SLOVENSKI STANDARD
SIST EN 13384-1:2015/oprA1:2018

01-december-2018

Dimniki - Računske metode termodinamike in dinamike fluidov - 1. del: Dimniki za eno ogrevalno napravo

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

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

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

Ta slovenski standard je istoveten z: **EN 13384-1:2015/prA1**

ICS:

91.060.40 Dimniki, jaški, kanali Chimneys, shafts, ducts

SIST EN 13384-1:2015/oprA1:2018 **en,fr,de**

EUROPEAN STANDARD

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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 draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 166.

This draft amendment A1, if approved, will modify the European Standard EN 13384-1:2015. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (EN 13384-1:2015/prA1:2018) has been prepared by Technical Committee CEN/TC 166 "Chimneys", the secretariat of which is held by ASI.

1 Modification to 1, 3, 4, 5, 6, 7, 8, 9 and Annex B

Replace

“heating appliance”

By

“combustion appliance”.

2 Modification to 5.5.2

Replace Clause 5.5.2 with the following text:

"5.5.2 Flue gas mass flow and combustion air mass flow

5.5.2.1 Flue gas mass flow and combustion air mass flow at nominal heat output of the combustion appliance

For the calculation of pressure and temperature values according to relationships of Formulae (1), (2), (2a), (3), (4), (5), (5a) and (6) the flue gas mass flow and combustion air mass flow at nominal heat output conditions for the combustion appliance shall be obtained.

If the data are not available the flue gas mass flow, combustion air mass flow and the volume concentration of CO_2 can be determined from the formulas in Tables B.1, B.2 or B.3.

If the chimney is connected to a multi-fuel combustion appliance the calculation and dimensioning should be carried out by considering all the fuels suited to the appliance.

In the case of combustion appliances with a draught diverter the flue gas mass flow downstream of the draught diverter shall be used.

The flue gas mass flow $\dot{m}$ and combustion air mass flow $\dot{m}_B$ of an open fire place depends on its opening. For the calculation use the following formula:

$$\dot{m} = f_{mf} \cdot A_F \text{, in kg/s} \qquad (8)$$

$$\dot{m}_B = \dot{m} \text{, in kg/s} \qquad (8a)$$

where

f_{mf} is the mass flow factor of an open fire place, in kg/(s·m^2);

A_F is the cross section of the opening of the open fire place, in m^2;

For open fire places with an opening height less than or equal its width f_{mf} = 0,139 kg/(s·m^2).

For open fire places with an opening height greater than its width f_{mf} = 0,167 kg/(s·m^2).

The CO_2-content of the flue gas for open fire places may be taken as $\sigma(CO_2)$ = 1 %.

5.5.2.2 Flue gas mass flow and combustion air mass flow at the lowest permissible heat output

If the combustion appliance is designed to operate under modulating conditions an additional check shall be conducted for the pressure and temperature requirement of the flue gas mass flow and combustion air mass flow at the lowest possible and permissible heat output of the combustion appliance. If the manufacturer does not provide flue gas data and combustion air mass data for the lowest heat output use a mass flow of one third of the flue gas mass flow and combustion air mass flow at nominal heat output.

5.5.2.3 Flue gas mass flow and combustion air mass flow at the maximum draught or minimum differential pressure of the combustion appliances

For the calculation of maximum draught or minimum positive pressure in a chimney the flue gas mass flow and combustion air mass flow at maximum draught or minimum differential pressure of the combustion appliance shall be obtained from the manufacturer of the combustion appliance if appropriate.

5.5.2.4 Flue gas mass flow with secondary air

If secondary air is supplied by a draught regulator or draught diverter the air flow shall be calculated according to 6.3 depending on the actual difference of the pressure in the room of installation of the combustion appliance and the chimney or connecting flue pipe."

3 Modification to 5.11.4

Replace Formula (43) with the following:

$$w_B = \frac{\dot{m}_B}{A_B \cdot \rho_B}, \text{ in m/s} \tag{43}$$

where

A_B is the cross-section of the combustion air pipe, in m^2;

$\dot{m}_B$ is the combustion air mass flow, in kg/s;

ρ_B is the density of the combustion air, in kg/m^3.

