BS EN 16510-2-2:2022

BSI Standards Publication

Residential solid fuel burning appliances

Part 2-2: Inset appliances including open fires

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Full document details: BS EN 16510-2-2:2022

National foreword

This British Standard is the UK implementation of EN 16510-2-2:2022. Together with BS EN 16510-1:2022 it supersedes BS EN 13229:2001+A2:2004, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/28, Domestic solid mineral fuel appliances.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

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Appareils de chauffage domestiques à combustible solide - Partie 2-2 : Foyers ouverts et inserts

Häusliche Feuerstätten für feste Brennstoffe - Teil 2-2: Kamineinsätze einschließlich offene Kamine

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European foreword

This document (EN 16510-2-2:2022) 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of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by November 2025.

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 13229:2001 as amended and corrected. In relation to EN 13229:2001 as amended and corrected the following changes have been made:

— measurement methods for NO_x, hydrocarbon and particulate matter emissions for solid fuel burning appliances;

— specifications for classification of solid fuel burning appliances and system boundaries for room sealed appliances;

— requirements for the safety of solid fuel burning appliances with water-bearing components added;

— Annex ZA updated according to requirements of M/577;

— energy efficiency and energy class labelling and seasonal space heating efficiency added;

— requirements for environmental sustainability added.

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

For relationship with (EU) Regulation 305/2011, see informative Annex ZA, which is an integral part of this document.

The structure of EN 16510, *Residential solid fuel burning appliances*, is as follows:

— Part 1: *General requirements and test methods*;

— Part 2-1: *Roomheaters*;

— Part 2-2: *Inset appliances including open fires*;

— Part 2-3: *Cookers*;

— Part 2-4: *Independent boilers — Nominal heat output up to 50 kW*;

— Part 2-5: *Slow heat release appliances*;

— Part 2-6: *Mechanically by wood pellets fed roomheaters, inset appliances and cookers*.

Other sections of Part 2 will be added to cover residential solid fuel burning appliances not included in parts 2-1 to 2-6.

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Subclauses and Figures which are additional to those in EN 16510-1:2022 are numbered starting with 201. Annexes which are additional to those in EN 16510-1:2022 are numbered starting with BA.

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.

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1 Scope

This document is applicable to inset appliances including open fires for solid fuel (hand fed solid fuel fired inset appliances, with or without functional modification, that operate without fire doors or operate with fire doors either as closed only or as closed or open, and also includes open fires fired by solid fuel).

The intended use of the appliances is space heating in residential buildings. They can be fitted with a boiler (integral part of the appliance containing water to be heated up) for the supply of hot water for central heating systems.

The surround of these appliances is integrated with the building with the exception of free-standing appliances and those inset appliances which are installed into a fireplace recess or enclosure.

These appliances can burn one or more types of the following solid fuels as specified:

— wood logs;

— compressed untreated wood;

— wood pellets;

— lignite briquettes;

— solid mineral fuels;

— peat briquettes.

This document is also applicable to Kachelofen/Putzofen inset appliances, having nominal heat outputs up to 15 kW.

This document is not applicable to appliances with fan assisted combustion air or appliances that are mechanically fed.

Open fireplace components such as a bottomgrate with associated fire front which are intended for installation into an existing heat resistant, insulated firebox are not covered by this document.

This document specifies procedures for assessment and verification of constancy of performance (AVCP) of characteristics of solid fuel burning inset appliances including open fires.

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.

EN 15804:2012+A2:2019, *Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products*

EN 16510-1:2022 *Residential solid fuel burning appliances — Part 1: General requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16510-1:2022 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at https://www.electropedia.org/

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Add the following new clauses:

3.201
Kachelofen/Putzofen heat generator
component of an inset in which the fuel is burned

3.202
Kachelofen/Putzofen heat generator flue gas outlet
part of the Kachelofen/Putzofen heat generator for connecting the flue gas pipe

Note 1 to entry: See EN 16510-1:2022, Figure A.16.

3.203
Kachelofen/Putzofen inset
appliance consisting of a heat generator connected to a heat-exchanger forming the flueway and surrounded by an enclosure

Note 1 to entry: The Kachelofen/Putzofen inset appliance may be fitted with a thermostat to automatically control the room temperature.

