BS EN 16647:2015

BSI Standards Publication

Fireplaces for liquid fuels — Decorative appliances producing a flame using alcohol based or gelatinous fuel — Use in private households

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National foreword

This British Standard is the UK implementation of EN 16647:2015.

BSI, as a member of CEN, is obliged to publish EN 16647:2015 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee voted against its approval as a European Standard.

The UK committee is concerned that the requirements specified in this standard are too restrictive. The main concerns are summarized as follows:

- In Subclause 5.1 it states that "All tests should be performed by laboratory accredited according to EN ISO/IEC 17025". This prevents self-certification.
- Throughout the standard the measurements and quantities referenced do not align with current testing practices. For example, in Subclause 5.3, a 20 kg load is referenced. A 15 kg load would be more reasonable in respect of existing products available on the UK market.
- In the test method outlined in Subclause 5.7, the 42 day timeframe for keeping a piece of filling material, as well as other aspects, make the test difficult to carry out.

The UK participation in its preparation was entrusted by Technical Committee RHE/13, Oil burning equipment, to Subcommittee RHE/13/1, Fireplaces for liquid fuels.

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

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

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Date	Text affected

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16647

September 2015

ICS 97.100.99

English Version

Fireplaces for liquid fuels - Decorative appliances producing a flame using alcohol based or gelatinous fuel - Use in private households

Foyers pour combustibles liquides - Appareils décoratifs produisant une flamme à l'aide de combustible à base d'alcool ou de combustible gélifié - Utilisation domestique

Feuerstellen für flüssige Brennstoffe - Dekorative Geräte, die unter Verwendung eines Alkohol basierten flüssigen oder gelförmigen Brennstoffes eine Flamme erzeugen - Nutzung im privaten Haushaltbereich

This European Standard was approved by CEN on 1 August 2015.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16647:2015) has been prepared by Technical Committee CEN/TC 46 “Fireplaces for liquid fuels”, the secretariat of which is held by DIN.

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 March 2016, and conflicting national standards shall be withdrawn at the latest by March 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document defines the requirements for the construction and operating methods, the operation tests, as well as for the production, labelling and the instruction manuals of decorative fireplaces/appliances producing a flame using liquid or gelatinous alcohol based fuels.

This document contains definitions regarding the technical safety of the appliances.

The requirements listed in the document refer to appliances which are ready for use only. Single components - like simple burner cups – are not considered herein (and are not considered safe when used on their own).

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

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1 Scope

This European Standard applies for decorative fireplaces/appliances for domestic use, producing a flame using alcohol, hereafter referred to as fuel, in liquid or gelatinous fuel for decoration.

NOTE 1 The requirements are strictly applied even when used in other areas. Outside the private household and outdoor area can apply more or different rules on the use of the appliances.

This European Standard applies to free-standing, wall-mounted and built-in appliances with a maximum power output of 4,5 kW.

This European Standard applies for appliances ready for use, whose burner is of one unit or are an integral component of the appliances but not for appliances with a fuel tank separate from the appliance.

This European Standard does not apply for appliances specifically designed for heating food or keeping food warm (rechauds), as well as for appliances for use in boats, caravans, other vehicles or outdoor areas.

This European Standard does not apply for appliances with a power output higher than 4,5 kW or with a defined heating function.

NOTE 2 National regulation may restrict the power output to less than 4,5 kW.

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 1023-3, *Office furniture — Screens — Part 3: Test methods*

EN 13240, *Roomheaters fired by solid fuel — Requirements and test methods*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 60335-1, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1)*

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 ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1)*

IEC 60417-DB-12M, *Graphical symbols for use on equipment — 12-month subscription to online database comprising all graphical symbols published in IEC 60417 and ISO 7000 Graphical symbols for use on equipment*

ISO 3864 (all parts), *Graphical symbols — Safety colours and safety signs*

ISO 7000, *Graphical symbols for use on equipment — Registered symbols*

ISO/IEC Guide 37, *Instructions for use of products by consumers*

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3 Terms and definitions

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

3.1
appliance which is ready for use
unit comprising a burner and housing which are supplied ready for use by the manufacturer or a burner which is ready to be built into a setting as per the manufacturer's instructions

3.2
area of flame impingement
area which could to be touched by the flame under normal operating conditions

3.3
body
unit comprising walls, base and covers made of non-combustible or thermally protected materials which encase the burner and within which the combustion takes place

3.4
burner
unit comprising at least secondary containment chamber and the burner opening

3.5
burner opening
opening in the burner at which the combustion of the fuel-air mixture takes place

3.6
secondary containment chamber
container in which the fuel storage tank is located in order to contain excess, overfilled fuel or fuel leaving out of a defective fuel storage tank

3.7
decorative fireplaces fuelled by liquid fuel or gelatinous fuel
appliance which is fuelled with liquid fuel and/or gelatinous fuel and used for decorative purposes

3.8
fixed appliance
appliance designed to be permanently fixed to the fabric of the building

3.9
free standing appliance
appliance not designed to be permanently fixed to the fabric of the building and not provided with helping devices for moving

3.10
fuel
alcohol derivate alcohol with at least 95 % C_2H_5OH

3.11
filling material
material inside of the burner to absorb the fuel

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3.12
fuel storage tank
container part of the appliance, from which the fuel is fed to the burner

3.13
gelatinous fuel
combustible paste based on alcohol at least 95 % of denaturated volume, as well as gelling agent

3.14
minimum burner adjustment
burner setting at lowest fuel consumption

3.15
ignition device
device for ignition of the burner

3.16
maximum burner adjustment
burner setting at highest fuel consumption

3.17
non-combustible material
material classified A2-s1d0 as described in EN 13501-1

