

Domestic cooking appliances burning gas

Part 1-1: Safety — General

<http://www.china-gauges.com/>

ICS 97.040.20

National foreword

This British Standard is the UK implementation of EN 30-1-1:2008+A3:2013, incorporating corrigendum November 2011. It supersedes BS EN 30-1-1:2008+A2:2010 which is withdrawn.

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.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by CEN corrigendum November 2011 is indicated in the text by AC.

The UK participation in its preparation was entrusted to Technical Committee GSE/35, Gas cooking appliances (domestic).

A list of organizations represented on this committee 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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English Version

Domestic cooking appliances burning gas - Part 1-1: Safety -
General

Appareils de cuisson domestiques utilisant des combustibles gazeux - Partie 1-1: Sécurité - Généralités

Haushalt-Kochgeräte für gasförmige Brennstoffe - Teil 1-1: Sicherheit - Allgemeines

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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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Foreword

This document (EN 30-1-1:2008+A3:2013) has been prepared by Technical Committee CEN/TC 49 "Gas cooking appliances", the secretariat of which is held by UNI.

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 August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

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 includes Corrigendum 1 issued by CEN on 23 November 2011, Amendment 1 approved by CEN on 29 May 2010, Amendment 2 approved by CEN on 4 October 2010 and Amendment 3 approved by CEN on 31 December 2012.

This document supersedes A3 EN 30-1-1:2008+A2:2010 A3.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1, A2 A2 and A3 A3.

The modifications of the related CEN Corrigendum have been implemented at the appropriate places in the text and are indicated by the tags AC AC.

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 document.

AC Requirements concerning the emission of NO_x are not mentioned in this European Standard; taking account of the usage of the appliances and their low output, their contribution to environment pollution is negligible. AC

EN 30 *Domestic cooking appliances burning gas* consists of the following parts:

- *Part 1-1: Safety — General;*
- *Part 1-2: Safety — Appliances having forced-convection ovens and/or grills;*
- *Part 1-3: Safety — Appliances having a glass ceramic hotplate;*
- *Part 1-4: Safety — Appliances having one or more burners with an automatic burner control system;*
- *Part 2-1: Rational use of energy — General;*
- *Part 2-2: Rational use of energy — Appliances having forced-convection ovens and/or grills.*

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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.

1 Scope

This European Standard specifies the construction and performance characteristics as well as the requirements and methods of test for the safety and marking of freestanding and built-in domestic cooking appliances burning the combustible gases given in 4.1 according to the categories specified in 4.2, referred to in the text as "appliances".

This European Standard covers the following types of domestic cooking appliances, as defined in Clause 3, and belonging to the classes defined in 4.3 (see Table 1):

- independent freestanding hotplates;
- independent built-in hotplates;
- independent hotplates and grills;
- table cookers;
- freestanding ovens;
- built-in ovens;
- freestanding or built-in grills;
- griddles;
- freestanding cookers;
- built-in cookers.

Unless specifically excluded hereafter, this European Standard applies to these appliances or their component parts, whether or not the component parts are independent or incorporated into a single appliance, even if the other heating components of the appliance use electrical energy (e.g. combined gas-electric cookers).

This European Standard includes requirements covering the electrical safety of equipment incorporated in the appliance that is associated with the use of gas. It does not include requirements covering the electrical safety of electrically-heated component parts or their associated equipment¹⁾.

This European Standard does not apply to:

- a) outdoor appliances;
- b) appliances connected to a combustion products evacuation duct;
- c) appliances having a pyrolytic gas oven;
- d) appliances having covered burners which are not in conformity with the constructional requirements of 5.2.8.2.2;
- e) appliances incorporating flame supervision devices and having an automatic ignition device for which the duration of the ignition attempt is limited by design;
- f) appliances equipped with a burner that is periodically ignited and extinguished under the control of an automatic on/off device;

1) Refer to the electrical safety rules.

- g) appliances equipped with an oven and/or with a grill having a fan:
- 1) either for the supply of combustion air or for the evacuation of the products of combustion;
 - 2) or for the circulation of the products of combustion within the compartments;
- h) appliances supplied at pressures greater than those defined in 7.1.2;
- i) appliances having one or more burners that are capable of remote operation (type 1 or type 2), unless the burner(s) concerned are thermostatically controlled oven burners or time-controlled ovens that are designed for a delayed start without the user being present.

Ⓐ

- j) appliances incorporating one or more hotplate or grill burners that enable the user to program the cooking cycle, including the start and/or the end of the cycle. Ⓐ

This European Standard does not cover the requirements relating to third family gas cylinders, their regulators and their connection.

This European Standard only covers type testing.

Table 1 — Three-language table of the names of the different types of domestic cooking appliances

- Tables de cuisson isolées	- Freistehende Kochteile	- Independent hotplates - freestanding
- Tables de cuisson à encastrer	- Eingebaute Kochteile	- Independent hotplates - built-in
- Tables-grilloirs	- Kochteile mit Strahlungsgrilleinrichtung	- Independent hotplates and grill
- Réchauds-fours	- Tischherde	- Table cookers
- Fours isolés	- Freistehende Backöfen	- Ovens - freestanding
- Fours à encastrer	- Einbaubacköfen	- Ovens - built-in
- Grilloirs par rayonnement isolés	- Freistehende Strahlungsgrilleinrichtungen	- Grills - freestanding
- Grilloirs par rayonnement à encastrer	- Eingebaute Strahlungsgrilleinrichtungen	- Grills - built-in
- Grilloirs par contact	- Kontaktgrilleinrichtungen	- Griddles
- Cuisinières isolées	- Freistehende Herde	- Cookers - freestanding
- Cuisinières encastrées	- Eingebaute Herde	- Cookers - built-in

2 Normative references

[A3] 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. **[A3]**

EN 88-1:2007, *Pressure regulators and associated safety devices for gas appliances — Part 1: Pressure regulators for inlet pressures up to and including 500 mbar*

EN 125:1991, *Flame supervision devices for gas-burning appliances — Thermo-electric flame supervision devices*

EN 126:2004, *Multifunctional controls for gas burning appliances*

EN 257:1992, *Mechanical thermostats for gas-burning appliances*

[A1] EN 437:2003+A1:2009 **[A1]**, *Test gases — Test pressures — Appliance categories*

EN 549:1994, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 751-1:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 1: Anaerobic jointing compounds*

EN 751-2:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 2: Non-hardening jointing compounds*

[AC] EN 1106:2010 **[AC]**, *Manually operated taps for gas burning appliances*

EN 10226-1:2004, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

EN 10226-2:2005, *Pipe threads where pressure tight joints are made on the threads — Part 2: Taper external threads and taper internal threads — Dimensions, tolerances and designation*

EN 60068-2-75:1997, *Environmental testing — Part 2: Tests — Test Eh: Hammer tests (IEC 60068-2-75:1997)*

EN 60335-1:2002, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2001, modified)*

EN 60335-2-6:2003, *Household and similar electrical appliances — Safety — Part 2-6: Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances (IEC 60335-2-6:2002, modified)*

EN 60335-2-102:2006, *Household and similar electrical appliances — Safety — Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102:2004, modified)*

EN 60584-1:1995, *Thermocouples — Part 1: Reference tables (IEC 60584-1:1995)*

EN 60730-2-1:1997, *Automatic electrical controls for household and similar use — Part 2: Particular requirements for electrical controls for electrical household appliances (IEC 60730-2-1:1989, modified)*

EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 3166-1:2006, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1:2006)*

ISO 5732:1978, *Kitchen equipment — Sizes of openings for built-in appliances*

 deleted text 

3 Terms and definitions

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

3.1 General terms and definitions

3.1.1 conversion

operation carried out by a specialist on an appliance at the time of a change of gas

3.1.2 removable

can be removed without the aid of a tool

3.1.3 reference conditions

15 °C, 1 013,25 mbar

3.1.4 mechanically fastened

can only be removed with the aid of a tool

3.1.5 normal maintenance

maintenance carried out by a specialist not including any replacement of parts

3.1.6 soft soldering

soldering for which the lowest temperature of the melting range, after application, is less than 450 °C

3.1.7 direct country of destination

country for which the appliance has been certified and which is specified by the manufacturer as the intended country of destination, such that, at the time of putting the appliance on the market and/or installation, the appliance needs to be capable of operating, without adjustment or modification, with one of the gases distributed in the country concerned, at the appropriate supply pressure

NOTE More than one country can be specified if the appliance, in its current state of adjustment, can be used in each of these countries.

3.1.8 indirect country of destination

country for which the appliance has been certified, but for which, in its present state of adjustment, it is not suitable; subsequent modification or adjustment is essential in order that it can be utilized safely and correctly in this country

3.2 Terms and definitions relating to the appliance

3.2.1 appliance incorporating a cylinder

appliance functioning in particular with third family gases which includes a compartment for the cylinder

3.2.2

freestanding appliance

appliance not normally having direct contact with adjacent furniture or walls

3.2.3

appliance for building-in between two furniture units

appliance which can have its side panels in direct contact with adjacent furniture units

NOTE When installed, the appliance may only be in contact with a single furniture unit

3.2.4

appliance for building into a furniture unit

appliance intended to be installed in a kitchen cabinet or unit or in a housing located in a wall or under similar conditions

NOTE For this reason, the appliance may not necessarily have a casing on all sides.

3.2.5

domestic cooking appliance

appliance to be used by private individuals in a domestic dwelling

NOTE This is indicated in the instructions for use and maintenance as well as in the technical instructions.

3.2.6

cooker

cooking appliance comprising:

- a hotplate;
- one or more ovens with or without a thermostat, having possibly a grill;
- possibly a grill

3.2.7

table cooker

cooking appliance intended to rest on a raised support or stand comprising:

- a hotplate;
- an oven;
- possibly a grill

3.2.8

independent hotplate

cooking appliance consisting only of a hotplate

3.2.9

independent hotplate and grill

cooking appliance consisting of hotplate and a grill

3.3 Terms and definitions relating to gases and pressures

3.3.1 Terms and definitions relating to gases

3.3.1.1

test gases

gases intended for the verification of the operational characteristics of appliances using combustible gases; they consist of reference gases and limit gases

NOTE Table 7 gives the characteristics of reference gases and limit gases.

3.3.1.2

reference gases

test gases with which appliances operate under nominal conditions when they are supplied at the corresponding normal pressure

3.3.1.3

limit gases

test gases representative of the extreme variations in characteristics of the gases for which the appliances have been designed

3.3.1.4

relative density

d

ratio of the masses of equal volumes of dry gas and dry air under the same conditions of temperature and pressure: 15 °C or 0 °C and 1 013,25 mbar

3.3.1.5

calorific value

quantity of heat produced by complete combustion at a constant pressure of 1 013,25 mbar, of a unit volume or mass of gas, the constituents of the combustible mixture being taken at reference

A distinction is made between:

- the gross calorific value H_s : the water produced by combustion is assumed to be condensed;
- the net calorific value H_i : the water produced by combustion is assumed to be in the vapour state.

NOTE 1 The calorific value is expressed:

- either in megajoules per cubic metre MJ/m^3 of dry gas under the reference conditions;
- or in megajoules per kilogram (MJ/kg) of dry gas.

NOTE 2 In this European Standard only the gross calorific value is used

3.3.1.6

Wobbe index

gross Wobbe index W_s ; net Wobbe index W_i

ratio of the calorific value of a gas per unit volume and the square root of its relative density under the same reference conditions. The Wobbe index is said to be gross or net according to whether the calorific value used is the gross or net calorific value

NOTE The Wobbe indices are expressed:

- either in megajoules per cubic metre MJ/m^3 of dry gas under the reference conditions;
- or in megajoules per kilogram (MJ/kg) of dry gas.

3.3.1.7

theoretical air

volume of air necessary for the stoichiometric combustion of a unit volume of gas

3.3.2 Terms and definitions relating to pressures

3.3.2.1

gas supply pressure

p

difference between the static pressure measured at the inlet connection of the appliance in operation and the atmospheric pressure

NOTE The gas supply pressure is expressed in millibar (mbar): 1 mbar = 10^2 Pa.

3.3.2.2

test pressures

gas pressures used to verify the operational characteristics of appliances using combustible gases. They consist of normal and limit pressures

NOTE 1 The gas pressures used are expressed in millibars (mbar): 1 mbar = 10^2 Pa.

NOTE 2 The test pressures are given in Table 9.

3.3.2.3

normal pressure

p_n

pressure under which the appliances operate in nominal conditions, when they are supplied with the corresponding reference gas

3.3.2.4

limit pressures

maximum pressure: p_{max} ; minimum pressure: p_{min}

pressures representative of the extreme variations in the supply conditions

3.3.2.5

pressure couple

combination of two distinct gas distribution pressures applied by reason of the significant difference existing between the Wobbe indices within a single family or group in which:

- the higher pressure corresponds only to gases of low Wobbe index;
- the lower pressure corresponds to gases of high Wobbe index

3.4 Terms and definitions relating to the parts of the appliance

3.4.1 Burners

3.4.1.1

burners

component devices that allow the gas to burn

NOTE 1 They may be one of two types:

- non-aerated burners in which the air for combustion is entrained entirely at the burner outlet;
- aerated burners in which part of the air for combustion termed "primary air", is entrained by the gas flow and is mixed with gas before the burner outlet. The remainder of the air, termed "secondary air" is entrained after the burner outlet.

NOTE 2 These burners consist of:

- a gas injector;
- a body forming the mixing tube;

- a head equipped with ports for the air-gas mixture.

3.4.1.2

ignition burners

small burners, the flame of which is intended to light a principal burner

3.4.1.3

pilot

ignition burner controlled independently from principal burners

3.4.1.4

principal burners

burners intended to assure a thermal function to the appliance

3.4.1.5

covered burners

hotplate burners for which the pans being heated are screened from direct flame contact by the interposition of a surface on which they rest

NOTE Covered burners may be of two types:

- a) non enclosed covered burners;
- b) enclosed covered burners.

3.4.1.5.1

non enclosed covered burner

covered burner for which all products of combustion are evacuated directly to atmosphere, e.g. around the periphery of the plate and which is designed so that partial visibility of the flames is possible in normal operation

NOTE A non-enclosed covered burner can be:

- permanent, i.e. designed to be used only with the plate in position;
- temporary, i.e. designed so that it may also be used as an uncovered burner after removal of the removable plate.

3.4.1.5.2

enclosed covered burner

covered burner having a combustion circuit in which all products of combustion are evacuated to atmosphere indirectly through a purpose-designed outlet

NOTE The burner may be so enclosed that flames may not be visible during normal operation.

3.4.1.6

uncovered burners

hotplate burners for which the pans being heated are in direct contact with the flames

3.4.1.7

injector

component part that admits the gas into an aerated burner

NOTE There are two types of injectors:

- calibrated injector in which the section of the outlet orifice is fixed;
- adjustable injector in which the section of the outlet orifice is variable.

3.4.1.8

multi-ring hotplate burners

hotplate burner assembly having two or more rings of burner ports

NOTE 1 The term ring includes any distribution of burner ports around the central axis of the burner.

NOTE 2 Two types of multi-ring hotplate burner are recognised.

3.4.1.8.1

multi-ring hotplate burner with sectional control

multi-ring hotplate burner that is so designed that one or more of its rings of burner ports can be utilised independently

3.4.1.8.2

multi-ring hotplate burner with simple control

multi-ring hotplate burner that is so designed that its rings of burner ports cannot be utilised independently.

3.4.2 Auxiliary equipment, control devices

3.4.2.1

auxiliary equipment

all controls and devices that can affect the safety of operation of the gas appliance or the gas part of a combined gas-electric appliance

EXAMPLES

- taps and cocks;
- gas regulators;
- flame supervision devices;
- thermostats.

3.4.2.2

ignition device

device to ignite one or more burners directly or indirectly, for example by means of a flash tube

NOTE It may be:

- an electrical means (resistance, spark, etc.);
- a thermal means (flame, pilot, etc.).

3.4.2.3

flame supervision device

device which, under the influence of the flame on the detector element, holds open a supply of gas to the burner and pilot if it exists, and which shuts off at least this supply of gas in the event of extinction of the supervised flame

NOTE A distinction can be made between:

- a) one which controls all of the gas supply to the burner and pilot, if it exists;
- b) one which partially controls the supply of gas to the burner and pilot, if it exists (see 5.2.12.1).

3.4.2.4

putting an adjuster or control out of service

adjuster or control (of rate, pressure etc.) is said to be put out of service if it is put out of action and sealed in this position; the appliance then functions as if this device had been removed

3.4.2.5

means of assuring soundness

any static or dynamic device intended to assure soundness, for example: flat face joints, O-ring joints, conical joints, diaphragms, greases, pastes, mastics

3.4.2.6

primary air adjuster

device allowing the primary aeration of a burner to be set at a pre-determined value according to the supply conditions

NOTE The operation of changing the setting of this device is termed the "adjustment of primary air".

3.4.2.7

gas rate adjuster

device allowing the gas rate to a burner to be set at a pre-determined value according to the supply conditions

NOTE 1 The adjustment may be continuous (adjustment screw) or discontinuous (change of calibrated orifices, etc.).

NOTE 2 The operation of changing the setting of this device is termed the "adjustment of the gas rate".

3.4.2.8

locking of an adjuster

immobilization, by the manufacturer or installer, of an adjuster in its adjustment position by some means (screw, etc.)

3.4.2.9

sealing of an adjuster

any arrangement relating to the adjuster whereby any change to the adjustment causes breaking of the sealing device and makes interference with the adjuster apparent; the adjuster is then said to be sealed in the adjusted position.

NOTE A factory-sealed adjuster is regarded as non-existent.

3.4.2.10

calibrated orifice

device with one or more orifices which is placed in the gas circuit to create a pressure loss and thus reduces gas pressure of the burner to a pre-determined value for a supply pressure and for a given rate

3.4.2.11

regulator

device which maintains a sensibly constant downstream pressure when the upstream pressure and the gas rate vary within a range of given values

3.4.2.12

tap

device to isolate the gas supply to a burner and possibly to adjust its gas rate during use

3.4.2.13

thermostat

device to maintain automatically a temperature within given limits

NOTE It generally includes a graduated scale for the selection of the cooking temperature depending on the cooking being undertaken.

