BS EN 16510-2-6:2022

BSI Standards Publication

Residential solid fuel burning appliances

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

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National foreword

This British Standard is the UK implementation of EN 16510-2-6:2022. It supersedes BS EN 14785:2006, which is withdrawn.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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Published by BSI Standards Limited 2023

ISBN 978 0 539 16434 3

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ICS 97.100.30

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2023.

Amendments/corrigenda issued since publication

Date	Text affected

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16510-2-6

December 2022

ICS 97.100.30

Supersedes EN 14785:2006

English Version

Residential solid fuel burning appliances - Part 2-6: Mechanically by wood pellets fed roomheaters, inset appliances and cookers

Appareils de chauffage domestiques à combustible solide - Partie 2-6 : Poêles, inserts et cuisinières à granulés de bois et à alimentation mécanique

Häusliche Feuerstätten für feste Brennstoffe - Teil 2-6: Mechanisch mit Holzpellets beschickte Raumheizer, Einsätze und Herde

This European Standard was approved by CEN on 23 October 2022.

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Ref. No. EN 16510-2-6:2022 E

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European foreword

This document (EN 16510-2-6:2022) 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of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by November 2025.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 14785:2006 as amended and corrected. In relation to EN 14785:2006 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 601. Annexes which are additional to those in EN 16510-1:2022 are numbered starting with FA.

For inset pellet appliances and especially their testing, additional information from EN 16510-2-2:2022 is relevant.

For pellet cookers and especially their testing, additional information from EN 16510-2-3:2022 is relevant.

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 mechanical by wood pellets fed roomheaters, inset appliances and cookers up to 50 kW nominal heat output.

The intended use of the appliances is space heating in residential buildings and can be cooking. 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.

These appliances typically use auxiliary energy which is measured in this document as well. They can be operated with either natural draught or fan-assisted combustion air.

NOTE A fan-assisted appliance does still operate under negative pressure in the flue gas system.

These appliances burn wood pellets only as specified. They only operate with the firedoors closed.

This document is not applicable to appliances:

— with boiler intended for water systems having water temperatures above 110 °C and 3 bar;

— with boiler intended for water systems having direct contact with sanitary hot water;

— intended to be used with a pure horizontal exhaust (through the building wall);

— with flue gas condensation in the appliance;

— switching on/off for part load operation.

This document specifies procedures for assessment and verification of constancy of performance (AVCP) of characteristics of mechanical by wood pellets fed roomheaters, inset appliances and cookers.

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 15456:2008, *Heating boilers — Electrical power consumption for heat generators — System boundaries — Measurements*

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*

EN 16510-2-2:2022, *Residential solid fuel burning appliances — Part 2-2: Inset appliances including open fires*

EN 16510-2-3:2022, *Residential solid fuel burning appliances — Part 2-3: Cookers*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16510-1:2022, EN 16510-2-2:2022, EN 16510-2-3:2022 and the following 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/

Add the following new clauses:

3.601
heat output control device
device to control the heat output of the appliance

3.602
ignition system
device used to ignite the fuel in the retort of the combustion chamber

Note 1 to entry: Ignition could be performed manually, automatically and by using, for example, a hot air blower, an electrical resistor or an electrical resistance for ignition.

3.603
standby operation
operation mode without heat demand, in which the system is launched immediately in the required mode as soon as the heat demand is required

3.604
back burning
state in which the fuel ignites in direction to the fuel line and the burning spreads to the fuel storage or the integral hopper

Note 1 to entry: Back burning can be caused by three driving forces:

a) fuel ignition in direction to the fuel line or the integral hopper;

b) spreading and ignition of hot and ignitable gases into the fuel line or the integral hopper;

c) thermal conduction to the fuel line or the integral hopper.

3.605
back burning safety device
one or more self-acting certificated devices to avoid back burning, including extinguishing installations

3.606
safety shut-down
process by which the fuel supply and/or combustion air supply is stopped immediately as a response of a safety device or the detection of a fault in a safety device

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4 Characteristics

4.1 Load bearing capacity

The performance of the appliance in relation to the ability to carry a chimney shall be determined in accordance with EN 16510-1:2022, 4.6.

If for an appliance with an upper outlet the ability to carry a chimney is specified the value of the maximum load is to be given in [kg] as an integer according to EN 16510-1:2022, Table 22, no. 57 (m_{chim}).

4.2 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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4.3 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
closed fronted solid fuel local space heaters using compressed wood in form of pellets including cookers	300 mg/m^3

4.4 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 emission 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

4.5 Emission of organic gaseous compounds (OGC) emissions

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.

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

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

4.6 Particulate matter (PM) emissions

The performance of the appliance in relation to particulate matter 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 6.3.5.

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
closed fronted solid fuel local space heaters using compressed wood in form of pellets	20 mg/m^3

4.7 Safety and accessibility in use

4.7.1 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.

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

4.7.3 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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4.7.4 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}).

Appliances with a nominal heat output less than or equal to 25 kW shall be tested at a flue draught of (12 ± 2) Pa or at the flue draught specified for the nominal heat output test. The temperature safety test shall be carried out at the same draught.

Appliances having a nominal heat output greater than 25 kW shall be tested during the nominal heat output test at such flue draught specified in the appliance instructions.

4.7.5 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}).

For the partial load test all appliances shall be tested either at a flue draught of (10 ± 2) Pa or at the flue draught specified for the part load heat output test.

4.7.6 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 ($\phi_{f,g\ nom}$).

4.7.7 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 ($\phi_{f,g\ part}$).

4.7.8 Fire safety of installation to the chimney

The performance of the appliance in relation to the flue gas temperature (mean value) of the last 30 min 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. Deviating from 6.2.2 of EN 16510-1:2022 the chimney designation shall be at least T200 G.

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