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Standards

Irish Standard  
I.S. EN 13384-1:2015

# Chimneys - Thermal and fluid dynamic calculation methods - Part 1: Chimneys serving one heating appliance

**I.S. EN 13384-1:2015**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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*This document is based on:*

EN 13384-1:2015

*Published:*

2015-04-01

*This document was published under the authority of the NSAI and comes into effect on:*

2015-04-18

ICS number:

91.060.40

NOTE: If blank see CEN/CENELEC cover page

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Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

**EN 13384-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2015

ICS 91.060.40

Supersedes EN 13384-1:2002+A2:2008

English Version

## Chimneys - Thermal and fluid dynamic calculation methods - Part 1: Chimneys serving one heating appliance

Conduits de fumée - Méthodes de calcul thermo-aéraulique  
- Partie 1: Conduits de fumée ne desservant qu'un seul  
appareil

Abgasanlagen - Wärme- und strömungstechnische  
Berechnungsverfahren - Teil 1: Abgasanlagen mit einer  
Feuerstätte

This European Standard was approved by CEN on 24 January 2015.

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## Foreword

This document (EN 13384-1:2015) has been prepared by Technical Committee CEN/TC 166 “Chimneys”, the secretariat of which is held by ASI.

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of an identical text or by endorsement, at the latest by October 2015, and conflicting national standards shall be withdrawn at the latest by October 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13384-1:2002+A2:2008.

According to EN 13384-1:2002+A2:2008 the following fundamental changes are given:

- editorial mistakes have been corrected;
- mistakes in formulas have been corrected;
- for wood the rise of the dew point to take into account the acid condensation has been deleted;
- table for material characteristics in Table B.5 has been adapted to EN 15287-1 and supplemented by radiation coefficients;
- in Calculation of thermal resistance according to Annex A are linked to the method of EN 15287-1 for taking into account the temperature dependence has been added;
- for non-concentric ducts the calculation of the mean temperature of the air supply has been amended;
- for chimney fans a calculation procedure has been added;

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This European Standard “Chimneys — Thermal and fluid dynamic calculation methods” consists of three Parts:

- Part 1: Chimneys serving one heating appliance
- Part 2: Chimneys serving more than one heating appliance
- Part 3: Methods for the development of diagrams and tables for chimneys serving one heating appliance

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## EN 13384-1:2015 (E)

### 1 Scope

This European Standard specifies methods for the calculation of the thermal and fluid dynamic characteristics of chimneys serving one heating appliance.

The methods in this part of this European Standard are applicable to negative or positive pressure chimneys with wet or dry operating conditions. It is valid for chimneys with heating appliances for fuels subject to the knowledge of the flue gas characteristics which are needed for the calculation.

The methods in this part of this European Standard are applicable to chimneys with one inlet connected with one appliance. The methods in Part 2 of this European Standard are applicable to chimneys with multiple inlets and one inlet with multiple appliances. Part 3 describes methods for the development of diagrams and tables for chimneys serving one heating appliance.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 1856-1, *Chimneys - Requirements for metal chimneys - Part 1: System chimney products*

EN 1859, *Chimneys — Metal chimneys — Test methods*

EN 13502, *Chimneys - Requirements and test methods for clay/ceramic flue terminals*

EN 15287-1:2007+A1:2010, *Chimneys - Design, installation and commissioning of chimneys - Part 1: Chimneys for non-roomsealed heating appliances*

prEN 16475-2, *Chimneys - Accessories - Part 2: Chimney fans - Requirements and test methods*

CEN/TR 1749, *European scheme for the classification of gas appliances according to the method of evacuation of the combustion products (types)*

### 3 Terms and definitions

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

#### 3.1

##### heat output

$Q$

amount of heat produced by a heating appliance per unit of time

#### 3.1.1

##### nominal heat output

$Q_N$

continuous heat output specified by the manufacturer of the heating appliance related to specified fuels



**3.1.2****heat output range**

range of output below the nominal heat output specified by the manufacturer over which the appliance can be used

**3.2****heat input** $Q_F$ 

amount of heat in unit time which is supplied to the heating appliance by the fuel based on its net caloric value  $H_u$

**3.3****efficiency of the heating appliance** $\eta_w$ 

ratio of the heat output ( $Q$ ) from the appliance to the heat input ( $Q_F$ )

**3.4****flue gas mass flow** $\dot{m}$ 

mass of flue gas leaving the heating appliance through the connecting flue pipe per time unit

**3.5****effective height of the chimney** $H$ 

difference in height between the axis of the flue gas inlet into the chimney and the outlet of the chimney

**3.6****effective height of the connecting flue pipe** $H_V$ 

difference in height between the axis of the flue gas chimney outlet of the heating appliance and the axis of the flue gas inlet into the chimney

Note 1 to entry In the case of open fire chimneys,  $H_V$  is the difference in height between the height of the upper frame of the furnace and the axis of the flue gas inlet into the chimney.

**3.7****draught**

positive value of the negative pressure in the flue

**3.8****theoretical draught available due to chimney effect** $P_H$ 

pressure difference caused by the difference in weight between the column of air equal to the effective height outside a chimney and the column of flue gas equal to the effective height inside the chimney

**3.9****pressure resistance of the chimney** $P_R$ 

pressure which is necessary to overcome the resistance of the flue gas mass flow which exists when carrying the flue gases through the chimney

**3.10****wind velocity pressure** $P_L$ 

pressure generated on the chimney due to wind

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