



SLOVENSKI STANDARD
SIST EN 14785:2006
01-november-2006

Naprave za gretje stanovanjskih prostorov na lesne pelete - Zahteve in preskusne metode

Residential space heating appliances fired by wood pellets - Requirements and test methods

Raumheizer zur Verfeuerung von Holzpellets - Anforderungen und Prüfverfahren

Appareils de chauffage domestique à convection à granulés de bois - Exigences et méthodes d'essai

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Ta slovenski standard je istoveten z: EN 14785:2006

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ICS:

97.100.30

SIST EN 14785:2006

en,fr,de

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English Version

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This European Standard was approved by CEN on 3 May 2006.

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Foreword

This document (EN 14785:2006) 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of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive "Construction products".

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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1 Scope

This European Standard specifies requirements relating to the design, manufacture, construction, safety and performance (efficiency and emissions), instructions and marking together with associated test methods and test fuels for type-testing residential space heaters fired by wood pellets, and mechanically fed up to 50 kW nominal heat output.

These appliances may be freestanding or inset appliances and provide heat into the space where they are installed and may be operated with either natural draught or fan-assisted combustion air. Additionally, where fitted with a boiler, they also provide domestic hot water and/or central heating. These appliances burn wood pellets only, in accordance with the appliance manufacturer's instructions. They operate with firedoors closed only.

Non mechanically fed appliances burning solid mineral fuels, peat briquettes and natural or manufactured wood logs are not included in this European Standard, but are covered by EN 13229 and EN 13240.

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

2 Normative references

The following referenced documents are indispensable for the application 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 1561:1997, *Founding — Grey cast irons*

EN 1563:1997, *Founding — Spheroidal graphite cast irons*

EN 10025:2004 (all parts), *Hot rolled products of structural steels*

EN 10027-2:1992, *Designation systems for steels — Part 2: Numerical system*

EN 10028-2:2003, *Flat products made of steels for pressure purposes — Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

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

EN 10088-2:2005, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

EN 10111, *Continuously hot-rolled low carbon steel sheet and strip for cold forming — Technical delivery conditions*

EN 10120:1996, *Steel sheet and strip for welded gas cylinders*

EN 10226-3, *Pipe threads where pressure-tight joints are made on the threads —Part 2: Verification by means of limit gauges*

CEN/TS 14774-1:2004, *Solid biofuels — Methods for determination of moisture content — Oven dry method — Part 1: Total moisture — Reference method*

EN 50165:1997, *Electrical equipment for non-electric appliances for household and similar purposes — Safety requirements*

EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimension, 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 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, *Hard coal — Determination of the crucible swelling number*

ISO 562:1998, *Hard coal and coke — Determination of volatile matter*

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

ISO 687:2004, *Solid mineral fuels — Coke — Determination of moisture in the general analysis test sample*

ISO 1171:1997, *Solid mineral fuels — Determination of ash*

ISO 1928:1995, *Solid mineral fuels — Determination of gross calorific value by the bomb calorimetric method, and calculation of net calorific value*

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*

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3 Terms and definitions (standards.iteh.ai)

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

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3.1 Appliances

3.1.1

appliance with boiler

heat generator consisting of a room heating component and a water heating component in one unit

3.1.2

continuous burning appliance

heating appliance designed to provide a source of heat by continuous burning and meeting the requirement of the slow combustion test

3.1.3

fireplace recess

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

3.1.4

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 means of air grilles

3.1.5

freestanding appliance

appliance designed to operate without the need to be built into a fireplace recess or fireplace enclosure and which is not connected to the building except by the flue gas connector

3.1.6

inset appliance

appliance with doors designed to be installed into a fireplace recess or an enclosure, or into a firebox of an open fire

3.1.7

residential space heating appliance fired by wood pellets (pellet stove)

free standing or inset appliance with closed door only and automatically stoked by a conveyor system. They may have an integral or external fuel hopper

3.2 Functional characteristics

3.2.1

ash content of the fuel

solid matter remaining after the complete combustion of solid fuel

3.2.2

burning rate

reduction in the mass of fuel per unit of time

3.2.3

combustion air

air supplied to the firebox, which is entirely or partially used to burn the fuel