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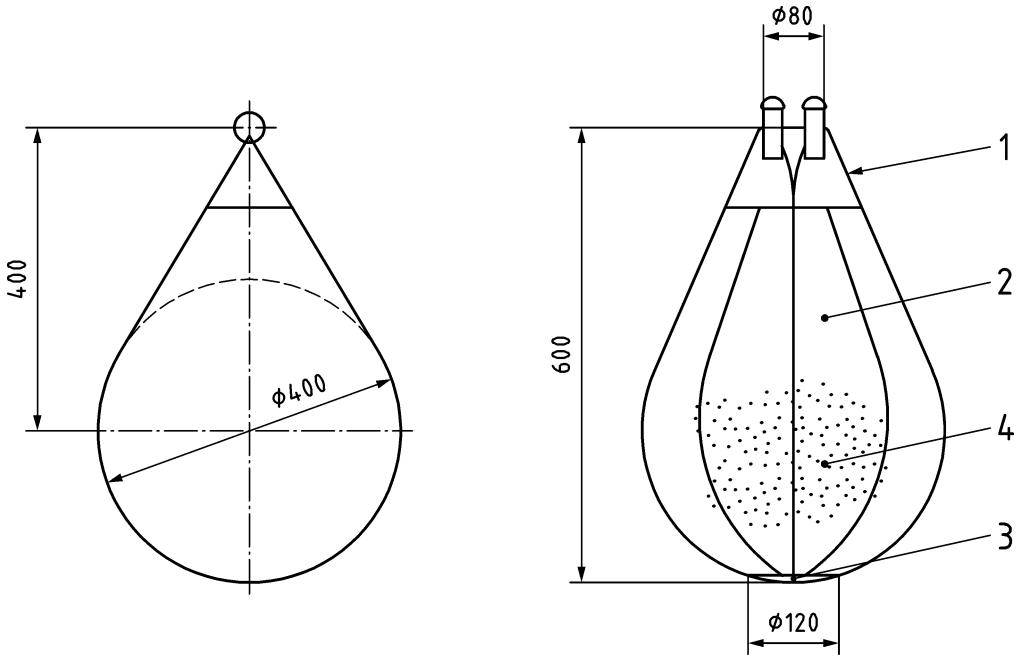
3.18
test bag

Dimensions in millimetres



Key

1 leather string
2 eight canvas sections
3 leather bottom
4 20 kg dry corn

Figure 1 — Spheroconical bag for the stability test

3.19
tabletop appliance
appliance which is placed exclusively on furniture, wall shelves in accordance with the manufacturer's definition and not in the walkable area within a room

4 Construction

4.1 General

The appliance shall be produced in such a way as to:

— rule out any kind of permanent deformations or other damages on the appliance after testing;

— withstand any tensions occurring during normal use;

— facilitate being operated safely.

The use of decorative elements e.g. imitation wood, pebbles in the flame area are not permitted.

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4.2 Fuel Volume

The maximum burner volume shall not exceed 3 l. The total fuel capacity of the appliance shall not exceed 10 l.

NOTE National or regional legislation might impose lower limits.

4.3 Construction

The appliance shall be fitted with a feature with an easy-to-use closing mechanism (in order to extinguish the flames). This mechanism shall work reliably and safely also if the appliance is in use – if required by means of auxiliary tools that shall be provided by the manufacturer.

Furthermore, the design of the construction shall ensure:

— any welding seams of the fuel storage tank shall be continuously welded;

— that replaceable parts or parts necessary for assembly on site shall not be fitted incorrectly;

— that all parts used for operation and/or maintenance of the appliance shall be free from sharp edges which could constitute a safety hazard for the user;

— an extinguishing device fulfilling 5.6 is a requirement.

4.4 Materials

The parts which are in contact with than alcohol shall be constructed with chrome-nickel steel 1.4301 or with material of better thermal, chemical, mechanical properties and corrosion resistance than chrome-nickel steel 1.4301.

Asbestos and Cadmium containing hard soldering flux shall not be used in any components of the appliance. Any insulation material shall be non-combustible (A2s1d0 class, EN 13501-1) and its application shall not pose any threat to health and safety.

It shall be ensured that any filling materials used in the burners are durable and specifically suited for the thermal strain under contact with fuel and its combustion, and shall not alter their properties. Certificates issued by a test institute shall be submitted accordingly. This shall be tested according to 5.7.

The burner and all components which can reach a temperature over 65 K above room temperature, shall be constructed of non-combustible materials.

4.5 Stability test

If fittings for the mounting or fixing of the appliances are provided by the manufacturer, they shall be durable for the whole life of the appliance.

If unintentionally moved or tilted during operation the appliance shall be stable according with the tests in Clause 5.

Appliances provided with wheels or any other devices helping their movement shall be naturally blocked and it shall be impossible to move them without extinguishing the flame.

The free standing appliances shall pass the stability test (tilting and sliding, impact, movement test), as stated in Clause 5.

For all the tests the fuel tank shall be filled with fuel to the maximum level according to the user instruction.

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For wall-mounted appliances, unintentional moving shall be prevented. Especially it shall not be possible to unlatch or lift off the appliance from the hook.

NOTE Damage to the appliance which is caused by impact stress (e.g. crack in a glass screen) can be accepted as long as the requirements towards mechanical stability and fuel spillage are met.

4.6 Ignition device

The appliance shall be safe to ignite.

It shall be possible to light the appliance with commonly available lighters, if the appliance is not equipped with an integrated ignition device or a lighter is not included with the appliance. The user shall be able to ignite the fire from a horizontal minimum distance of 140 mm (shortest distance between the handle of the lighter or ignition device and the burner opening).

Devices which would enable the user to light the fire without visual contact with the flames are not allowed.

If a remote control device is provided, an unwanted ignition shall not be possible and a child safety device shall be provided.

EXAMPLE Pressing two buttons is considered enough for chid safety.

5 Test methods and requirements

5.1 General

Table 1 shows an overview of the tests which shall be performed according to type of appliance.

Table 1 — Tests to be performed according to appliance type

Test	Appliance		
	Fix	**Free standing**	**Tabletop**
Tilting + Sliding	NO	YES	YES
Movement from impact	YES	YES	YES
Tilting from impact	NO	YES	YES
Stress	YES	NO	NO
Spillage	NO	YES	YES

For all the tests the fuel tank shall be filled with fuel or water to the maximum level according to user instruction or lower if any level is considered more critical by the laboratory.

All tests should be performed by laboratory accredited according to EN ISO/IEC 17025.

5.2 Tilting and sliding test

The appliance shall be placed on an inclinable surface of glass with low friction and without any fixation.

The surface shall successively be tilted by 5° to all four sides and for free-standing appliances and tabletop appliances by 10°.

The speed at which the surface is tilted shall not exceed 1,5 ± 0,5° increase of tilt angle/second.

The test is considered as passed if there is no spillage.

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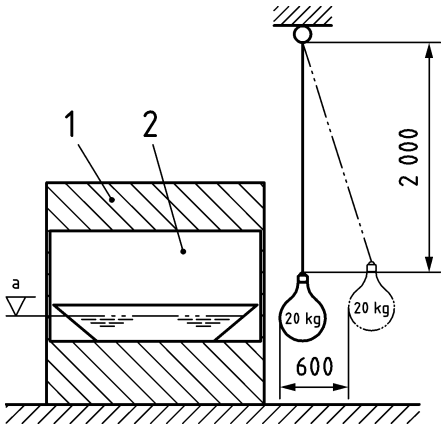
5.3 Movement from impact test

The appliance shall be placed on a rigid, horizontal, levelled surface with a low friction (e.g. glass plate).