3.4.2.14

multifunctional control

control having two or more functions, one of which is a shut-off function, integrated within one housing, whereby the functional parts cannot be operated if separated

3.4.3 Other components

3.4.3.1

control handle

part intended to be manually operated in order to operate an appliance control, such as a tap, cock, thermostat, etc.

3.4.3.2

touchable parts

external parts of the appliance intended to be handled in normal use

3.4.3.3

combustion circuit

assembly consisting of a combustion chamber and a circuit for the evacuation of the combustion products

3.4.3.4

hotplate

part of a cooking appliance comprising one or several covered or uncovered burners, and/or one or more electric cooking plates, and possibly a griddle

3.4.3.5

pan support

support placed above an uncovered hotplate burner, which supports the pan being heated

3.4.3.6

griddle

part of a hotplate consisting of a plate situated above a burner that allows cooking of food by direct contact with its surface when heated to a high temperature

NOTE A griddle may be:

- permanent, i.e. designed so that the burner is only to be used under the above conditions;
- temporary, i.e. designed so that it may also be used as a an uncovered or covered burner after removal or replacement of the removable plate.

3.4.3.7

shut-down lid

lid intended to be shut down over the hotplate

3.4.3.8

oven

closed compartment for cooking roasts, pastries, etc.

3.4.3.9

centre of the oven

geometric centre of the useful volume of the oven

3.4.3.10

useful oven height

height calculated from the bottom to the top of the door aperture, which may be reduced in size owing to projections (base, grill burner or grill frets (see Figure 1))

NOTE 1 When the door is not rectangular, the average height is taken.

NOTE 2 A door is also regarded as rectangular if it has four rounded corners one or more of which is rounded. These dimensions do not take account of local projections: bulbs, screws, oven viewing panel, light, etc.

3.4.3.11

useful oven plan area

useful measured dimensions so as to represent the actual surface area available for cooking (see Figure 1); determined from the product of the distance between the shelf supports (or the width of the door aperture, whichever is smaller) and the distance between the internal surface of the door and:

- either the back wall;
- or the rear vertical plane of the cooking zone as it passes through the furthestmost end of the longest oven accessory held in place by a rear stop device, the calculation being based on whichever is the lower of these two values.

NOTE These dimensions do not take into account local projections: probes, screws, oven viewing panel light, etc.

3.4.3.12

useful oven volume

V

product of the useful oven plan and the useful oven height (see Figure 1)

NOTE The useful oven volume is expressed in cubic decimetre (dm^3).

3.4.3.13

shelf supports

supports in the side walls of the oven or grill intended to support oven or grill accessories

3.4.3.14

oven and grill accessories

accessories delivered with the appliance, or mentioned as optional, used for oven and grill cooking

EXAMPLES:

- the grid which is intended to support food to be cooked in the oven or under the grill and to keep the food from contact with cooking juices. It also serves as a shelf for supporting dishes in the oven;
- the grill pan: pan used to collect juices from grill cooking or to hold food cooked in the oven;
- the cake tray: a tray intended to hold small pastries.

3.4.3.15

viewing panel

area of transparent material allowing the inside of a compartment to be seen

3.4.3.16

grill

appliance or part of an appliance that allows cooking by radiant heat from a surface which is raised to a high temperature

3.5 Terms and definitions relating to operation

3.5.1

yellow tipping

phenomenon characterized by the appearance of yellow colouring at the top of the blue cone of an aerated flame

3.5.2

sooting

phenomenon appearing at the time of incomplete combustion and characterized by a deposit of soot on the surfaces in contact with the flames or the products of combustion

3.5.3

mass flow rate

M

mass of gas consumed by the appliance in unit time during continuous operation

NOTE The mass flow rate is expressed in kilogram per hour (kg/h), or eventually gram per hour (g/h).

3.5.4

volume rate

V

volume of gas consumed by the burner or burners in unit time, with the gas under reference conditions

NOTE The volume rate is expressed in cubic meter per hour (m^3/h) or possibly litre per minute (l/min), litre per second (l/s), cubic decimetre per hour (dm^3/h), cubic decimetre per second (dm^3/s).

3.5.5

heat input

Q

quantity of energy consumed per unit of time corresponding to the volume or mass flow rates, the calorific value to be considered in this standard being the gross calorific value

NOTE The heat input is expressed in kilowatts (kW).

3.5.6

nominal heat input of a burner

Q_n

value of the heat input as declared by the manufacturer

3.5.7

primary aeration rate

ratio between the volume of primary air and the volume of theoretical air

3.5.8

primary air

volume of air entrained at the injector by unit volume of gas

3.5.9

flame lift

phenomenon characterized by the partial or total movement of the base of the flame away from the burner port

3.5.10

light back

phenomenon characterized by the return of the flame inside the body of the burner

3.5.11

flame stability

state of the flames at the burner ports when the phenomena of flame lift or light back do not occur

3.5.12

opening time

time which elapses between the ignition of the supervised flame and the moment when the effect of this flame is sufficient to hold open the shut-off device

3.5.13

extinction delay time

time which elapses between the extinction of the supervised flame and the closure of the gas supply controlled by the flame supervision device

3.5.14

centre oven temperature

temperature measured at the centre of the oven using a bare thermocouple

3.5.15

remote operation (type 1)

operation by means of a control intended to be actuated out of sight of the appliance, such as by telecommunications or bus systems

3.5.16

remote operation (type 2)

operation by means of a separate hand-held control (e.g. an infrared device) designed for use only when the appliance is directly visible to an operator of the control who is present within the same room as the appliance

4 Classification

4.1 Classification of gases

Gases are classified in three families, which may be divided into groups according to the value of the Wobbe index. Table 2 gives the families and groups of gases used in this European Standard.

Table 2 — Classification of gases

Families and groups of gases	Gross Wobbe index at 15 °C and 1 013, 25 mbar	
	MJ/m ³	
	minimum	maximum
1st family		
- Group a	22,4	24,8
2nd family	39,1	54,7
- Group H	45,7	54,7
- Group L	39,1	44,8
- Group E	40,9	54,7
3rd family	72,9	87,3
- Group B/P	72,9	87,3
- Group P	72,9	76,8
- Group B	81,8	87,3

4.2 Categories of appliances

4.2.1 General

Appliances are classified by categories defined according to the gases and pressures for which they are designed.

The definitions of categories are given in 4.2.2, 4.2.3 and 4.2.4.

In each country, only some of the categories defined in 4.2.2, 4.2.3, and 4.2.4 are marketed, on account of local gas distribution conditions (composition of gases and supply pressures).

The situations relating to the marketing of these categories of appliance in each country, and the corresponding supply pressures, are given in Tables A.1 and A.2 (see also in A.4 particular categories marketed locally and nationally corresponding to the specific gases and supply pressures given in Table A.4; A.5 gives certain conditions relating to a specific country).

4.2.2 Category I

4.2.2.1 General

Appliances in category I are designed exclusively for use with gases of a single family or of a single group.

4.2.2.2 Appliances designed for use with gases of the first family only

Category I_{1a}: Appliances using only gases from group a of the first family, at the fixed supply pressure (this category is not used).

4.2.2.3 Appliances designed for use with gases of the second family only

Category I_{2H}: Appliances using only gases from group H of the second family, at the fixed supply pressure.

Category I_{2L}: Appliances using only gases from group L of the second family, at the fixed supply pressure.

Category I_{2E}: Appliances using only gases from group E of the second family, at the fixed supply pressure.

Category I_{2E+}: Appliances using only gases from group E of the second family, and operating without intervention on the appliance with a pressure couple. The device for regulating the gas pressure of the appliance, if any, is not operational within the range of the two normal pressures of the pressure couple.

4.2.2.4 Appliances designed for use with gases of the third family only

Category I_{3B/P}: Appliances capable of using gases of the third family (propane and butane) at the fixed supply pressure.

Category I₃₊: Appliances capable of using gases of the third family (propane and butane) and operating with a pressure couple without intervention on the appliance other than an adjustment of the primary air for conversion from butane to propane and vice versa. No operational device for regulating gas pressure is permitted in the appliance.

Category I_{3P}: Appliances using only gases from group P of the third family (propane) at the fixed supply pressure.

4.2.3 Category II

4.2.3.1 General

Appliances of category II are designed for use with gases of two families.

4.2.3.2 Appliances designed for use with gases of the first and second families

Category II_{1a2H}: Appliances capable of using gases from group a of the first family and gases from group H of the second family. Gases of the first family are used under the same conditions as for category I_{1a}. Gases of the second family are used under the same conditions as for category I_{2H}.

4.2.3.3 Appliances designed for use with gases of the second and third families

Category II_{2H3B/P}: Appliances capable of using gases from group H of the second family and gases of the third family. Gases of the second family are used under the same conditions as for category I_{2H}. Gases of the third family are used under the same conditions as for category I_{3B/P}.

Category II_{2H3+}: Appliances capable of using gases from group H of the second family and gases of the third family. Gases of the second family are used under the same conditions as for category I_{2H}. Gases of the third family are used under the same conditions as for category I₃₊.

Category II_{2H3P}: Appliances capable of using gases from group H of the second family and gases from group P of the third family. Gases of the second family are used under the same conditions as for category I_{2H}. Gases of the third family are used under the same conditions as for category I_{3P}.

Category II_{2L3B/P}: Appliances capable of using gases from group L of the second family and gases of the third family. Gases of the second family are used under the same conditions as for category I_{2L}. Gases of the third family are used under the same conditions as for category I_{3B/P}.

Category II_{2L3P}: Appliances capable of using gases from group L of the second family and gases from group P of the third family. Gases of the second family are used under the same conditions as for category I_{2L}. Gases of the third family are used under the same conditions as for category I_{3P}.

Category II_{2E3B/P}: Appliances capable of using gases from group E of the second family and gases of the third family. Gases of the second family are used under the same conditions as for category I_{2E}. Gases of the third family are used under the same conditions as for category I_{3B/P}.

Category II_{2E+3+}: Appliances capable of using gases from group E of the second family and gases of the third family. Gases of the second family are used under the same conditions as for category I_{2E+}. Gases of the third family are used under the same conditions as for category I₃₊.

4.2.4 Category III

Appliances of category III are designed for use with gases of the three families.

This category is not in general use.

The categories III permitted in certain countries are given in Annex A (see A.4).

4.3 Classes of appliances (see Figure 2)

Appliances belong to one of the classes defined below:

- a) **Class 1:** Freestanding appliances.
- b) **Class 2:** Appliance for building in between two furniture units. These appliances are divided into two subclasses.
 - 1) **Class 2 - subclass 1:** Class 2 appliance made in one complete unit but also capable of being installed so that the side walls are accessible.
 - 2) **Class 2 - subclass 2:** Class 2 appliance consisting of one or more ovens or oven/grills, placed beneath the worktop and, possibly, a hotplate built into the worktop.
- c) **Class 3:** Appliance for building into a kitchen unit or worktop.

5 Constructional requirements

5.1 General

5.1.1 Conversion to different gases

5.1.1.1 General

The only acceptable operations when converting from a gas of one group or family to a gas of another group or family and/or to adapt to different gas distribution pressures are given below for each category.

It is recommended that these operations should be possible without disconnecting the appliance.

Unless otherwise specified, conformity to the requirements of this clause is checked by inspection.

5.1.1.2 Category I

- Category I_{2H}, I_{2L}, I_{2E}, I_{2E+}: No modification to the appliance;
- categories I_{3B/P}: No modification to the appliance;
- category I₃₊: Replacement of injectors or calibrated orifices but only in order to convert from one pressure couple to another (for example 28-30/37 mbar to 50/67 mbar). Adjustment of primary air when converting from one pressure couple to another or from one pressure to another within a pressure couple;
- category I_{3P}: No modification to appliance relative to a change of gas. For changing pressure: replacement of injectors, adjustment of gas rates and adjustment of primary air.

5.1.1.3 Category II

5.1.1.3.1 Categories of appliance designed for use with gases of the first and second families

- Replacement of injectors or calibrated orifices;
- adjustment of gas rate in the first family;
- adjustment of primary air;

- replacement of complete pilots or certain of their components;
- putting the regulator out of service under the conditions of 5.2.7;
- putting the gas rate adjuster out of service for gases of the second family.

These adjustments are only acceptable when converting from a gas of the first family to a gas of the second family or vice versa.

5.1.1.3.2 Categories of appliance designed for use with gases of the second and third families

- Replacement of injectors or calibrated orifices;
- adjustment of primary air;
- putting the regulator out of service, under the conditions of 5.2.7;
- for gases of the third family, putting the reduced gas flow adjusters out of service.

These adjustments or replacements of parts are only acceptable:

- for converting from a gas of one family to a gas of another family;
- for converting from a butane/propane pressure couple to another couple (e.g. 28-30/37 mbar to 50/67 mbar).

To convert from one gas to another within a pressure couple of third family gases, it is only permissible to adjust the primary air.

5.1.1.4 Category III

The adjustments or replacements of parts permitted for converting from one gas of one family to a gas of another family, or for converting from one butane/propane pressure couple to another, are the following:

- replacement of injectors or calibrated orifices;
- adjustment of the gas rate in the first family;
- adjustment of primary air;
- replacement of complete pilots and some of their components;
- putting the regulator out of service under the conditions of 5.2.7;
- for third family gases, putting the reduced gas rate adjuster out of service.

To convert from one gas to another within a pressure couple of a third family gas, it is only permissible to adjust the primary air.

5.1.2 Materials

5.1.2.1 General

The nature and state of the surface of materials intended to come into contact with food shall be such that they cannot contaminate or degrade this food.

The quality and thickness of materials used in the construction of the appliance shall be such that the constructional and performance characteristics are not altered in use. In particular, all parts of the appliance, when it is installed according to the instructions and the appropriate rules, shall withstand the mechanical, chemical and thermal conditions to which they could be submitted during normal use, for example:

- the pilot gas supply circuit shall not be made of copper unless the metal is protected against the action of the gas;
- condensation produced during starting and/or operation of the appliance shall not reduce its safety.

The accessible edges of all parts shall not be sharp.

Parts not made of corrosion resistant material shall have effective protection against corrosion. This requirement does not apply to the cake tray.

Materials containing asbestos shall not be used in the construction of the appliance.

If elastomeric materials are used for seals in gas carrying parts of the appliance other than in gas controls, they shall comply with the relevant requirements of EN 549:1994.

Sealing materials for metallic threaded joints in gas carrying parts shall be in accordance with EN 751-1:1996 (for anaerobic jointing compounds) or EN 751-2:1996 (for non-hardening jointing compounds).

5.1.2.2 Surfaces of glass or glass ceramic

5.1.2.2.1 General

Glass components or glass ceramic parts including their edges or corners shall not have fissures or scratches.

The means used to hold glass components or glass ceramic parts of the appliance shall not allow any unnecessary stress or risk of mechanical damage to the glass or glass ceramic. For example, screws used for assembly shall not come into contact with glass components or glass ceramic parts.

A₃

5.1.2.2.2 Additional requirements for glass or glass ceramic

The glass or glass ceramic components shall have the characteristics that ensure durability against damage in normal use.

This requirement is deemed to be met if, after application of the test given in 7.2.1.4.1, for hotplates 7.2.1.4.2 and for oven doors 7.2.1.4.3 the glass or glass ceramic surface is not broken and does not show any crack visible to the naked eye.

When a pan support for an uncovered burner is in contact with the glass or glass ceramic surface of the hotplate, the surface area of the pan support in contact with the glass or glass ceramic surface shall be at least 25 mm². **A₃**

5.1.2.2.3 Additional requirements for surfaces of thermally toughened soda-lime glass

A₃ Glass components of thermally toughened soda-lime glass (for example hob surface, the shutdown lid, oven doors, control panels) shall fragment into small particles. **A₃**

General compliance with this requirement for thermally toughened soda-lime glass is verified by testing according to **A₃** Annex G **A₃**.

It can be verified by presentation of a declaration of conformity by the glass manufacturer that the thermally toughened soda-lime glass used in the construction of the component is manufactured to comply with the requirement above.

5.1.2.2.4 Additional requirements for other types of glass

If any other types of glass are used, the manufacturer shall provide evidence that:

- a) similar safety tests, suitable to the particular material, have been successfully applied;
- b) the glass material is suitable for its intended purpose.

If such glass is major component (e.g. oven doors, top or side panels) the glass surface shall not be broken and shall not show any crack visible to the naked eye after application of the tests given in 7.2.1.4.

5.1.3 Ease of cleaning and maintenance

Any part of the appliance requiring cleaning by the user shall be easily accessible without having to move the appliance or use a tool for dismantling. It shall be possible to replace such parts correctly and without undue difficulty in accordance with the information in the instructions for use and maintenance. Any incorrect reassembly (e.g. pan support arms-pots centring clearly out centred with respect to the burner lay out, or pan supports opening diameter clearly larger than the diameter of the burner) shall be obvious, if this could create a potential hazard to the user.

Compliance is checked by inspection.

Sharp borders and edges which could give rise to injury to the user, for example during cleaning, shall be avoided.

Any control placed in the gas circuit shall be arranged so that any adjustment or maintenance by a service engineer is easy and its replacement by a service engineer is possible.

Parts of the appliance which are not intended to be removed by the user, and for which removal would affect safety (for example injectors) shall only be able to be removed with the aid of tools.

5.1.4 Strength

5.1.4.1 General

The construction of an appliance shall be such that, during normal conditions of use, it shall not be possible to detect:

- any displacement of parts;
- any distortion;
- any deterioration;

likely to impair its safety.

The conformity of the appliance to the strength requirement is checked by the absence of visible change in the functional parts following the two tests described in 5.1.4.2 and 5.1.4.3, and by the conformity of the whole appliance to the specifications of the standard.

These two tests, when applied, are carried out under the conditions described in 7.2.1 before undertaking the tests or checks specified by the standard, apart from the soundness test specified in 7.3.1.1 which is carried out on the appliance in its as-delivered condition.

5.1.4.2 Cooker bodies

For cookers of class 1 and class 2, subclass 1, the application of a force to the upper part under the conditions of 7.2.1.2.

