Draft for Public Comment

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Interested committees:

Title: BS EN 16510-2-7 Residential solid fuel burning appliances

Part 2-7: Combination appliances fired by wood logs and pellets

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Date: xx/xx/20xx	Document: ISO/DIS xxxx

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex **(e.g. 3.1)**	Paragraph/Figure/ Table/Note	**Type of comment**	**Commend (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations on each comment submitted**
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 16510-2-7

May 2023

ICS 97.100.30

English Version

Residential solid fuel burning appliances - Part 2-7: Combination appliances fired by wood logs and pellets

Häusliche Feuerstätten für feste Brennstoffe - Teil 2-7: Kombinationsfeuerstätten für Scheitholz und Pellets

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 295.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European foreword

This document (prEN 16510-2-7:2023) has been prepared by Technical Committee CEN/TC 295 “Residential solid fuel burning appliances”, the secretariat of which is held by BSI.

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*;

— Part 2-7: *Combination appliances fired by wood logs and pellets*.

Other sections of Part 2 will be added to cover residential solid fuel burning appliances not included in parts 2-1 to 2-7.

Subclauses and Figures which are additional to those in FprEN 16510-1:2022 are numbered starting with 701. Annexes which are additional to those in FprEN 16510-1:2022 are numbered starting with GA.

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

For pellet appliances and especially their testing, additional information from FprEN 16510-2-6:2022 is relevant.

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

For appliances according to this document the same additional information regarding instructions as specified in EN 16510-1:2022, Clause 7 for appliances according to EN 16510-2-6:2022 is applicable.

Descriptive features according to EN 16510-1, 4.4 for devices according to EN 16510-2-6 are equally valid for devices according to this document.

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1 Scope

This document is applicable to space heaters, inset appliances and cookers intended for mechanical fuelling with wood pellets and for manual fuelling with other solid fuel. They can be freestanding or inset appliances.

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 standard as well. They are operated with natural draught and can be fan-assisted.

NOTE 1 A fan-assisted appliance does still operate under negative pressure in the flue gas system.

For inset appliances and especially their testing additional information can be necessary from EN 16510-2-2.

These appliances burn wood pellets and wood logs only, in accordance with the appliance instructions. They only operate with the firedoors closed.

NOTE 2 These appliances can have an integral fuel hopper or be combined with an external fuel hopper.

These appliances can be fitted with a single or double combustion chamber having a single flue gas outlet.

This document specifies procedures for assessment and verification of constancy of performance (AVCP) of characteristics of combination appliances fired by wood logs and pellets.

This document is not applicable to appliances

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

— with simultaneous wood and pellet operation with a single flue gas outlet,

— with non-automatic pellet loading,

— with single combustion chamber and double flue gas outlet.

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*

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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*

EN 16510-2-4:2022, *Residential solid fuel burning appliances — Part 2-4: Independent boilers — Nominal heat output up to 50 kW*

EN 16510-2-6:2022, *Residential solid fuel burning appliances — Part 2-6: Mechanically by wood pellets fed roomheaters, inset appliances and cookers*

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, EN 16510-2-6:2022 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/

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 combustibles 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).

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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 combustibles - bottom (d_B)		–
Minimum distance to combustibles – floor in front (d_F)		–
Minimum distance to combustibles – ceiling (d_C)		–
Minimum distance to combustibles – rear (d_R)		–
Minimum distance to combustibles – side (d_S)		–
Minimum distance to combustibles – side radiation area (d_L)		–
Minimum distance to adjacent combustible materials (e.g. furniture) (d_P)		–
Protective insulation material (s)		

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 FprEN 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/m³] as an integer according to FprEN 16510-1:2022, Table 22, no. 17 (CO_{nom} (13 % O_2)).

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

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Table 2 — Threshold levels for CO emission

Appliance type	Threshold level at 13 % O_2
open fronted solid fuel local space heaters	2000 mg/m³
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets including cookers	1500 mg/m³
closed fronted solid fuel local space heaters using compressed wood in form of pellets including cookers	300 mg/m³

Each test shall be performed for both fuels (wood logs and compressed woods in form of pellets).

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/m³] 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/m³
open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers using fossil solid fuel	300 mg/m³

Each test shall be performed for both fuels (wood logs and compressed woods in form of pellets).

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/m³] 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
open fronted solid fuel local space heaters	120 mg C/m³
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets including cookers	120 mg C/m³
closed fronted solid fuel local space heaters using compressed wood in form of pellets including cookers	60 mg C/m³

Each test shall be performed for both fuels (wood logs and compressed woods in form of pellets).

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/m³] 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/m³
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers	40 mg/m³
closed fronted solid fuel local space heaters using compressed wood in form of pellets	20 mg/m³

Each test shall be performed for both fuels (wood logs and compressed woods in form of pellets).

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.

Each test shall be performed for both fuels (wood logs and compressed woods in form of pellets).

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}).

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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}).

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.

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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.

4.8 Energy economy and heat retention

4.8.1 General

Each of the tests described in the following shall be performed for both fuels (wood logs and compressed woods in form of pellets).

4.8.2 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 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, flue bypass devices, internal flue gas diverters draught regulators, air inlets, retorts, heat output control devices, and/or hoppers for the safety or function of the appliance may be present.

Some of these devices are optional, but if present their influence on the performance of the appliance shall be checked according to EN 16510-1:2022, 4.4.4, 4.4.6, 4.4.9, 4.4.11, 4.4.12, 4.4.13, 4.4.14, 4.4.16, 4.4.24, 4.4.25, 4.4.26, and 4.4.27.

4.8.3 Water heat output, if existing at nominal heat output

The performance of the appliance in relation to water heat output (where appropriate) at nominal heat output shall be determined in accordance with EN 16510-1:2022, 6.9.

The water heat output of the appliance if specified at nominal heat output is to be given in [kW] with 1 decimal according to EN 16510-1:2022, Table 22, no. 3 (P_{Wnom}).

4.8.4 Efficiency at nominal heat output

The performance of the appliance in relation to efficiency at nominal heat output shall be determined in accordance with EN 16510-1:2022, 6.4.

The efficiency of the appliance if specified at nominal heat output is to be given in [%] as an integer according to EN 16510-1:2022, Table 22, no. 13 (η_{nom}).

4.8.5 Space heat output at part load heat output

The performance of the appliance in relation to space heat output at part load heat output (if part load is specified) shall be determined in accordance with EN 16510-1:2022, 6.8.

The space heat output of the appliance if specified at part load heat output (if part load is specified) is to be given in [kW] with 1 decimal according to EN 16510-1:2022, Table 22, no 5 (P_{SHpart}).

For the proper performance of the appliance the following shall be considered as well for those essential characteristics and descriptive features assessed during the part load heat output test (A.4.8).

Additional devices, such as flue gas outlet components, components built-in the flue ways, flue bypass devices, internal flue gas diverters draught regulators, air inlets, retorts, heat output control devices, and/or hoppers for the safety or function of the appliance may be present.

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