

Roomheaters fired by solid fuel — Requirements and test methods

ICS 97.100.30

National foreword

This British Standard is the UK implementation of EN 13240:2001 +A2:2004, incorporating corrigenda September 2003, June 2006 and August 2007. It supersedes BS EN 13240:2001 which is withdrawn.

NOTE CEN amendment A2:2004 incorporates both CEN amendment A1:2001 and CEN amendment A2:2004.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

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Conflicting national standards will need either to be withdrawn or amended and these are under consideration in Technical Committee RHE/28.

The UK participation in its preparation was entrusted to Technical Committee RHE/28, Domestic solid mineral fuel appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

The publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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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.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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Foreword

This document (EN 13240:2001/A2:2004) has been prepared by Technical Committee CEN/TC 295 “Residential solid fuel burning appliances”, the secretariat of which is held by BSI.

This Amendment to the European Standard EN 13240:2001 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by May 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(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Foreword to amendment A2

This document (EN 13240:2001/A2:2004) has been prepared by Technical Committee CEN/TC 295 “Residential solid fuel burning appliances”, the secretariat of which is held by BSI.

This Amendment to the European Standard EN 13240:2001 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2005, and conflicting national standards shall be withdrawn at the latest by July 2007.

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(s).

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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.*

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

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.*

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

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

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 combustibile 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 combustibile 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

3.30

flue gases

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

A₂ 3.31

flue gas connector

duct through which flue gases are conveyed from the flue spigot of the appliance into the chimney flue **A₂**

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

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

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

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.

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.

A₂ 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. **A₂**

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.

4.2 Construction

4.2.1 General construction

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.

Table 2 — Steel — Nominal minimum wall thicknesses

Application	Non-alloy steels mm	Stainless and corrosion resistant steels 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.

The tolerances on the nominal minimum wall thicknesses for non-alloyed steels given in Table 2 shall be as specified in EN 10029:1991.

Table 3 — Steel material types

European Standard references	Material type	Material number in accordance with EN 10027-2:1992
EN 10111:1998	DD 11	1.0332
	DD 12	1.0398
	DD 13	1.0335
	DD 14	1.0389
EN10025:1993	S235JR	1.0037
	S235JRG2	1.0038
	S235JO	1.0114
	S235J2G3	1.0116
	S275JR	1.0044
	S275JO	1.0143
	S275J2G3	1.0144
	S355JR	1.0045
	S355JO	1.0553
	S355J2G3	1.0570
	S355K2G3	1.0595
EN 10028-2:1992	P235GH	1.0345
	P265GH	1.0425
	P295GH	1.0481
	P355GH	1.0473
	16Mo3	1.5415
	13CrMo4-5	1.7335
	10CrMo9-10	1.7380
	10CrMo9-10	1.7383
EN 10120:1996	P245NB	1.0111
	P265NB	1.0423
	P3 IONB	1.0437
	P355NB	1.0557
EN 10088-2:1995	X5CrNi 18-10	1.4301
	X6CrNi 17-12-2	1.4401
	X6CrNiTi 18-10	1.4541
	X6CrNiNb 18-10	1.4550
	X6CrNiMo Ti 17-12 -2	1.4571
	X6CrNiMoNb 17-12 -2	1.4580
	X3CrNiMo 17-3-3	1.4436
NOTE Materials and wall thicknesses other than those specified may only be used on production of appropriate evidence as regards at least their equivalent corrosion resistance, heat resistance and strength to non-alloy steel at the material thicknesses specified in 4.2.2.1.2 for the particular application/usage.		

4.2.2.2 Boilers constructed of cast iron

4.2.2.2.1 Cast iron parts subject to water pressure

The mechanical properties of cast iron used for parts subject to water pressure shall, as a minimum, correspond to the values listed in Table 4.

Table 4 — Minimum mechanical requirements for cast irons

Grey cast iron (in accordance with EN 1561:1997)	
Tensile strength R_m	$> 150 \text{ N/mm}^2$
Brinell hardness	160 HB to 220 HB
Spheroidal graphite iron (In accordance with EN 1563:1997)	
Tensile strength R_m	$> 400 \text{ N/mm}^2$
Elongation	18 % A_3

4.2.2.2.2 Minimum wall thicknesses (cast iron)

The wall thickness of the casting section shall be not less than the minimum thicknesses listed in Table 5.

