

8]a b]\_j!`G]ghYa g\_]X]a b]\_j`g`\_YfUa ] b]a j`h`\_Uj Ua j!`%rXY. `NU hYj Y`nUcXdcfbcgh  
dfch]`dcjUfi `gU^]b`dfYg\_i gbY`a YtcXY

Chimneys - System chimneys with clay/ceramic flue liners - Part 1: Requirements and test methods for sootfire resistance

Abgasanlagen - System-Abgasanlagen mit Keramik-Innenrohren - Teil 1: Anforderungen und Prüfungen für Rußbrandbeständigkeit

Conduits de fumées - Conduits-systèmes avec conduit intérieur en terre cuite/céramique - Partie 1: Exigences et méthodes d'essai relatives à la détermination de la résistance au feu de cheminée

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**Ta slovenski standard je istoveten z: EN 13063-1:2005**

**ICS:**

91.060.40      Dimniki, jaški, kanali      Chimneys, shafts, ducts

**SIST EN 13063-1:2006****en**

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English Version

## Chimneys - System chimneys with clay/ceramic flue liners - Part 1: Requirements and test methods for sootfire resistance

Conduits de fumées - Conduits-systèmes avec conduit  
intérieur en terre cuite/céramique résistant au feu de  
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Innenrohren - Teil 1: Anforderungen und Prüfungen für  
Rußbrandbeständigkeit

This European Standard was approved by CEN on 2 September 2005.

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 European Standard (EN 13063-1:2005) 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 June 2006, and conflicting national standards shall be withdrawn at the latest by September 2007.

This European Standard 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(s).

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

This standard is part 1 of a series of standards for system chimneys with clay/ceramic flue liners.

Part 2 is for system chimneys working under wet conditions and part 3 is for system air flue chimneys.

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 requirements and test methods for multiwall soot fire resistant system chimneys, working under dry conditions, with corrosion resistance 3, with negative pressure (see EN 1443) in which the products of combustion are conveyed to the atmosphere through clay/ceramic flue liners. Marking and inspection are also covered by this standard.

This standard does not apply to structurally independent (free standing or self-supporting) system chimneys.

A soot fire resistant system chimney has the following items where appropriate:

- clay/ceramic flue liners;
- Insulation layer;
- outer walls;
- mortar for jointing flue liners;
- mortar for jointing outer walls;
- terminal;
- chimney base;
- cladding;
- opening section;
- cleaning and inspection door;
- distance piece;
- reinforcement.

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The soot fire resistant chimney covers a combination of compatible chimney components, obtained or specified from one manufacturing source with product responsibility for the whole chimney.

## 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 998-2:2003, *Specification for mortar for masonry – Part 2: Masonry mortar*.

EN 1366-8, *Fire resistance tests for service installations – Part 8: Smoke extraction ducts*.

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

EN 1457:1999, *Chimneys – Clay/ceramic flue liners – Requirements and test methods*.

EN 1806:2000, *Chimneys – Clay/ceramic flue blocks for single wall chimneys – Requirements and test methods*.

EN 1859, *Chimneys – Metal chimneys – Test methods.*

EN 12446:2003, *Chimneys – Components – Concrete outer wall elements.*

EN 13069:2005, *Chimneys – Clay/ceramic outer walls for system chimneys – Requirements and test methods.*

EN 13162:2001, *Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification.*

EN 13216-1:2004, *Chimneys – Test methods for system chimneys – Part 1: General test methods.*

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

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

EN ISO 1182, *Reaction to fire tests for building products – Non-combustibility test (ISO 1182:2002).*

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

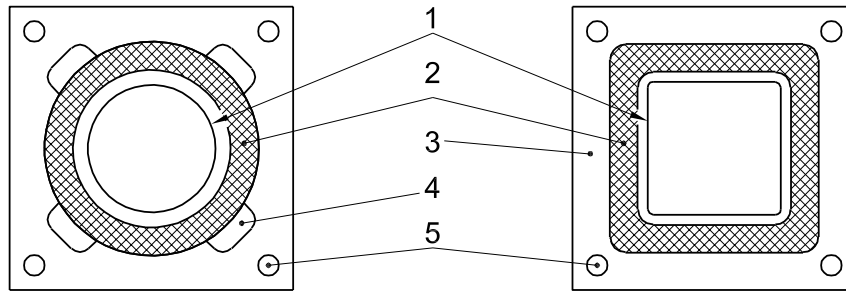
### 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1443:2003 and EN 13216-1:2004 and the following apply.

