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Grelne naprave na trdna goriva za stanovanjske stavbe - 2-4. del: Grelni kotli - Nazivna grelna moč do 50 kW

Residential solid fuel burning appliances - Part 2-4: Independent boilers - Nominal heat output up to 50 kW

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

Equipement de chauffage domestique - Partie 2-4 : Chaudières domestiques à combustible solide - Puissance calorifique nominale inférieure ou égale à 50 kW

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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

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

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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EN 16510-2-4:2022 (E)**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of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by November 2025.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.

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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[SIST EN 16510-2-4:2023](https://standards.iteh.ai/catalog/standards/sist/912f86a4-9eca-4d14-92fb-42cad7031a7b/sist-en-16510-2-4-2023)

<https://standards.iteh.ai/catalog/standards/sist/912f86a4-9eca-4d14-92fb-42cad7031a7b/sist-en-16510-2-4-2023>

EN 16510-2-4:2022 (E)

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 intended 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/>

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) | | |

EN 16510-2-4:2022 (E)

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/m³] as an integer according to EN 16510-1:2022, Table 22, no. 17 (CO_{nom} (13 % O₂)).

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/m³] as an integer according to EN 16510-1:2022, Table 22, no. 20 (NO_{xnom} (13 % O₂)).

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 NO₂)

| 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/m³] as an integer according to EN 16510-1:2022, Table 22, no. 23 (OGC_{nom} (13 % O₂)).

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 |

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/m³] as an integer according to EN 16510-1:2022, Table 22, no. 26 (PM_{nom} (13 % O₂)).

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 |

EN 16510-2-4:2022 (E)**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 is to be evaluated at safety test heat output. Additional data is 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}).

4.6.4 Minimum flue draught**4.6.4.1 General**

The flue draught values, related to the appliance's nominal heat output, given in Figure 1, shall be taken as the values for the static pressure to be applied in the measurement section (see EN 16510-1:2022, Figures A.10, A.11 and A.12) when undertaking the nominal heat output test in accordance with A.4.7, the part load heat output test in accordance with A.4.8, the slow combustion test for continuous burning appliances in accordance with A.4.9 and the safety test in accordance with A.4.10.

Where the flue draught values given in Figure 1 need to be exceeded in order to obtain the specified nominal output, the required flue draught shall be clearly stated in the appliance's installation instructions.

This means that a value above 12 Pa, but not below 12 Pa may be specified.