5.1.4.3 Hotplate pan supports

For all appliances, the application on the pan supports of the loads indicated in 7.2.1.3 under the specified conditions.

5.1.5 Soundness of the gas circuit assembly

Holes for screws, fixing pins etc. intended for the assembly of components shall not open into the gas ways which lead to the injector.

The soundness of parts and assemblies connected to the gas circuit shall be assured, by means of metal-to-metal joints or joints with seals (e.g. washer, O-rings or gaskets), i.e. excluding the use of any product which ensures soundness in the threads.

However, for parts that do not require to be dismantled during normal maintenance or for a change of gas, the use of thread sealing compounds is permitted.

Soft soldering, as defined in 3.1.6, shall not be used to ensure soundness of the connections of the gas circuit. However, it is permitted for internal connections within the gas circuit when a damage of the connection does not involve soundness of the circuit. Conformity will be checked on the basis of the manufacturer's specifications.

Mechanically fastened components, or the threaded parts of the pipework, which may be dismantled during normal maintenance shall remain sound after 5 disconnections and reassemblies carried out in accordance with the manufacturer's instructions, if necessary after changing a gasket, where this is indicated in the technical instructions.

5.1.6 Connections

5.1.6.1 Appliances of categories I_{3B/P}, I₃₊ and I_{3P}

For appliances of categories I_{3B/P}, I₃₊ and I_{3P}, the gas inlet to the appliance may be one of the following three types (see **AC** Table A.6 **AC**).

- a) Without a thread: for a length of at least 30 mm its extremity shall be cylindrical, smooth and clean to allow connection by means of a gas-tight compression fitting.
- b) With an external thread: its extremity shall have a thread for connection with or without sealing in the thread according to EN 10226-1:2004, EN 10226-2:2005 or EN ISO 228-1:2003.

In this case, the nominal diameter shall conform to the nominal sizes 1/2, 3/8 or 1/4 taking into account the requirements of 5.1.6.3.

- c) With an internal thread: its extremity shall have a thread for connection with sealing in the thread according to EN 10226-1:2004 or EN 10226-2:2005.

In this case, the nominal diameter shall conform to the nominal sizes 1/2, 3/8 or 1/4 taking account of the requirements of 5.1.6.3.

b) and c) may be achieved, if necessary, by the use of an adaptor fitted on the appliance or supplied with it as an accessory by the manufacturer. If such an adaptor is supplied with the appliance as an accessory by the manufacturer, it shall, unless its correct fitting is obvious, have a clear marking indicating the type of thread.

The details for the fitting and use of such an adaptor shall appear in the technical instructions (see 8.3.2). The installation practices in force in the various countries are given in Table A.6.

5.1.6.2 Appliances other than categories I_{3B/P}, I₃₊ and I_{3P}

For all categories of appliances except categories I_{3B/P}, I₃₊ and I_{3P}, the extremity of the gas inlet to the appliance shall have a thread conforming to EN 10226-1:2004, EN 10226-2:2005 or EN ISO 228-1:2003 (see Table A.6).

For all types of thread, the useful length of thread shall conform to the values indicated in EN 10226-1:2004 or EN 10226-2:2005.

If the thread is external, the nominal diameter shall conform to the nominal sizes 1/2, 3/8 or 1/4 taking account of the requirements of 5.1.6.3.

If the thread is internal, it shall comply with EN 10226-1:2004 or EN 10226-2:2005 and the nominal diameter shall comply with the nominal sizes 1/2, 3/8 or 1/4 taking account of the requirements of 5.1.6.3.

This may be achieved, if necessary, by the use of an adaptor fitted on the appliance or supplied with it as an accessory by the manufacturer. If such an adaptor is supplied with the appliance as an accessory by the manufacturer, it shall, unless its correct fitting is obvious, have a clear marking indicating the type of thread. The details for the fitting and use of such an adaptor shall appear in the technical instructions (see 8.3.2). The installation practices in force in the various countries are given in Table A.6.

5.1.6.3 Supplementary conditions

All appliances:

- The end of the gas inlet connection shall be positioned to allow the free movement of a flexible hose connection;
- In the case of connections where pressure-tight joints are not made on the threads according to EN ISO 228-1:2003, the extremity of the gas inlet connection shall have a flat annular surface of at least 3 mm wide in the case of a thread of nominal size 1/2, of at least 2,5 mm wide in the case of a thread of nominal size 3/8 and of at least 2,2 mm wide in the case of a thread of nominal size 1/4 in order to allow the interposition of a sealing washer.

Moreover, when the extremity of the gas inlet connection has a thread of nominal size 1/2, it shall be possible to insert a gauge of 12,3 mm diameter to a depth of at least 4 mm.

Appliances of class 1:

- The connection of the gas inlet to the gas supply shall be possible from both the left and the right of the appliance.
- The appliance may have one or two points of connection. If there is only one gas inlet connection point, it shall be such that connection to the gas supply can be made from either side during normal installation of the appliance. In order to satisfy this requirement, the use of supplementary means provided by the manufacturer is allowed. If, for this purpose, a part of the pipework is movable, it shall be sufficiently rigid, if necessary by use of a means of support.
- The end of the gas inlet connection may be fitted with a push-on connection (see Table A.6). This connector may be installed on the appliance.

Appliances of classes 2 and 3:

- They shall be designed so that the connection to the gas supply may easily be carried out in accordance with the instructions of the manufacturer.

- The appliance shall not be dismantled for connection unless the manufacturer recommends the use of a flexible hose.
- The end of the gas inlet connection may be fitted with a push-on connector when the appliances are supplied with liquefied petroleum gas, as indicated in Table A.6.

5.1.7 Movable appliances

If the appliance has devices such as castors allowing it to be moved, a means shall be provided to stop inadvertent movement of the appliance in normal use.

With the mobility device in use (unless this is evident to the user), the appliance shall not tilt under the test conditions described in 7.2.2.3.

5.1.8 Fixing or stability of appliances

The appliance shall be so designed that it can be provided with a fixing or stabilisation device when the installation rules in force in the country where it is to be installed require fixing or stabilisation of appliances.

Appliances of class 2, subclass 2, and class 3 shall be capable of being positioned correctly and secured after installation.

5.1.9 Additional components

For appliances of class 2 and class 3, any additional components necessary for the evacuation of products of combustion and for ventilation specified by the manufacturer shall be supplied with the appliance, with the exception of those that are commercially available and for which the characteristics and installation are specified in the technical instructions.

5.1.10 Safety of operation in the event of fluctuation, interruption and restoration of the auxiliary energy

When the appliance is supplied by a mains electrical supply, its design shall be such that no risk can appear in the event of loss of the electrical energy and its subsequent restoration.

NOTE Requirements relating to the continued operation and safety of the appliance in the event of normal and abnormal fluctuation of electrical energy are specified in 6.2.2 and 6.3.2.

5.1.11 Electrical safety of appliances and immunity to electromagnetic phenomena

Appliances with electrical components other than electrical heating elements associated with the use of gas shall comply with the relevant clauses of EN 60335-2-102:2006 and with those clauses of EN 60335-2-6:2003 given in the following list:

Clause	Content	Remark
7.12	User instructions	1 st paragraph, if relevant
13.2	Leakage current warm	Clause relevant
13.3	High voltage test	Clause relevant
15.2	Spillage test	Clause relevant
16.2	Leakage current cold	Clause relevant
16.3	Electrical strength	Clause relevant
21.102	Hob surface temperature shock test	Clause relevant
22.113	Hobs	If relevant
25.3	Supply connection and external flexible cords	Clause relevant
29.2	Clearances and clearance distances	Clause relevant ^a

^a 1 - The macro-environment in a domestic kitchen is pollution degree 2.

2 - The micro-environment inside the appliance with respect to positioning of the insulation may be 2 or 3 depending on the design and pollution produced by operation of the appliance itself. This does not exclude the possibility to accept pollution degree 1 where this applies.

NOTE The electrical safety of cooking functions performed by electrically heated components is not covered by this European Standard; appropriate requirements are given in EN 60335-2-6:2003.

If the appliance incorporates automatic controls these components shall comply with the relevant clauses of EN 60730-2-1:1997.

5.2 Special requirements

5.2.1 Taps

Each burner shall be controlled by a tap or a device assuring the opening and closing of its supply and where required allowing the variation of its rate between two extreme values by operation of the control handle.

Where a manually operated tap is covered by the scope of **EN 1106:2010**, the requirements of **EN 1106:2010** shall be applied and the number of operations of the taps shall be:

- for oven and/or grill burners: 5 000;
- for hotplate burners: 40 000.

Taps shall be placed in such a way that their strength, operation, manipulation and accessibility undergo no damage from actions to which they are subjected in normal use, and that they are protected against spillage of food.

All parts of the taps shall be clean (e.g. free from swarf).

Taps shall be mounted in such a way that no accidental movement relative to the gas supply connection is possible. Taps shall be replaceable.

For a given appliance, all the taps controlling the same type of burners shall be of the same type, e.g. with the reduced rate either at the end of the tap travel or between the closed and full on positions.

If the oven and grill burners have a combined control tap, the "off" position shall be designed to make it impossible for the tap handle to be inadvertently moved from one adjustment range to another, for example requiring an axial displacement. If the burners are fitted with flame supervision devices, a combined tap

requires only a device to arrest it in its "off" position, for example an arrest $\overline{A_1}$, in compliance with \overline{AC} 7.101.5 \overline{AC} of \overline{AC} EN 1106:2010 \overline{AC} . $\overline{A_1}$

$\overline{A_1}$ If a multi-ring hotplate burner has a single sectional control with two closing directions, the "off" position shall be designed to make it impossible for the tap handle to be inadvertently moved from one adjustment range to another, for example requiring an axial displacement. However, if each ring of such a multi-sectional hotplate burner is supervised by a flame supervision device, the single sectional control requires only a device to arrest it in its "off" position, for example an arrest, in compliance with \overline{AC} 7.101.5 \overline{AC} of \overline{AC} EN 1106:2010 \overline{AC} . $\overline{A_1}$

If the oven and grill burners are situated in the same compartment and they are controlled by different control taps, an interlock device shall prevent gas being supplied to the two burners simultaneously.

5.2.2 Control handles

5.2.2.1 Design

The purpose of handles shall be clearly identifiable with respect to the burners they control. There shall not be any risk of confusion with the control for other energy.

If the control handle operates by turning, the closing direction $\overline{A_1}$ shall only be clockwise $\overline{A_1}$. This does not apply to combined oven and grill tap handles $\overline{A_1}$ and to multi-ring hotplate burners with a single sectional control and two closing directions. $\overline{A_1}$

Control handles shall be so arranged relative to one another, and with respect to control handles for any other energy, that the movement of one handle does not cause inadvertent movement of an adjacent handle.

Control handles shall be so designed that they can neither be fitted in the wrong position nor move by themselves.

Control handles shall not be interchangeable if this leads to a risk of confusion between the energy controlled, the closing direction, the operating positions and the "off" position.

5.2.2.2 Marking

For each burner the closed, open and, if it exists, the reduced rate positions shall be marked in a visible, legible, identifiable and durable fashion.

The marking, symbols and index shall be identifiable to the user during operation of the appliance when the tap is in the appropriate position.

The position of handles is determined by alignment of symbols with an index: the index may be fixed and the symbols carried on the handle (or on a device controlled by it) or vice versa. However, alternative means of determining the position of handles may be used if they are equally effective, e.g. the appearance of symbols in a window on condition that:

- in any position, a symbol or a significant part of the symbol, is visible in the window; the visible part of the symbol shall enable the reduced rate direction to be identified;
- the closing direction is clearly apparent, whatever the position of the handle, if this is different from the reduced rate direction.

If control handles do not operate by rotation, the same symbols shall be used in a manner which prevents any ambiguity.

For needle type taps, the closing direction shall be indicated by an arrow whose point is directed towards the full disc or circle indicating the closed position. Marking of the reduced rate position is not required.

If the axes of the handles are horizontal (or nearly horizontal), the closed position shall be situated in the vertical plane containing the axes of the handles, and above them.

If the axes of the handles are vertical (or nearly vertical), and in a plane parallel or perpendicular to the front of the appliance, the closed positions may be selected from the four positions defined by the two vertical planes containing the axis of the handle which are parallel and perpendicular to the front of the appliance.





The closed position shall be the same for all the taps.

In all cases, including needle type taps, the identification of the closed position of the tap shall not give rise to any confusion with the identification of the open position, or with other markings.

The closed position shall be marked with a full disc or a circle of at least 3 mm in diameter:

● or ○.

For the other positions, the following symbols may be used:

- | | | |
|--------------------------|-----------------|---|
| - full on position: | large flame |  |
| - reduced rate position: | small flame |  |
| - range of rates: | - triangle |  or  |
| | or | |
| | - scale 1 2 3 4 | or 4 3 2 1 |

Other symbols, with the exception of letters, may be used, on condition that they give equivalent information clearly.

Additional markings are allowed on condition that they create no confusion for the user of the appliance.

Any special position of the tap which is intended for ignition and/or any special button which has to be operated for ignition shall be marked with a stylised star.

When the oven burner is supplied by a tap and a thermostat:

- if there are two control handles, the full-on and closed positions of the tap shall be marked as indicated above; any reduced rate position shall also be marked;
- if there is only a single control handle, the closed position of the tap shall be marked as indicated above.

If there is a risk of confusion between the control handle of the oven burner and that of the grill burner, the control handle of the oven burner shall be marked by a rectangle carrying a clearly identifiable symbol in its lower part and that of the grill burner by a rectangle carrying a clearly identifiable symbol in its upper part. When the burner of the oven and grill are controlled by the same handle, these markings are used for each of the corresponding ranges.

5.2.3 Injectors and adjusters

Injectors

It shall be possible to dismantle injectors. However, for appliances intended to operate exclusively with an injector mounted in the factory (appliances of categories I_{2H}, I_{2L}, I_{2E}, I_{2E+}, I_{3B/P}, I₃₊, I_{3P}), the interposition of a sealing material in the thread is permissible if the installation instructions mention that it is mandatory to use this product in the case of disassembly.

Every injector shall have an indelible means of allowing it to be identified with the aid of the instructions, so preventing any confusion.

When a gas rate adjuster is an adjustable injector for use with butane and propane, the gas rates, main and reduced, shall be controlled by means of a calibrated device, annulling the adjustment possibility intended for other gases.

Gas rate adjusters

Gas rate adjusters shall meet the following requirements:

- they shall have been adjusted in the factory, in compliance with the gas family, gas group and pressure for which the appliance is labelled;
- if this position is to be altered when the gas is changed, instructions for conversion to various gases, provided in 8.3.4, shall describe the operations to be carried out and shall clearly specify the adjustment position to be attained;
- the main gas rate adjusters shall either be locked in a predetermined adjustment position²⁾ and sealed, or immobilised in this position and sealed by a means such as a sealed stop;
- the reduced rate adjusters shall be locked in the adjustment position.

Instructions for conversion to various gases shall also specify that any sealing shall be restored after the gas conversion operations.

It shall only be possible to move the adjusters with the use of a tool.

With the exception of independent hotplates, table cookers and movable cookers, the gas rate adjusters of all the burners shall be accessible to the installer without having to move the appliance when it is installed under the conditions specified in 7.1.3.3.

Adjusting screws shall be placed so that they cannot fall into the gas ways. They shall be fitted with a cap or some other sealing device.

Gas rate adjusters are permitted for pilots.

Air rate adjusters

Air rate adjusters shall meet the following requirements:

- they shall have been adjusted in the factory, in compliance with the gas family, gas group and pressure for which the appliance is labelled;

2) The meaning of "predetermined adjustment position" is the position of the adjuster which may be obtained unambiguously and independently of the gas composition used (for example, stop device, dimensions, mark, pressure, number of screw turns).

- if this position is to be altered when the gas is changed, instructions for conversion to various gases provided in 8.3.4 shall describe the operations to be carried out and shall clearly specify the adjustment position to be attained;
- the air rate adjusters for the main burners shall be locked in a predetermined adjustment position³⁾ and sealed;
- the air rate adjusters for the ignition burners shall be locked in the adjustment position.

Instructions for conversion to various gases shall also specify that any sealing shall be restored after the gas conversion operations.

It shall only be possible to move the adjusters with the use of a tool.

With the exception of independent hotplates, table cookers and movable cookers, the air rate adjusters of all the burners shall be accessible to the installer without having to move the appliance when it is installed under the conditions specified in 7.1.3.3.

Presence of adjusters

A continuous-action adjuster, adjusted, locked and sealed by the manufacturer or his agent and which according to the technical instructions, shall not be adjusted at the moment of installation is considered to be non-existent.

The presence of gas rate adjusters is optional for appliances of category II_{1a2H}. For these appliances, where they are supplied with a second family gas, annulment of the function of the continuous nominal flow rate adjusters is obligatory, annulment of the function of continuous reduced flow rate adjusters is optional.

Appliances of categories I_{2H}, I_{2L}, I_{2E}, I_{2E+}, I_{3B/P}, I₃₊, I_{3P}, II_{2H3B/P}, II_{2H3+}, II_{2H3P}, II_{2E3B/P}, II_{2E+3+} shall not be fitted with continuous gas rate adjusters. However, it is permissible to adjust reduced rates for appliances of categories II_{2H3B/P}, II_{2H3+}, II_{2H3P} and II_{2E3B/P}, II_{2E+3+}, II_{2E+3+} when using second family gases; the same applies to category I_{2E+} when it is marketed in one country jointly with category II_{2E+3+}.

The presence of primary air adjusters is optional for all categories apart from categories I_{2H}, I_{2L}, I_{2E}, I_{2E+} and I_{3P} for which they are prohibited.

Special requirements regarding the presence of adjusters for appliances of category III are given in Annex A (see A.4).

5.2.4 Oven thermostats

Where the thermostat is covered by the scope of EN 257:1992, the requirements of EN 257:1992 shall be applied.