#### 3.1

##### **soot fire resistant multiwall system chimney**

multiwall construction, consisting mainly of an outer wall, an insulation layer and a sootfire resistant inner clay/ceramic flue liner. The combination of these components forms a sootfire resistant system chimney (see Figure 1)



**Key**

- 1 Inner liner
- 2 Insulation layer
- 3 Outer wall
- 4 Cavities for back ventilation
- 5 Cavities for structural reinforcement

**Figure 1 – Construction of a soot fire resistant system chimney**

**3.2**

**chimney base**

section of the system chimney, situated at the bottom, which comprises an inspection opening with door

**3.3**

**reinforced outer wall**

outer wall having reinforcement to assist handling (not for structural stability)

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**3.4**

**structural reinforcement**

additional strengthening for structural stability (in the outer wall)

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**3.5**

**freeze-thaw-resistance**

ability of the product to resist the effects of freezing and thawing

**3.6**

**opening section**

flue liner which has an opening for cleaning and inspection or connection for another flue (junction)

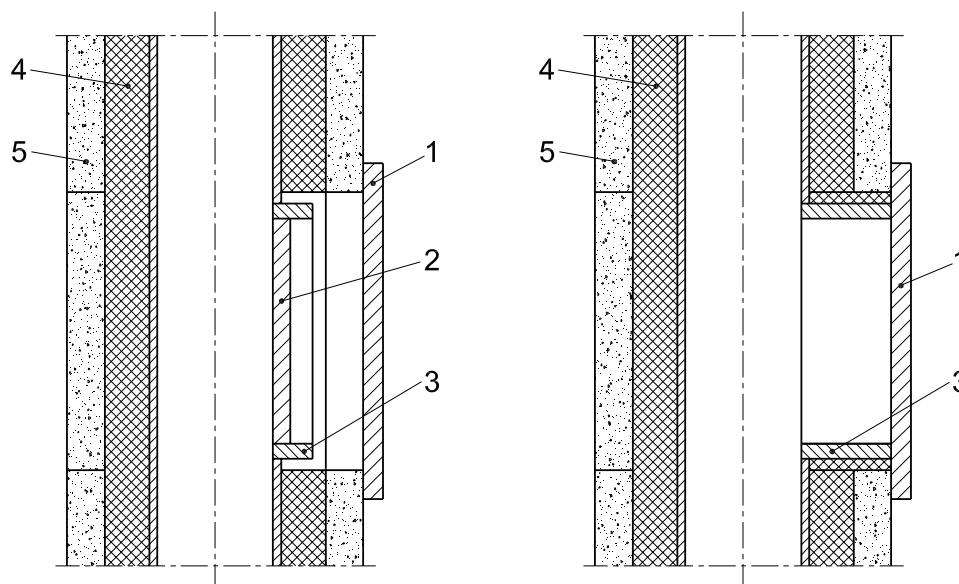
**3.7**

**cleaning and inspection door**

door in outer wall element to allow cleaning and inspection of the chimney. There are two types of cleaning and inspection doors (see Figure 2):

- a cleaning and inspection door combined with an opening section with inner door
- a cleaning and inspection door combined with an opening section without inner door





#### Key

- 1 Cleaning and inspection door
- 2 Inner door of the opening section
- 3 Opening section
- 4 Insulation layer
- 5 Outer wall

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**Figure 2 - Examples of cleaning and inspection doors and the opening sections**

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#### 3.8

##### distance piece

spacer to keep distance between outer wall element and insulation or inner liner

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## 4 Shapes, dimensions and tolerances

### 4.1 Flue liners

#### 4.1.1 General

Flue liners shall meet the requirements on size and tolerance of dimensions given in 7.1, 7.2, 7.3, 7.4, 7.5, 7.6 and 7.7 of EN 1457:1999.

#### 4.1.2 External dimensions of flue liner

When tested in accordance with A.2.6, the external dimensions of flue liners measured on any cross section shall not deviate more than  $\pm 3\%$  of the manufacturer's stated nominal external dimensions.

### 4.2 Insulation

The insulation layer shall meet the requirements on tolerance of dimensions given in 4.2.2 (length and width) and 4.2.3 (thickness class T3) of EN 13162:2001.

### 4.3 Outer wall elements

Outer wall elements shall fulfil the requirements on shapes and tolerances on dimensions given in:

concrete outer wall elements: EN 12446:2003, Clause 7

clay/ceramic outer walls: EN 13069:2005, Clause 6

metal outer walls: Annex B

### 4.4 Cleaning and inspection doors

Dimensions and tolerances shall be declared by the manufacturer.

## 5 Material requirements

### 5.1 General requirements for components

#### 5.1.1 General

All components of soot fire resistant system chimneys shall be non combustible in accordance to EN ISO 1182.

#### 5.1.2 Clay/ceramic flue liners

Flue liners shall meet the requirements of EN 1457 clauses:

- 8.1 Straight flue liners (proof load);
- 8.3 Minimum load for inspection opening sections (proof load);
- 9.1 Initial test (gas tightness, thermal shock resistance and resistance to fire for straight flue liners);
- 9.2 Final gas tightness after thermal shock testing;
- 10 Acid resistance;
- 11 Water absorption and bulk density;
- 12 Sweeping resistance.