4 Characteristics

4.1 Protection of combustible materials

The performance of the appliance in relation to protection of combustible materials shall be determined in accordance with EN 16510-1:2022, 5.6.

When tested in accordance with EN 16510-1:2022, 5.6, the protection measure(s) as specified according to table 1 shall be given as minimum distance to combustible materials and if appropriate as material type and thickness of protective insulation material.

The protection measures as specified shall be given in [mm] as an integer according to EN 16510-1:2022, Table 22, no. 33, 34, 35, 36, 37, 38, 39 and 41 (d_R, d_S, d_C, d_P, d_F, d_L, d_B, s).

Table 1 — Protection of combustible materials

Protection measure	Declared clearance distance to combustible material or thickness of protective insulation material [mm]	Protective insulation material if any
Minimum distance to combustible materials - bottom (d_B)		-
Minimum distance to combustible materials – floor in front (d_F)		-
Minimum distance to combustible materials – ceiling (d_C)		-

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Protection measure	Declared clearance distance to combustible material or thickness of protective insulation material [mm]	Protective insulation material if any
Minimum distance to combustible materials – rear (d_R)		-
Minimum distance to combustible materials – side (d_S)		-
Minimum distance to combustible materials – side radiation area (d_L)		-
Minimum distance to adjacent combustible materials (e.g. furniture) (d_P)		-
Protective insulation material (s)		

4.2 Carbon monoxide emission (CO)

The performance of the appliance in relation to carbon monoxide emission at nominal heat output and at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022, 6.3.1 and 6.3.2.

The CO value if specified at nominal heat output and at part load heat output (if part load is specified) is to be given in [mg/m^3] as an integer according to EN 16510-1:2022, Table 22, no. 17 (CO_{nom} (13 % O_2)).

When tested in accordance with EN 16510-1:2022, 6.3.2 the CO emission at nominal heat output shall not exceed the threshold levels as given in Table 2.

Table 2 — Threshold levels for CO emission

Appliance type	Threshold level at 13 % O_2
open fronted solid fuel local space heaters	2000 mg/m^3
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets including cookers	1500 mg/m^3
closed fronted solid fuel local space heaters using compressed wood in form of pellets including cookers	300 mg/m^3

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4.3 Nitrogen oxides (NO_x) emissions

The performance of the appliance in relation to nitrogen oxides emissions at nominal heat output and at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022, 6.3.1 and 6.3.3.

The NO_x value if specified at nominal heat output and at part load heat output (if part load is specified) is to be given in [mg/m^3] as an integer according to EN 16510-1:2022, Table 22, no. 20 (NO_{xnom} (13 % O_2)).

When tested in accordance with EN 16510-1:2022, 6.3.3 the NO_x emissions at nominal heat output shall not exceed the threshold levels as given in Table 3.

Table 3 — Threshold levels for NO_x emission (expressed as NO_2)

Appliance type	Threshold level at 13 % O_2
open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers using biomass	200 mg/m^3
open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers using fossil solid fuel	300 mg/m^3

4.4 Emission of organic gaseous compounds (OGC)

The performance of the appliance in relation to organic gaseous compounds emission at nominal heat output and at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022, 6.3.1 and 6.3.4.

The OGC value if specified at nominal heat output and at part load heat output (if part load is specified) is to be given in [mg/m^3] as an integer according to EN 16510-1:2022, Table 22, no. 23 (OGC_{nom} (13 % O_2)).

When tested in accordance with EN 16510-1:2022, 6.3.4 the OGC emission at nominal heat output shall not exceed the threshold levels as given in Table 4.

Table 4 — Threshold levels for OGC emission (expressed as C)

Appliance type	Threshold level at 13 % O_2
open fronted solid fuel local space heaters	120 mg C/m^3
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets including cookers	120 mg C/m^3
closed fronted solid fuel local space heaters using compressed wood in form of pellets including cookers	60 mg C/m^3

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4.5 Particulate matter (PM) emissions

The performance of the appliance in relation to particulate matter emissions at nominal heat output and at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022,6.3.1 and 6.3.5.

The particulate matter value if specified at nominal heat output and at part load heat output (if part load is specified) is to be given in [mg/m^3] as an integer according to EN 16510-1:2022, Table 22, no. 26 (PM_{nom} (13 % O_2)).

