



SLOVENSKI STANDARD

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Grelniki prostorov na trdna goriva - Zahteve in preskusne metode

Room heaters fired by solid fuel - Requirements and test methods

Raumheizer für feste Brennstoffe - Anforderungen und Prüfung

Poeles a combustible solide - Exigences et méthodes d'essai

Ta slovenski standard je istoveten z: **EN 13240:2001**

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97.100.30 Grelniki na trdo gorivo Solid fuel heaters

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English version

Roomheaters fired by solid fuel - Requirements and test methods

Poêles à combustible solide - Exigences et méthodes d'essai

Raumheizer für feste Brennstoffe - Anforderungen und Prüfung

This European Standard was approved by CEN on 7 April 2001.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by December 2001, and conflicting national standards shall be withdrawn at the latest by December 2002.

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

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1 Scope

This European Standard specifies requirements relating to the design, manufacture, construction, safety and performance (efficiency and emission) instructions and marking together with associated test methods and test fuels for type testing residential roomheaters fired by solid fuel.

This Standard is applicable to non-mechanically fired appliances which are listed under categories 1a and 2a of Table 1. These appliances provide heat into the space where they are installed. Additionally, where fitted with a boiler, they also provide domestic hot water and/or central heating. These appliances may burn either solid mineral fuels, peat briquettes, natural or manufactured wood logs or be multi-fuel in accordance with the appliance manufacturer's instructions.

This standard is not applicable to appliances with fan assisted combustion air.

Table 1 - Categorisation of appliances

	a) Freestanding or inset appliances without functional modification	b) Freestanding or inset appliances which have functional modification	c) Inset appliances for fireplace recess and enclosure
1 Appliances operating with firedoors closed	EN 13240	EN 13229	EN 13229
2 Appliances operating with firedoors closed or open	EN 13240	EN 13229	EN 13229
3 Open fires without firedoors	EN 13229	EN 13229	EN 13229

NOTE Without functional modification means “ modification of the surround of an appliance, that only changes the transmission of heat, without effect on combustion”.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

- EN 1561:1997 Founding - Grey cast irons
- EN 1563:1997 Founding - Spheroidal graphite cast iron
- EN 10025:1993 Hot rolled products of non-alloy structural steels - Technical delivery conditions
- EN 10027-2:1992 Designation systems for steels - Part 2: Numerical system

EN 10028-2:1992	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 10088-2:1995	Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip for general purposes
EN 10111:1998	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
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 228-1:2000	Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation
ISO 228-2: 1987	Pipe threads where pressure-tight joints are not made on the threads - Part 2: Verification by means of limit gauges
ISO 331:1983	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 501:1981	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 687:1974	Coke - Determination of moisture in the analysis sample
ISO 1171:1997	Solid mineral fuels - Determination of ash content
ISO 1928:1995	Solid mineral fuels - Determination of gross calorific value by the bomb calorimetric method, and calculation of net calorific value

3 Terms and definitions

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

3.1

air grilles

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

3.2

air inlet control

manual or automatic device which controls the quantity of air supplied for combustion

3.3

appliance with boiler

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

3.4

ash content of the fuel

solid matter remaining after the complete combustion of solid fuel

3.5

ashpan

removable receptacle shaped to receive the residue falling from the firebed

3.6

ashpit

enclosed chamber designed to receive the residue or the ashpan

3.7

ashpit loss

part of the residue which is combustible

3.8

basic firebed

quantity of glowing embers which ensures ignition of the test fuel to be charged

NOTE The basic firebed may be specified by the manufacturer.

3.9

boiler

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

3.10

boiler flueway

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

3.11

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

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3.12

bottomgrate bars; firebars

bars supporting the fuelbed, separate or integral with a surrounding frame

3.13

charging door

door which covers the refuelling opening

3.14

combustion air

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

3.15

combustion gases

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

3.16

continuous burning appliance

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

3.17

de-ashing

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

3.18

de-ashing mechanism

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

NOTE It may also be used to change the bottomgrate operating position on some appliances.

3.19

direct water system

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

3.20

draught regulator

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

3.21

efficiency

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

3.22

firebox; combustion chamber

that part of the appliance in which the fuel is burned

3.23

firebox opening

aperture in the firebox through which an appliance may be fuelled

3.24

firedoor

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

3.25

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

3.26

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

3.27

flue by-pass device

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

NOTE This can be used as a preheating aid to overcome chimney condensation.

3.28

flue damper

mechanism to change the flow of the combustion gases

3.29

flue draught

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

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3.30

flue gases

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

3.31

flue gas connector

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

3.32

flue gas mass flow

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

3.33

flue gas temperature

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

3.34

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

3.35

flueway

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

3.36

freestanding appliance

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

3.37

front firebars

grating or plate fitted at the front of the firebox opening to prevent spillage of fuel and ash or to change the firebox capacity, or both

3.38

fuel hopper

fuel store integral with the appliance from which fuel is fed to the firebox

3.39

heat input

quantity of energy which the fuel provides to the appliance

3.40

heat output

quantity of useful heat released by the appliance

3.41

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 the primary (heating) water and the stored domestic hot water

3.42

inset appliance

appliance with or without doors designed to be installed into a fireplace recess or an enclosure, or into a firebox of an open fire

3.43

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 user to the fuel charging position

3.44

intermittent burning appliance

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

NOTE An appliance may be either a continuous burning appliance or an intermittent burning appliance according to the fuel used.