A test bag shall be deflected by 600 mm and then swings freely towards to the barycentre.

Dimensions in millimetres



Key

1 fireplace

2 combustion chamber

a maximum height of water or fuel

Figure 2 — Safety test for movement and leakage of fuel while striking against the appliance

The test is considered as passed if there is no spillage and the appliance does not move more than 50 % of the safety distance stated in the user instruction. In any case, the appliance shall not move more than 1 m.

5.4 Tilting from impact stress

Appliances shall be placed on a rigid, horizontal, levelled surface with a low friction (e.g. glass plate). A stopping device/barrier, the purpose of which is to restrict the movement of the appliance, shall be fixed on the floor next to the appliance. Its height shall not exceed 12 mm (according to EN 1023-3), provided that the construction of the appliance does not require a higher stopping device/barrier. In that case, the height to be chosen shall be the lowest one which prevents the appliance from moving.

During the impact test with a pendulum from the side of the appliance opposed to the stopping device/barrier, the appliance shall not spill.

The test bag of 20 kg weight shall be suspended from a 2 m long rope in such a manner that it hangs right next to the most critical point of the appliance (with regards to tilting it) (which is usually the point at the biggest distance from barycentre) in 1 m height or next to its upper edge if the appliance be lower than 1 m. The test bag is deflected by 600 mm and then swings freely towards the appliance.

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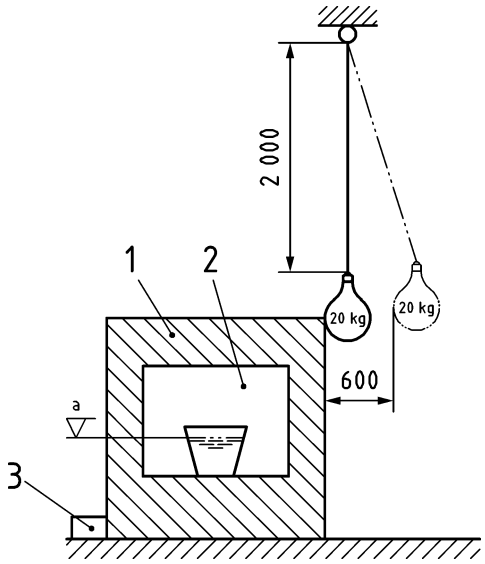
Dimensions in millimetres



Key

1 fireplace

2 combustion chamber

3 stopping device/Barrier

a maximum height of water or fuel

Figure 3 — Tilting test for appliances

The test is considered as passed if there is no spillage.

5.5 Stress test

The appliance shall be fixed to the test wall/ceiling as specified in the instruction.

The appliance shall then be lit; after 3/4 of the maximum combustion time the appliance shall be shut down and a test weight, made by two weights of 30 kg each connected with a rope (the two weights shall be suspended), shall be applied within 2 min after shutdown.

The weight shall be left on the appliance for 10 min and then removed.

For testing wall mounted appliances a lateral force of 45 kg shall be applied to the appliance for 2 min. The force shall be applied to the farthest point from the appliance's wall fixes.

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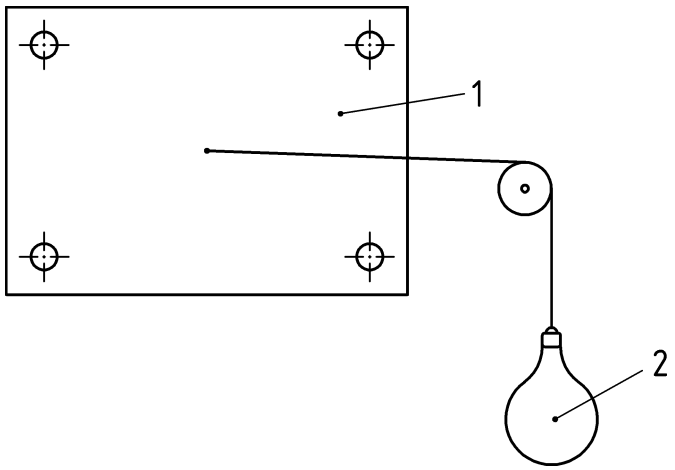

Key

1 wall mounted appliance

2 lateral force (45 kg)

Figure 4 — Stress test for wall mounted appliances

The test is considered as passed if the appliance presents no deformations of its structure and its connection system and no spillage from the appliance after any of the test.

5.6 Spillage test

The appliance shall be placed on an inclinable surface with low friction (e.g. glass) without any fixation.

The surface shall be successively tilted towards all four sides by 10°. The appliance shall neither tilt nor slip.

The speed at which the surface is tilted shall not exceed 1,5 ± 0,5° increase of tilt angle/second.

The test in considered as passed if there is no spillage.

5.7 Fuel storage container

The fuel storage container shall be tight i.e. at maximum filling level no fuel shall leak during a period of 24 h. Alternatively, the tightness can be tested by applying pressure of 0,5 bar to the container which shall not show any visible leaks.

EXAMPLE Bubble formation when using leak detection spray.

The appliance shall be constructed in such a way that any fuel leakage is avoided. In order to prevent leakage, a secondary containment chamber shall be provided which has a minimum volume of 110 % of the actually filling volume and sufficient ventilation. In case of an inaccessible secondary containment chamber a safety device with a spilling sensor shall be provided.

The appliance shall be overfilled with 10 % of the maximum capacity and lighted on. The test is considered as passed if extra flames are safe and do not lend to explosions.

The product documentation shall contain a safety advice regarding the danger of ignition of fuel spillover. Furthermore, the user shall be instructed to check the secondary containment chamber for excess fuel before lighting the fireplace.

The appliance shall be equipped with a durable and clearly visible device which helps preventing overfilling and subsequent overrun of fuel during filling when carried out in accordance with the intended terms of use. A level indicator or a fill level mark is regarded as suitable devices.

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A piece of filling material shall be kept at operating temperature (or 60 °C) for 42 d. The weight and the dimensions of the dry filling material shall be determined before and after the test.

At the end of the test the changes shall not exceed 5 %, than the test is considered as passed. Furthermore a visually test whether there are flaws in the structure of the filling material (local damage). After the storage test the ignition tests shall be performed.

Clearly visible and durable safety symbols shall be shown around the filling opening of the appliance indicating that filling when warm or in operation is not allowed (Figure 5). Pictograms are not required if active safety devices are available on appliance. Active safety devices shall accomplish the requirements in Annex B.