Table 5 — Cast iron — Minimum wall thicknesses

Nominal heat output kW	Grey cast iron mm	Spheroidal graphite cast iron mm
< 30	3,5	3,0
≥ 30 and < 50	4,0	3,5

4.2.2.3 Boiler shell tappings

The threads of boiler shell tappings, for flow and return pipes, shall be not less than the minimum thread size designation given in Table 6.

Where tapered threads are used, they shall be in accordance with the requirements of ISO 7-1:1994 and ISO 7-2:2000. Where parallel threads are used, they shall be in accordance with ISO 228-1:2000 and ISO 228-2:1987. The design and position of flow tappings shall be such that air will not be retained within the boiler shell.

Table 6 — Minimum thread size designation of flow and return tappings

Nominal heat output kW	Gravity circulation thread size designation ¹⁾	Pumped circulation thread size designation ¹⁾
≤ 22	1	½
> 22 ≤ 35	1¼	1
> 35 < 50	1½	1
¹⁾ Designation in accordance with ISO 7-1:1994 and ISO 7-2:2000 or ISO 228-1:2000 and ISO 228-2:1987.		

If boilers are supplied with reducing bushes in horizontal flow tappings, these shall be eccentric and fixed so that the reduced outlet is uppermost. The minimum depth of tapping or length of thread shall conform to Table 7.

Table 7 — Minimum depth of tapping or length of thread

Thread size designation ¹⁾	Minimum depth or length of thread Mm
½ to 1¼	16
1½	19
¹⁾ Designation in accordance with ISO 7-1:1994 and ISO 7-2:2000 or ISO 228-1:2000 and ISO 228-2:1987.	

Where a drain socket is provided in the boiler shell, it shall be a minimum thread size designation of ½ and shall be in accordance with ISO 7-1:1994 and ISO 7-2:2000 or ISO 228-1:2000 and ISO 228-2:1987.

4.2.2.4 Boiler waterways

4.2.2.4.1 Design of all boiler waterways

The design of the boiler shall ensure a free flow of water through all parts. To minimize the build up of sediments, sharp or wedge-shaped waterways with a taper towards the bottom shall be avoided.

Where inspection holes are provided in the boiler to give access for inspection and cleaning of the waterways, they shall be a minimum of 70 mm x 40 mm or have a minimum diameter of 70 mm and be sealed with a gasket and cap.

4.2.2.4.2 Boiler waterways used with indirect water systems

The minimum internal dimension of waterways throughout the main body of the appliance shall be not less than 20 mm except where waterways have to be locally reduced to facilitate manufacture or are in areas not in direct contact with burning fuel, in these cases the width of the waterways shall not be less than 15 mm.

4.2.2.4.3 Boiler waterways used with direct water systems

The minimum internal dimensions of waterways in boilers designed for direct water systems shall be not less than 25 mm.

4.2.2.4.4 Venting of the water sections

The boiler and its components shall be designed in such a way that their respective water sections can be vented.

The boiler shall be so designed that under normal operation in accordance with the manufacturer's installation instructions, no undue boiling noises occur.

4.2.2.4.5 Water tightness

Holes, for screws and similar components, which are used for the attachment or removal of parts, shall not open into waterways or spaces through which water flows.

NOTE This does not apply to pockets for measuring, control and safety equipment.

4.2.3 Cleaning of heating surfaces

All heating surfaces shall be accessible from the flue gas side for inspection and cleaning with brushes, scrapers or chemical agents by means of sufficient cleaning openings. Where cleaning and servicing of the boiler and its components require the use of special tools (e.g. special brushes), these shall be supplied by the appliance manufacturer.

4.2.4 Flue spigot or socket

For horizontal flue connection, the flue spigot/socket shall be designed to allow fitting, internal or external, over a length of at least 40 mm, of a flue gas connector.

For vertical flue connection, the fitting shall overlap by at least 25 mm.

NOTE For inset appliances (made for fireplace recesses) with a vertical chimney flue connection and where the manufacturer's installation instructions specify, in addition to the flue gas connector, that an insulating mortar infill should be added around the connector to seal the appliance to the chimney flue, then in this case it is permissible for the flue spigot/socket overlap to be reduced to a minimum of 6 mm.