When the oven burner is supplied by a tap and a thermostat:

- if there is only a single control handle, the closed position as well as the maximum and minimum positions shall be marked; the symbol for the closed position shall be as indicated in 5.2.2.2;
- if there are two control handles, the one for the tap shall satisfy the requirements of 5.2.2 and the marking of the thermostat handle shall include at least an indication of the maximum and minimum positions.

3) The meaning of "predetermined adjustment position" is the position of the adjuster which may be obtained unambiguously and independently of the gas composition used (for example, stop device, dimensions, mark, pressure, number of screw turns).

5.2.5 Ignition systems

All the components of the ignition device shall be designed to avoid damage or accidental displacement in normal use. The relative positions of the ignition device and the burner shall be sufficiently well defined to ensure satisfactory operation of the assembly.

When the ignition devices include a permanent pilot, the gas rate of this pilot shall not exceed 0,06 kW for each burner controlled.

If necessary, it shall be possible to adjust the pilot gas rate in the event of a gas change, either by adjuster or by change of injector.

A means shall be provided to cut off the gas supply to any pilot.

In the event of failure of the ignition system for the burner(s) of the appliance, it shall be possible in the following circumstances to light the burner(s) concerned with a match after removing, if necessary, a movable part (griddle, bottom of the oven etc.).

- a) uncovered hotplate burners;
- b) temporary and permanent covered burners and griddles (see 5.2.8.2.2);
- c) ovens and grill burners that can only be ignited after manual intervention.

This requirement shall not apply to oven burners that are designed specifically to prevent the ignition by means of a match.

In this case, the manufacturer's instructions for use and maintenance shall state that the ignition by means of a match is prohibited.

The ignition system shall meet the requirements of 6.2.1 and 6.3.1.

5.2.6 Flame supervision devices

Where the flame supervision device is covered by the scope of EN 125:1991, the requirements of EN 125:1991 shall be applied.

Where flame supervision devices are fitted, in order to comply with the requirements of 5.2.12, they shall be so designed that, in the case of a failure of any of the components indispensable to their operation, the supply of gas controlled by the device is cut off automatically and that its re-establishment requires manual intervention. It shall be so mounted as to ensure satisfactory performance. The sensing element of a flame supervision device shall control a single burner only.

The appliance shall not incorporate any device that allows the flame supervision device to be permanently over-ridden. However, during the ignition operation, a momentary admission of gas in the absence of a flame is permitted under the conditions of 6.1.3, if this requires a continuous manual action.

5.2.7 Regulators

Where the regulator is covered by the scope of EN 88-1:2007, the requirements of EN 88-1:2007 shall be applied.

Except for appliances of categories having the index $_{2E+}$, the presence of a regulator is prohibited, or its function shall be annulled, when appliances are equipped and adjusted to operate without modification or adjustment of the gas rate within a pressure couple. Appliances of categories having the index $_{2E+}$ may have an appliance regulator if this is not operational within the range of the two normal pressures of this pressure couple.

In other cases, the regulating function is optional.

Where a regulator is used, the appliance shall have a pressure test point downstream of the regulator. The pressure test point shall have an external diameter of $\left(9_{-0,5}^0\right)$ mm and a useful length of at least 10 mm to allow connection of a rubber tube. At least one part of the orifice of the pressure test point shall have a diameter not exceeding 1 mm.

The design and accessibility of the regulator shall be such that it can be easily adjusted and immobilized for use with another gas, but provision shall be made to hinder any unauthorized access to the adjuster. Where a regulator is locked in the open position and sealed, it is considered to be non-existent.

5.2.8 Hotplates

5.2.8.1 General requirements

There shall be an adequate number of points of support for vessels to rest level in a stable fashion on the supports of each of the uncovered burners.

Except where rim-based or convex-based vessels are required, one of the pans defined in C.1 is used for verification purposes. This pan shall have the largest diameter which is equal to, or less than, that of the smallest pan specified in the instructions for use and maintenance. It is verified that when the pan is displaced off-centre by 15 mm, it remains stable.

The instructions for use shall state the minimum diameter of the pan that can be placed on each of the burners. At least one of these pans shall have a diameter of 120 mm or less except for single burner appliances having a nominal heat input greater than 3 kW.

In the case where the instructions for use and maintenance do not prohibit the use of rim based or convex-based vessels on the hotplate, the following verification is carried out.

The following rings are placed on the pan support over each burner:

- external diameter: 140 mm, 160 mm, 180 mm and 200 mm;
- height: 25 mm;
- thickness: 3 mm;

then moved off-centre by up to 25 % of their diameter. In all these positions, they shall be supported sufficiently at a level equivalent to that of a flat based vessel of the same diameter.

If the pan supports are designed to be removed, in two or more separate parts, for example for cleaning, the removal of one or more of these parts shall not make the remaining parts unstable.

In normal use, the hotplate pan supports shall not suffer distortion likely to impair the performance of the appliance.

Possible spillages from pans placed on the burners shall not affect the operation of the burners and shall be accessible for cleaning. If the appliance is constructed in such a way that spillages are collected in spillage containers, the minimum capacity of each container shall be 0,3 l.

It shall not be possible for shut-down lids, pan supports and spillage containers to fall accidentally from their fully raised position. This requirement shall be verified under the conditions of 7.2.2.5.

If the appliance is fitted with a glass shut-down lid, it shall meet the requirements in a) or b) below at the discretion of the manufacturer:

- a) A_2 The glass shut-down lid shall have the following warning notice, in which the letters shall have a height of at least 4 mm when measured on the capital letter, stating: "CAUTION: glass lids may shatter when heated. Turn off all the burners before shutting the lid." or the symbol as represented in Annex F. A_2 This warning notice or symbol shall be incorporated (e.g. screen printed) in the glass and shall be positioned so that it is legible when the lid is on open position. The warning notice or the meaning of the symbol shall also be stated in the instructions for use and maintenance (see 8.3.3).
- b) The appliance shall have a gas shut-off device which interrupts the gas supplied to the hotplate burners when the lid is closed. This device shall be designed and installed so that the following requirements are met under the test conditions described in 7.2.4:
1. no reduction in the gas rate of the burners shall be observed if the lid is moved through an angle of 5° relative to the fully-open position; this requirement is not applicable if the lid is held in the fully-open position by a mechanical device and
 2. the gas supply shall be interrupted if the lid is moved 45° from its fully-opened position.

Glass shut-down lids shall be fitted with a device slowing down their rate of descent.

For appliances having a glass shut-down lid, means shall be provided to prevent a 200 mm test pan conforming to Table C.1 resting flat on the pan supports from coming into contact with the glass part shut-down lid when in its fully raised position.

5.2.8.2 Hotplate burners

5.2.8.2.1 General

Burner bodies shall be mounted such that they cannot be displaced accidentally from their correct positions.

Parts of a burner likely to be soiled as a result of cooking shall be removable and easy to clean.

However, if these parts have an external shape that makes cleaning easy without affecting the subsequent performance of the burner, they may be fixed. Burner ports shall be designed so that spillage of food does not cause internal fouling.

All removable burner parts, particularly the caps, shall not be interchangeable if they are not identical. Any incorrect reassembly shall be obvious.

The flash tubes and parts with which they are intended to function, particularly those parts of the burner concerned with the ignition, shall be placed in well defined positions.

5.2.8.2.2 Covered burners and griddles

Covered burners and griddles may be permanent or temporary.

When a covered burner or griddle is temporary, the plate shall be removable and shall be supplied with the appliance.

Correct replacement of the removable plate or griddle on the burner for which it is intended shall be easy and obvious. The removable plate or griddle shall be stable when in its correct position.

Non enclosed covered burners and griddles shall be designed so that all products of combustion are evacuated directly to the atmosphere, e.g. around their periphery. In addition, partial visibility of the flames shall be possible in normal operation.

Griddles shall be designed such that any grease produced in cooking cannot spill onto the burner or onto parts not intended for this purpose.

5.2.8.2.3 Multi-ring hotplate burners

When a multi-ring hotplate burner with sectional control has separate gas taps to supply and control each of its rings of burner ports independently, it shall be so designed and arranged that each ring of burner ports is supervised by a separate flame supervision device.

If a multi-ring hotplate burner with sectional control is supplied from a single gas tap and is equipped with a single flame supervision device that only supervises the flame(s) of one of its rings of burner ports, the gas tap shall be so designed and arranged that when using it to open the gas supply to an unsupervised ring of burner ports from the supervised ring of burner ports, it is not possible for the gas tap to be left in a position in which cross-ignition from one to the other is not assured.

5.2.8.3 Removable devices for small pans

Specially removable supports allowing the use of very small pans are allowed on all of the burners.

— They shall be stable and rest in a predetermined position on the pan supports above the burner(s) intended by the manufacturer and specified in his instructions.

— They shall be supplied with the appliance.

A 60 mm diameter pan, even when moved off-centre by 15 mm, shall rest in a stable fashion on the special support.

5.2.8.4 Devices for convex-based vessels

Fixed or removable supports intended to support convex-based vessels are allowed.

The vessels recommended in the instructions for use and maintenance shall be supplied by the manufacturer to the laboratory. They shall rest in a stable fashion on the special supports.

If the devices are removable, they shall be supplied with the appliance:

— either they shall rest in a stable fashion and in a predetermined position on the pan supports, above the burner(s) intended by the manufacturer and indicated in the instructions for use and maintenance, and in this case they are not tested;

— or they shall replace the original support in which case they shall be subjected to the tests required by this European Standard under the conditions specified in the instructions for use and maintenance.

5.2.9 Ovens and grills

5.2.9.1 Compartments

5.2.9.1.1 Door strength

Under the conditions of 7.2.2.2, the inside surface of oven doors with horizontal hinges and ovens equipped with a grill, when completely open, shall be horizontal (within $\pm 5^\circ$) and remain in this position.

Moreover, under the conditions of 7.2.2.2, a load as indicated in Table 3 being placed on oven doors with horizontal or vertical hinges, the front (upper) edge of the door shall not sag by more than 15 mm.

Table 3 — Strength of the door

Mass in kilograms

Appliance	Mass
a single oven	10
double ovens - the larger - the smaller	$(3 + 0,1v)^a$
^a v: useful volume of the oven, in dm ³ cube.	

5.2.9.1.2 Appliance tilting

Under the conditions of 7.2.2.3, oven doors with horizontal hinges are loaded with 22,5 kg and oven doors with vertical hinges with 15 kg.

Under these conditions, the appliances shall not tilt.

If, for appliances of class 1 on the floor and class 2, subclass 1, the appliance is provided with a fixing or $\overline{A_1}$ stabilizing device $\overline{A_1}$, the requirement shall be satisfied using this device. This requirement does not apply either to the doors of separate grills situated above the oven or hotplate, nor to wall-mounted grills.

However, in the case of table cookers and freestanding ovens of class 1 and class 2, subclass 1, designed to be placed on a work surface, compliance with the requirement will be verified with the appliance fixed according to the manufacturer's instructions.

For appliances of class 2, subclass 2, and class 3, the fixing or stabilizing is carried out in accordance with the manufacturer's instructions.

When the appliance has an LPG cylinder compartment and in accordance with the instructions for use and maintenance it can only function with the cylinder in place, the requirement is checked with an empty cylinder in the compartment. Alternatively, the requirement is checked with the compartment empty.

After the test, the appliance shall continue to satisfy the requirements of this European Standard.

5.2.9.1.3 Strength and stability of oven and grill accessories

- a) When they are loaded as indicated in Table 4 and under the conditions of 7.2.2.4:
 - 1) the supports or runners of ovens, ovens equipped with grills and separate grills shall be designed so that the oven accessories intended to slide on these supports or runners still have adequate guidance and do not incline more than 10° when they are pulled out halfway;
 - 2) the oven and grill accessories intended to slide on these supports or runners shall slide correctly when cold and hot;
- b) if necessary, the extreme rear position which the oven and grill accessories and the cooking utensils can occupy shall be made evident, for example with lips or stops, in order not to impair the combustion or cause overheating;
- c) when the grill pan has a handle it shall be so designed that when it is held to carry the grill pan or to pour fluid contents, it shall not bend or become loose under the conditions of 7.2.2.4.

Table 4 — Strength and stability of accessories

Mass in kilograms

Accessories	Mass
- Ovens, Ovens incorporating grills:	
Grill grid	$(2 + 0,12v)^a$
Grill pan	$(2 + 0,12v)^a$
Cake tray	3 ^{b c}
- Grills:	
Grill grid	3
Grill pan	3
<p>^a v: useful volume of the oven, in dm³.</p> <p>^b The instructions shall specify that the load placed on the cake tray shall not be more than 3 kg.</p> <p>^c If the cake tray is required to be supported by an oven shelf, these requirements do not apply to it.</p>	

5.2.9.1.4 Appliances capable of using third family gases

For appliances capable of using third family gases, the space situated under the oven or grill burners shall be designed so that in the case of release of un-burnt gas, this gas can escape out of the appliance without risk of accumulation.

5.2.9.1.5 High temperature ovens

If in normal use an oven is capable of achieving a temperature at the centre of the oven in excess of 350 °C, the appliance shall incorporate a means which prevents access to the interior of the oven as long as the oven exceeds 350 °C.

This requirement shall be verified under the following conditions:

- for an appliance with an oven without a special thermostat adjustment position for cleaning, those of 7.3.1.5.2.3 test no. 5;
- for an appliance with an oven with a special thermostat adjustment position for cleaning, whichever of the following is more severe:
 - 7.3.1.5.2.3 test no. 4, or
 - 7.3.1.5.2.3 test no. 5.

5.2.9.2 Oven and grill burners

If there is no ignition device, it shall be possible to light the oven and grill burners by hand, each at a single point, in an easy and safe manner, with the compartment door open. If the compartment has two burners with two taps, there may be two lighting points.

Flash tubes and the parts associated with them, particularly the parts of the burner concerned with ignition, shall be placed in well defined positions.

The user shall be able to see the burner flames totally or partially either with the door open or shut, depending on the design of the appliance.

Burner components including the radiating elements of the grill burners shall be mounted in such a way that they cannot be displaced accidentally from their correct position.

5.2.9.3 Combustion products outlets

The final outlet for the oven and/or grill products of combustion shall be designed so that accidental obstruction by pans placed on the hotplate is either not possible or does not give rise to a CO content in the products of combustion of more than 0,10 % by volume, 15 min after ignition under the test conditions of 7.3.3.2.5.

5.2.10 Cylinder compartment

The opening of this compartment shall be of a size which will permit the easy introduction and removal of the cylinder.

The dimensions of the opening and of the inside of the compartment shall be at least large enough to accommodate the largest cylinder (with regulator fitted) specified by the manufacturer in accordance with 8.3.3.

In addition, the compartment shall be so designed that:

- effective ventilation is provided by openings at its base and upper part; the total area of the openings in the upper part being at least 1/100 of the floor area of the compartment and that of the openings at the base being at least 1/50 of the floor area of the compartment;
- the cylinder support has sufficient mechanical strength to resist permanent deformation under the load of a full cylinder; an arrangement with the cylinder resting directly on the ground is not allowed;
- the cylinder fitted with its regulator can easily be inserted in, or removed from, the compartment;
- the cylinder tap is readily accessible and remains easy to manipulate when the cylinder is in place;
- overflow of liquid from pans on the hotplate does not fall onto the cylinder or its accessories;
- where the appliance may be connected by a flexible tube, the latter shall not be in contact with sharp edges. The length of flexible tube necessary for correct connection of the cylinder shall be indicated in the manufacturer's instructions. It shall not be less than 400 mm. The cylinder connection point shall be easily accessible.

In addition, no internal communication shall exist between the cylinder compartment and the different parts of the appliance where burners are located.

The ventilation openings of the compartment shall not be able to be obstructed when the appliance is placed in position.

5.2.11 Appliances with a cooling fan

When an appliance incorporates a cooling fan, this fan shall operate automatically.

The moving parts of the fan shall be positioned or protected such that in normal use appropriate protection is provided for persons against accidents, in accordance with the requirements of EN 60335-2-6:2003.

5.2.12 Accumulation of un-burnt gas

5.2.12.1 Accumulation of un-burnt gas in indoor spaces

AC3 The appliance shall incorporate means that automatically shuts off the gas supply to the burner(s) to prevent a dangerous accumulation of un-ignited gas in the space where the appliance is installed as a result of inadvertent release of un-ignited gas from one or more of its burners. **AC3**

Where compliance with this requirement is met by provision of flame supervision devices, these devices shall comply with the requirements of 5.2.6 and 5.2.12.2.2.

Where an alternative(s) to flame supervision devices is used, compliance with the requirement is deemed to be met where it is assessed that the alternative provides an equivalent level of safety to that provided by flame supervision devices that comply with the requirements of 5.2.6 and 5.2.12.2.2.

NOTE A re-ignition device without proof of ignition is not considered acceptable.

5.2.12.2 Accumulation of un-burnt gas within the appliance

5.2.12.2.1 General

Any appliance shall be so constructed that gas release during ignition and re-ignition and after flame extinction is sufficiently limited in order to avoid a dangerous accumulation of un-burnt gas within the appliance.

This requirement is deemed to be satisfied if the requirements of 5.2.12.2.2 to 5.2.12.2.4 are met.

5.2.12.2.2 Requirements concerning flame supervision devices

The flame supervision device shall be of one of the following types:

5.2.12.2.2.1 Either a device which controls all of the gas supply to the burner and the pilot, if it exists, **AC** but which requires continuous manual intervention for a short period (see 6.1.3) in order to open the gas supply during ignition. **AC**

5.2.12.2.2.2 **AC** Or a device which partially controls the gas supply to the burner and the pilot, if it exists, but does not require continuous manual intervention for the purpose of ignition. The heat input that is not controlled by this device shall not exceed 0,6 kW. **AC**

5.2.12.2.3 Safety of ignition

5.2.12.2.3.1 **AC** Where the burner is fitted with a flame supervision device of the type described in 5.2.12.2.2.1, the manufacturer's instructions for ignition of that burner shall include a statement with the substance of the following wording: "The device shall not be operated for more than 15 s. If after 15 s the burner has not lit, stop operating the device and open the compartment door and/or wait at least 1 min before attempting a further ignition of the burner." **AC**

This requirement does not apply in the following circumstances:

- if the burner, situated in an oven or grill, can only be ignited with the compartment door open;
- if the ignition heat input is, by design and construction, lower than or equal to 0,06 kW.

