



SLOVENSKI STANDARD

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Stanovanjske grelne naprave na trdna goriva - 1. del: Splošne zahteve in preskusne metode

Residential solid fuel burning appliances - Part 1: General requirements and test methods

Häusliche Heizgeräte für feste Brennstoffe - Teil 1: Allgemeine Anforderungen und Prüfverfahren

Équipement de chauffage domestique - Partie 1 : Exigences et méthodes d'essai générales

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Residential solid fuel burning appliances - Part 1: General requirements and test methods

Équipement de chauffage domestique - Partie 1 :
Exigences et méthodes d'essai générales

Häusliche Heizgeräte für feste Brennstoffe - Teil 1:
Allgemeine Anforderungen und Prüfverfahren

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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (prEN 16510-1:2013) 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 CEN Enquiry.

This document will supersede EN 13240:2001, EN 13229:2001, EN 12815:2001 and EN 12809:2001.

EN 13240:2001, EN 13229:2001, EN 12815:2001 and EN 12809:2001 will be totally superseded by EN 16510 series. The revision of these European Standards takes into account the comments received at their 5-year review.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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.*

Principally, it is possible to add further parts 2 at a later stage in order to cover other residential solid fuel burning appliances such as pellet stoves or slow heat release appliances.

This Part 1 of EN 16510 is to be used in conjunction with the appropriate Part 2. The Parts 2 contain clauses to supplement or modify the corresponding clauses in Part 1 to provide the relevant requirements for each type of appliance.

1 Scope

This European Standard is applicable to residential solid fuel burning appliances.

This European Standard is not applicable to appliances with boiler parts in contact with fire or flue gases other than steel or cast iron.

This European Standard includes as well appliances which are designed for operating under room sealed conditions and that are intended to be installed with a chimney not serving any other appliance.

NOTE Appliances receiving combustion air from outside by means of a pipe system which is not air tight are not considered roomsealed.

This European Standard does not cover appliances to be operated with ventilating systems which have pressure below - 15 Pa in the room of installation of the appliance in relation to the outside atmosphere

This European Standard specifies requirements relating to the design, manufacture, construction, safety and performance (efficiency and emission) of roomheaters fired by solid fuel (hereafter referred to as “appliance(s)”) and provides instructions for them. Furthermore, it also gives provisions for evaluation of conformity i.e. initial type testing (ITT) and factory production control (FPC) and marking of these appliances.

This European Standard covers as well the CO, NO_x, OGC/total hydrocarbons and particulate matter emission test methods, however it does not contain any limit values for these emissions.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 303-5:2012, *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*

EN 1561:1997 ¹⁾, *Founding – Grey cast irons*

EN 1563:1997 ²⁾, *Founding – Spheroidal graphite cast iron*

EN 10025-1:2004, *Hot rolled products of structural steels – Part 1: General technical delivery conditions*

EN 10027-2, *Designation systems for steels – Part 2: Numerical system*

EN 10028-2, *Flat products made of steels for pressure purposes – Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

EN 10028-3, *Flat products made of steels for pressure purposes – Part 3: Weldable fine grain steels, normalized*

EN 10029:1991 ³⁾, *Hot rolled steel plates 3 mm thick or above – Tolerances on dimensions, shape and mass*

EN 10088-1, *Stainless steels – Part 1: List of stainless steels*

EN 10088-2, *Stainless steels – Part 2: Technical delivery conditions for sheet/plate and strip for general purposes*

1) EN 1561:1997 is replaced by EN 1561:2011, *Founding – Grey cast irons*.

2) EN 1563:1997 is replaced by EN 1563:2011, *Founding – Spheroidal graphite cast iron*

3) EN 10029:1991 is replaced by EN 10029:2010, *Hot-rolled steel plates 3 mm thick or above – Tolerances on dimensions and shape*.