Figure 5 — Graphical symbols "Do not fill fuel into the open flame. Do not fill fuel into the hot burner"

The size of the symbol shall be at least 25 mm. If the symbol is engraved or laser etched into the metal it does not have to be coloured. Marking of components of the appliance which are removed during operation or a marking of accessories (funnel, lighter, fuel refill container) are not considered as sufficient.

The durability of the safety mark/symbol is not only to be tested and confirmed during operation in accordance with the intended terms of use, but shall additionally be confirmed in the following test procedure: For the duration of 15 s the symbol shall be firstly rubbed with a cotton cloth soaked in water. Subsequently, it shall be again rubbed for 15 s with a cotton cloth soaked in fuel. Stickers are not acceptable as substitutes of the symbols.

The test shall show whether the mark/symbol remains clearly legible following the described treatment.

The way of safe refilling of the appliance shall be described in the user instruction.

If symbols on the burner are not coloured, coloured stickers shown in Figure 4 shall be added to the burner, in order to force the removing before the first use of the appliance.

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5.8 Operating method

5.8.1 General

Unless mentioned otherwise, all tests relating to the combustion within this paragraph shall be carried out with both maximum and minimum burner adjustment; if there is no regulation system, only one test needs to be carried out.

5.8.2 Test conditions

All tests shall be carried out with the fuel as specified in the user instruction.

Testing room:

— temperature 20°C ± 5°C;

— relative humidity between 30 % and 90 %.

Table 2 — Uncertainty of measurement

Indicator	Uncertainty of measurement
Gas analysis CO CO_2	± 3 ppm 0,1 % volume fraction
Temperature Room Surface Touchable surfaces	≤ 2 K ≤ 2 K ≤ 2 K
Masses Fuel mass	± 10 g

5.8.3 Fuel consumption

The whole appliance shall be placed on a scale and fuel consumption is determined at the maximum setting. Since the construction of the appliance can greatly influence the fuel consumption it is not allowed to perform these measurements on the burner alone.

The test period shall begin with the ignition and shall last at least until 30 min after the appliance has reached thermal stability or at least until a full fuel tank has been consumed. Reading of weight change shall be made every 5 min. Thermal stability is considered as reached when three consecutive readings do not deviate more than 5 % from each other.

The fuel consumption B (kg/h) shall be determined from the weight change readings.

The thermal output is calculated as follows:

$$P = B * Hi$$

where

P = thermal output, kW;

B = fuel consumption, kg/h;

H_i = calorific value of the fuel, kWh/kg.

For fuel with alcohol concentration at least 95 %, Hi = 7,8 kWh/kg.

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5.8.4 Operating safety

The access to the fire shall be obstructed at least from one side. If areas of the fireplace could be used as a repository, the access to the fire shall be blocked from two sides. The housing of tabletop appliances shall restrict access to the flames from at least two sides. The tips of the flames in appliances which are open at the top shall be confined to the inside of the housing.

The appliance shall be constructed in such a way, that flaring out of the flames under normal air draft conditions by more than the safety distance as indicated by the manufacturer is prevented. The safety distance indicated in the user instruction and shall not exceed 50 cm.

The tests shall be performed twice, once with an airflow of 2,0 m/s and a second one with an airflow of 0,5 m/s.

The appliance shall be operated with a full fuel tank in accordance with the operating instructions, and an airstream shall be created in height of the burner opening. The airstream shall reach at least across the width of the burner opening. For the purpose of this test, a shield is positioned between the fan and the appliance which shall be removed for 3 s once the appliance has been lit. Then the airstream shall be interrupted again for 3 s using the shield. This sequence (3 s at a time) shall be repeated until the flames have been exposed to the draft three times. The exposure to the airstream shall be repeated in a semicircle around the burner's opening from different directions, whereby the centre of the circle is located at the intersection point of the middle axis of the appliance and the testing level.

This test shall be repeated with a half-filled and 10 % filled fuel tank from all critical incidence angles.

If the appliance feature a burner which is filled with absorbent materials like ceramic fibres or refractory material, any flame shall be clearly visible during the burning-out phase i.e. hidden flames inside the filling material shall be avoided.

The test shall be performed during the burning-out phase: the CO volume of all exhaust gases excluding air and water vapour measured within a 10 min period shall not exceed 0,2 %. The average values found during 10 min shall be measured from the moment of extinction of the flame until the point of uncertainty of CO measurement has been reached.

A visual test shall be performed: if the fame is not clearly visible, the test is not passed.

5.8.5 Autoignition test

The test shall be carried out at maximum burner settings until the temperature reached in the area which can be touched by the flame under normal operating conditions does not fluctuate for more than ± 5 K in 5 min or after 30 min of burning at maximum power.

The appliance shall be shut down for a duration of 10 s; after that the burning area shall be re-opened; no auto ignition shall take place.

5.8.6 Extinguish test

The test shall be carried out at maximum burner settings until the temperature reached in the area which can be touched by the flame under normal operating conditions does not fluctuate for more than ± 5 K in 5 min or after 30 min of burning at maximum power.

The manual shut down procedure shall be operated and the test is considered as passed if the fire extinguish in 10 s or less.

If an automatic shutdown system is provided, a second test shall be performed and it is considered as passed if the fire extinguish in 5 min or less.

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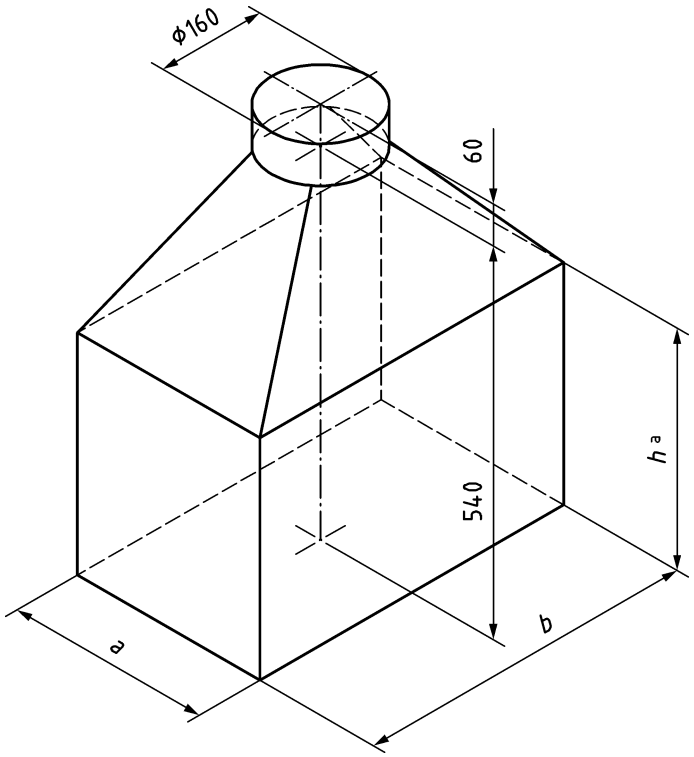
5.8.7 Combustion performance

The test shall be performed according to 5.8.2. and at maximum combustion rate; if the burner is adjustable a second test shall also be performed, at minimum combustion rate in according to the user instructions.