5.2.12.2.3.2 Where the burner is fitted with a flame supervision device of the type described in 5.2.12.2.2.2, it **AC** shall be verified under the conditions given in 7.2.3, that ignition of any accumulation of un-burnt gas, if this is possible, does not affect safety. **AC**

5.2.12.2.4 Safety of re-ignition and after flame extinction

Where the burner is not fitted with an automatic re-ignition device, the instructions for use and maintenance shall include the following in the ignition instructions for the burner:

Ⓐ "In the event of the burner flames being accidentally extinguished, turn off the burner control and do not attempt to re-ignite the burner for at least 1 min." Ⓐ

5.2.13 Food hygiene in time controlled ovens

For time controlled ovens with delayed ignition for which the pilot stays alight during the waiting period, the temperature rise at equilibrium shall not exceed the ambient temperature by more than 4 K under the conditions of 7.2.5.

5.3 Additional requirements for appliances having one or more burners that are capable of remote operation

5.3.1 Application

The appliance shall not incorporate an oven that is capable of remote control unless the oven burner is thermostatically controlled and the oven is a time-controlled oven designed for delayed start.

If an oven is capable of remote operation, the appliance shall comply the requirements given in 5.3.2 and, depending on whether the remote operation is type 1 or type 2 (see 3.5.15 and 3.5.16), the requirements given in 5.3.3 or 5.3.4.

5.3.2 General

The appliance shall be so designed and arranged that remote operation of the burner or burners may only be achieved after the user has set the appliance for remote operation. When the burner or burners are set for remote operation this condition shall be indicated visually.

Each burner that is capable of remote operation shall be provided with a direct acting manually operated control that enables the burner to be used safely in accordance with the manufacturer's instructions when remote operation is not in use. The appliance shall be so designed and arranged that it is always possible for the user to utilise these manual operated controls to override remote operation of the burner or burners.

Direct-acting manually operated controls shall comply with 5.2.1 and 5.2.2.

When the appliance, and any hand-held control supplied for type 2 remote operation, are tested in accordance with all the tests described in 19.11.4 of EN 60335-2-102:2006, it shall be verified that:

- the burner or burners are not put into operation when in the stand-by mode and that any gas valves supplying these burners remain closed;
- the burner or burners are not put into operation when the burner control system is in non-volatile lock-out and that any gas valves supplying these burners remain closed;
- the burner or burners, when in remote operation, continue to operate safely or the burner(s) are shut off by the burner control system.

5.3.3 Remote operation (type 1)

The appliance signal receiver/control system shall be provided with a unique recognition code or address and, possibly, a password that has to be signalled to the appliance by the user in order to initiate remote operation.

Where a password is utilised this may be changed by the user but only after the existing password has been entered and recognised by the appliance control system.

The appliance signal receiver/control system shall be so designed that the duration of any remote operation cycle is required to be set before the burner or burners can be operated, unless the burner or burners shut off automatically at the end of a cycle or continuous operation of the burner or burners is not hazardous.

The appliance signal receiver/control system shall be designed so as to enable the user, when signalling the appliance remotely:

- to shut off any burner which can be operated remotely and
- to cancel any remote operating programme.

5.3.4 Remote operation (type 2)

The appliance shall be supplied with the separate hand-operated control for remote operation of the burner or burners.

The separate hand-operated control shall be designed and/or programmed by the manufacturer so as to minimise the risk of its signals operating another appliance.

The appliance signal receiver shall be designed and/or programmed by the manufacturer so as to minimise the risk of the appliance being operated by the hand-held controls for other appliances.

The separate hand-held control shall be so designed that operation of the appliance by means of this control is only possible when the appliance is directly visible to an operator of the control who is present in the same room as the appliance.

The separate hand-held control shall be so designed that:

- at least two distinct manual actions are required to start the operation of any burner (e.g. activation of two different buttons) and
- the burner or burners can be shut off quickly by means of a single action if necessary.

6 Performance requirements

6.1 General

6.1.1 Soundness

Under the test conditions in 7.3.1.1, any leak detected during each of the tests shall not exceed $0,10 \text{ dm}^3/\text{h}$.

6.1.2 Obtaining the input rates

6.1.2.1 Obtaining the nominal heat input

Under the test conditions in 7.3.1.2.1, each of the burners, supplied separately, shall be capable of giving the nominal heat input stated by the manufacturer.

This requirement is deemed to be satisfied if:

- for burners not equipped with gas rate adjusters and
- for burners equipped with gas rate adjusters, but only to check the manufacturer's adjustment instructions in accordance with 7.3.1.2.1.2 test n° 3;

the variation between the heat input obtained with each of the gases indicated in 7.3.1.2.1.2 and the nominal heat input Q_n is within the limits indicated below:

- if the nominal heat input Q_n of the burner does not exceed 2,25 kW, the tolerance shall be $\pm 8 \%$;
- if the nominal heat input Q_n of the burner exceeds 2,25 kW and does not exceed 3,6 kW, the tolerance shall be $\pm 0,177$ kW;
- if the nominal heat input Q_n of the burner exceeds 3,6 kW, the tolerance shall be $\pm 5 \%$;
- the tolerance is extended to $\pm 10 \%$ for burners fitted with injectors with a diameter more than 0,3 mm but not exceeding 0,5 mm.
- the tolerance is extended to $\pm 20 \%$ for burners fitted with injectors with a diameter not exceeding 0,3 mm.

If an appliance can function with several gas families, the nominal heat input of the burner is not required to be identical for all the gas families, however:

- the variation of the nominal heat input between the two gas families shall not exceed 10 %;
- if the variation of the nominal heat input between two gas families is less than 3 %, the data plate shall only give the lower value of the nominal heat input, but the documents supplied to the laboratory shall specify the values for each of the gas families;
- if the variation in the nominal heat input of the various gas families is between 3 % and 10 %, the data plate and the instructions shall include the respective values.

For appliances with gas rate adjusters, the heat input shall be at least equal to the nominal heat input when measured under the conditions stated in 7.3.1.2.1.2, test no. 1 and at most equal to the nominal heat input when measured under the conditions stated in 7.3.1.2.1.2 test no. 2.

6.1.2.2 Obtaining the reduced heat input

Under the test conditions in 7.3.1.2.2, the reduced heat input, if any, declared by the manufacturer in the technical instructions for each of the burners shall not be exceeded.

The reduced rates shall either be fixed (by calibrated orifice) or adjustable according to the appliance category and the gas group used as given in 5.1.1 and 5.2.3.

6.1.3 Flame supervision devices

Under the test conditions described in 7.3.1.3, the opening time shall be equal to or less than 10 s for hotplate burners and equal to or less than 15 s for oven and grill burners where there is continuous manual intervention by the user; if there is no continuous manual intervention, the opening time may be increased to 60 s.

The extinction delay time shall be less than 60 s where the burner is situated in a compartment and less than 90 s in the case of an open burner or a covered burner or under a griddle as defined in 5.2.8.2.2.

If a burner is protected by a flame supervision device having a pilot, then, under the test conditions in 7.3.1.3.2, the ignition or re-ignition shall remain satisfactory or the supply of gas controlled by the device shall be shut off in the event of blockage of the port which supplies the ignition flame or of any other part of the ignition device leading to shortening or distortion of the flame.

6.1.4 Safety of operation

6.1.4.1 Resistance to overheating

After the tests in 7.3.1.4.1, the burners shall show no deterioration likely to jeopardize performance.

6.1.4.2 Escape of un-burnt gas

6.1.4.2.1 Soundness of burner parts

When a burner, having a body made up of several parts, operates under the test conditions in 7.3.1.4.2.1, there shall be no leakage of any flammable quantity of air/gas mixture at the joints of the assembly.

6.1.4.2.2 Spillage of un-burnt gas

When a burner operates under the test conditions in 7.3.1.4.2.2, there shall be no hazardous accumulation of un-burnt gas within the body of the appliance.

6.1.4.3 Safety of operation at reduced pressure

Appliance supplied with gases of the 2nd family of groups H and E shall operate safely at a reduced pressure of 70 % of the normal test pressure, i.e. 14 mbar.

This requirement is complied with if, under the test conditions in 7.3.1.4.3, the flame of the burner concerned is not extinguished, or if the gas supply under the control of the flame supervision device is shut-off.

6.1.5 Heating

6.1.5.1 Heating of the various parts of the appliance

6.1.5.1.1 Front and sides

6.1.5.1.1.1 General

Under the test conditions in 7.3.1.5.2.3, test no.1a, the temperature of those parts of the front and sides of the appliance which can be touched accidentally shall not exceed the ambient temperature by more than:

- metal and painted metal	60 K;
- enamelled metal	65 K;
- glass and ceramics	80 K;
- plastic	100 K.

The temperature rise limit of 100 K also applies to plastic materials having a metal finish of thickness less than 0,1 mm.

NOTE When the thickness of the plastic coating does not exceed 0,3 mm, the temperature rise limits of the supporting material apply.

These requirements shall not apply to those parts of the front or sides:

- which are not accessible to a test probe 75 mm in diameter having a hemispherical end, or
- which, on appliances having a hotplate, are less than 25 mm below the level of the hotplate, excluding the pan supports, or which are above the hotplate, or

- which are of small dimension, such as vents for ventilation or for evacuation of products of combustion, hinges and trims of which the width of the accessible surface is less than 10 mm, or
- which are less than 10 mm from outlet vents intended for the evacuation of products of combustion, or
- which are within 10 mm of the gap between the oven door and its mating surface.

6.1.5.1.1.2 Front of the oven door and any protective means

Under the test conditions in 7.3.1.5.2.3, test no. 1b, the temperature rises of those parts of the front surface of the protective means (see 8.3.3) and on the front surface of the oven door which can be touched accidentally shall not exceed:

- metal and painted metal: 45 K
- enamelled metal: 50 K
- glass and ceramics: 60 K
- plastic having a thickness exceeding 0,3 mm: 80 K.

The temperature rise limit of 80 K also applies to plastic materials having a metal finish of thickness less than 0,1 mm.

NOTE When the thickness of the plastic coating does not exceed 0,3 mm, the temperature rise limits of the supporting material apply.

These requirements shall not apply to ovens intended to be used on a worktop.

These requirements shall not apply to those parts on the front surface of the protective means or on the front surface of the oven door:

- which are not accessible to a test probe 75 mm in diameter having a hemispherical end, or
- which are situated more than 850 mm above the floor when an appliance of class 3 is installed according to the manufacturer's instructions, or
- which are situated within 10 mm of the edges of the door.

NOTE The additional protective means may be an alternative door.

6.1.5.1.2 Independent class 3 hotplates

If, when installed in accordance with the technical instructions, the base of the independent class 3 hotplate is not protected from contact by a horizontal partition or plate, the surface temperature of the base, or of any easily accessible part of the base, shall not exceed the ambient temperature by more than 100 K when measured under the conditions of 7.3.1.5.2.3, test no. 3.

6.1.5.1.3 Surfaces in contact with the flexible tube

In the case where the appliance may be connected by means of a flexible tube that is not entirely metallic, the temperatures of the surfaces of the appliance that are likely to come into contact with the tube, when this is installed and connected according to the technical instructions, shall not exceed the ambient temperature by more than 70 K under the following test conditions:

- for all appliances, those of 7.3.1.5.2.3 tests no. 2 and 3;

- in addition for an appliance with an oven having a special thermostat adjustment position for cleaning, those of 7.3.1.5.2.3 test no. 4.

6.1.5.1.4 Push-on connector

If the end of the appliance supply tubing can be fitted with a push-on connector in accordance with the national situations indicated in Table A.6, this push-on connector shall be located such that its temperature does not exceed the ambient temperature by more than 30 K under the following conditions:

- for all appliances, those of 7.3.1.5.2.3, tests no. 2 and 3;
- in addition, for appliances with ovens having a particular thermostat setting for cleaning, that of 7.3.1.5.2.3, test no. 4.

6.1.5.1.5 Auxiliary equipment

The temperature of auxiliary equipment, the failure of which can affect the safety of operation of the gas part of the appliance, shall not exceed the maximum temperature specified by the equipment manufacturer when measured under the following conditions:

- for all appliances, those of 7.3.1.5.2.3 tests no. 2 and 3;
- for an appliance with an oven without a special thermostat adjustment position for cleaning, those of 7.3.1.5.2.3 test no. 5;
- for appliances with an oven having a special thermostat adjustment position for cleaning, whichever of the following is more severe:
 - 7.3.1.5.2.3 test no. 4, or
 - 7.3.1.5.2.3 test no. 5.

6.1.5.1.6 Handles and touchable parts

Under the conditions of 7.3.1.5.2.3, tests no. 2 and 3, the temperature rises above the ambient temperature of parts, other than oven and grill accessories, intended to be manipulated in normal use, measured only in the contact zones, shall not exceed the following limits:

metal and painted metal:	35 K;
glass and ceramic:	45 K;
plastic:	60 K.

In addition, the above temperature limits shall not be exceeded by such contact zones in the following particular circumstances:

- under the conditions of 7.3.1.5.2.3, test no. 4, when an appliance, with a special thermostat adjustment position for cleaning is operated for cleaning purposes in accordance with the instructions for use and maintenance and simultaneous operation of hotplate cooking elements is not forbidden;
- under the conditions of 7.3.1.5.2.3, test no. 6⁴⁾, when, in accordance with the technical instructions, an appliance of class 1, that can also be installed between two furniture units, or an appliance of class 2, subclass 1, that can be installed freestanding, has a grill which operates with the door open;

4) For these requirements, appliances having a grill which operates with the door open are tested with the appliance freestanding, if this method of installation is permitted by the manufacturer's instructions. This is because installation of the

- c) under the conditions of 7.3.1.5.2.3, test no. 3 for parts of handles likely to be operated in normal use, when the appliance is equipped with a grill for which the grill pan has one or more handles. This requirement shall not apply to detachable grill pan handles if the manufacturer's instructions for use and maintenance warn that such handles are not left attached to the grill pan while the appliance is in use.

6.1.5.1.7 Temperatures rise in the neighbourhood of handles

If the appliance has any openings at the front for the evacuation of products of combustion or cooling air, the air temperature at a distance of 100 mm in front of the openings as well as in the normal approach zone of the appliance handles shall not exceed the ambient temperature by more than 30 K under the following conditions.

- 7.3.1.5.2.3, test no. 3 for all appliances;
- 7.3.1.5.2.3, test no. 4, when an appliance has an oven with special thermostat adjustment position for cleaning, which is operated for cleaning purposes in accordance with the instructions for use and maintenance and simultaneous operation of hotplate cooking elements is not forbidden;
- 7.3.1.5.2.3, test no. 6⁵⁾, when, in accordance with the instructions, an appliance of class 1, that can also be installed between two furniture units, or an appliance of class 2 sub-class 1, that can be installed freestanding, has a grill that operates with the door open.

6.1.5.2 Temperature of the support, walls, adjacent surfaces and building-in cabinets

The temperature of the support on which the appliance is placed, the panels situated near the appliance and, for class 2 and class 3 appliances, the walls of the building-in cabinet, including that part of the cabinet situated above the front of an oven, shall not exceed the ambient temperature by more than 65 K under the following conditions:

- for all appliances, those of 7.3.1.5.2.3, tests no. 2 and 3;
- in addition for appliances with an oven having a special thermostat setting for cleaning, those of 7.3.1.5.2.3 test no. 4.

6.1.6 Temperature of the LPG cylinder and its compartment

6.1.6.1 Temperature of the walls of the compartment

Under the test conditions in 7.3.1.6, the temperature rise above ambient of the compartment walls shall not exceed 30 K at any point that is likely to come into contact with:

- a) the flexible tube, taking into account the maximum length specified in the technical instructions, or
- b) the gas cylinder.

appliance between furniture units can increase the thermal draught at the back of the appliance and decrease the heat emitted from the front of the grill compartment. Test no. 6 applies to those appliances which, although capable of being installed freestanding, are required to be installed between two furniture units in the other tests given in AC 7.3.1.5.2.3 AC.

5) For these requirements, appliances having a grill which operates with the door open are tested with the appliance freestanding, if this method of installation is permitted by the manufacturer's instructions. This is because installation of the appliance between furniture units can increase the thermal draught at the back of the appliance and decrease the heat emitted from the front of the grill compartment. Test no. 6 applies to those appliances which, although capable of being installed freestanding, are required to be installed between two furniture units in the other tests given in AC 7.3.1.5.2.3 AC.

6.1.6.2 Temperature of the LPG cylinder

The compartment shall be such that, under the test conditions in 7.3.1.6, when the cylinder is in the compartment, there is no overheating that will produce an increase of vapor pressure within the cylinder greater than that defined in Table 5.

Table 5 — Maximum pressure increase inside the LPG cylinder

Ambient temperature °C	Maximum permitted pressure increase bar ^a
10	0,35
15	0,40
20	0,45
25	0,50
30	0,55
35	0,60
40	0,65

^a This increase corresponds to a temperature rise of 5 K starting from the appropriate ambient temperature.

6.1.7 Total input of the appliance

Under the test conditions in 7.3.1.7, the total input of the appliance, all the taps being in the fully open position, shall not be more than 10 % less than the sum of the individual inputs of the different burners supplied separately under the same conditions.

6.1.8 Regulator performance

An appliance fitted with an operating gas regulator is checked to ensure that, under the conditions in 7.3.1.8, the gas-rate does not vary by more than $\pm 7,5$ % of the rate obtained at the normal test pressure.

6.1.9 Appliances with a cooling fan

Where an appliance has a cooling fan, the requirements regarding the operation of the burner or burners are verified under the operating conditions for which the fan is designed.

In addition, in all cases in which operation of the burner may require the operation of the fan, the appliance shall meet the requirements described in 6.1.9.1, 6.1.9.2 or 6.1.9.3 as appropriate.

6.1.9.1 The following requirements are applicable to appliances fitted with a safety device which, in the event of a fault in the operation of the fan, automatically interrupts the supply of gas to the burner(s), so that the maximum temperature rise of the supports, walls and adjacent surfaces does not exceed 80 K; a temperature rise of 65 K may only be exceeded for a limited period of time.