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- EN 10111, *Continuously hot-rolled low carbon steel sheet and strip for cold forming – Technical delivery conditions*
- EN 10120, *Steel sheet and strip for welded gas cylinders*
- EN 10216-1, *Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 1: Non-alloy steel tubes with specified room temperature properties*
- EN 10222-4, *Steel forgings for pressure purposes – Part 3: Nickel steels with specified low temperature properties*
- EN 12619, *Stationary source emissions – Determination of the mass concentration of total gaseous organic carbon – Continuous flame ionisation detector method*
- EN 13284-1, *Stationary source emissions – Determination of low range mass concentration of dust – Part 1: Manual gravimetric method*
- EN 13526, *Stationary source emissions – Determination of the mass concentration of total gaseous organic carbon in flue gases from solvent using processes – Continuous flame ionisation detector method*
- EN 14597, *Temperature control devices and temperature limiters for heat generating systems*
- EN 14792, *Stationary source emissions – Determination of mass concentration of nitrogen oxides (NO_x) – Reference method: Chemiluminescence*
- EN 15250, *Slow heat release appliances fired by solid fuel – Requirements and test methods*
- EN 60335-2-102, *Household and similar electrical appliances – Safety – Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102)*
- EN 60730-1, *Automatic electrical controls for household and similar use – Part 1: General requirements (IEC 60730-1)*
- CEN/TS 14793, *Stationary source emissions – Intralaboratory validation procedure for an alternative method compared to a reference method*
- EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*
- EN ISO 228-2:2003, *Pipe threads where pressure-tight joints are not made on the threads – Part 2: Verification by means of limit gauges (ISO 228-2:1987)*
- ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions, tolerances and designation*
- ISO 7-2:2000, *Pipe threads where pressure-tight joints are made on the threads – Part 2: Verification by means of limit gauges*
- ISO 331:1983 ⁴⁾, *Coal – Determination of moisture in the analysis sample – Direct gravimetric method*
- ISO 334:1992, *Solid mineral fuels – Determination of total sulfur – Eschka method*
- ISO 351:1996, *Solid mineral fuels – Determination of total sulfur – High temperature combustion method*
- ISO 501:2003 ⁵⁾, *Coal – Determination of the crucible swelling number*

4) ISO 331:1983 is withdrawn.

5) ISO 501:2003 is replaced by ISO 501:2012, *Coal – Determination of the crucible swelling number*.

ISO 562:2010, *Hard coal and coke – Determination of volatile matter*

ISO 609:1996, *Solid mineral fuels – Determination of carbon and hydrogen – High temperature combustion method*

ISO 687:2010, *Solid mineral fuels – Coke – Determination of moisture in the general analysis sample*

ISO 1171:2010, *Solid mineral fuels – Determination of ash*

ISO 1928:2009, *Solid mineral fuels – Determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value*

ISO 10849:1996, *Stationary source emissions – Determination of the mass concentration of nitrogen oxides – Performance characteristics of automated measuring systems*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

- 3.1 absorption**
incorporation of a substance into the body of a liquid or solid
- 3.2 accumulator**
part of the appliance forming the flueway consisting of ceramic materials and designed for accumulation of the heat released by the heat generator
- 3.3 accumulation heat output**
quantity of useful heat released by an appliance with accumulator (i.e. the heat output from both the appliance and the accumulator) when burning the test fuel load stated by the manufacturer and achieved under defined test conditions in accordance with this European Standard (see A.4.10) <https://standards.iteh.ai/catalog/standards/sist/d7580c9e-85ed-45a4-a32f-015751280148/sist-en-16510-1-2018>
- 3.4 accumulator load**
quantity of heat which the fuel provides to the appliance for accumulation
- 3.5 air grilles**
components in the inlet and outlet openings to distribute and direct convection air flow
- 3.6 air inlet control**
manual or automatic device which controls the quantity of combustion air
- 3.6a appliance family**
group of appliances of similar construction and/or performance characteristics where it is permissible to test only selected appliances in accordance with the requirements of this European Standard
- 3.7 appliance with boiler**
heat generator consisting of a room heating component and a water heating component in one unit
- 3.8 ash content of the fuel**
solid matter remaining after the complete combustion of solid fuel
- 3.9 ashpan**
removable receptacle shaped to receive the residue falling from the firebed

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- 3.10
ashpit**
enclosed chamber designed to receive the residue or the ashpan
- 3.11
ashpit loss**
part of the residue which is combustible
- 3.12
basic firebed**
quantity of glowing embers which ensures ignition of the test fuel to be charged
- 3.13
boiler**
vessel in which water is heated, intended for fitting in or forming an integral part of a solid fuel appliance
- 3.14
boiler flueway**
portion of the flueway formed wholly or in part by the surfaces of the boiler
- 3.15
boiler waterways**
space within a boiler which contains water
- 3.16
bottomgrate**
part of the appliance at the base of the firebox which supports the firebed through which the residue falls into the ashpan or ashpit and through which combustion air and/or combustion gases may be drawn
- 3.17
bottomgrate bars
firebars**
bars supporting the fuelbed, separate or integral with a surrounding frame
- 3.18
burning rate**
mass of test fuel burnt per unit of time as fired
- 3.19
calibration**
set of operations that establish the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards
- 3.20
charging door**
door which covers the refuelling opening
- 3.20a
class**
range of levels, delimited by a minimum and a maximum value, of performance of a construction product
- 3.20b
Classified Without Further Testing
CWFT**
classification assigned to construction products showing a stable behavior of a given characteristic in a given levels and/or class of performance related to characteristics adopted by the Commission or established by CEN/CENELEC Technical Committees and included by the Commission in a revised mandates
- 3.21
combustion air**
air supplied to the firebox which is entirely or partially used to burn the fuel

