the specifications of the relevant product standards.

6 Requirements

6.1 General

The requirements listed apply to chimneys constructed using components for a "system chimney" and for a "custom-built chimney".

Informative annex A lists the applicability to system chimneys or the components of custom-built chimneys of the requirements given in 6.2 to 6.7.

Informative annex B gives an example of the essential mandated characteristics for an annex ZA required for an harmonized product standard for chimneys.

6.2 Mechanical resistance and stability

All chimneys shall be capable of withstanding horizontal and vertical loads. The following is a list of criteria to be taken into consideration in the material related product standards:

— compressive strength;

— tensile strength;

— resistance to lateral load for a reference wind velocity pressure of 1.5 kN/m^2;

— resistance to abrasion and effects due to sweeping;

— bulk density;

— resistance to freeze-thaw by test according to prEN 14297 or appropriate material dependent test.

6.3 Thermal behaviour

6.3.1 Heat resistance

When thermal testing takes place, it shall be carried out at the test temperatures under steady state conditions appropriate to the product designation given in Table 4. Steady state conditions are defined in the relevant material related test standards.

Table 4 — Test temperatures

Temperature class	T 80	T 100	T 120	T 140	T 160	T 200	T 250	T 300	T 400	T 450	T 600
Test temperature °C	100	120	150	170	190	250	300	350	500	550	700

6.3.2 Sootfire resistance

When thermal testing takes place for sootfire resistance it shall be carried out at a test temperature of 1 000 °C for 30 min.

6.3.3 Resistance to fire

6.3.3.1 General

The manufacturer shall declare the distance to combustible material, see 4.7. The distance shall satisfy the requirements given in 6.3.3.2 and 6.3.3.3 as appropriate.

NOTE The manufacturer can declare a distance to combustible material that reflects installation practice in individual member states' regulations.

6.3.3.2 Resistance to fire from internal to external resulting from normal operating conditions

The maximum temperature of adjacent combustible materials shall not exceed 85 °C when related to an ambient temperature of 20 °C. The distance to combustible materials shall be verified by a test in accordance with prEN 13216-1 for system chimneys or in the appropriate material dependent test standard to steady state at a test temperature given in Table 4 appropriate to the product designation.

6.3.3.3 Resistance to fire from internal to external resulting from sootfire conditions

The maximum temperature of adjacent combustible materials shall not exceed 100 °C when related to an ambient temperature of 20 °C when tested at the test temperature of 1 000 °C over a period of 30 min. This distance to combustible material shall be verified by a test in accordance with prEN 13216-1 for system chimneys or in the appropriate material dependent test standard.

6.3.3.4 Resistance to fire resulting from external to external

The resistance to fire external to external shall be tested according to the relevant test standards for shafts and ducts (for classification of resistance to fire).

6.3.4 Reaction to fire

In a chimney with plastic flue liners the manufacturer shall declare the reaction to fire class for the liner.

6.4 Hygiene, health and environment

6.4.1 Gastightness

When tested in accordance with the appropriate standardized test the leakage rate in litres/seconds per square meters of flue surface area of chimneys or of the flue liners or connecting flue pipes with joints before and after exposure to heat, see 6.3.1 and where appropriate 6.3.2, shall not exceed the values given in Table 5.

Table 5 — Gas tightness classes

Class	Leakage rate $l \cdot s^{-1} \cdot m^{-2}$	Test pressure Pa
N 1	2,0	40 for negative pressure chimneys
N 2	3,0	20 for negative pressure chimneys
P 1	0,006	200 for positive pressure chimneys
P 2	0,120	200 for positive pressure chimneys
H 1	0,006	5 000 for high positive pressure chimneys
H 2	0,120	5 000 for high positive pressure chimneys

6.4.2 Water vapour diffusion resistance and condensate resistance

6.4.2.1 Chimneys operating under wet conditions

The water vapour diffusion resistance and the condensate resistance shall be in accordance with the requirements of the relevant product standard.

6.4.2.2 Chimneys operating under dry conditions

The water vapour diffusion resistance shall be in accordance with the requirements of the relevant product standard.

6.4.3 Corrosion resistance

The effect of corrosion on the flue liner shall be in accordance with the requirements of the relevant product standard.

6.5 Safety in use

Where accidental human contact is possible the maximum temperature of the outer surface of a chimney or of its enclosure shall be for an one second burn threshold in accordance with EN 563 when tested at the nominal working temperature appropriate to the product designation.