6.1.9.1.1 The action of this safety device shall be such that once the gas supply to the burner has been interrupted, it can only be re-established following a manual intervention.

6.1.9.1.2 The requirements of 6.1.5.1.5 and 6.1.5.2 shall be satisfied when the fan is stopped 5 min before the end of the test period specified in the following clauses and these tests are continued up to 10 min after automatic interruption of supply to the burner(s), under the following test conditions:

— for all appliances, those of 7.3.1.5.2.3, tests no. 2 and 3;

- for appliances with an oven having a special thermostat setting for cleaning, those of 7.3.1.5.2.3 test no. 4.

For the purposes of these tests, the fan shall be stopped by preventing its rotation by a means which does not interfere with nor cause premature operation of the safety device which automatically cuts off the gas supply to the burner(s) in the case of a fault with the fan.

The maximum temperatures reached during the tests are used as a basis for verifying the requirements of 6.1.5.1.5.

It is also verified that the maximum temperatures of the support, walls and adjacent walls do not exceed ambient temperature by more than 80 K during the tests and the requirements of 6.1.5.2 at the end of the test.

6.1.9.2 The following requirements are applicable to appliances fitted with a safety device which, in the event of a fault in the operation of the fan, automatically reduces the heat input of the burner(s), so that the maximum temperature rise of the support, walls and adjacent surfaces does not exceed 80 K; a temperature rise of 65 K may only be exceeded for a limited period of time.

6.1.9.2.1 The action of a safety device shall be such that a manual intervention is required, once the heat input of the burner or burners has been reduced, in order to re-establish the nominal heat input.

6.1.9.2.2 The requirements of 6.1.5.1.5 and 6.1.5.2 shall be satisfied when the fan is stopped 5 min before the end of the test period specified in the following clauses and these tests are continued up to 10 min after the automatic reduction of the heat input of the burner(s), under the following test conditions:

- for all appliances, those of 7.3.1.5.2.3, tests no. 2 and 3;
- for appliances with an oven having a special thermostat setting for cleaning, those of 7.3.1.5.2.3, test no. 4.

For the purposes of these tests, the fan shall be stopped by preventing its rotation by a means which does not interfere with nor cause premature operation of the safety device which automatically reduces the heat input of the burner(s) in the event of a fault with the fan.

The maximum temperatures reached during the tests are used as a basis for verifying the requirements of 6.1.5.1.5.

It also verified that the maximum temperatures of the support, walls and adjacent partitions do not exceed ambient temperature by more than 80 K during the tests, and the requirements of 6.1.5.2 at the end of the tests.

6.1.9.2.3 In addition, after the automatic reduction of the heat input of the burner(s), the requirements of 6.3.1 and 6.3.2 shall be satisfied when the burners controlled by the device are tested under the conditions of 7.3.3.1, 7.3.3.2.2 and 7.3.3.2.3 that require the use of a reference gas.

6.1.9.3 The following requirements are applicable to appliances for which the supports, walls and adjacent surfaces undergo, in the event of a fault in the fan, a maximum temperature rise exceeding 80 K.

6.1.9.3.1 The appliance shall have either a fan fault indicator, or an automatic burner cut-out device.

- a) Where the appliance is fitted with a fan fault indicator, this indicator shall be designed and constructed in such a way that it indicates a fault in the fan when the appliance is subjected to the tests stated in 6.1.9.3.2.

The fan fault indicator, once activated, shall continue to give the indication corresponding to the fan fault in all circumstances in which the fan should normally operate. Cancellation of this fault indication shall be possible only following the use of a tool.

The indicator shall be installed in such a way that the fault indication is obvious for the user standing in front of the appliance. In addition, the installation and maintenance instructions shall include all necessary information regarding the indicator and the steps to be taken in the event of a fault in the fan.

- b) Where the appliance is fitted with an automatic burner cut-out device, this device shall be designed and constructed in such a way that it interrupts the supply to the burner or burners, with which the fan shall normally operate, when the appliance is subjected to the tests mentioned in 6.1.9.3.2.

Once the supply has been interrupted, the burners shall be unable to operate before the appliance has been repaired. This repair shall only be possible after the use of a tool giving access to the parts to be reset, repaired or replaced.

6.1.9.3.2 The requirements of 6.1.5.1.3 and 6.1.5.1.4 shall be complied with, and also the requirements of 6.1.5.2, but allowing a temperature rise limit of 120 K in place of the one stated, when the appliance is used with the fan stopped under the following conditions:

- for all appliances, those of 7.3.1.5.2.3, tests no. 2 and 3;
- for appliances with an oven having a special thermostat setting for cleaning, those of 7.3.1.5.2.3, test no. 4.

For the purposes of these tests, the fan shall be stopped by preventing its rotation by a means which does not interfere with nor cause premature operation of the safety device which automatically cuts off the gas supply to the burner(s) in the case of a fault with the fan nor interfere with the operation of the fault indicator.

- If the appliance is fitted with a device which cuts the supply to the burner(s) in the event of a fault in the fan, the fan is stopped 5 min before the end of the specified test period and these tests are continued for 10 min after automatic cut-off of the supply to the burner(s);
- if the appliance is not fitted with such a device, the fan is stopped from the start of the test.

The maximum temperatures reached during these tests are used as a basis for verifying the requirements of 6.1.5.1.3 and 6.1.5.1.4, and the 120 K limit for the supports, walls and adjacent surfaces. At the end of each test, it is verified that the fan fault indicator or the cut-off device has operated.

6.1.9.3.3 The requirements of 6.1.5.1.5 shall be met when the appliance is tested, with the fan stopped, under the following conditions:

AC

- for an appliance with an oven not having a special thermostat setting for cleaning, those of 7.3.1.5.2.3, test no. 5;
- for an appliance with an oven having a special thermostat setting for cleaning, the more severe of the two following conditions: **AC**
 - 7.3.1.5.2.3, test no. 4, or
 - 7.3.1.5.2.3, test no. 5.

For the purposes of these tests, the fan shall be stopped by preventing its rotation by a means which does not interfere with nor cause premature operation of the safety device which automatically cuts off the gas supply to the burner(s) in the case of a fault with the fan.

- If the appliance is fitted with a device which cuts the supply to the burner(s) in the event of a fault in the fan, the fan is stopped 5 min before the end of the specified test period and these tests are continued for 10 min after automatic cut-off of the supply to the burner(s);

— if the appliance is not fitted with such a device, the fan is stopped from the start of the test.

The maximum temperatures reached during these tests are used as a basis for verifying the requirements of 6.1.5.1.5.

6.1.9.3.4 The requirements of 6.3.1 and 6.3.2 shall be satisfied with the fan stopped.

When the burners with which the cooling fan normally operates are tested under the conditions of 7.3.3.1, 7.3.3.2.2 and 7.3.3.2.3, only the reference gases are used.

6.1.10 Safety in the event of failure of the oven thermostat

Appliances having ovens with thermostats complying with EN 257:1992 or with thermostats incorporated in multifunctional controls complying with $\overline{\text{AC}}$ EN 126:2004 $\overline{\text{AC}}$ shall comply with the requirements of 6.1.10.1 or 6.1.10.2.

Appliances having ovens with other thermostats shall comply with the requirements of 6.1.10.2.

6.1.10.1 The requirements of 6.1.5.2 shall be satisfied under whichever of the following test conditions are the most severe:

- for an oven without a special thermostat position for cleaning, those of 7.3.1.5.2.3, test no. 5⁶⁾;
- for an oven having a special thermostat position for cleaning, whichever of the following is more severe:
 - 7.3.1.5.2.3, test no. 4, or
 - 7.3.1.5.2.3, test no. 5;
- those of 7.3.1.5.2.3 test no. 5⁷⁾, but with the oven thermostat out of action and the oven temperature controlled independently to give a maximum temperature during the test of (250_0^{+4}) °C at the centre of the oven.

If the most severe condition is that with the thermostat out of action, it shall be verified that the requirements of 6.1.5.1.5 are met under the same test conditions.

6.1.10.2 The appliance shall meet the requirements described in 6.1.10.2.1, 6.1.10.2.2 or 6.1.10.2.3 as appropriate.

6.1.10.2.1 The requirements of 6.1.5.1.5 and 6.1.5.2 shall be satisfied under the test conditions of 7.3.1.5.2.3 test no. 5⁸⁾, but with the oven thermostat put out of action.

6.1.10.2.2 The following requirements are applicable to appliances fitted with a safety device which, in the event of failure of the oven thermostat, automatically shuts off the gas supply to the burners, so that the maximum temperature rise of the supports, walls and adjacent surfaces does not exceed 80 K.

The action of the safety device shall be such that once the gas supply to the burner has been interrupted, it can only be re-established following manual intervention.

6) For this test a tolerance of 10 K above the requirements of 6.1.5.2 is allowed.

7) For this test a tolerance of 10 K above the requirements of 6.1.5.2 is allowed.

8)9) For this test a tolerance of 10 K above the requirements of 6.1.5.2 is allowed.

The requirements of 6.1.5.1.5 shall be satisfied under the conditions of 7.3.1.5.2.3, test no. 5⁹⁾, but with the oven thermostat put out of action.

The maximum temperatures reached during the test are used as a basis for verifying the requirements of 6.1.5.1.5.

It is also verified that the maximum temperatures of the support, walls and adjacent surfaces do not exceed the ambient temperature by more than 80 K during the test, and the requirements of 6.1.5.2 at the end of the test.

6.1.10.2.3 The following requirements are applicable to appliances for which the maximum temperature rise of the support, walls and adjacent surfaces exceeds 80 K in the event of oven thermostat failure.

6.1.10.2.3.1  The appliance shall incorporate either a thermostat fault indicator or an automatic burner shut off device. 

- a) For an appliance fitted with a thermostat fault indicator, this indicator shall be so designed and arranged that it indicates an oven thermostat fault when the appliance is tested under the conditions given in 6.1.10.2.3.2.



When the thermostat fault indicator has been activated, it shall continue to indicate the existence of an oven thermostat fault whenever the oven is required to operate.

Cancellation of this fault indication shall only be possible after the use of tools to gain access to the parts which require replacement or re-setting.

The indicator shall be so positioned that it is obvious to the user standing in front of the appliance when the thermostat fault is being indicated. In addition, the instructions for use and maintenance shall include all necessary information on the purpose of the indicator and the action to be taken in the event of a thermostat fault.

- b) For an appliance fitted with an automatic burner shut-off device, the device shall be so designed and arranged that it shuts off the burner, when the appliance is tested under the conditions given in 6.1.10.2.3.2.

Following shut off, further operation of the burner shall not be possible until the appliance has been repaired. This repair shall only be possible after the use of tools to gain access to parts which require replacement or re-setting.

6.1.10.2.3.2  The requirements of 6.1.5.1.3, 6.1.5.1.4 and 6.1.5.1.5 as well as the requirements of 6.1.5.2, (but allowing a temperature rise limit of 120 K instead of that specified), shall be satisfied when the appliance is tested under the following conditions: 

— those of 7.3.1.5.2.3, test no. 5, but with the oven thermostat out of action.

The maximum temperatures achieved during the test are used as a basis for verification of the requirements of 6.1.5.1.3, 6.1.5.1.4, 6.1.5.1.5 and the 120 K limit for the support, walls and adjacent surfaces. At the end of the test it is verified that any thermostat indicator or burner shut-off device has been activated.

6.2 Special requirements for hotplates

6.2.1 Ignition, cross-lighting and flame stability

6.2.1.1 All hotplate burners except multi-ring hotplate burners

When the hotplate burners are ignited under the conditions of 7.3.2.1, ignition and cross-lighting shall occur smoothly within 5 s of turning the burner control to the full-on position or the ignition position if it exists.

After ignition under these conditions, the flames shall be stable and quiet. A slight tendency to flame lift is permitted on ignition but flames shall be stable 60 s after ignition.

When the burner taps are turned to their reduced rate positions under the test conditions in 7.3.2.1, the hotplate burner flames shall not light back and neither shall they be extinguished.

When the oven door or the cupboard (if any) are opened and closed under the test conditions in 7.3.2.1, the hotplate burner flames shall not light back and neither shall they be extinguished.

However, if there is a permanent ignition device or an automatic re-ignition device, extinction is allowed if normal operation returns without any manual intervention 5 s after the movement of the door ceases.

6.2.1.2 Multi-ring hotplate burners

When the appliance incorporates a multi-ring hotplate burner for which each ring of burner ports is controlled independently by a means of a separate tap or control, the requirements of 6.2.1.1 shall be met with each ring of burner ports being operated as if it were a separate burner.

When the appliance incorporates a multi-ring hotplate burner that is controlled by a single tap or control, the requirements of 6.2.1.1 shall be met with this burner operating as described for other hotplate burners. In addition, if such a burner is a multi-ring hotplate burner with sectional control it shall be verified under the conditions of 7.3.2.1.4 that when the gas rate supplied to the supervised ring of burner ports is reduced to the rate corresponding to that obtained when the tap or control is set to its lowest marked position, ignition and cross-lighting at any unsupervised ring of burner ports occurs smoothly within 5 s of turning on the gas supply to that ring of burner ports by means of the burner control.

For multi-ring hotplate burners with simple control it shall be verified under the conditions described in 7.3.2.1.4 that when its tap or control set to the lowest marked position for which ignition of the supervised ring of burner ports is possible, ignition and cross-lighting at any unsupervised ring of burner ports occurs smoothly within 5 s of ignition at the supervised ring of burner ports.

Uncovered multi-ring hotplate burners equipped with a single flame supervision device shall not be extinguished under the test conditions given in 7.3.2.2 and 7.3.2.3 unless the extinction of the burner is complete and the gas supply to the burner is shut off under the control of its flame supervision device.

6.2.2 Combustion

Under the conditions in 7.3.2.4.1, the volume content of the CO in the air- and water-free products of combustion shall not exceed:

- 0,10 % for test no. 1;
- 0,15 % for tests no. 2, 3 and if applicable test no. 6;
- 0,20 % for test no. 4 and if applicable test no. 5.

In addition, when the appliance has a mains electrical supply, and fluctuation of the supply can affect the operation, ignition and/or the combustion, it shall be verified under the conditions described in 7.3.2.4.1, test no. 5, that each hotplate burner ignites and continues to function during the test.

Moreover, under the test conditions described in 7.3.2.4.4, where the hotplate burners are supplied individually with the limit sooting gas, yellow tipping is permitted if it does not result in a soot deposit 10 min after a test vessel has been placed over the burner.

6.3 Special requirements for ovens and grills

6.3.1 Ignition, cross-lighting and flame stability

6.3.1.1 Oven

When an oven is ignited in a still atmosphere under the test conditions in 7.3.3.1.2, 7.3.3.1.3 and, where applicable 7.3.3.1.9, ignition and cross-lighting shall occur smoothly within 5 s of turning the burner control to the full on position, or the ignition position if it exists.

Following ignition under these conditions, the flames shall be stable and quiet. A slight tendency for the flames to lift at the moment of ignition is allowed, but they shall be stable 60 s after ignition.

When the oven control is turned to the minimum position under the conditions in 7.3.3.1.4, the oven burner flames shall not light back and neither shall they be extinguished.

When the oven door and, where applicable, the cupboard door(s) are opened and closed under the test conditions in 7.3.3.1.5 and 7.3.3.1.6, the oven burner flames shall not light back and neither shall they be extinguished.

However, if there is a permanent ignition device or an automatic re-ignition device, extinction is allowed if normal operation returns without any manual intervention 5 s after the movement of the door ceases.

If an appliance with an oven is capable of being installed between two cabinets or built into a unit then under the test conditions in 7.3.3.1.10, the oven burner flames shall not light back and neither shall they be extinguished. However, if there is a permanent ignition device or an automatic re-ignition device, extinction is allowed if normal operation returns without any manual intervention when the movement of the door ceases. In addition, when the oven control settings are altered during the tests, the flames shall not be disturbed in a way which would damage the appliance or risk compromising its safety of operation.

6.3.1.2 Grill

When a grill is ignited in a still atmosphere under the test conditions in 7.3.3.1.2, 7.3.3.1.3 and where applicable in 7.3.3.1.7, 7.3.3.1.8 and 7.3.3.1.9, ignition and cross-lighting shall occur smoothly within 5 s of the burner control being in the maximum position or in the ignition position, if there is one.

Under the test conditions in 7.3.3.1.2, 7.3.3.1.3, 7.3.3.1.7 and 7.3.3.1.9, the flames shall be stable and quiet. A slight tendency for the flames to lift at the moment of ignition is allowed, but they shall be stable 60 s after ignition.

When the grill control is turned to the reduced rate position, if this exists, under the test conditions in 7.3.3.1.4, the grill burner flames shall not light back and neither shall they be extinguished.

Under the test conditions in 7.3.3.1.8, there shall be no excessive flame instability in evidence.

In particular, the flames shall on no account extend outside the roof of the grill, but a certain amount of flame movement and elongation is acceptable.

6.3.2 Combustion

When the ovens and grills are operating individually with a reference gas, under the conditions in 7.3.3.2.3, the CO content of air and water vapor free products of combustion shall not exceed 0,10 % by volume, 15 min after ignition.

When the appliance is supplied under the same conditions with the incomplete combustion gas specified in 7.1.1, the CO content shall not exceed 0,20 % by volume 15 min after ignition.

If, for an appliance having a mains electrical supply, fluctuation of this supply can affect the operation, ignition and/or the combustion, then under the conditions of 7.3.3.2.4, when ovens and grills are operated individually, the CO content of the air and water vapor free products of combustion shall not exceed 0,20 %, by volume, 15 min after ignition. Under the same conditions it shall be verified that each oven and grill burner ignites and continues to function during the test.

When a grill is tested under the conditions in 7.3.3.2.6, the CO content shall not exceed 0,10 %, by volume after 15 min previous operation at the nominal heat input.

When a high level grill is situated so that it might be affected by the operation of the hotplate or oven burners, the CO content of the air and water vapor free products of combustion shall not exceed 0,20 %, by volume when tested under the conditions of 7.3.3.2.7.