3.2.4

combustion gases

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

3.2.5

efficiency

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

3.2.6

flue draught

differential between the static air pressure in the place of installation and the static pressure at the flue gas measurement point

3.2.7

flue gases

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

3.2.8

flue gas mass flow

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

3.2.9

flue gas temperature

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

3.2.10

heat input

quantity of energy which the fuel provides to the appliance

3.2.11

maximum water operating pressure

limiting water pressure at which the boiler of an appliance can be safely operated

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3.2.12**nominal heat output**

total heat output of the appliance quoted by the manufacturer and achieved under defined test conditions when burning the specified test fuel

3.2.13**operating tool**

device supplied with the appliance for handling movable and/or hot components

3.2.14**residue**

ashes, including combustibles, which collect in the ashpit

3.2.15**routine test pressure**

pressure to which all waterways are subjected during production at the manufacturer's plant or during setting up by the installer

3.2.16**space heating output**

heat output furnished by convection and radiation to the room

3.2.17**steady state conditions**

stage in the flue gas temperature does not change more than ± 5 K

NOTE Some appliances are fitted with an automatic cleaning procedure. In the cleaning time the flue gas temperature may rise or fall.

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3.2.18**temperature in the fuel hopper**

temperature at the hottest point, measured in the area of possible fuel storage

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3.2.19**total heat output**

rate of useful heat released by the appliance

3.2.20**type test pressure**

pressure to which all waterways of the test appliance are subjected

3.2.21**water flow temperature**

temperature of the heated water exiting the appliance

3.2.22**water heating output**

heat output to water, averaged during the test period

3.2.23**water return temperature**

temperature of the cooled water entering the return tapping connectors of the appliance

3.2.24**reduced heat output**

minimum possible heat output of the appliance as a percentage of nominal heat output and achieved under defined test conditions when burning the specified test fuel

3.3 Characteristics

3.3.1

air inlet control

manual or automatic device to control the quantity of air supplied for combustion

3.3.2

air grilles

components in the inlet and outlet openings to distribute and control convection air flow

3.3.3

ashpan

removable receptacle shaped to receive the residues from the firebed

3.3.4

ashpit

chamber designed to receive the residues from the ashpan

3.3.5

boiler

vessel in which water is heated, intended for fitting in or forming an integral part of a solid fuel appliance

3.3.6

boiler flueway

portion of the flueway formed wholly or in part by the surfaces of the boiler

3.3.7

bottomgrate

part of the appliance at the base of the firebox which supports the firebed and through which the ash falls into the ashpan and combustion air and/or combustion gases may pass

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3.3.8

retort (burner pot)

vessel forming the firebox of a wood pellet stove into which the pellets are automatically fed from the fuel hopper and in which they are burned

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3.3.9

combustion control device

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

3.3.10

cut-off device

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

3.3.11

damper

mechanism to change the resistance to flow of the combustion gases

3.3.12

de-ashing mechanism

mechanism to agitate or disturb the residues to facilitate their removal from the firebed

NOTE May also be used to change the bottomgrate operating positions on some appliances.

3.3.13

direct water system

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

3.3.14**draught regulator**

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

3.3.15**firebox; combustion chamber**

part of the appliance in which the fuel is burned

3.3.16**firedoor**

door through which the fire may be viewed and which may be opened to allow cleaning of the firebox and the retort

3.3.17**flue gas adaptor**

fitting between the flue spigot of an appliance and the inlet to the flue gas connector or chimney flue which allows for variations in size and shape of components

3.3.18**flue gas connector**

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

3.3.19**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

3.3.20**fuel hopper**

fuel store either integral with the appliance or external from which fuel is fed to the retort

3.3.21**indirect water system**

hot water system in which stored domestic hot water is heated by a primary heater through which hot water from the boiler is circulated without mixing of primary (heating) water and the stored domestic hot water

3.3.22**integral fuel storage container**

enclosed area forming part of the appliance, but not connected directly to the fuel charging area, in which fuel is stored prior to it being physically transferred by the conveyor system to the fuel charging position

3.3.23**primary air**

combustion air which passes through the fuel bed

3.3.24**safety heat exchanger**

device which allows excess heat to be released from an appliance with boiler and which limits the maximum temperature of the water

3.3.25**secondary air**

air supplied for the purpose of completing combustion of gases leaving the fuel bed

3.3.26**thermal discharge control**

mechanical device controlled by the water flow temperature which opens a drain in the water circuit of a safety heat exchanger when a specified flow temperature is attained

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3.3.27

thermostat

temperature sensitive device which automatically changes the amount of combustion air and/or the mass flow of fuel

3.3.28

working surfaces

all surfaces of an appliance designed to transmit heat to the surrounding atmosphere

NOTE All external surfaces of an appliance including the flue gas connector in accordance with this standard are classified as working surfaces because they are designed to transmit heat to the room in which they are installed.