For each test, the emission of CO and CO_2 shall be detected by a sampling hood according to Figure 6 during a complete burning cycle (time from full tank to full stop).

Dimensions in millimetres



Key

[a] $h \geq 320$ mm in order to allow for opening of the shut-down lid or to allow free space between the device and any high-level grill

Figure 6 — Verification of combustion — Sampling hood

Table 3 — Dimensions of the sampling hood

Value	Dimensions mm						
a	300	500	580	680	710	630	790
b	500	600	700	680	780	1 140	1 000

NOTE 1 The sampling hood is also used for gas fired cooking alliances (e.g. EN 30–1-1) and decorative fire places (e.g. EN 613).

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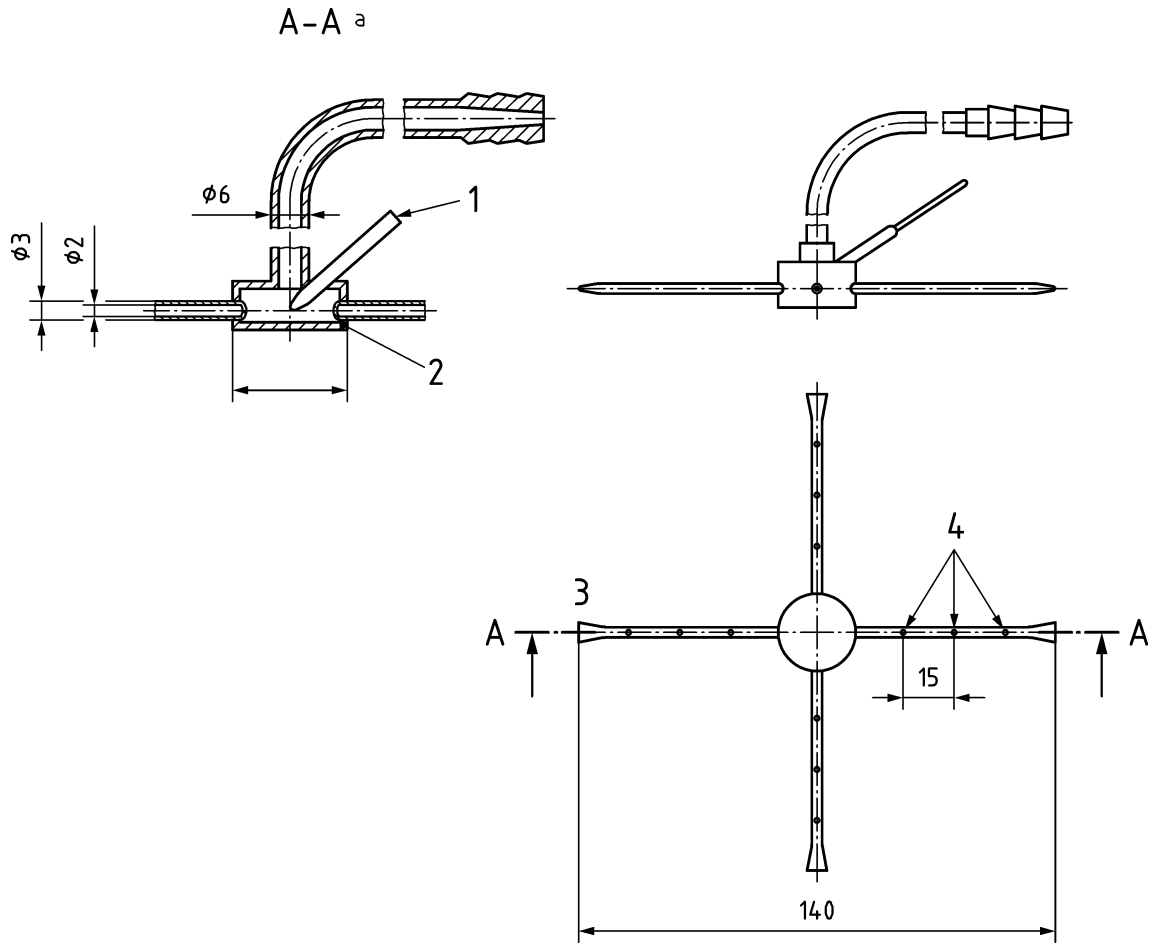

Material - stainless steel

Key

1 steatite tube with two holes into which thermocouple wires are sealed

2 measuring point

3 pipe ends closed

4 3 holes Ø 1 per branch

Figure 7 — Example for a sampling probe

The hood shall be placed above the burner in such a way that the combustion is not affected.

The combustion products are sampled by extracting some combustion gases through the upper part of the sampling hood.

NO_x and OGC should also be measured parallel to the CO and CO_2 measurement.

NOTE 2 With this test method the emissions which came directly out of the burner are measured. With this measured value the emissions of any room can be calculated.

The following maximum ratings shall not be exceeded during the tests, with an assumed air renewal of 0,5 Volume/h:

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The CO concentration shall be lower than:

— 87 ppm for every 15 min period during the test,

— 52 ppm for every 30 min period during the test,

— 26 ppm for every 1 h period during the test,

— 9 ppm for every 8 h period during the test.

The test for CO_2 concentration is performed only at maximum burner adjustment in an 8-h test, during which the appliance shall be refilled continuously in accordance to the use instruction once the tank is empty. The CO_2 concentration mean value shall be lower than 5 000 ppm.

If electronic safety devices are provided to shut down the appliance, the refuelling shall be done only when the safety device allows it to.

The laboratories shall provide the manufacturer with indications on the minimum room size for the tested appliance; the manufacturer shall put the room size indication on the package and in the user instruction.

5.8.8 Fire safety

5.8.8.1 General

The tests following in 5.8.8.1 to 5.8.8.5 shall be carried out at maximum burner setting until the stationary state according to 5.8.5 is reached. Here it might be necessary to run several consecutive burn cycles on the appliance while adhering to the minimum waiting period between the cycles as per the user instructions.

The tests shall be carried out in a test corner as per EN 13240, including the test walls (partition walls) and test floor defined therein.

5.8.8.2 Floor temperature

The surface temperature of the test floor shall not exceed 65 K above room temperature.