A1) When a grill, which is designed to be used only with the compartment door open can be operated with its compartment door closed, is tested with its compartment door closed under the conditions of 7.3.3.2.8, the maximum CO content of the air- and water vapour-free products of combustion shall not exceed 0,20 % by volume.

NOTE This requirement is met if, 15 min after closure of the door under each of the test conditions given in 7.3.3.2.8, the grill burner gas supply has been shut-off. **A1)**

7 Test methods¹⁰⁾

7.1 General

7.1.1 Reference and test gases

7.1.1.1 Characteristics of the test gases

The burners are tested with the gases indicated in Table 6 according to the category of the appliance (see 4.2).

10) This clause describes the methods of test which enable the requirements of Clauses 5 and 6 to be verified.

Table 6 — Test gases corresponding to the categories of appliances ^{a b}

Category	Reference gas	Incomplete combustion limit gas	Light back limit gas	Flame lift limit gas	Sooting limit gas
I ₂ H	G 20	G 21	G 222	G 23	G 21
I ₂ L	G 25	G 26	G 25	G 27	G 26
I ₂ E, I ₂ E+	G 20	G 21	G 222	G 231	G 21
I ₃ B/P, I ₃ +	G 30	G 30	G 32	G 31	G 30
I ₃ P	G 31	G 31	G 32	G 31	G 31, G 32
II _{1a2} H	G 110, G 20	G 21	G 112	G 23	G 21
II ₂ H3B/P, II ₂ H3+	G 20, G 31	G 21	G 222, G 32	G 23, G 31	G 30
II ₂ H3P	G 20, G 31	G 21	G 222, G 32	G 23, G 31	G 31, G 32
II ₂ L3B/P	G 25, G 30	G 26	G 32	G 27, G 31	G 30
II ₂ L3P	G 25, G 31	G 26	G 32	G 27, G 31	G 31, G 32
II ₂ E3B/P, II ₂ E+3B/P, II ₂ E+3+	G 20, G 30	G 21	G 222, G 32	G 231, G 31	G 30
II ₂ E3P, II ₂ E+3P	G 20, G 31	G 21	G 222, G 32	G 231, G 31	G 31, G 32

^a For the test gases corresponding to the categories commercialised nationally or locally, refer to Table A.4.

^b Tests with limit gases are carried out with the injector and adjustment corresponding to the reference gas of the group to which the limit gas used for the test belongs.

The compositions and main characteristics of the different test gases corresponding to the families or groups of gases are given in Table 7, measured and expressed at 15 °C, resulting from the application of EN ISO 6976:2005.

Table 7 — Characteristics of the test gases dry gases, at 15 °C and 1 013,25 mbar ^a

Gas families and groups	Test gases	Designation	Volume Composition %	W _i MJ/m ³	H _i MJ/m ³	W _s MJ/m ³	H _s MJ/m ³	d
1st family gases ^b								
Group a	Reference gas	G 110	CH ₄ = 26 H ₂ = 50 N ₂ = 24	21,76	13,95	24,73	15,87	0,411
	Incomplete combustion, flame lift and sooting limit gas							
	Light back limit gas	G 112	CH ₄ = 19 H ₂ = 59 N ₂ = 24	19,48	11,81	22,36	13,56	0,367
2nd family gases ^b								
Group H	Reference gas	G 20	CH ₄ = 100	45,67	34,02	50,72	37,78	0,555
	Incomplete combustion and sooting limit gas	G 21	CH ₄ = 87 C ₃ H ₈ ^(AC) = 13	49,60	41,01	54,76	45,28	0,684
	Light back limit gas	G 222	CH ₄ = 77 H ₂ = 23	42,87	28,53	47,87	31,86	0,443
	Flame lift limit gas	G 23	CH ₄ = 92,5 N ₂ = 7,5	41,11	31,46	45,66	34,95	0,586
Group L	Reference gas and light back limit gas	G 25	CH ₄ = 86 N ₂ = 14	37,38	29,25	41,52	32,49	0,612
	Incomplete combustion and sooting limit gas	G 26	CH ₄ = 80 C ₃ H ₈ = 7 N ₂ = 13	40,52	33,36	44,83	36,91	0,678
	Flame lift limit gas	G 27	CH ₄ = 82 N ₂ = 18	35,17	27,89	39,06	30,98	0,629
Group E	Reference gas	G 20	CH ₄ = 100	45,67	34,02	50,72	37,78	0,555
	Incomplete combustion and sooting limit gas	G 21	CH ₄ = 87 C ₃ H ₈ = 13	49,60	41,01	54,76	45,28	0,684
	Light back limit gas	G 222	CH ₄ = 77 H ₂ = 23	42,87	28,53	47,87	31,86	0,443
	Flame lift limit gas	G 231	CH ₄ = 85 N ₂ = 15	36,82	28,91	40,90	32,11	0,617

Table 7 (continued)

Gas families and groups	Test gases	Designation	Volume Composition %	W_i MJ/m ³	H_i MJ/m ³	W_s MJ/m ³	H_s MJ/m ³	d
3rd family gases ^c								
3rd family and Group 3 B/P	Reference gas and sooting limit gas	G 30	n-C ₄ H ₁₀ = 50 i-C ₄ H ₁₀ = 50 ^d	80,58	126,09	37,33	125,81	AC 2,075
	Flame lift limit gas	G 31	C ₃ H ₈ = 100	70,69	88,00	76,84	95,65	1,550
	Light back limit gas	G 32	C ₃ H ₆ = 100	68,14	82,78	72,86	88,52	1,476
Group 3P	Reference incomplete combustion and sooting limit gas	G 31	C ₃ H ₈ = 100	70,69	88,00	76,84	95,65	1,550
	Flame lift limit gas	G 32	C ₃ H ₆ = 100	68,14	82,78	72,86	88,52	1,476 AC
^a For gases used locally, refer to A.4. ^b For other groups, refer to A.4. ^c See also Table 8. ^d See footnote 11).								

The heat inputs for the test gases of the third family expressed in megajoules per cubic meter (MJ/m³) in Table 7 can also be expressed in megajoules per kilogram (MJ/kg), dry gas, as in Table 8.

Table 8 — Heat inputs of test gases of the third family dry-gas

Designation of test gases	H_i MJ/kg	H_s MJ/kg
G 30	45,65	49,47
G 31	46,34	50,37
G 32	45,77	48,94

7.1.1.2 Conditions for producing test gases

The composition of the gases used for the tests shall be as near as possible to those given in Table 7. The production of these gases shall be in accordance with the following rules:

- the Wobbe index of the gas used shall be within $\pm 2\%$ of the value indicated in the table for the corresponding test gas (this tolerance includes the error of the measuring equipment);
- the constituents used to produce the mixtures shall have the following minimum degrees of purity:

nitrogen	N ₂	99 %	
hydrogen	H ₂	99 %	
methane	CH ₄	95 %	} with a total content of H ₂ and CO and O ₂ under 1 % and a total content of N ₂ and CO ₂ under 2 %.
propene	C ₃ H ₆	95 %	
propane	C ₃ H ₈	95 %	
butane ¹¹⁾	C ₄ H ₁₀	95 %	

However, these requirements are not obligatory for each constituent if the final mixture is of a composition identical to that of a mixture that would have been obtained if the constituents given above had been used. To make up a mixture, a gas already containing several constituents of the final mixture in convenient proportions may be used as a starting point.

However, for gases of the second family one can:

- for tests carried out with the G20 and G25 reference gases, use a gas belonging respectively to group H, group L or group E even if its composition does not comply with the above requirements, provided that, after a possible addition of either propane or nitrogen, according to the situation, the final mixture has a Wobbe index within ± 2 % of the value indicated in the table for the corresponding reference gas;
- for making up the limit gases, take as a base gas instead of methane:
 - a) for limit gases G 21, G 222, G 23: a natural gas of group H;
 - b) for limit gases G 27 and G 231: a natural gas of groups H, L or E;
 - c) for limit gas G 26: a natural gas of group L.

In all cases, the final mixture obtained by adding propane or nitrogen shall have a Wobbe index within ± 2 % of the value given in Table 7, and the hydrogen content of this final mixture shall be as in Table 7.

7.1.1.3 Practical methods of test

In order to facilitate certain tests, the reference gases may be replaced by gases actually distributed in the country or countries where the appliance is to be installed, provided that the following requirements are fulfilled:

- the distributed gases to be used for testing shall be of the same family and group as the specified reference gas;
- burners are adjusted to the same heat input as with the corresponding reference gas and the primary aeration of the burners is so adjusted as to be close to that obtained with the corresponding reference gas, either by using the aeration adjuster or by adjusting the supply pressure and/or by changing the injector.

11) Any mixture of iso-butane and n-butane can be used.

7.1.2 Test pressures

The test pressures, i.e. the static pressures to be applied at the gas inlet connection of the appliance in operation, are given in Table 9 (see also Table A.3).

Table 9 — Test pressures ^a

Appliance category having the following number	Test gas	p_{min} mbar	p_{max} mbar
1st family gas: 1a	G 110, G 111	8	15
2nd family gas: 2H	G 20, G 21, G 222, G 23	20	25
2nd family gas: 2L	G 25, G 26, G 27	25	30
2nd family gas: 2E	G 20, G 21, G 222, G 231	20	25
3rd family gas: 3 B/P	G 30, G 31, G 32	29 ^b	35
	G 30, G 31, G 32	50	57,5
3rd family gas: 3P	G 31, G 32	37	45
	G 31, G 32	50	57,5
2nd family gas: 2E+	G 20, G 21, G 222	20	25
	G 231	25 ^d	30
3rd family gas: 3+ (couple 28-30/37)	G 30	29 ^b	35
	G 31, G 32	37	45
3rd family gas: 3+ (couple 50/67)	G 30	50	57,5
	G 31, G 32	67	80

^a For the pressures corresponding to the gas distributed nationally or locally, refer to Table A.3.

^b The appliances in this category may be used without adjustment at the specified supply pressures of 28 mbar to 30 mbar.

^c See **AC** A.6 **AC**.

^d This pressure corresponds to using a gas with a low Wobbe index but only the resistance to draught test 7.3.2.2 is carried out at this pressure.

7.1.3 Test procedures

7.1.3.1 General

The ambient temperature for the tests shall be (20 ± 5) °C.

For the purposes of this European Standard, the burner is still deemed to be cold if it has not operated for more than 5 s.

7.1.3.2 Adjustment of the burner

7.1.3.2.1 General

For all the tests, the appliance is fitted with the appropriate injector(s) for the family or group of gases to which the test gas belongs. The primary air adjuster, if any, shall be adjusted according to the technical instructions.

Unless specified otherwise in the technical instructions, once the adjustments have been made for one reference gas, they are not altered for the tests at the other pressures and with the other test gases of the family or group for which the appliance is equipped and adjusted.

If on changing from butane to propane an adjustment of the primary air is specified in the technical instructions, the tests using G 32 are carried out with the primary air adjustment appropriate to G 31. In addition, the quality of combustion shall be checked in accordance with 7.3.2.4.1 (test no. 1) for hotplates and 7.3.3.2.3 for oven or grill burners, utilising G 31 as the reference gas and the supply conditions of 7.3.2.4.1 (test no. 1).

7.1.3.2.2 Burners with gas rate adjusters

Unless specified otherwise for certain tests, any integral appliance regulator and any pilot gas rate adjusters or reduced rate adjusters are set in accordance with the technical instructions with reference gas at normal pressure for the family or group to which it belongs.

The adjustment instructions shall be included in the technical instructions. Their accuracy is checked by carrying out test no. 3 in 7.3.1.2.1.2.

All the above adjustments are subject to the restrictions of 5.1.1 and 5.2.3.

7.1.3.2.3 Burners without gas rate adjusters

Unless instructed to the contrary, a non-adjustable burner is considered to be operating at the nominal heat input if, when supplied at the normal pressure with the reference gas of the category to which it belongs, the heat input meets the requirements of 6.1.2.1.

7.1.3.2.4 Pressure corrections

Prior to all the tests which are specified to be carried out at nominal heat input, or at a specified heat input, and taking account of the supply conditions, the local test temperature, the atmospheric pressure and the measuring conditions (dry meter or not), the test laboratory shall ensure that the pressure upstream of the injectors is such that the heat input can be obtained to within $\pm 2\%$ (by means of the adjusters or the appliance pressure regulator if it is adjustable or the appliance supply pressure).

If the laboratory has to use a supply pressure p'_n different from the normal test pressure p_n to obtain a nominal input to within $\pm 2\%$, the test carried out on the burners individually at the minimum test pressures p_{\min} and maximum test pressures p_{\max} shall be carried out at corrected pressures p'_{\min} and p'_{\max} so that:

$$\frac{p'_n}{p_n} = \frac{p'_{\min}}{p_{\min}} = \frac{p'_{\max}}{p_{\max}} \quad (1)$$

Tests on several burners operating simultaneously shall be carried out at non-corrected test pressures.

7.1.3.3 Test installation

7.1.3.3.1 Appliance of Class 1

7.1.3.3.1.1 General

Unless specified to the contrary in the particular clauses, the tests are carried out with the appliance adjusted to the lowest height specified by the manufacturer and placed in the test installation as described below (see Figure 12).

7.1.3.3.1.2 Cookers

The test installation consists of vertical wooden panels 19 mm to 25 mm thick coated with matt black paint. One panel is placed as close as possible to the rear face of the appliance. Another is placed at a distance from one side of the appliance equal to the minimum declared by the manufacturer, but not exceeding 20 mm ; if the technical instructions do not forbid it, another panel is placed at the same distance from the other side of the appliance.

The side panel(s) shall abut with the back panel. Any insulating material specified in the instructions shall be placed between the panels and the appliance in accordance with the technical instructions.

The back panel is at least 1,80 m high and wide enough to project at least 50 mm beyond the sides of the appliance.

The side panel(s) are the same height as the hotplate, not taking account of the height of the pan supports. However, for an appliance with a shut-down lid intended to be installed, in compliance with the technical instructions, so that the lid is the same height as the work surface of the adjacent furniture, the side panel(s) shall be the same height as the shut-down lid in its closed position. The side panel(s) shall be deep enough to project at least 50 mm beyond the front of the appliance.

7.1.3.3.1.3 Table cookers, independent hotplates and freestanding ovens

The test installation is similar to that described in 7.1.3.3.1.2 except that the appliance is placed on a horizontal support positioned against the back panel at such a height that the side panels are level:

- with the hotplate or the shut-down lid (as specified above for cookers) in the case of table cookers and independent hotplates;
- with the top of the appliance in the case of freestanding ovens.

The distance between the appliance and the side panels is the minimum indicated in the technical instructions.

7.1.3.3.1.4 Wall-mounted grills

The test installation is similar to that described in 7.1.3.3.1.2 except that the appliance is fixed to a back panel which projects at least 150 mm beyond each side of the appliance.

The appliance is fixed, at the minimum distance specified in the technical instructions, above a 600 mm deep horizontal panel, which extends from one side panel to the other.

Side panels, 600 mm deep, are installed at each side of the appliance at the minimum distance(s) which shall be indicated in the technical instructions.

7.1.3.3.2 Appliances of Class 2

7.1.3.3.2.1 Appliances of class 2, subclass 1

Unless specified to the contrary in the particular clauses, the tests are carried out with the appliance adjusted to the lowest height specified by the manufacturer, and placed in the test installation as described below (see Figure 12).

The test installation comprises 3 vertical wooden panels 19 mm to 25 mm thick coated with matt black paint. One panel is placed as close as possible to the rear face of the appliance the other two are placed against the sides of the appliance.

The side panels shall abut with the back panel. Any insulating material specified in the instructions shall be placed between the panels and the appliances in accordance with the technical instructions.

The back panel is at least 1,80 m high and wide enough to project at least 50 mm beyond each side of the appliance.

The side panels are the same height as the hotplate, not taking account of the height of the pan supports.

However, for an appliance with a shut-down lid intended, according to the technical instructions, to be installed so that the lid is the same height as the work surface of the adjacent furniture, the side panels shall be the same height as the shut-down lid in its closed position. The side panels shall be deep enough to project at least 50 mm beyond the front of the appliance.

7.1.3.3.2.2 Appliances of class 2, subclass 2

The installation described below consists of wooden panels.

The tests are carried out with the appliance in its building-in unit comprising either a work top linking two cupboards, one on each side of the appliance (see Figure 2) or a work top and two side panels representing the two furniture units.

The construction of the unit for building-in and the horizontal separation, if it exists (see Figure 13) shall be in accordance with the critical dimensions given in the technical instructions.

If the technical instructions specify the use of a panel to close the space at the front between the top of the appliance and the underside of the work top, this shall be provided.

The work top shall be (30 ± 5) mm thick and project by the maximum value given in the instructions beyond the front of the oven. All other panels shall be at least 15 mm thick.

The back panel shall be at least as wide as the gap between the two cupboards and shall be at least 1,80 m high.

The appliance is installed as close to the base of the building-in unit as the technical instructions allow.

7.1.3.3.3 Appliances of class 3

7.1.3.3.3.1 General

Unless specified to the contrary in the particular clauses, the tests are carried out with the appliance installed according to the technical instructions in its building-in unit made of wood (see Figure 13).

- If the unit specified in the technical instructions does not comply with the requirements of AC ISO 5732:1978 AC the manufacturer shall specify in his instructions the critical dimensions of the unit. He shall supply the laboratory with a unit with the critical dimensions;

- if the unit specified in the technical instructions complies with the requirements of AC ISO 5732:1978 AC , it does not have to be supplied by the manufacturer. Its dimensions shall correspond with the critical ISO dimensions, taking account of the tolerances.

If the manufacturer allows several options for ventilating and evacuating the products of combustion, the tests are carried out for every option.

Unless specified otherwise in the individual clauses, the tests are carried out with all the unit doors closed.

Any gaps allowing air to pass through between the side panels, the support and the back panel are sealed with adhesive tape.

7.1.3.3.2 Construction requirements for the unit for building-in appliances of class 3

According to the type and/or method of installation for the appliance, the unit shall meet the following requirements where appropriate.