3.45

maximum water operating pressure

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

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3.46

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

3.47

open fire

appliance which is built as an inset and designed to be connected to the building and surrounded by non combustible materials

3.48

operating tool

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

3.49

primary air

combustion air which passes through the fuel bed

3.50

recommended fuel

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

3.51

recovery capability

ability of the fire to re-ignite existing or newly charged fuel after a defined burning period without external assistance

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3.52

reduced combustion capability

ability of an intermittent burning appliance to continue burning for a minimum period, dependent on appliance type and fuel burned, without any input of fuel and without any external interference with the combustion process, in such a manner that at the end of this period, the firebed can be recovered

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3.53

refuelling interval

period of time for which the combustion may be maintained in the appliance with a single load of fuel, without intervention by the user

3.54

residue

ashes, including combustibles, which collect in the ashpit

3.55

roomheater

appliance having a fully enclosed firebox with firedoor(s) which are normally closed, that distributes heat by radiation and/or convection and also provides hot water when fitted with a boiler

3.56

safety heat exchanger

device which allows excess heat to be released from an appliance

3.57

slow combustion capability

ability of an appliance to continue operating at a low burning rate for a specified minimum period without any input of fuel and without any interference with the combustion process, in such a manner that the basic firebed can be recovered at the end of this period

3.58

solid fuel

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

3.59

solid mineral fuel

coal, lignite, coke and fuels derived from these

3.60

space heating output

heat output provided by convection and radiation to the room

3.61

steady-state condition

stage at which values to be measured in successive equal periods of time do not exhibit significant change

3.62

surround

outside components or assembly enclosing the appliance or parts of it

3.63

test fuel

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

3.64

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

3.65

thermostat

temperature sensitive device which automatically changes the air inlet cross-sectional area

3.66

water heating output

heat output to water, averaged during the test period

3.67

working surfaces

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

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

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4 Materials, design and construction

4.1 Production documentation

The manufacturer shall state the type of appliance, which he is submitting for test and the laboratory shall test the appliance using the standard appropriate to that claim.

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

- the specification of the materials used in the construction of the appliance;
- the nominal 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:

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

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

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

4.1 4.2 Construction

4.2.1 General construction

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The shape and dimensions of the components and equipment and the method of design and manufacture and if assembled on site the method of assembly and installation, shall ensure that when operated as specified in accordance with the test procedures of this standard and exposed to the associated mechanical, chemical and thermal stresses, the appliance shall operate reliably and safely such that during normal operation no combustion gas posing a hazard can escape into the room in which the appliance is installed nor can embers fall out. Non-combustible materials shall be used, except that it shall be permissible to use combustible materials for the following applications:

- components or accessories fitted outside the appliance;
- internal components of controls and safety equipment;
- operating handles;
- electrical equipment.

No part of the appliance shall comprise any material known to be harmful.

When fired with solid mineral fuels, the appliance shall have a bottomgrate and an ashpan.

Component parts, which require periodic replacement and/or removal shall be either so designed or marked for identification to ensure correct fitting.

NOTE 1 Because the entire heat dissipating surfaces of the appliance including the flue spigot/socket and the flue gas connector are working surfaces, there is no requirement for limiting the surface temperature of the appliance.

NOTE 2 All operations which the user carries out, including loading and emptying of the appliance, adjusting controls and de-ashing should be easy, safe and effective.

4.2.2 Integral boiler

The boiler shell shall be constructed from cast iron and/or steel and shall be capable of operating at the maximum operating pressure declared by the manufacturer. The integral boiler shall meet the requirements of A.4.7.

The materials and dimensions for the integral boiler construction shall be in accordance with the specifications given in Tables 2 to 7. If alternative materials are used, a certificate giving evidence of similar performance is required.

Provision shall be made for parts, which form a seal, to be located securely by means of bolts, gaskets or welding to prevent the leakage of air/water or combustion products. Adjacent surfaces between metal components in the firebox or the flueways shall be gastight. Where a seal is made with fire-cement, cement shall be well supported by adjacent metal surfaces.

4.2.2.1 Boilers constructed of steel

4.2.2.1.1 Welding and welding materials

The materials used shall be suitable for welding.

NOTE The materials listed in Table 3, are suitable and do not require any additional heat treatment after welding.

4.2.2.1.2 Nominal minimum wall thicknesses (steel)

Boilers constructed of mild steel shall have the appropriate wall thicknesses set out in Table 2.

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Table 2 - Steel - Nominal minimum wall thicknesses

Application	Non-alloy steels	Stainless and corrosion resistant steels
	mm	mm
Walls of the firebox which are in contact with fire and/or water	5	3
Walls of convection heating surfaces outside combustion chamber (except circular tubes)	4	2
Circular tubes used in convection part of heat exchanger	3,2	1,5
Water cooled grate tubes	4	3
Surfaces not in contact with burning fuel or products of combustion	3	2

NOTE 1 The nominal minimum wall thicknesses of Table 2 apply to pressure loaded sheets and tubes other than immersion coils, safety heat exchangers.

NOTE 2 Thinner wall thicknesses are only permissible with proof of equivalent corrosion resistance, heat resistance and strength.

NOTE 3 The nominal minimum wall thicknesses listed in Table 2 have been specified taking into consideration:

- the maximum water operating pressure (4 bar),
- the material properties,
- the heat transfer location.