



**SLOVENSKI STANDARD**  
**oSIST prEN 16510-2-5:2023**  
**01-junij-2023**

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**Grelne naprave na trdna goriva za stanovanjske stavbe - 2-5. del: Naprave, ki počasi oddajajo toploto**

Residential solid fuel burning appliances - Part 2-5: Slow heat release appliances

Häusliche Feuerstätten für feste Brennstoffe - Teil 2-5: Speicherfeuerstätten

Appareils de chauffage domestiques à combustible solide - Partie 2-5: Appareils à libération lente de chaleur (SHRA)

**Ta slovenski standard je istoveten z: prEN 16510-2-5**

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**ICS:**

97.100.30      Grelniki na trdo gorivo      Solid fuel heaters

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ICS

English Version

## Residential solid fuel burning appliances - Part 2-5: Slow heat release appliances

Häusliche Feuerstätten für feste Brennstoffe - Teil 2-5:  
Speicherfeuerstätten

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

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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**prEN 16510-2-5:2023 (E)****European foreword**

This document (FprEN 16510-2-5:2023) has been prepared by Technical Committee CEN/TC 295 “Residential solid fuel burning appliances”, the secretariat of which is held by BSI.

This document is currently submitted to the Enquiry.

This document will supersede EN 15250:2007.

In relation to EN 15250:2007 as amended and corrected, the following changes have been made:

- Measurement methods for NO<sub>x</sub>, 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 FprEN 16510-1:2022 are numbered starting with 501. Annexes which are additional to those in FprEN 16510-1:2022 are numbered starting with EA.



## 1 Scope

This document is applicable to slow heat release appliances for solid fuel (freestanding hand fuelled intermittent burning slow heat release appliances (SHRA) having heat storage capacity such that they can provide heat and release it for an extended period after the fire has gone out).

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

These slow heat release appliances may be supplied either as an assembled appliance or as a pre-designed unit consisting of prefabricated components designed to be built on site in accordance with the specified assembly instructions.

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 not applicable to:

- mechanically fed appliances
- appliances with fan assisted combustion air
- one off installations

This document specifies procedures for assessment and verification of constancy of performance (AVCP) of characteristics of solid fuel burning slow heat release 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. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

FprEN 16510-2-4:2022 *Independent boilers - Nominal heat output up to 50 kW*

EN 993-1:2018 *Methods of test for dense shaped refractory products. Part 1: Determination of bulk density, apparent porosity and true porosity*

EN 993-12:1997 *Methods of test for dense shaped refractory products. Part 12: Determination of pyrometric cone equivalent (refractoriness)*

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EN 1936:2007 *Natural stone test methods - Determination of real density and apparent density, and of total and open porosity*

EN 303-5:2021, *Heating boilers - Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW - Terminology, requirements, testing and marking*

### 3 Terms and definitions

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

ISO and IEC maintain terminological 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/>

#### 3.1 General

Add the following new clauses:

##### 3.501

##### **total energy**

thermal energy of slow heat release appliance transferred to the room over whole heat release period of heating cycle, expressed in [kWh]

##### 3.502

##### **test load**

mass of test fuel specified for the burning period.

NOTE The test load can be added as batch charges if this is specified in the appliance instructions

##### 3.503

##### **burning period**

period when test load is burned in SHRA.

##### 3.504

##### **heat release period**

period when the SHRA provides the heat by radiation and convection from the surface of the appliance into the space where the appliance is installed.

#### 3.2 Terms and definitions related to Annex EB

##### 3.505

##### **heat absorbers**

heat exchanger(s) that is not directly contact with fire or flue gases where the design of the appliance has heat retaining material between fire or flue gases and heat exchanger that damps and delays the heat transfer to the heat transfer fluid installed in the structure of slow heat release appliance (SHRA)

##### 3.506

##### **nominal heat output of heat absorbers**

nominal heat output of heat absorbers that is not directly in contact with fire or flue gases and is installed in the structure of SHRA

##### 3.507

##### **total energy output of heat absorbers**

thermal energy transferred by heat absorbers to water heating system, expressed in [kWh]

**3.508****safety valve**

valve which releases not allowed over pressures or over temperature caused by heat absorbers

**3.509****safety- and expansion line**

<for systems with closed or open expansion vessel>

connecting line between heat absorbers and expansion vessel and safety valve

**3.510****drainage line**

line between the safety valve and the environment

**3.511****heat circuit piping**

connecting piping and fittings between water heat tank or central water heating system and heat absorbers including the safety and expansion line

**3.512****heat transfer fluid**

fluid transferring heat from the SHRA fitted with heat absorbers

**3.513****flow rate indicator**

component indicating the flow of heat transfer fluid from SHRA fitted with heat absorbers

**3.514****pressure gauge**

component indicating the heat transfer fluid pressure of heat absorbers

**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 FprEN 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 FprEN 16510-1:2022, Table 22, no. 57 ( $m_{\text{chim}}$ ).