6.6 Energy economy and heat retention

The thermal resistance of the chimney shall be determined by calculation or tests.

6.7 Additional criteria for chimney operation

6.7.1 Apertures for cleaning and inspection

The doors of openings for cleaning or inspection shall be in accordance with the requirements of the relevant product standard.

6.7.2 Water penetration

The ability to withstand weathering shall be in accordance with the requirements of the relevant product standard.

6.7.3 Aerodynamic properties of terminal

Where special aerodynamic properties are claimed, the performance of the terminal shall be in accordance with the requirements of the relevant product standard.

6.7.4 Condensate collection and removal

Chimneys operating normally under wet conditions shall have a facility to enable the collection and removal of the condensate which shall be in accordance with the requirements of the relevant product standard.

6.7.5 Flow resistance

For the calculation of the pressure loss in a flue the mean value of roughness for the material of the flue and the coefficient of flow resistance due to a directional and/or cross sectional and/or mass flow change in the flue shall be determined.

7 Marking, labelling and instruction

7.1 General

For CE-marking information see guidance paper D.

7.2 Chimney component

A representative number of chimney components as defined in the relevant product standard shall be marked or labelled indelibly with the EN number of the relevant product standard and with the following items:

— name or identifying mark of the producer;

— individual item block of the designation given in the relevant product standard;

— identification of the date of manufacture or batch identification.

7.3 Chimney

A permanent form of identification shall be provided with a system chimney and the information contained on it shall be in accordance with 4.11.

NOTE Identification for custom-built chimney should be in accordance with the relevant execution standard.

7.4 Product information

Product information shall be provided for chimney components as detailed in the relevant product standard.

8 Evaluation of conformity

The criteria for the evaluation of conformity shall be given in the relevant product standard. It should contain for the manufacturer initial type-testing, further type-testing and factory production control and tasks for the notified body relating to attestation of conformity (see guidance paper B).

Annex A
(informative)

Relevance of performance requirements to system chimneys and custom-built chimneys related to test methods or prior knowledge

Relevance of performance requirements of relevant subclauses		System chimney	Custom built chimney
6.2	Mechanical resistance and stability		
	— compressive strength	TC, TM	TM
	— tensile strength	TC, TM	TM
	— resistance to lateral loads	TC, TM, C	TM, C, E, P
	— resistance to abrasion and sweeping effects	TC, P	TM, E, P
	— bulk density	TM, P	TM, P
	— freeze-thaw	TM, P	TM, P
6.3	Thermal behaviour		
6.3.1	Heat resistance	TC	TM, E, P
6.3.2	Sootfire resistance	TC	TM, E, P
6.3.3.2	Resistance to fire, internal to external, normal operating conditions	TC	TM, E, P
6.3.3.3	Resistance to fire, internal to external, sootfire conditions	TC	TM, E, P
6.3.3.4	Resistance to fire, external to external	TC	TM, E, P
6.3.4	Reaction to fire (only for plastic)	TM	TM
6.4	Hygiene, health and environment		
6.4.1	Gastightness	TC	TM, E, P
6.4.2	Condensate resistance	TC, TM, P	TM, E, P
6.4.3	Corrosion resistance	TC, TM, P	TM, E, P
6.5	Safety in use	TC	TM, E, P
6.6	Energy economy and heat retention	TC, C	TM, C, E, P
6.7	Additional criteria for chimney operation		
6.7.1	Apertures for cleaning and inspection	TC, TM	TM, E, P
6.7.2	Water penetration from rain	TC, TM	TM, E, P
6.7.3	Aerodynamic properties of terminal	TM	TM, E
6.7.4	Condensate collection and removal	TC, P	TM, E, P
6.7.5	Flow resistance of chimney	TC, P	TM, E, P

Symbols:

TC Test chimney
TM Material specific test on chimney components
C Calculation method
E Execution standard
P Prior knowledge applicable to components design and execution

Annex B
(informative)

Characteristics for a chimney

Table B.1 — Mandated characteristics for a chimney (elements and kits)