If the surface temperature exceeds 65 K, the appliances shall only be positioned on a non-combustible flooring of suitable thickness in order to prevent heat transfer to adjacent underlying components.

5.8.8.3 Wall temperature

For testing the wall temperature the appliance shall be installed in accordance with the clearance distances specified in the installation instructions, the temperature of the radiation area around the appliance 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.

5.8.8.4 Temperature of operating handles

The temperatures on any touchable surfaces of operating handles shall fulfil the requirements of EN ISO 13732-1 for burn threshold.

The user instruction shall clearly indicate the correct way to use the operating handles.

Adjustable or movable parts of the burner are excluded from the temperature threshold if an operating handle or tool is delivered as auxiliary equipment. The user instruction shall clearly indicate the correct way to use the operating tool.

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5.8.8.5 Temperature of touchable surfaces

The temperatures on any touchable surfaces shall fulfil the requirements of EN ISO 13732-1 for burn threshold.

These requirements do not apply to the following parts of the front or sides of the appliance:

— parts which are not accessible with a test pin with a diameter of 75 mm and a rounded end; or

— smaller parts and locations of inferior dimensions like ventilations openings, hinges and other parts with a surface of less than 10 mm width; or

— parts which are located in a distance of 50 mm from any ventilation opening; or

— glass surfaces and their fixings with a max width of 100 mm which can clearly be identified as hot due to their closeness to open flames; or

— parts which have a distance of less than 100 mm to unprotected housing openings with access to the burner opening.

5.8.8.6 Ignition, extinguishing and relighting of the fire (in cold and warm state)

5.8.8.6.1 Ignition of the fire in cold state

Safe ignition in cold (appliance at room temperature) state shall be possible at maximum and reduced fuel level.

The ignition process in a cold state shall be carried out with a fuel tank filling at 100 %, 50 %, 25 % and 10 %, regardless of the user instruction. After a burning time of 3 min, the flame shall be extinguished with the closing device. The appliance shall be left with the burner opening covered until the area around the burner opening has reached room temperature, however, longest for one hour. Then, the cover of the burner opening shall be removed and the fuel shall be lit again immediately. The ignition shall result in a stable flame whereby not any fuel shall leak from the burner e.g. in form of drops nor any other critical condition may occur. If the appliance does not ignite with reduced fuel in a cold state, the requirement is fulfilled.

5.8.8.6.2 Relighting of the fire in warm state

After 1 h burning at maximum adjustment of the burner, the appliance shall be shut down and reignite after 3 min; test is considered as passed if no dangerous situation during the test shall occur.

This test is not applicable to appliances provided with active or passive safety devices. These kind of appliances shall fulfil the requirements according Annex B in order to be considered as full filling this requirements.

5.8.8.6.3 Extinguishing of the fire

The appliance shall be provided with a shutdown device that extinguishes the flame in less than 10 s.

5.8.9 Electrical safety

EN 60335-1 and EN 60335-2-102 are applicable for all appliances using auxiliary electrical power.

5.8.10 Electronic devices

If the appliance is provided with any electronic device, it shall shut down or prevent ignition if any device is not working or if the appliance has no power.

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If the appliance is equipped with electronic devices, these shall be tested in accordance with the relevant European legislation.

Some more requirements for electronic devices are provided in Annex B.

5.9 Labelling

Any advisory labelling shall be legible during testing. Also once the tests are finished, those labels shall still be legible and shall not show any signs of deformation or delamination.

A piece of cotton imbued in the test fuel shall be passed on the label for 5 min and every indication shall stay clearly readable.

6 Marking

6.1 General

Warnings or safety related advice shall be written in accordance with the requirements in ISO/IEC Guide 37. Markings and symbols (if suitable symbols exist) shall be specified in accordance with European or International Standards (e.g. ISO 7000, IEC 60417, ISO 3864- series).

NOTE Some examples of pictograms are provided in Annex A.

The advisory labelling shall pass the test as indicated in 5.9.

6.2 Labelling/Rating plate

The appliances shall bear a label/rating plate/pictograms which shall be durable, legible, indelible and in the national language. The label shall be accessible/legible also once the appliance has been installed as intended and shall contain the following information:

— manufacturer's or importer’s name and contact information;

— trade name of the appliance;

— identification number if applied by the manufacturer;

— kind of fuel and type;

— burner capacity;

— distances to combustible materials and items;

— minimum room volume.

6.3 Safety instruction

On unpacking, the appliance shall show clear safety instruction, which shall also be referred to in the operating instructions, containing the following advices:

— not suitable for continuous operation;

— only use the intended fuel;

— only to be operated in rooms according to the manual;

— the operating instructions shall be read carefully before installation and use;

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— beware of hot surfaces;

— do not put anything on top of the appliance.

6.4 Marking on the package

The packaging shall show the following marking/advices:

— for decorative and domestic use only;

— the pictogram “Read manual before installation and use!”;

— the number of this standard.

— only use fuel according to the requirements in the user manual;

— only use in a ventilated room in accordance with the manufacturer’s indications;

— never pour fuel into a hot or burning appliance;

— never overfill the appliance and carefully wipe away any spilt fuel before igniting the appliance;

— only use in draught-free surroundings;

— never ignite a hot appliance;

— never move the appliance while it is in operation;

— never leave small children or pets unattended near a burning appliance.

6.5 Warning advice fuel storage tank

The fuel storage tank shall show the necessary safety/warning pictograms in accordance with 4.3.

7 User’s manual

7.1 General

Written instructions for installation, operation, maintenance and if applicable for the assembly of the parts of the appliance on site shall be enclosed in the packaging. These instructions shall be written in the language of the country of destination.

7.2 Installation instructions

The instructions shall include at least the following advices:

— “this document is part of the appliance”; “for decorative and domestic use only”;

— “keep away from children”;

— type of appliance;

— weight of the appliance in kg;

— manufacturer's or importer’s name and contact information;

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— trade name of the appliance;

— identification number if applied by the manufacturer;

— indications on distance to flammable materials (by number or pictogram);

— “please be sure the wall/table/floor you are placing this appliance can bear its weight”;

— installation only in a location which is protected against cross-aeration/air draft;

— convection air slots and rear ventilations shall not be covered/obstructed;

— do not put any flammable items on top of the appliance;

— the wall/roof type the appliance can be fixed to;

— advice about the safe appliance fitting;

— the safe way to refill and to shut down the appliance.