**4.2 Protection of combustible materials**

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

When tested in accordance with FprEN 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 FprEN 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 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 A.4.7, A.4.8 and FprEN 16510-1:2022, 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  $[\text{mg}/\text{m}^3]$  as an integer according to FprEN 16510-1:2022, Table 22, no. 17 ( $CO_{\text{nom}}$  (13 %  $O_2$ )).

When tested in accordance with A.4.7 and 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.

**Table 2 — Threshold levels for CO emission**

Appliance type	Threshold level at 13 % O <sub>2</sub>
open fronted solid fuel local space heaters	2000 mg/m <sup>3</sup>
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets including cookers	1500 mg/m <sup>3</sup>
closed fronted solid fuel local space heaters using compressed wood in form of pellets including cookers	300 mg/m <sup>3</sup>

#### 4.4 Nitrogen oxides (NO<sub>x</sub>) 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 A.4.7, A.4.8 and FprEN 16510-1:2022, 6.3.3.

The NO<sub>x</sub> 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<sup>3</sup>] as an integer according to FprEN 16510-1:2022, Table 22, no. 20 (NO<sub>xnom</sub> (13 % O<sub>2</sub>)).

When tested in accordance with A.4.7 and FprEN 16510-1:2022, 6.3.3 the NO<sub>x</sub> emissions at nominal heat output shall not exceed the threshold levels as given in Table 3.

**Table 3 — Threshold levels for NO<sub>x</sub> emissions (expressed as NO<sub>2</sub>)**

Appliance type	Threshold level at 13 % O <sub>2</sub>
open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers using biomass	200 mg/m <sup>3</sup>
open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers using fossil solid fuel	300 mg/m <sup>3</sup>

#### 4.5 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 A.4.7, A.4.8 and FprEN 16510-1:2022, 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<sup>3</sup>] as an integer according to FprEN 16510-1:2022, Table 22, no. 23 (OGC<sub>nom</sub> (13 % O<sub>2</sub>)).

When tested in accordance with A.4.7 and FprEN 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 <sub>2</sub>
open fronted solid fuel local space heaters	120 mg C/m <sup>3</sup>
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 <sup>3</sup>
closed fronted solid fuel local space heaters using compressed wood in form of pellets including cookers	60 mg C/m <sup>3</sup>

#### 4.6 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 A.4.7, A.4.8 and FprEN 16510-1:2022, 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<sup>3</sup>] as an integer according to FprEN 16510-1:2022, Table 22, no. 26 ( $PM_{nom}$  (13 % O<sub>2</sub>)).

When tested in accordance with A.4.7 and FprEN 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 emissions**

Appliance type	Threshold level at 13 % O <sub>2</sub>
open fronted solid fuel local space heaters	50 mg/m <sup>3</sup>
closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers	40 mg/m <sup>3</sup>
closed fronted solid fuel local space heaters using compressed wood in form of pellets	20 mg/m <sup>3</sup>

#### 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 FprEN 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 FprEN 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 A.4.8 and FprEN 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 FprEN 16510-1:2022, Table 22, no. 48 ( $T_{\text{spart}}$ ).

#### 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 FprEN 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 FprEN 16510-1:2022, Table 22, no. 29 ( $p_{\text{nom}}$ ).

#### 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 A.4.8 and FprEN 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 FprEN 16510-1:2022, Table 22, no. 30 ( $p_{\text{part}}$ ).

#### 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 FprEN 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 FprEN 16510-1:2022, Table 22, no. 50 ( $\Phi_{f,g \text{ nom}}$ ).

#### 4.7.7 Flue gas mass flow at part load heat output

<https://standards.iteh.ai/catalog/standards/sist/c5334bc9-6697-4ab1-a0cb->

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 A.4.8 and FprEN 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 FprEN 16510-1:2022, Table 22, no. 51 ( $\Phi_{f,g \text{ part}}$ ).

#### 4.7.8 Fire safety of installation to the chimney

The performance of the appliance in relation to the flue gas temperature (mean value) at safety test shall be determined in accordance A.4.10.

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 FprEN 16510-1:2022, 6.2.2 and FprEN 16510-1:2022, Table 22, no. 49.

### 4.8 Energy economy and heat retention

#### 4.8.1 Space heat output at nominal heat output

##### 4.8.1.1 General

The performance of the appliance in relation to space heat output at nominal heat output shall be determined in accordance with A.4.7.

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