3.3.29

conveyor system

device for feeding the fuel from the hopper to the retort

3.4 Fuels

3.4.1

recommended fuels

fuel of commercial quality, listed in the appliance manufacturer's instructions, and shown to achieve the claimed performance when tested according to this European Standard

3.4.2

solid fuel

naturally occurring or manufactured solid mineral fuels, natural or manufactured wood logs, pellets and peat briquettes

3.4.3

wood pellet

solid fuel, usually in cylindrical form, made from untreated pulverised wood of the whole tree and compressed with or without the aid of binders (e.g. molasses, paraffin wax, glucose)

3.4.4

test fuel

fuel of commercial quality being characteristic of its type to be used for testing appliances

4 Materials, design and construction

4.1 Production documentation

The manufacturer shall state the type of appliance which he submits for type testing and the test laboratory shall test the appliance using the provisions appropriate to that claim.

The parameters and characteristics considered in making the decisions in relation to either the family or range of appliances to be submitted for initial type testing (see 9.2.1) or further type testing where changes are made to an appliance (see 9.2.2) shall be recorded. A copy of the parameters and characteristics considered in making the decisions shall be included in the production documentation for each appliance."

To identify the appliance, the manufacturer shall have available documents and/or scaled assembly drawings and electrical circuit diagrams showing the basic design and construction of the appliance. The documentation and/or the drawings shall include at least the following information:

- specification of the materials used in the construction of the appliance;
- nominal heat output and reduced heat output in kW using fuels recommended by the manufacturer.

If the appliance is fitted with a boiler then the following additional details shall also be specified:

- welding process used in the manufacture of the boiler shell;

NOTE 1 The symbol for the type of weld used is sufficient.

- permissible maximum operating water temperature in °C;
- permissible maximum operating pressure in bar;
- type test pressure in bar;
- water heating output in kW;
- reduced heat output in kW.

NOTE 2 The manufacturer should also have available any declarations of conformity of the appliance to all other applicable directives.

4.2 General construction requirements

The shape and dimensions of the components and equipment and the method of design and manufacture and, if partly assembled on site, the method of assembly and installation shall ensure that, when operated in accordance with the provisions of the appropriate test and exposed to the associated mechanical, chemical and thermal stresses, the appliance shall operate reliably and safely such that during normal operation no combustion gases posing a hazard can escape into the room in which the appliance is installed nor can embers fall out.

Component parts such as covers, operating controls, safety devices and electrical accessories shall be arranged in such a way that their surface temperatures under the test conditions described in A.4.7, do not exceed those specified either by the manufacturer or in the relevant component part standard.

No part of the appliance shall comprise of or contain asbestos. Hard solder, containing cadmium in its formulation, shall not be used.

Where thermal insulation is used, it shall be made of non-combustible material and shall not be a known hazard to health in its applied position.

NOTE The thermal insulation should withstand normal thermal and mechanical stresses.

Component parts which require periodic replacement and/or removal shall be either so designed or identified so as to ensure correct fitting.

Parts which act as a seal shall be located securely; for example by means of bolts or welding; to prevent the ingress or leakage of air, water or combustion products.

Where a seal is made with fire cement, the cement shall be supported by adjacent metal surfaces.

If the appliance is fitted with a boiler it shall meet the requirements given in 4.13 as appropriate to the material of construction and intended usage.

The boiler, if fitted, shall be capable of operating safely at the permissible maximum operating pressure declared by the manufacturer and shall meet the requirements of the type pressure test described in 5.9.

4.3 Flue spigot or socket

The flue spigot or socket where required for installation purposes shall be designed to enable a suitable gastight connection to be made between the flue gas connector and the appliance. The spigot or socket shall