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Chimneys - Thermal and fluid dynamic calculation methods - Part 2: Chimneys serving more than one heating appliance

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN 13384-2:2015 sisaldab Euroopa standardi EN 13384-2:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 13384-2:2015 consists of the English text of the European standard EN 13384-2:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.04.2015.	Date of Availability of the European standard is 01.04.2015.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Chimneys - Thermal and fluid dynamic calculation methods - Part 2: Chimneys serving more than one heating appliance

Conduits de fumée - Méthodes de calcul thermo-aéraulique - Partie 2: Conduits de fumée desservant plus d'un appareil de chauffage

Abgasanlagen - Wärme- und strömungstechnische Berechnungsverfahren - Teil 2: Abgasanlagen mit mehreren Feuerstätten

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

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

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Foreword

This document (EN 13384-2:2015) 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of an identical text or by endorsement, at the latest by October 2015, and conflicting national standards shall be withdrawn at the latest by October 2015.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 13384-2:2003+A1:2009.

According to EN 13384-2:2003+A1:2009 the following fundamental changes are given:

— editorial mistakes have been corrected;

— mistakes in formulas have been corrected;

— characteristic values for heating appliances for solid fuel and for liquid fuels in Annex B have been adapted to actual data;

— for the mixture of fuels a clarification about the rise of the dew point has been added;

— for non-concentric ducts the calculation of the mean temperature of the air supply has been amended;

— the process for iteration for appliances with low impact of the pressure to the flue gas mass flow (e.g. CHP with combustion engine) has been simplified;

— for chimney fans a calculation procedure has been added;

This standard is one of a series of standards prepared by CEN/TC 166 comprising product standards and execution standards for chimneys.

National installation rules are not regarded in the standard.

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.

Introduction

The calculation described in this standard is complex and is intended to be solved by using a computer programme. The general principles of this calculation method of EN 13384-1 also apply to this standard.

This standard is in support of the execution standards for a chimney installation serving more than one heating appliance.

The execution standard identifies limitations and safety considerations associated with the design, installation, commissioning and maintenance of a chimney serving more than one heating appliance (not dealt within the calculation method).

1 Scope

This part of EN 13384 specifies methods for calculation of the thermal and fluid dynamic characteristics of chimneys serving more than one heating appliance.

This part of EN 13384 covers both the cases, either

a) where the chimney is connected with more than one connecting flue pipe from individual or several appliances in a multi-inlet arrangement; or

b) where the chimney is connected with an individual connecting flue pipe connecting more than one appliance in a cascade arrangement.

The case of multiple inlet cascade arrangement is covered by the case a).

This part of EN 13384 deals with chimneys operating under negative pressure conditions (there can be positive pressure condition in the connecting flue pipe) and with chimneys operating under positive pressure conditions and is valid for chimneys serving heating appliances for liquid, gaseous and solid fuels.

This part of EN 13384 does not apply to:

— chimneys with different thermal resistance or different cross-section in the various chimney segments. This part does not apply to calculate energy gain;

— chimneys with open fire places, e.g. open fire chimneys or chimney inlets which are normally intended to operate open to the room;

— chimneys which serve different kinds of heating appliances regarding natural draught, fan assisted, forced draught or combustion engine. Fan assisted appliances with draught diverter between the fan and the chimney are considered as natural draught appliances;

— chimneys with multiple inlets from more than 5 storeys. (This does not apply to balanced flue chimney.);

— chimneys serving heating appliances with open air supply through ventilation openings or air ducts, which are not installed in the same air supply pressure region (e.g. same side of building).

For positive pressure chimneys this part only applies if any heating appliance which is out of action can be positively isolated to prevent flue gas back flow.

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 1443:2003, *Chimneys - General requirements*

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

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

EN 15287-2:2008, *Chimneys - Design, installation and commissioning of chimneys - Part 2: Chimneys for roomsealed appliances*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1443:2003, EN 13384-1:2015, EN 15287-1:2007+A1:2010, EN 15287-2:2008 and the following apply.

3.1
chimney segment
part of a chimney between two consecutive flue gas connections or between the last flue gas connection and the chimney outlet

3.2
collector segment
part of a connecting flue pipe between two consecutive flue gas connections or between the last flue gas connection and the chimney inlet

3.3
flue gas mass flow
$\dot{m}$
mass of the flue gas leaving the heating appliance through the connecting flue pipe per unit of time

Note 1 to entry: In case of a chimney serving more than one heating appliance, the air being transported through an appliance which is out of action is also given the term flue gas mass flow.

3.3.1
declared flue gas mass flow
$\dot{m}_{W,j}$
flue gas mass flow given by the manufacturer of the heating appliance j with respect to the heat output used in the calculation

3.3.2
calculated flue gas mass flow
$\dot{m}_{Wc,j}$
flue gas mass flow calculated with respect to calculated draught and the working conditions of the heating appliance j

3.4
calculated flue gas temperature
$T_{Wc,j}$
flue gas temperature at the outlet of the heating appliance j depending on the calculated flue gas mass flow

3.5
calculated draught of the flue gas of the heating appliance
$P_{Wc,j}$
draught at the flue gas outlet of the heating appliance j depending on the calculated flue gas mass flow

3.6
flue damper
device to close or partially close the flue