Delete the following note:

"NOTE As an approximation β = 0,9 can be assumed."

4 Modification to 6.4.1

Replace Formula (51) with the following:

$$P_{BNL} = P_B \cdot \left(1 + \frac{\dot{m}_{NL}}{\dot{m}_B}\right)^{1,5}, \text{ in Pa} \tag{51}$$

where

$\dot{m}_{NL}$ is the secondary air mass flow, in kg/s;

$\dot{m}_B$ is the combustion air mass flow, in kg/s;

P_B is the effective pressure resistance of the air supply without secondary air, in Pa (see 5.11.4);

Replace Formula (53) with the following:

$$w_{BNL} = \frac{\dot{m}_B + \dot{m}_{NL}}{A_B \cdot \rho_B}, \text{ in m/s} \qquad (53)$$

where

A_B	is the cross-section of the ventilation openings or combustion air pipe, m^2 (see 5.11.4);
$\dot{m}_B$	is the combustion air mass flow, in kg/s;
$\dot{m}_{NL}$	is the secondary air mass flow, in kg/s;
ρ_B	is the density of the combustion air and the secondary air (see 5.11.4), in kg/m^3.

5 Modification to 7

Replace

“supply air”

by

“combustion air”.

6 Modification to Annex B, Table B.1

Replace Table B.1 by the following table

Table B.1 — Values for determination of the combustion air $\dot{m}_B$, flue gas mass flow $\dot{m}$, the specific gas constant R, the specific heat capacity c_p, the water dew point t_p, the rise in the dew point ΔT_{sp}, the coefficient of thermal conductivity λ_A and dynamic viscosity η_A of flue gas (c_p, λ_A and η_A to 400 °C)

	Characteristic fuel data						Coefficients for calculation of flue gas data													
kind of fuel	H_u	V_{Atr} min	V_L min	V_{H_2O}	$\sigma(CO_2)$ max	$\sigma(SO_2)$ max	f_{m1}	f_{m2}	f_{m3}	f_R without cond.	f_R with cond.	f_{R1}	f_{R2}	f_{c0}	f_{c1}	f_{c2}	f_{c3}	f_w	f_{s1}	f_{s2}
	kWh/kg kWh/m^3	m^3/kg or m^3/m^3	m^3/kg or m^3/m^3	m^3/kg or m^3/m^3	%	%	g %/(kWs)	g/(kWs)	g/(kWs)	1/%	1/%	1/%	1/%	J/(kgK %)	J/(kgK^2 %)	J/(kgK^3 %)	1/%	%	K	K
coke	8,06	7,64	7,66	0,13	20,60	0,09	7,06	0,033	0,001	−0,0036	−0,0038	0,0036	−0,0040	3,4	0,014	−0,000014	0,0046	1 235	99	7
stone coal (anthracite)	9,24	8,37	8,55	0,44	19,05	0,10	6,23	0,036	0,007	−0,0028	−0,0033	0,0036	−0,0039	5,6	0,014	−0,000013	0,0057	370	93	7
brown coal	5,42	5,09	5,17	0,68	19,48	0,04	6,61	0,055	0,005	−0,0014	−0,0026	0,0037	−0,0040	10,3	0,015	−0,000012	0,0083	149	80	7
RFO < 4 % S	9,43	9,91	10,48	1,15	16,17	0,28	6,14	0,052	0,022	−0,0012	−0,0024	0,0037	−0,0039	10,7	0,014	−0,000012	0,0082	142	94	7
RFO < 2 % S	9,61	10,06	10,67	1,21	16,15	0,14	6,11	0,052	0,023	−0,001	−0,0023	0,0037	−0,0038	11,0	0,014	−0,000011	0,0083	137	89	7
RFO < 1 % S	9,74	10,17	10,79	1,25	16,09	0,07	6,07	0,052	0,023	−0,0009	−0,0022	0,0037	−0,0038	11,2	0,014	−0,000011	0,0084	134	85	7