4.2.5 Flueways

The size of the flueway in its minimum dimension shall be not less than 30 mm except it shall be permissible to reduce it to not less than 15 mm for appliances designed only to burn fuels other than bituminous coals and peat briquettes, and where an access door(s) is provided for cleaning the flueway. It shall be possible to clean the flueways of the appliance completely using commercially available tools or brushes, unless special tools or brushes are provided by the appliance manufacturer.

4.2.6 Ashpan and ash removal

A means for the removal of the ash residue from the appliance shall be provided. When an ashpan is provided, it shall be capable of containing the combustion residue from two full charges of fuel whilst retaining sufficient space above to allow adequate primary air flow through the bottomgrate or firebed. If the ashpan resides in the appliance it shall locate in the ashpit in such a way that it allows the free passage of primary air and in such a position that it does not obstruct any primary air inlet control.

NOTE 1 The ashpan should be designed and constructed to ensure that:

- a) it effectively collects the residue from beneath the bottomgrate;
- b) it can be easily and safely withdrawn, carried and emptied when hot, using the tool(s) provided, without undue spillage of residue material.

NOTE 2 The ashpan can be shovel shaped.

4.2.7 Bottomgrate

Where the bottomgrate is removable it shall be so designed or marked as to ensure correct fitting. If a de-ashing mechanism is fitted it shall be capable of effectively de-ashing the fuelbed.

NOTE 1 The preferred design with the firedoor(s) and ashpit door(s) closed should allow de-ashing to be carried out. The de-ashing should be possible without undue effort.

NOTE 2 If it is necessary to remove the ashpit door to de-ash the fire, the appliance should be designed to minimise ash or fuel spillage during the de-ashing operation.

4.2.8 Combustion air supply

4.2.8.1 Primary air inlet control

The appliance shall be fitted with either a thermostatically controlled primary air inlet control or a manual primary air inlet control. For appliances with a boiler, a manual primary air inlet control shall only be allowed for boiler outputs up to 7,5 kW. The adjusting control shall be clearly visible or shall be permanently marked so that its operation is readily understandable.

The design shall be such that during operation of the appliance, neither ash nor unburned fuel can prevent the movement or closure of the air inlet control.

The “cold” setting of the air inlet control shall be clearly marked and the method of adjustment shall be described in the user instructions.

The thermostat shall have a variable temperature range and be of the immersion or dry pocket type. The pocket shall be positioned so that the thermostat senses the temperature of the flow water from the appliance.

4.2.8.2 Secondary air inlet control

Where a secondary air inlet control is provided, the position of air entry shall be so designed that the passage of air is not restricted when the firebox is filled to the manufacturer's recommended capacity.

4.2.9 Control of flue gas

If a flue damper is fitted it shall be of a type, which does not block the flue totally. The damper shall be easy to operate and incorporate an aperture within the blade, which in a continuous area occupies at least 20 cm² or 3 % of the cross-sectional area of the blade if this is greater.

The position of the damper shall be recognizable from the setting of the device.

If a draught regulator is fitted the minimum cross sectional area requirement shall not be applicable but the device shall be easily accessible for cleaning.

4.2.10 Firedoors and charging doors

When the appliance is equipped with a charging door, that door shall be large enough to allow the appliance to be filled with the commercial fuels recommended by the manufacturer. Firedoors and charging doors shall be designed to prevent accidental opening and to facilitate positive closure.

4.2.11 Flue bypass device

Any flue bypass device shall be easily operable. The extreme positions corresponding to full opening and closing shall be stable and easily identifiable.

4.2.12 Front firebars and/or deepening plate

Front firebars shall be designed to retain the fuel or ash such that there is no undue spillage of ash or burning fuel from the roomheater during normal operations, particularly during refuelling or de-ashing.

If the appliance is fitted with removable front firebars and/or deepening plate, they shall be of a design such that they can neither be incorrectly fitted nor accidentally dislodged.

4.2.13 Solid mineral fuel and peat briquettes burning appliances

When the recommended fuels are solid mineral fuel and peat briquettes, the appliances shall have a bottomgrate and an ashpan.