7.3 Operating instructions

The operating instructions shall at least contain the Installation instructions (7.2) and the following information:

— how to safely store fuel; indicate the indoor storage limits imposed by national and (or) regional legislation in the country where the appliance is marketed or give indications to look for national regulations;

— information about the appropriate fire extinguishing equipment and recommendation that the appropriate fire extinguishing equipment is located near the appliance;

— indication on operation in draughty environment;

— that an appliance should never be moved while in use, and if fitted with wheels, that the breaks shall be locked during operation;

— “observe the local legislation”;

— “use only in a well adequately ventilated room”;

— instructions for filling the fuel, about the maximum tank capacity and burning period;

— description of the ignition and re-ignition process;

— description of the correct and safe operation of the appliance;

— advice about minimum room volume and adequate ventilation;

— advice about measures to be taken when re-igniting the appliance after a shut-down;

— “DO NOT ignite the appliance if it is in a hot state“;

— advice about correct use of adjustment devices and controls (min/max settings);

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— precaution measures against danger of ignition of combustible components;

— warning advice that the construction of the appliance shall not be changed;

— advice about exclusive use of spare parts which are approved by the manufacturer;

— manufacturer's name and address;

— trade name of the appliance;

— identification number if applied by the manufacturer;

— distances to combustible materials and items;

— explanation of warnings and instruction pictograms;

— a list of recommended fuels;

— advice about detection of malfunctioning and description of subsequent safe shut-down of the appliance;

— a warning notice that parts of the fireplace - especially the outer surfaces – are getting hot during operation and that adequate attention is necessary;

— a warning notice that operation of several appliances is only allowed if the power output is equal or lower 4,5 kW/h and that additional ventilation of the room is required;

— indication of room size and adequate ventilation needed for a correct use of the appliance;

— instructions for safe cold and hot filling of the burner, mentioning a suitable filling device;

— any overspill shall be removed before lighting the appliance;

— instructions to check the secondary containment chamber regularly for fuel overspill. If excess fuel is detected therein the tank shall be emptied (e.g. before each refilling of the fuel tank);

— “not suitable for continuous operation”;

— “never leave the appliance unattended during operation”;

— “never leave the appliance when light on”;

— “only use the type of fuel as specified by the manufacturer”;

— fuel shall be stored in a fire-safe area;

— the safe way to refill and to shut down the appliance.

7.4 Emergency extinguish instructions

The manufacturer shall indicate the appropriate extinguishing device and procedure for the appliance.

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7.5 Type examination

7.5.1 Test sample and documents

The test shall be done with the fireplace, indications, fuel, fittings provided by the manufacturer.

Furthermore, the manufacturer shall provide the testing laboratory with the following documents:

— assembly drawings and detail drawings of the main components with the function-relevant dimensions;

— bill of material specifying each component;

— verification of suitability for all materials;

— installation and operating instructions;

— identification plate/rating plate;

— mentioning of the intended fuel/fuels and submission of its/their safety data sheet.

7.5.2 Test report

The testing laboratory shall create a test report, which shall contain following items:

— description of the fireplace with drawings, installation and operating instructions;

— fuel used during testing;

— description of applications tested during the test setup and distances to combustible building materials which have been checked;

— results of the examination of the construction of the appliance giving details of the test setup and the tests carried out;

— results of the examination of the operating method giving details of the test setup and the tests carried out;

— results of combustion analysis.

8 Factory production control

8.1 General

The manufacturer introduces documents and maintains a continuous factory-owned production control system and defines areas of responsibility in order to ensure that the products brought onto the market are in line with their documented performance parameters. The factory owned control system consists of methods, regular check-ups and tests and/or ratings and foresees the use of the results in order to control raw materials as well as other sourced materials, technical production equipment, production processes and the final product itself which shall comply with the requirements as laid out in 8.5.

In line with the factory owned production control system, the manufacturer carries out tests in order to check the conformity of the products. Samplings, tests or ratings should be based on ISO 2859 (all parts) or a similar system which complies with this standard. The results of these inspections, tests or ratings which show need for improvement shall be recorded as well as any corrective action taken. All

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corrective action taken regarding non-compliance of control values or control criteria shall be recorded as well.

8.2 Materials and components

The specifications of all incoming materials and components shall be suited for the intended use and shall be documented. The inspection and testing scheme in place in order to secure conformity of these materials and components shall be documented as well.

8.3 Check of devices used for examinations, tests and measurements

All weighing, measuring and testing equipment used to demonstrate conformity of the product shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

8.4 Process control

The manufacturer shall identify and plan the production processes, which directly affect the product characteristics and shall ensure that these processes are carried out under controlled conditions. Where the required product characteristics cannot be fully verified by subsequent inspection and testing of the product, then the production processes shall be carried out by operators specifically trained to undertake this work.

8.5 Supervision, testing and evaluation of the product

8.5.1 General

The manufacturer shall establish and maintain documented procedures for in-process and final inspection and testing, as appropriate for the product type, to ensure that the stated values of all of the product characteristics are maintained.

At least the following product characteristics, their criteria and means of control shall be included in the factory production control scheme.

8.5.2 Building materials

a) Type - composite/specifications;

b) thickness;

c) dimensions;

d) surface condition.

A supplier's declaration for material type and properties is accepted, provided that the supplier has an appropriate factory production control system to ensure the adequacy, consistency and accuracy of the material type and properties.

8.5.3 Insulating material

a) Specification for insulating material;

b) density value – thermal conductivity.

A supplier's declaration for material type and properties is accepted, provided that the supplier has an appropriate factory production control system to ensure the adequacy, consistency and accuracy of the material type and properties.

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8.5.4 Seals and sealing material

a) Type - including identification or composition, when a conformity certificate is not available;

b) dimensions.

A supplier's declaration for material type and properties is accepted, provided that the supplier has an appropriate factory production control system to ensure the adequacy, consistency and accuracy of the material type and properties.

8.5.5 Production control

a) Construction and dimensions:

The Construction and dimensions of the following critical components will be tested at production and/or completion:

1) adjustment devices;

2) combustion chamber construction;

3) convection system.

b) Additional control measures:

At least the following control measures will be arranged for each individually produced appliance during the manufacturing process:

4) tightness of the burner.

8.6 Non-conforming products

The manufacturer shall establish and maintain documented procedures to ensure that any product which does not comply with the requirements is clearly identified and not marketed. These procedures shall foresee the documentation of the detected non-compliance, the subsequent elimination of the product and notification of relevant bodies. Repaired and/or reworked products will be checked in accordance with the plan for examination, testing and evaluation.

8.7 Corrective and preventive measures

The manufacturer shall establish documented procedures for implementation of corrective and preventive measures and maintains them. Any changes to the documented procedures as a result of those corrective and preventive measures will be implemented and recorded.

8.8 Handling, storage, packaging, preservation and delivery

If necessary in order to secure the conformity of the product with the defined requirements, the manufacturer shall establish and maintain documented procedures for handling, storage, packaging, preservation and delivery of the end product upon final inspection.