3.22**combustion air control device**

mechanism for setting the primary and/or secondary air in accordance with the burning rate required

3.23**combustion air inlet**

integral component of the fireplace for the connection to the combustion air pipe

3.24**combustion air selector**

device for adjusting the primary and/or secondary air according to the type of fuel burnt

3.25**combustion gas baffle**

device to change the direction of flow of the combustion gases

3.26**combustion gases**

compounds in gaseous form produced inside an appliance when fuel is burned

3.27**constant volume sampling**

method to sample all exhaust gases of an appliance at constant flow rate

3.28**continuous burning appliance**

heating appliance designed for slow burning over an extended period of time (e.g. overnight) and meeting the requirements of the slow combustion test

3.29**cut-off device**

mechanism to block the flue when the appliance is not in use

3.30**damper**

mechanism to change the resistance to flow of the combustion gasways

3.31**de-ashing**

process of clearing a fuelbed and discharging the residue into the collecting receptacle

3.32**de-ashing mechanism**

device to agitate or disturb the ash to facilitate its removal from the firebed

Note 1 to entry: It may also be used to change the bottomgrate operating position on some appliances.

3.33**dew point**

temperature at, or below which, the condensation from the gas phase will occur

3.34**dilution ratio**

volume ratio of the total diluted gas volume and the undiluted flue gas volume at standard conditions on dry basis.

3.35**dilution tunnel**

sampling duct to allow constant volume sampling of the appliance exhaust gases with dilution air

3.36**dilution tunnel flow volume**

total volume of the diluted gas in the dilution tunnel during a test cycle

prEN 16510-1:2013 (E)**3.37****dilution tunnel gas flow rate**

flow rate of the diluted gases in the dilution tunnel

3.38**direct water system**

hot water system in which domestic water is heated directly by circulating through the boiler

3.39**draught regulator**

inlet device for admission of air downstream of the firebed, enabling the flue draught to be controlled

3.40**dry cooker**

appliance which primarily provides the facility to cook by means of a hotplate and/or oven

Note 1 to entry: It also provides heat to the room in which it is installed.

3.41**efficiency**

ratio of total heat output to total heat input during the test period expressed as a percentage during the test period

3.42**emission sampling section**

section in the dilution tunnel where the particulate emission sampling train is attached

3.42a**essential characteristics**

characteristics of the construction product which relate to the basic requirements for construction works

3.43**extraction fan**

fan installed in the dilution tunnel downstream of the emission sampling section capable of gathering and moving all flue-gases and entrained dilution air from the dilution tunnel extraction cowl to the dilution tunnel exhaust having sufficient flow to maintain dilution rate specifications

3.43a**factory production control**

documented, permanent and internal control of production in a factory

3.44**firebed****fuelbed**

ash, ember and fuel contained in the firebox

3.45**firebox****combustion chamber**

part of the appliance in which the fuel is burnt

3.46**firebox opening**

aperture in the firebox through which an appliance may be fuelled

3.47**firedoor**

door through which the fire may be viewed and which may be opened to allow refuelling of the firebed

3.48**fireplace enclosure**

assembly consisting of walls and ceiling of non-combustible materials which is built on site to surround a heat generator and heat exchanger and to form a space from which hot convection air is emitted into the living space, e.g. by air grilles

3.49**fireplace recess**

space formed in a wall or chimney breast constructed from non-combustible materials and into which a heating appliance may be installed and from which a chimney flue leads

3.50**flue by-pass device**

device which in the open position allows flue gases to pass directly to the flue spigot/socket

Note 1 to entry: This can be used as a preheating aid to overcome chimney condensation.

3.51**flue draught**

difference between the static pressure in the place of installation and the static pressure at the specified point in the measurement section

3.52**flue gases**

gaseous compounds leaving the appliance flue spigot or socket and entering the flue gas connector

3.53**flue gas adaptor**

fitting between connection pipe and measurement section which allows in addition variations in size and shape of the flue components

3.54**flue gas connector**

duct through which flue gases are conveyed from the flue spigot of the appliance into the chimney flue

3.55**flue gas mass flow**

mass of flue gas drawn off from the appliance per unit of time

3.56**flue gas temperature**

temperature of the flue gas at the specified point in the measurement section

3.57**flue outlet**

integral component of the fireplace for the connection to the connector

3.58**flue spigot****flue socket**

integral part of the appliance for connecting the flue gas connector thus permitting the deliberate escape of products of combustion into the chimney flue

3.59**flue spigot temperature****flue socket temperature**

calculated temperature of the flue gas at the exit of the appliance

3.60**flueway**

that part of an appliance designed to convey combustion gases from the firebox to the flue spigot/socket