5 Safety requirements

5.1 Natural draught

A₂ Where the appliance manufacturer claims that a continuous burning appliance can be connected to a chimney serving more than one appliance, and can be operated with solid mineral fuel and peat briquettes as suitable fuels, then when tested in accordance with A.4.9.3 either the flue draught throughout the test period shall be not less than 3 Pa or where the flue draught falls below 3 Pa then over a further 10 h period from when the draught falls below 3 Pa the total quantity of carbon monoxide in the flue gas, calculated to NTP as detailed in A.6.2.8 shall not be greater than 250 dm³. **A₂** Such an appliance shall be clearly labelled to indicate whether or not it can be installed into a shared flue (see 7.2).

5.2 Operation with open firedoors

The operation of an appliance with an open firebox shall only be permitted when:

- any escape of harmful combustion gases, and
- any loss of the firebed from the appliance,

does not occur under the test conditions described in section A.4.9.1.

5.3 Strength and leaktightness of boiler shells

The boiler shell and its water carrying components shall not leak or become permanently deformed when subjected to the type pressure test described in A.4.9.4 and during the nominal heat output test described in A.4.7.

5.4 Temperature rise in the fuel storage container (other than the fuel hopper)

When tested in accordance with A.4.7 and A.4.9, the temperatures measured in the fuel storage container shall not exceed the ambient room temperature by more than 65 K.

5.5 Temperature rise of the operating components

If the manipulation of the operating components does not require the assistance of tools, the surface temperatures, measured only in the areas to be touched, shall not exceed the ambient room temperature by more than the following when tested in accordance with A.4.7:

- 35 K for metal;
- 45 K for porcelain, vitreous enamel or similar materials;
- 60 K for plastics, rubber or wood.

If these temperatures are exceeded, the manufacturer shall indicate in the instructions the need to use an operating tool. This tool shall be supplied with the appliance.

NOTE A suitable glove is regarded as a tool.

5.6 Temperature of adjacent combustible materials

A₂ When tested during the performance test at nominal heat output in accordance with A.4.7, and the temperature safety test in accordance with A.4.9, and when the appliance is installed in accordance with the clearance distances specified in the manufacturer's installation instructions, the temperature of the test hearth and walls and/or ceiling or any other structure surrounding the appliance comprising combustible material shall not exceed the ambient temperature by more than 65 K. **A₂**

If the temperature of the surrounding walls and/or of the floor exceeds the ambient temperature by more than 65 K, the manufacturer shall provide the necessary information for insulating the walls and/or floor or indicate the clearance distance required.

5.7 Thermal discharge control

For appliances fitted with a boiler designed to operate on a sealed system and where a thermal discharge control is fitted as part of the appliance, when tested in accordance with A.4.9.5, the control shall operate when the water flow temperature exceeds either 105°C or the manufacturer's declared operating temperature, whichever is the lower.

A₂ 5.8 Electrical safety

The appliance shall comply with the electrical safety requirements of EN 50165 if mains operated electrical equipment is fitted as part of the appliance. **A₂**

6 Performance requirements

6.1 Flue gas temperature

When tested in accordance with A.4.7, the flue gas temperature shall be measured and the mean calculated and recorded in the installation instructions.

A₂ 6.2 Carbon monoxide emission

When measured in accordance with A.4.7, the mean carbon monoxide concentration calculated to 13% oxygen (O₂) content in the flue gas shall be less than or equal to the manufacturer's declared value and shall not exceed 1,0%.

Some countries have existing national legislation which set limits for maximum carbon monoxide concentration levels under nominal heat output and /or under slow or reduced combustion, in these cases the carbon monoxide level shall be measured during the nominal heat output test in accordance with A.4.7 and the slow or reduced combustion test in accordance with A.4.8 for appliances sold in that country. **A₂**

AC₁ NOTE In some countries national laws also require limits for particulate and organic compound emissions, emissions under slow combustion conditions and for weighed values for emissions to be used. In some countries clean air legislation is based on the use of authorized fuels. **AC₁**

A₂ 6.3 Efficiency

When tested in accordance with A.4.7, the measured total efficiency from the mean of at least two test results at nominal heat output shall be greater than or equal to the manufacturer's declared value and shall equal or exceed 50%.

Some countries have existing national legislation which set limits for minimum efficiency under nominal heat output and/or slow or reduced combustion, in these cases the minimum efficiency shall be determined during the nominal heat output test in accordance with A.4.7 and/or the slow or reduced combustion test in accordance with A.4.8 for appliances sold in that country. **A₂**

6.4 Flue draught

The flue draught values, related to the appliance's nominal heat output, given in Figure 1 shall be taken as the values for the static pressure to be applied in the measurement section when undertaking the nominal heat output test in accordance with A.4.7, the slow combustion and reduced combustion test in accordance with A.4.8, and the safety test in accordance with A.4.9.