Product: chimney products as covered in clause 1 of this standard Intended use: single and multiwall chimneys			
Essential Characteristics	Requirement clauses in this and other European Standard(s)	Mandated Level/class	Notes
Resistance to windload	6.2 Mechanical resistance and stability - Resistance to lateral load for a reference wind velocity pressure of 1,5 kN/m²	None	Pass/fail criteria based on manufacturer's declaration of free standing height and support spacings for external sections
Compressive strength	6.2 Mechanical resistance and stability - Compressive strength	None	Pass/fail criteria based on manufacturer's declared value of maximum chimney height
Resistance to fire, internal to external	6.3.3.3 Thermal performance under sootfire conditions 6.3.3.2 Thermal performance under normal operation conditions	G xx	The declared distance to adjacent combustible material xx is expressed in millimetres. This value does not exceed the distance required to satisfy the criteria for normal operating conditions
Gas tightness / leakage	6.4.1 Gas tightness	None	The product is designated a pressure class. This reflects a gas tightness determined by a threshold leakage rate appropriate to the pressure class
Flow resistance	6.7.5 Flow resistance	None	Flow resistance of chimney sections and chimney terminals to be expressed as a mean roughness value in mm. Flow resistance of chimney, terminals and fittings, to be expressed as a coefficient of flow resistance to a dimensional and/or cross-sectional and/or mass-flow change in the flue.
Thermal resistance	6.6 Energy economy and heat retention - Thermal resistance	None	Declared value of thermal resistance in $m^2 \cdot K/W$
Thermal shock resistance (soot fire resistance)	6.4.1 Gas tightness	G	Pass fail criteria on maintenance of gas tightness
Flexural tensile strength	6.2 Mechanical resistance and stability - Tensile strength	None	Pass/fail criteria based on manufacturer's declared value
Durability against chemicals	6.4.2 Water and vapour diffusion resistance and condensate resistance	None	Pass-fail criteria
Durability against corrosion	6.4.3 Corrosion resistance	None	Pass-fail criteria
Freeze thaw	6.2 Mechanical resistance and stability - Freeze - thaw resistance	None	Pass-fail criteria

NOTE The requirement on a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to

this characteristic and the option “No performance declared” (NPD) in the information accompanying the CE marking can be used. The NPD option can not be used, where the characteristic is subject to a threshold level.

Otherwise, the NPD option can be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

European legislation without national derogations need not be mentioned.

Table B.2 — Volontary characteristics for a chimney

Product: chimney products as covered in clause 1 of this standard Intended use: single and multiwall chimneys			
Resistance to fire, external to external	6.3.3.4 Prevention of fire resulting from external fire	None	Pass-fail criteria

Bibliography

The following standards and draft standards prepared by CEN/TC 166 are available:

EN 1443, *Chimneys – General requirements.*
EN 1457, *Chimneys – Clay/ceramic flue liners – Requirements and test methods.*
EN 1806, *Chimneys – Chimneys – Clay/ceramic flue blocks for single-wall chimneys – Requirements and test methods.*
prEN 1856-1, *Chimneys – Requirements for metal chimneys – Part 1: System chimney products.*
prEN 1856-2, *Chimneys – Requirements for metal chimneys – Part 2: Metal liners and connection flue pipes.*
prEN 1857, *Chimneys – Components – Concrete flue liners.*
prEN 1858, *Chimneys – Components – Concrete flue blocks.*
EN 1859, *Chimneys – Metal chimneys – Test methods.*
prEN 12391-1, *Chimneys – Metal chimneys – Part 1: Execution standard.*
prEN 12391-2, *Chimneys – Metal chimneys – Part 2: Execution standard for room sealed appliances.*
prEN 12446, *Chimneys – Components – Concrete outer wall elements.*
prEN 13063-1, *Chimneys – Part 1: System chimneys with clay/ceramic flue liners – Requirements and test methods for soot fire resistance.*
prEN 13063-2, *Chimneys – Part 2: System chimneys with clay/ceramic flue liners – Requirements and test methods under wet conditions.*
prEN 13063-3, *Chimneys – Part 3: System chimneys with balance flue and clay/ceramic flue liners – Requirements and test methods.*
prEN 13069, *Chimneys – Clay/ceramic outer walls for system chimneys – Requirements and test methods.*
prEN 13384-1, *Chimneys – Thermal and fluid dynamic calculation methods – Part 1: Chimneys serving one appliance.*
prEN 13384-2, *Chimneys – Thermal and fluid dynamic calculation methods – Part 2: Chimneys serving more than one heating appliance.*
prEN 13501-2, *Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services*.

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