#### 5.1.3 Maximum compressive strength for opening sections

When tested as described in A.2.3, components shall withstand a load of at least five times the manufacturer's declared design load.

$$F = (\chi \times H \times G)/100 \quad (1)$$

where

$F$  = minimum load (kN);

$\chi$  = safety factor = 5;

$H$  = height of chimney (m);

$G$  = Weight per metre (kg/m).

NOTE The limiting factor of the maximum height of system chimneys is the compressive strength of the opening section.

#### 5.1.4 Jointing material for flue liners

##### 5.1.4.1 Density

The density of jointing material shall not vary more than  $\pm 10\%$  of the manufacturer declared value when tested in accordance to A.2.2.2.

##### 5.1.4.2 Compressive strength

The compressive strength shall be at least  $10 \text{ N/mm}^2$  when tested according to A.2.2.3.

#### 5.1.5 Insulation

##### 5.1.5.1 General

The insulation shall be to the manufacturer's specifications and shall be prefabricated and have an independent permanent shape before and after being exposed to heat in operating conditions (e.g. blocks or bonded loose material).

##### 5.1.5.2 Density

The manufacturer shall declare the density of the insulation and this shall not vary by more than  $\pm 10\%$  of the declared value and shall be tested according to EN 1806:2000, 17.15.

##### 5.1.5.3 Durability under soot fire conditions

When tested in accordance to A.2.1 the change in the outside surface temperature of the test sample after the fourth cycle of heating shall not exceed  $10\%$  of the maximum outside surface temperature of the sample of the first cycle.

#### 5.1.6 Outer wall elements

The outer wall elements shall fulfil EN 12446 for concrete outer wall elements, EN 13069 for clay/ceramic outer wall or Annex B for stainless steel metal outer walls.

#### 5.1.7 Jointing material for outer wall elements

Jointing materials used for jointing outer walls, where supplied with the system chimney, shall comply with the system chimney manufacturer's declared specification and shall be at least M2,5 according to EN 998-2:2003, 5.3.1, Table 1.

#### 5.1.8 Wind load

The free standing part of the chimney above the last lateral support of the soot fire resistant system chimney shall withstand a wind load of  $1,5 \text{ kN/m}^2$ . The maximum permissible height of a chimney outside the building of a soot fire resistant system chimney shall be calculated according to national calculation methods, taking into account the tilt momentum of the outer wall element. Alternatively the tilt momentum of the complete construction can be taken into account. A test method to evaluate the tilt momentum is given in A.2.4.

## 5.2 Safety in use

### 5.2.1 Distance to combustible materials

#### 5.2.1.1 General

The distance to combustible materials shall be tested in accordance with EN 13216-1:2004, 5.6. The distance between the outer surface of the chimney and the adjacent combustible material shall be declared as G(xx), where xx is the minimum distance in mm.

#### 5.2.1.2 Operating conditions

The soot fire resistant system chimney shall be tested in accordance to the heat stress test method described in EN 13216-1:2004, 5.6 for the required temperature types. The maximum surface temperature of combustible materials adjacent to the test chimney shall not be greater than 85 °C, when related to an ambient temperature of 20 °C.

#### 5.2.1.3 Soot fire and thermal shock conditions

The soot fire resistant system chimney shall be tested in accordance to soot fire test method described in EN 13216-1:2004, 5.6. The maximum surface temperature of combustible materials adjacent to the test chimney shall not be greater than 100 °C, when related to an ambient temperature of 20 °C.

The classification of the resistance to fire is given in EN 13501-2.

### 5.2.2 Relative movement between flue liner and outer wall

After thermal testing (operating conditions and soot fire conditions) in accordance with EN 13216-1:2004, 5.6, the final position after cooling down to room temperature of the upper flue liner shall be  $\pm 5$  mm to the original position when tested according to EN 13216-1:2004, 5.2.

#### 5.2.3 Thermal resistance

The thermal resistance value of the system chimney declared by the manufacturer shall be verified by testing according to the test method of EN 13216-1:2004 (as the reference test method), 5.7, or calculation in accordance with Annex C, both with inner surface temperature of the flue liner at 200 °C.

The designation of the thermal resistance shall be given as Ryy, where yy is the value in square metres Kelvin per Watt multiplied by 100, rounded to the nearest integer (e.g.: R22 is  $R=0,22 \text{ m}^2\text{K/W}$ ).

NOTE The thermal resistance value can be used for calculation according to EN 13384-1.

#### 5.2.4 Resistance to fire external to external

The resistance to fire external to external shall be tested according to EN 1366-8 for shafts and ducts. The performance criteria of integrity and insulation shall be declared by the manufacturer as EI xxx for the exposure outside to outside.

Examples are given in Table 1.

NOTE For fire classification see EN 13501-2.