Where the flue draught values given in Figure 1 need to be exceeded in order to obtain the manufacturer's declared nominal output, the required flue draught shall be clearly stated in the appliance's installation instructions.

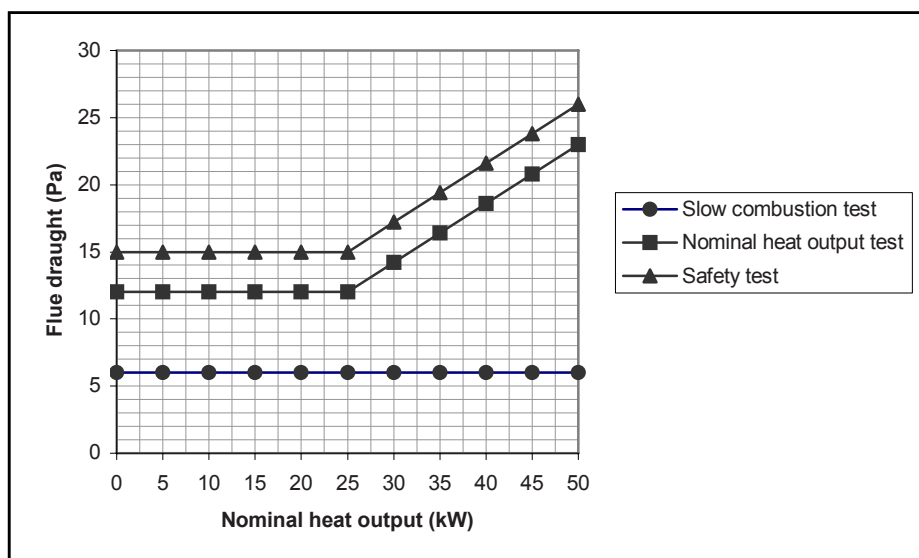


Figure 1 — Flue draught values

When undertaking the nominal heat output test in accordance with A.4.7 the flue static pressure shall be kept within ± 2 Pa of the specified value. For the slow combustion or reduced combustion test in accordance with A.4.8 the static pressure shall be kept within ± 1 Pa of the specified value. For the temperature safety test in accordance with A.4.9 the appliance shall be tested at a flue draught 3 Pa greater than that used during the nominal heat output test and the static pressure shall be kept within $^{+2}_0$ Pa of this specified value.

6.5 Recovery

At the conclusion of the slow combustion or reduced combustion test periods described in A.4.8, it shall be possible to satisfactorily revive the fire.

Recovery shall be deemed to be satisfactory if the refuel charge is visibly ignited under the test conditions described in A.4.8.4 within a time of 20 min.

6.6 Refuelling intervals

When tested in accordance with A.4, and when the appliances is operated with closed doors, the minimum times for maintenance of combustion with one added test load of fuel shall be not less than the values given in Table 10 as appropriate to the appliance type and/or the test fuel used.

Table 10 — Minimum refuelling intervals

Continuous burning appliances		
Combustion conditions	Fuels	Minimum refuelling interval hours
nominal	Solid mineral fuel	4
nominal	Wood	1,5
slow combustion	Solid mineral fuel	12
slow combustion	Wood	10
Intermittent burning appliances		
Combustion conditions	Fuels	Minimum refuelling interval hours
nominal	Solid mineral fuel	1
nominal	Wood	0,75
reduced combustion	Solid mineral fuel	0
reduced combustion	Wood logs	0

Where the refuelling interval declared by the manufacturer is greater than the minimum refuelling interval given in Table 10, or where the manufacturer states a refuelling interval for appliances under reduced combustion conditions, then the manufacturer's declared value shall be verified when tested during the tests in accordance with A.4.7 and A.4.8.

The nominal, slow and reduced test loads shall be the same. The nominal load shall be calculated using the refuelling intervals, the manufacturer's declared efficiencies and the calorific values of the fuels as detailed in A.4.2. The slope formed by the test load shall not obstruct, even partially, any flue. 

6.7 Space heating output

The space heating output declared by the manufacturer shall not exceed the space heating output measured in accordance with A.4.7.