



SLOVENSKI STANDARD
SIST EN 16510-2-10:2025

01-julij-2025

Nadomešča:
SIST EN 15821:2011

Večnamenske peči za savno na polena iz naravnega lesa - Zahteve in preskusne metode

Multi-firing sauna stoves fired by natural wood logs - Requirements and test methods

Mehrfach befeuerbare Saunaöfen zur Verfeuerung von naturbelassenem Scheitholz - Anforderungen und Prüfverfahren

Appareils de chauffage domestiques à combustion solide - Partie 2-10 : Poêles de sauna à allumage multiple à bûches de bois naturelles.

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Ta slovenski standard je istoveten z: EN 16510-2-10:2025

ICS:

97.100.30 Grelniki na trdo gorivo Solid fuel heaters

SIST EN 16510-2-10:2025 **en,fr,de**

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EUROPEAN STANDARD

EN 16510-2-10

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2025

ICS 97.100.30

Supersedes EN 15821:2010

English Version

Multi-firing sauna stoves fired by natural wood logs - Requirements and test methods

Appareils de chauffage domestiques à combustion
solide - Partie 2-10 : Poêles de sauna à allumage
multiple à bûches de bois naturelles.

Mehrfach befeuerbare Saunaöfen zur Verfeuerung von
naturbelassenem Scheitholz - Anforderungen und
Prüfverfahren

This European Standard was approved by CEN on 11 May 2025.

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Ref. No. EN 16510-2-10:2025 E

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European foreword

This document (EN 16510-2-10:2025) 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of an identical text or by endorsement, at the latest by November 2025, and conflicting national standards shall be withdrawn at the latest by November 2025.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-CENELEC shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15821:2010 as amended and corrected.

EN 16510-2-10:2025 includes the following significant technical changes with respect to EN 15821:2010:

- 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;
- Annex ZA updated according to requirements of M/577 and its amendments;
- Assessment and verification of constancy of performance – AVCP 3+ added;
- requirements for environmental sustainability added.

This document has been prepared under a standardization request given to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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*;
- Part 2-10: *Multi-firing sauna stoves fired by natural wood logs*.

Other sections of Part 2 will be added to cover residential solid fuel burning appliances not included in parts 2-1 to 2-7 and in 2-10.

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Subclauses and Figures which are additional to those in EN 16510-1:2022 are numbered starting with 1001. Annexes which are additional to those in EN 16510-1:2022 are numbered starting with JA.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN and CENELEC websites.

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 multi-firing sauna stoves for natural wood logs (in which the heating of stones are separated from and indirectly heated by the fire and the flue gases and which may be re-fuelled with several fuel loads).

The intended use of the appliances is space heating in residential buildings. The space heated is sauna room which is heated higher-than-normal room temperature for wellbeing and bathing purposes, for short period of time.

These multi-firing sauna stoves may be supplied either as an assembled appliance or as a manufacturer's pre-designed unit consisting of prefabricated components designed to be built on site in accordance with the manufacturer's specified assembly instructions.

These appliances can burn the following solid fuels as specified:

- wood logs;

This document is not applicable to:

- appliances that are mechanically fed;
- appliances with fan assisted combustion air;
- single-firing heat storage sauna stoves, in which the stones are directly heated by the fire and the flue gases, which pass through them;
- one off installations;
- appliances incorporating a boiler or connected to a water system.

This document specifies procedures for assessment and verification of constancy of performance (AVCP) of characteristics of multi firing sauna stoves.

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*

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

3 Terms and definitions

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

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3.14

EN 16510-1:2022 definition 3.14 is replaced in this document with following:

batch charge

proportion of the test load as declared in the operating manual that can be added at specified intervals during the test period of the performance test at nominal heat output

3.1001

sauna stove

stove that has a fully enclosed firebox with a firedoor which is normally closed, that distributes heat by radiation and/or convection and is also fitted with stones or other heat retaining material onto which water is poured to produce hot steam/vapour that rises from the hot sauna stones, and that may also provide hot water for washing when fitted with an optional open water vessel

3.1002

multi-firing sauna stove

sauna stove in which the stones are separated from and indirectly heated by the fire and the flue gases and which may be refuelled with several successive fuel loads also during sauna bathing

3.1003

test load

mass of test fuel declared in the operating instructions for the burning period

NOTE 1 to entry: The test load can be added as batch charges if this is indicated in the multi-firing sauna stove instructions.

3.1004

burning period

period when test load is burned in multi-firing sauna stove

4 Characteristics

4.1 Load bearing capacity

Some appliances with an upper outlet may be able to carry the load of a chimney. The max. load the appliance may carry shall be specified in the appliance installation instructions. The performance of the appliance in relation to the ability to carry a chimney shall be determined in accordance A.4.10.4 of this document.

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 combustibile materials

The performance of the appliance in relation to protection of combustibile materials shall be determined in accordance with A.4.10.4 and A.2.1001, Figure A.1005 of this document. The protection measure(s) as specified shall not lead to an excess of the more than 65 K above ambient room temperature at the hottest point of any adjacent floor, or 140 K above ambient room temperature at the hottest point of any adjacent walls, ceiling or other structure constructed of combustibile materials.

If necessary, the distances are increased until the temperature measured is below this value and the specification of the protection measures needs to be adapted accordingly.

When tested in accordance with A.4.10 and A.2.1001 of this document, 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). Minimum distance to adjacent combustible materials on side (d_{PS}) will be given in [mm] or [cm] in appliances' technical datasheet and data plate.

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 - 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 in front (e.g. sauna room benches) (d_P)		-
Minimum distance to adjacent combustible materials on free side (e.g. sauna room benches) (d_{PS})		-
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 shall be determined in accordance A.4.7 of this document and with EN 16510-1:2022, 6.3.2.

The CO value if specified at nominal heat output 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)).

4.4 Nitrogen oxides (NO_x) emissions

The performance of the appliance in relation to nitrogen oxides emissions at nominal heat output shall be determined in accordance with A.4.7 of this document and EN 16510-1:2022, 6.3.3.

The NO_x value if specified at nominal heat output is to be given in [mg/m^3] as an integer according to EN 16510-1:2022, Table 22, no. 20 ($NO_{x\text{nom}}$ (13 % O_2)).

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4.5 Emission of organic gaseous compounds (OGC)

The performance of the appliance in relation to organic gaseous compounds emission at nominal heat shall be determined in accordance with A.4.7 of this document and EN 16510-1:2022, 6.3.4.

The OGC value if specified at nominal heat output 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)).

4.6 Particulate matter (PM) emissions

The performance of the appliance in relation to particulate matter emissions at nominal heat output shall be determined in accordance with A.4.7 of this document and EN 16510-1:2022, 6.3.5.

The particulate matter value if specified at nominal heat output 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)).

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.

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 A.4.7 of this document and 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 [$^{\circ}\text{C}$] as an integer according to EN 16510-1:2022, Table 22, no. 47 (T_{snom}).

4.7.3 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 A.4.7 of this document and EN 16510-1:2022, 6.5.

For nominal heat output the flue static pressure shall be kept within (12 ± 2) Pa in all power ranges. Where this flue draught value of 12 Pa needs to be exceeded in order to obtain the declared specified nominal heat output, the required flue draught shall be clearly stated in the appliance's installation instructions.

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}).