BS EN 16510-2-4:2022

BSI Standards Publication

Residential solid fuel burning appliances

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

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National foreword

This British Standard is the UK implementation of EN 16510-2-4:2022. Together with BS EN 16510-1:2018 and BS EN 16510-2-4:2022, it supersedes BS EN 12809:2001+A1:2004 which is withdrawn.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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Residential solid fuel burning appliances - Part 2-4: Independent boilers - Nominal heat output up to 50 kW

Appareils de chauffage domestiques à combustible solide - Partie 2-4 : Chaudières à installer dans le volume habitable - Puissance utile nominale inférieure ou égale à 50 kW

Häusliche Feuerstätten für feste Brennstoffe - Teil 2-4: Heizkessel für feste Brennstoffe - Nennwärmeleistung bis 50 kW

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European foreword

This document (EN 16510-2-4:2022) 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of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by November 2025.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 12809:2001 as amended and corrected. In relation to EN 12809:2001 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 401. Annexes which are additional to those in EN 16510-1 are numbered starting with DA.

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 independent boiler appliances for solid fuel with a nominal output up to 50 kW (hand and automatically fired independent boilers (hereafter called appliances)).

The indented use of the appliances is space heating in residential buildings. This happens directly or via provision of hot water for central heating. They are designed for use only with open vented systems at a working pressure not exceeding 2 bar.

The 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.

The appliances are operated closed and/or open.

The appliances are typed according to their tightness depending on their designation in accordance with a possible operation together with a room ventilation system.

This document is not applicable for:

— appliances for hot water only production and heat output < 5 kW;

— automatic stoking devices.

This document specifies procedures for assessment and verification of constancy of performance (AVCP) of characteristics of solid fuel burning independent boiler appliances.

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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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)		--
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)		

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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

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 NOx 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

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