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STN	**Individuálne zhotovené kachľové pece** **Dimenzovanie**	**STN** **EN 15544** 06 1247

One off Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) - Dimensioning

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/23

Rozpracované prekladom.

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EUROPEAN STANDARD
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EN 15544

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ICS 97.100.30 Supersedes EN 15544:2009

English Version

One off Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) - Dimensioning

Poêles en faïence, poêles en maçonnerie fabriqués in situ - Dimensionnement

Ortsfest gesetzte Kachelgrundöfen/Putzgrundöfen - Auslegung

This European Standard was approved by CEN on 2 January 2023.

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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 15544:2023) has been prepared by Technical Committee CEN/TC 295 “Residential solid fuel burning appliances”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by August 2023, and conflicting national standards shall be withdrawn at the latest by August 2023.

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

This document supersedes EN 15544:2009.

The main changes compared to the previous edition are listed below:

a) correction of editorial mistakes;

b) correction of mistakes in formulae;

c) calculation of the fuel load based on a variable efficiency instead of a fixed efficiency of 78 %;

d) introduction of calculated flue pipe length;

e) introduction of factors to calculate minimum flue pipe length depending on efficiency (Table 1);

f) specification of water content and dimensions of the used log wood;

g) calculation of the minimum load;

h) specification how to deal with type tested combustion chambers;

i) change of the portion of the glass plate compared to the inner surface of the combustion chamber;

j) definitions of fair fuel ratio and calculated flue pipe length added;

k) definitions of “construction with air gap” and “construction without air gap” updated;

l) specification of the relation between nominal heat output and full house as well as partial heating;

m) specification that in divergence to EN 13384-1 the dew point condition is calculated only for nominal heat output.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

This document specifies a calculation method for the dimensioning of Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves).

This calculation method for the dimensioning of Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) is based on appropriate literature as well as EN 13384-1, and where empirically determined correlations are used in addition to physical and chemical formulas.

In case of a calculation method for different interior materials than fireclay the proof of the compliance of the emission values and the efficiency shall be delivered separately. Also, the empiric data of the combustion chamber dimensions, the minimum flue pipe length, the burning rate as well as the combustion chamber temperature and the decrease of the temperature along the flue pipe shall also be separately determined.

1 Scope

The application of the calculations of this document enables a verification of the emission values carbon monoxide, nitrogen dioxide, organically bound carbon as well as dust and the energy efficiency.

Complying with the calculations of this document results in emission values less or equal for carbon monoxide 1 500 mg/m_n^3 (1 000 mg/MJ), nitrogen dioxide 225 mg/m_n^3 (150 mg/MJ), organically bound carbon 120 mg/m_n^3 (80 mg/MJ) and dust 90 mg/m_n^3 (60 mg/MJ). If the calculations of this document are used in combination with suitable combustion chambers that prove lower emission values in a type test, these values are also considered to be complied with.

There might be national or local regulations, which impose stricter legal emissions and/or efficiency requirements.

This document specifies calculations for the dimensioning of Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) based upon the required nominal heat output of the stove as declared by the producer. The Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) are of individual one-off construction design. The document can be used for log wood fired Kachelgrundöfen/Putzgrundöfen (tiled/plastered stoves) that burn one fuel load per storage period with a maximum load between 10 kg and 40 kg (log wood with water content from 12 % to 20 %, thickness of 5 cm to 10 cm in diameter, length varies usually from 25 cm to 50 cm, and is oriented toward the combustion chamber dimensions) and a storage period (nominal heating time) between 8 h and 24 h.

This document is applicable for Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) equipped with fireclay as interior material, with an apparent density between 1 750 kg/m^3 and 2 300 kg/m^3, a degree of porosity from 17 % up to 33 % by volume and a heat conductivity from 0,90 W/mK up to 1,35 W/mK (temperature range 20 °C to 400 °C).

This document is applicable for Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) with combustion air supply from the side via a firebox door frame or the standing grate of the heating door into the combustion chamber. The document is applicable for an inflow speed of the combustion air between 2 m/s and 4 m/s.

This document also applies to the combination with combustion chambers that are suitable for one-off Kachelgrundöfen/Putzgrundöfen (tiled/mortared stoves) and for which compliance with the legally required emission values has been verified as part of a type test by an accredited and/or notified body.

The following general conditions apply to such combustion chambers:

— with an air-fuel ratio of between 1,95 and 3,95 according to the type test;

— with a maximum load from 5 kg to 40 kg;

— using other suitable materials as well as fireclay.

With regard to the type test, this document is applicable for combustion chambers which are tested:

— according to EN 15250 (or EN 16510-2-5[1]);

— according to EN 13229 (or EN 16510-2-2); or

— according to respective national standards (e.g. ÖNORM B 8303).

[1] Under preparation. Stage at the time of publication: prEN 16510-2-5:2023.

This document is applicable for type tested combustion chambers designed for batch fired pellet burning if meeting the requirements according to this document (air-fuel ratio between 1,95 and 3,95, the load of the pellets burned in (78 ± 20) min).

This document is not applicable for:

— combinations with water heat exchangers for central heating or other heat absorbing elements like open water tanks, etc.;

— combustion chambers with glass plates greater than 1/5 of the combustion chamber surface;

— mass-produced prefabricated stoves (slow heat release appliances) or partly prefabricated stoves (slow heat release appliances) according to EN 15250 (or EN 16510-2-5[1]).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 13384-1, *Chimneys - Thermal and fluid dynamic calculation methods - Part 1: Chimneys serving one combustion appliance*

Note 1 to entry: It is a construction with no air gap if the distance between the inner and outer shell is less than 2,5 cm and at least 50 % of the Kachelgrundofen/Putzgrundofen (tiled/mortared stove) is built in this way.