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Annex A
(informative)

Additional possible symbols

It is recommended to add more symbols in the operating instructions and on the packaging or when necessary on the appliance.

NOTE The safety signs of this annex are not registered through ISO/TC 145/SC 2 yet, but the registration is in progress. The registration number will be added with the next revision.

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Figure A.1 — Do not fill fuel into the open flame. Do not fill fuel into the hot burner

Figure A.2 — Do not put any objects onto the fireplaces

Figure A.3 — Protect fireplace against draft

Figure A.4 — Never fan the fire

Figure A.5 — Do not touch the flames

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Figure A.6 — Do not position the fireplace near combustible items

Figure A.7 — Keep suitable extinguishing agent ready

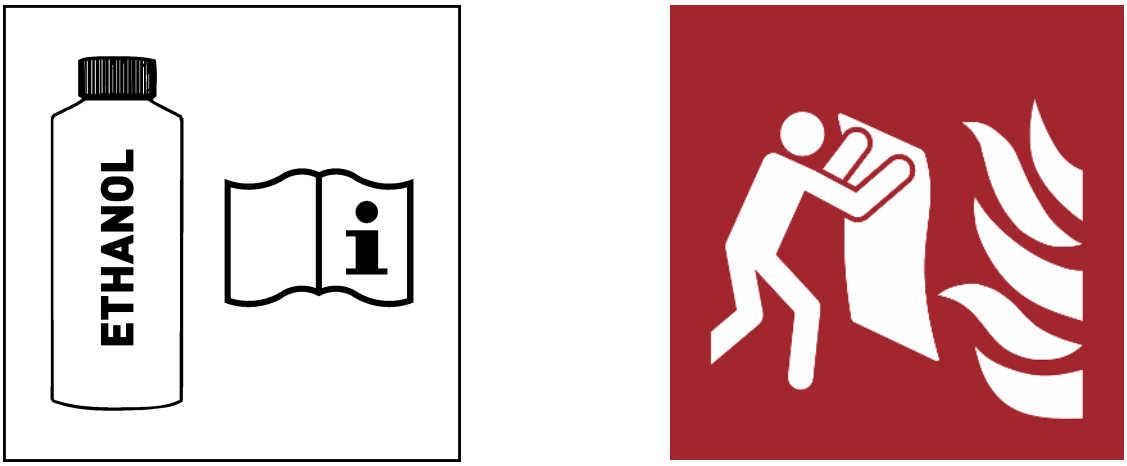

Figure A.8 —Adhere to instructions about fuel. ISO 7010-F016, Fire blanket.

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Figure A.9 — ISO 7010-W021, Warning; Flammable material

Figure A.10 — Health hazard

Figure A.11 — ISO 7010-P002, No smoking

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Annex B
(normative)

Guidelines for the safety of electronically controlled alcohol-powered flueless fireplaces

B.1 General

Electronic devices shall provide additional safety to the appliance; depending by the device type, different requirements shall be fulfilled. If any of the requirements is not fulfilled, the device is not considered as a safety device and the appliance shall be subjected to the tests in Clause 5.

A risk analysis shall be provided for each electronic device and it shall be tested to ensure the durability, functional and electronic safety.

B.2 Terms and definitions

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

B.2.1

Automatic Shutdown System

device that will automatically stop the burning of the fire within 5 min from when the risky situation occurs

B.3 Fuel-related devices

Fuel-related device shall ensure at least one of the following functions depending by its scope:

a) it shall not be possible to fill the appliance when the fire is on, and/or

b) there shall be a sound or a visual indication when a fuel container is full. In case of fuel overfill out of fuel container the appliance shall not start until the problem is resolved, and/or

c) there shall be a sound or visual indication in case of a spillage of the fuel and the appliance shall not start until the spillage problem is resolved.

B.4 CO_2 emissions-related devices

CO_2 emissions-related device shall ensure at least one of the following functions depending by its scope:

a) If the appliance is equipped with a CO_2 sensor, it shall be connected to the Automatic Shutdown System which shall stop the fuel flow into the burner when a CO_2 level of 5 000 ppm.

b) It is acceptable to have a separate CO_2sensor in the room that will inform the customer when CO_2 value reaches 5 000 ppm; this sensor shall be tested too.

B.5 Temperature-related devices

Temperature-related device shall ensure at least one of the following functions depending by its scope:

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a) it shall be placed on the fuel tank or on any other critical place (indicated by the manufacturer) connected to Automatic Shutdown System which shall stop the fire burning when a temperature level of 60° C is reached;

b) if the appliance is not equipped with Automatic Shutdown System it shall give a visual and sound indication that a temperature of 60 °C is reached.

There shall be a device blocking the re-ignition of the appliance till the temperature in the burner area is lower than 60 °C.

B.6 Leakage-related devices

Leakage-related device shall ensure at least one of the following functions depending by its scope:

a) if the appliance is equipped with leakage sensor, it shall be connected to the Automatic Shutdown System which shall stop burning when the leakage occurs;

b) if the appliance is not equipped with Automatic Shutdown System it shall give a visual and sound indication that the leakage has occurred.

B.7 Malfunction-related devices

Malfunction-related device shall ensure at least one of the following functions depending by its scope:

a) In case of any malfunction when the appliance is on, the appliance shall shut down and not start until all the malfunctions are solved;

b) If the appliance is not equipped with Automatic Shutdown System it shall give a visual and sound indication that the malfunction has occurred;

c) In case of any malfunction when the appliance is off, the appliance shall not start until all the malfunctions are solved.

B.8 Electric power-loss-related devices

Electric power-loss-related device shall ensure at least one of the following functions depending by its scope:

a) In case of a loss of electric power supply the appliance shall be stopped by and Authomatic Shutdown System, it shall not be possible to start it again until the electric power is back and restart shall be only manual.

b) If the appliance is not equipped with Automatic Shutdown System it should give a visual and sound indication that the electric power loss has occurred.

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[2] EN 613, *Independent gas-fired convection heaters*

[3] EN 1860-1, *Appliances, solid fuels and firelighters for barbecueing — Part 1: Barbecues burning solid fuels — Requirements and test methods*

[4] EN ISO 9001, *Quality management systems — Requirements (ISO 9001)*

[5] EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

[6] ISO 2859 (all parts), *Acceptance sampling inspection against the number of defective units or defects (attribute test)(ISO 2859)*

[7] ISO 7001, *Graphical symbols — Public information symbols*

[8] CLC Guide 29, *Temperatures of hot surfaces likely to be touched — Guidance document for Technical Committees and manufacturers*

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