When tested in accordance with EN 16510-1:2022, 6.3.5 the particulate matter (PM) emissions at nominal heat output shall not exceed the threshold levels as given in Table 5.

Table 5 — Threshold levels for PM emission

Appliance type	Threshold level at 13 % O_2
open fronted solid fuel local space heaters	50 mg/m^3
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers	40 mg/m^3
closed fronted solid fuel local space heaters using compressed wood in form of pellets	20 mg/m^3

4.6 Safety and accessibility in use

4.6.1 General

The data for the installation to a chimney are to be evaluated at nominal heat output. Specific data are to be evaluated at safety test heat output. Additional data are to be evaluated at part load heat output, if part load is specified.

4.6.2 Flue gas outlet temperature at nominal heat output

The performance of the appliance in relation to flue gas outlet temperature at nominal heat output shall be determined in accordance with EN 16510-1:2022, 6.2.1.

The value of the flue gas outlet temperature for the installation of the appliance to a chimney if specified is to be given in [°C] as an integer according to EN 16510-1:2022, Table 22, no. 47 (T_{snom}).

4.6.3 Flue gas outlet temperature at part load heat output

The performance of the appliance in relation to flue gas outlet temperature at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022, 6.2.1.

The value of the flue gas outlet temperature at part load heat output (if part load is specified) for the installation of the appliance to a chimney if specified is to be given in [°C] as an integer according to EN 16510-1:2022, Table 22, no. 48 (T_{spart}).

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4.6.4 Minimum flue draught at nominal heat output

The performance of the appliance in relation to the minimum flue draught at nominal heat output shall be determined in accordance with EN 16510-1:2022, 6.5.

The value of the minimum flue draught if specified at nominal heat output for the installation of the appliance to a chimney is to be given in [Pa] as an integer according to EN 16510-1:2022, Table 22, no. 29 (p_{nom}).

4.6.5 Minimum flue draught at part load heat output

The performance of the appliance in relation to the minimum flue draught at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022, 6.5.

The minimum value of the flue draught if specified at part load heat output (if part load is specified) for the installation of the appliance to a chimney is to be given in [Pa] as an integer according to EN 16510-1:2022, Table 22, no. 30 (p_{part}).

4.6.6 Flue gas mass flow at nominal heat output

The performance of the appliance in relation to the flue gas mass flow at nominal heat output shall be determined in accordance with EN 16510-1:2022, 6.12.

The flue gas mass flow value if specified at nominal heat output for the installation of the appliance to a chimney is to be given in [g/s] with 1 decimal according to EN 16510-1:2022, Table 22, no. 50 ($\phi_{f,g\ nom}$).

4.6.7 Flue gas mass flow at part load heat output

The performance of the appliance in relation to the flue gas mass flow at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022, 6.12.

The flue gas mass flow value if specified at part load heat output (if part load is specified) for the installation of the appliance to a chimney is to be given in [g/s] with 1 decimal according to EN 16510-1:2022, Table 22, no. 51 ($\phi_{f,g\ part}$).

4.6.8 Fire safety of installation to the chimney

The performance of the appliance in relation to the flue gas temperature (mean value) at safety test shall be determined in accordance with EN 16510-1:2022, A.4.10.4.

The data for installation of the appliance to a chimney with regards to the fire safety if specified is to be given as the Tclass of the chimney required according to EN 16510-1:2022, 6.2.2 and EN 16510-1:2022, Table 22, no. 49.

4.7 Energy economy and heat retention

4.7.1 Space heat output at nominal heat output

The performance of the appliance in relation to space heat output at nominal heat output shall be determined in accordance with EN 16510-1:2022, 6.8.

The space heat output of the appliance if specified at nominal heat output is to be given in [kW] with 1 decimal and shall be specified according to EN 16510-1:2022, Table 22, no. 2 (P_{SHnom}).

For the proper performance of the appliance the following shall be considered as well for those essential characteristics and descriptive features assessed during the nominal heat output test (A.4.7).

Additional devices, such as flue gas outlet components, components built-in the flue ways, combustion air supply control devices, charging doors and ash-pit doors, flue bypass devices, internal flue gas

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