- a) Ovens and oven/grills intended for installation below the work top

The building-in unit shall comprise an upper panel (work top), a bottom panel and two side panels. For test purposes, the unit does not have a back panel but it is placed against a back panel as described in 7.3.1.5.1.3.

The construction of the unit shall be such that the dimensions of the space for installing the appliance are the critical values specified in the technical instructions. If the manufacturer specifies the use of a unit complying with the requirements of ISO 5732:1978, then the unit shall be of the critical dimensions given in ISO 5732:1978, taking account of the permitted tolerances.

The upper panel (work top) shall be (30 ± 5) mm thick and shall project beyond the front of the appliance by the maximum distance given in the technical instructions. All other panels shall be at least 15 mm thick.

- b) Ovens and oven/grills designed to be built into a tall kitchen unit (see Figure 2; class 3, independent oven)

The specified unit shall meet the requirements of 7.1.3.3.2 a) except that the thickness of the top panel shall not be less than 15 mm. The upper and lower panels shall have the critical dimensions specified by the manufacturer.

If the appliance can be installed in a kitchen unit having doors, the test unit shall be supplied with doors of the largest surface area in accordance with the technical instructions.

- c) Hotplates

The unit for building-in comprises a panel (work top) as described hereafter, fitted onto a kitchen unit.

The work top shall be (30 ± 5) mm thick and shall have an opening of the minimum size given in the technical instructions for installing the appliance. This opening shall be located so that when the appliance is installed, the distance between the appliance and the back of the work top is the minimum given in the instructions.

For an appliance of width less than 600 mm, the work top is fixed on a unit 600 mm wide with a single door.

For an appliance of width 600 mm or more, the unit for building in shall be of the minimum width specified by the manufacturer, which shall not be less than 600 mm. The unit shall have one door for each 600 mm width.

The door(s) shall be full, flat and shall close well.

The kitchen unit shall have a back panel at least as wide as the unit. It shall be possible to remove this panel in order to carry out the tests in 7.3.1.5. If the unit does not have a sealed base, any gaps allowing air to pass through are sealed with adhesive tape.

The side and back panels shall not be less than 15 mm thick.

When specified in the technical instructions, the kitchen unit shall be fitted with a horizontal partition under the hotplate, at a distance from the surface of the work top which is not less than that specified in the technical instructions, which shall not exceed 150 mm (see Figure 13).

d) Combined oven-hotplate units

The building-in unit shall comprise an upper panel (work top), a bottom panel and two side panels. For test purposes, the unit does not have a back panel.

The construction of the building-in unit shall be such that the dimensions of the space for installing the appliance are the critical dimensions specified in the technical instructions. If the manufacturer specifies the use of a building-in unit complying with the requirements of ISO 5732:1978, then the unit shall be of the critical dimensions given in [ISO 5732:1978](#), taking account of the tolerances allowed.

The work top shall have an opening of the minimum size given in the technical instructions for installing the appliance. This opening shall be located so that when the appliance is installed, the distance between the appliance and the back of the work top is the minimum given in the instructions.

The work top shall be (30 ± 5) mm thick and shall project beyond the front of the appliance by the maximum distance given in the instructions. All the other panels shall be at least 15 mm thick.

The building-in unit shall be placed in the test installation according to the installation instructions supplied by the manufacturer in the technical instructions.

7.1.4 Pans

7.1.4.1 Individual tests

Where the use of a pan is required on a hotplate burner or an electric cooking plate, a pan as described below is used, unless otherwise indicated:

- 220 mm diameter pan, filled with 2 kg of water at ambient temperature, is used on a covered and uncovered hotplate burner having a nominal heat input not exceeding 4,2 kW and on a fish burner of useful length equal to, or less than, 140 mm;
- 300 mm diameter pan, filled with 3 kg of water at ambient temperature, is used on a covered and uncovered hotplate burner having a nominal heat input greater than 4,2 kW;
- a pan, filled with 2 kg of water at ambient temperature, is used on a fish burner of useful length greater than 140 mm. This pan shall have a height of 140 mm and a width and length sufficient to overlap all sides of the burner by at least 60 mm and at most 80 mm. A fish pan conforming to these dimensions shall be supplied by the manufacturer to the laboratory;
- a pan, which shall be in conformity with the instructions for use and maintenance, is used on a burner designed to be used exclusively with convex-based pans;
- a pan and water content given in C.2 are used on an electric cooking plate;
- a permanent griddle and a temporary griddle, when it is being used as a griddle, are tested without a pan.

Pans are placed on the geometrical centre of the cooking area, unless otherwise indicated.

7.1.4.2 Simultaneous tests

Where the use of a pan is required simultaneously on each of the hotplate burners and the electric cooking plates, a distance of at least 10 mm shall be provided between the side surface of the pan and:

- all other pans;

- any test panel;
- the shut-down lid;
- any sampling device for products of combustion.

If for an appliance that does not have any hotplate burners with a nominal heat input greater than 4,2 kW, using the pans described for individual tests for the burners, this arrangement is impossible, a pan of diameter given in C.1 is used on each of the burners which allows this arrangement to be fulfilled. The special pans (convex-based, rectangular) used in the individual tests are retained for the simultaneous tests.

In the case of an appliance with one or more hotplate burners having a nominal heat input greater than 4,2 kW, pans are initially placed on any other hotplate burners and electric cooking plates. A distance of at least 10 mm shall be provided between the side surface of each pan and:

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- all other pans; AC
- any test panel;
- the shut-down lid;
- any sampling device for products of combustion.

In addition no pan shall overlap the edges of the hotplate. If, using the pans described for individual tests for these burners, this arrangement is impossible, a pan of diameter given in C.1 is used on each of the burners which allows this arrangement to be fulfilled. Pans are then placed on each of the burners having a nominal heat input greater than 4,2 kW. If, using the 300 mm diameter pans described for individual tests for these burners, this arrangement is impossible, a pan of diameter given in C.1 is used on each of the burners which allows this arrangement to be fulfilled. The special pans (convex-based, rectangular) used in the individual tests are retained for the simultaneous tests.

A permanent griddle and a temporary griddle, when it is being used as a griddle, are tested without a pan.

Pans are placed on the geometrical centre of the cooking area, unless otherwise indicated.

7.1.5 Ovens and grill temperatures

Unless otherwise indicated:

- a) for an oven with a thermostat, the control handle is positioned in order to obtain an average temperature of 230 °C at the centre of the oven using the reference gas at the normal test pressure, or using the nominal voltage;
- b) for an oven without a thermostat, the control handle is set at the highest position until a temperature of about 230 °C is obtained at the centre of the oven using the reference gas at the normal test pressure, or at the nominal voltage. The control handle is then set to the position allowing a temperature of 230 °C to be maintained;
- c) for all ovens:
 1. if the oven temperature control is not continuous in action, the control handle is set in the position corresponding to the nearest possible temperature above 230 °C;
 2. if a temperature of 230 °C at the centre of the oven cannot be achieved, the control handle is set to the position corresponding to the maximum temperature;

d) for grills, the control handle is set to the position corresponding to the maximum temperature.

7.1.6 Appliances having a mains electrical supply

Unless otherwise indicated, an appliance having a mains electrical supply is supplied at the nominal voltage.

7.1.7 Appliances having one or more multi-ring hotplate burners

In the case of appliances incorporating multi-ring hotplate burners the test methods requiring the operation of hotplate burners shall be carried out as follows:

- appliances having multi-ring hotplate burners with simple control. Unless otherwise stated such tests shall be carried out with the multi-ring hotplate burner(s) operating as described for other hotplate burners;
- appliances having multi-ring hotplate burners with sectional control, each supplied from a single gas tap. Unless otherwise stated such tests shall be carried out with the multi-ring hotplate burner(s) operating as described for other hotplate burners;
- appliances having multi-ring hotplate burners with sectional control, each ring of burner ports supplied from a separate gas tap. Unless otherwise stated such tests shall be carried out with each ring of burner ports operating as if it were a separate hotplate burner.

7.2 Verification of construction characteristics

7.2.1 Strength

7.2.1.1 General

The requirements of 5.1.4 are verified in the course of the following tests.

7.2.1.2 Cooker bodies

The cooker is placed on a horizontal plane and is held or retained in position there, e.g. by means of stops.

None of the appliance components are removed if this could affect the strength of the cooker body. However, particular components may be removed if this is necessary to ensure that the test correctly assesses the strength of the cooker body.

A force, the horizontal component of which is $500 \text{ N} \pm 10 \%$ is then applied suitably distributed to the upper part of the front in the direction from front to back (see Figure 3).

After 5 min, the application of the force is stopped.

During these tests:

- precautions are taken to avoid deterioration, in the area where the force is applied, which could impair the normal operation of the appliance;
- if deterioration cannot be avoided, the damaged pieces are replaced by identical new ones before carrying out the other tests.

Figure 3 shows the arrangement for carrying out the test: the sum of the horizontal components of the forces applied by the dynamometers shall be $500 \text{ N} \pm 10 \%$.

7.2.1.3 Hotplate pan supports

A mass m , centred above each of the burners, is placed simultaneously on the pan support (grid or plate) so that:

$$m = m_1 + m'_2 \quad (2)$$

where

$$m_1 = (5 \pm 0,2) \text{ kg};$$

m'_2 is a mass chosen from a series of masses with the following nominal values:

$$2,5 - 3,3 - 4,1 - 5 - 6 - 8 - 9,3 - 10,5$$

The test masses m'_2 shall have a value within $\pm 4\%$ of the nominal value.

For m'_2 a value is chosen from the series which is just greater than the value m_2 calculated according to the following equation:

$$m_2 = (2,5 \times Q_n) \pm 0,2 \quad (3)$$

where

Q_n is the nominal heat input expressed in kilowatts.

The masses m , m_1 , m_2 and m'_2 are expressed in kilograms.

The contact area of the mass m_1 on the grid or plate is flat and has a diameter of (180 ± 4) mm (see Figure 4).

Masses m appropriate for each burner are put into position quickly and carefully.

Once all the burners are fully laden, the weights are left in position for 5 min and then the weights are removed carefully.

The strength requirement of 5.1.4 shall be checked.

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7.2.1.4 Strength of surfaces of glass ceramic or glass parts

7.2.1.4.1 Impact strength

Compliance with 5.1.2.2 shall be checked by applying blows to the appliance by means of the spring operated impact test apparatus as described in EN 60068-2-75, test Ehb. The release cone of the test apparatus shall be applied perpendicular to the surface tested.

The appliance is rigidly supported and three blows are applied to every point of the surface of the glass or glass ceramic components that is likely to be weak. Lids and doors shall be tested in closed position.

If the appliance has glass doors the blows are applied to the centre of the glass. If the door has horizontal hinges, the blows are also applied to the inside of the door when it is in the open position.

The blows have an impact energy of $(0,5 \pm 0,04)$ Nm perpendicular to the surface and are not applied to places within a distance of 20 mm from rims (e.g. knobs, burners), edges or facettes.

7.2.1.4.2 Verification of the strength of the hotplate surfaces of glass or glass ceramic against thermal stress

Each burner of the glass or glass ceramic hotplate is supplied with one of the reference gases at the normal pressure corresponding to the appliance category. The burners are operated simultaneously at full rate with pans filled with water according to 7.1.4, until steady conditions are established. Then the burners are shut-off, the pans and pan supports are removed.

NOTE Steady conditions are deemed to have been achieved when the temperature of the glass or glass ceramic surface does not vary by more than 1 K in 15 min.

A quantity of 1,0 l to 1,1 l of cold water having a temperature of $15^{\circ}\text{C} \pm 5^{\circ}\text{C}$ is poured steadily and uniformly over the glass or glass ceramic hotplate, and 1 min later all excess water is removed and the surface wiped dry. Compliance with 5.1.2.2.2 is then checked.

7.2.1.4.3 Verification of the strength of glass or glass ceramic in oven doors against thermal stress

The following test is carried out for appliances where the oven door has horizontal hinges.

The burner of each oven is supplied with one of the reference gases at the normal pressure corresponding to the appliance category. The oven burner is operated in accordance with 7.1.5, until steady conditions are established. Then the burner is shut-off.

NOTE Steady conditions are deemed to have been achieved when the temperature of the glass or glass ceramic surface does not vary by more than 1 K in 15 min.

The door is then opened and 0,2 l of water having a temperature of $15^{\circ}\text{C} \pm 5^{\circ}\text{C}$ is poured within 5 s onto the centre of the glass or glass ceramic panel. A3

7.2.2 Strength, stability

7.2.2.1 General

The tests for the strength of the oven door or of the oven fitted with a grill, as well as the appliance tilting tests, are carried out immediately after the initial soundness test carried out on the appliance in the as-delivered condition in conformity with AC 7.3.1.1 AC .

7.2.2.2 Strength of the oven door

The shutdown lid, if it exists, is in the fully open position.

Doors with bottom horizontal hinges are opened completely. It is verified, using the device shown in Figure 5, that the requirements of 5.2.9.1.1 are met, firstly without a load, then, when a load as specified in 5.2.9.1.1 is placed smoothly on the surface of the door so that its centre of gravity is vertically above the geometric centre of the door. The contact surface of the load is such that no damage shall result from it to the door.

Doors with a vertical hinge are opened to an angle of 90° , the load as specified in 5.2.9.1.1 is placed in the centre of the top edge of the door.

If an appliance has two ovens, the tests are carried out successively. If the two ovens are identical, they are both regarded as large ovens.

The requirements of 5.2.9.1.1 shall be met.

7.2.2.3 Appliance tilting

The appliance is placed on a horizontal surface with the shutdown lid, if it exists, closed and the ovens or grills empty.

Doors with bottom horizontal hinges are opened completely and a load conforming to the requirements of 5.2.9.1.2 is placed smoothly on the surface of the door so that its centre of gravity is vertically above the geometric centre of the door. The contact surface of the load is such that no damage shall result from it to the door.

Doors with a vertical hinge are opened to an angle of 90° and a mass as specified in 5.2.9.1.2 is then placed carefully in the middle of the top edge of the door. This test is repeated with the door open as much as normally possible but without the opening angle exceeding 180°.

For appliances with more than one door, the tests are carried out under the same conditions for each door separately.

The requirements of 5.2.9.1.2 shall be met.

7.2.2.4 Stability of the oven and grill accessories

a) A mass as shown in Table 4 is uniformly distributed over the useful surface of each of the oven and grill accessories; the requirements of 5.2.9.1.3 a) are checked for each item in turn.

The hot sliding test is carried out in accordance with 7.1.5, with one of the reference gases for the category to which the appliance belongs:

- 1) for the oven, after 30 min;
 - 2) for the grill, after 15 min;
- b) the requirements of 5.2.9.1.3 b) are checked by visual inspection;
- c) if the grill pan has a handle, the following test is carried out:
- 1) the grill pan is filled with water to 25 % of its capacity. It is lifted up and the water then poured out;
 - 2) the requirements of 5.2.9.1.3 c) shall be verified.

7.2.2.5 Stability of parts that are intended to be raised (if fitted)

If hinged parts of the hotplate, that are intended to be raised, are not fitted with a mechanical means of preventing them from falling accidentally, the following tests are carried out under the installation conditions in 7.1.3.3:

- the shut-down lid is fully raised and then brought back by 30 mm, measured at the extremity of the lid;
- with the shut-down lid in the fully raised position, the pan supports are raised, then brought back by 20 mm;
- with the shut-down lid and pan supports in the raised position, the spillage trays are fully raised, then brought back by 20 mm.

The requirements of the 9th paragraph of 5.2.8.1 shall be met.

7.2.2.6 Protection of the glass shut-down lid

In order to verify the requirements of the last paragraph of 5.2.8.1, a 200 mm diameter pan (in accordance with Table C.1) is placed flat on the pan supports of the hotplate. It is placed at the extreme position(s) which, at the same time, retains its stability on the pan supports and is as close as possible to the shut-down lid in its fully open position.

7.2.3 Accumulation of un-burnt gas in the appliance

7.2.3.1 Examination of the construction

The requirements of 5.2.12.2 shall be checked in the first instance by examining the appliance construction and that of its controls in order to determine the circumstances under which un-burnt gas can be admitted to the appliance where, after some delay, it could be ignited by any source of ignition on the appliance.

During the examination of the appliance, a number of additional factors shall be taken into consideration, the application of which is dependent on the use of auxiliary energy and the means of ignition employed. These factors are given in Table 10.

- 1) appliances without electricity supply: item A), if appropriate, and item B);
- 2) appliances with electricity supply and manual ignition: items A), B) and C);
- 3) appliances with delayed ignition of the oven: items A), B), C) D) and E).

Table 10 — Additional factors to be taken into consideration for testing the safety of burners in the appliance

Item	Factors
A)	The possibility that controls may be operated incorrectly or out of sequence ^a
B) ^b	The possibility of ignition by means of some other ignition source on the appliance, e.g. via flue duct
C)	Interruption and restoration of the electrical supply
D)	Failure of a clock, timer or programmer
E)	Operation of any device which would enable the appliance to be used in the event of loss of the electricity supply: items A) and B) are considered whilst this device is in operation
^a The factor A) is considered when the user is required to carry out several manual actions when putting the appliance into operation e.g. when using an oven for automatic cooking. In such cases, the examination ensures that accidental mistakes or omissions when carrying out these actions would not create a dangerous accumulation of un-burnt gas in the appliance. Factor A) is not intended to apply to manual ignition where the action taken by the user is continuous (see 5.2.6). ^b The factor B) includes the possibility of ignition resulting from operation of an electric oven in the same compartment.	

When the appliance has a manual ignition device that does not require continuous operation of the device or an automatic device with no limit on the ignition time, then, in order to assess the possibility of un-ignited gas becoming ignited, it is assumed that this un-ignited gas is released for an unlimited period.

If, after this examination, delayed ignition of a potentially dangerous accumulation of gas is not possible, the requirements of 5.2.12.2 are deemed to be satisfied.

7.2.3.2 Test

If, after the examination of 7.2.3.1, a delayed ignition of a potentially dangerous accumulation of gas seems possible, the following test is carried out using the reference gas or gases at the normal test pressure.

The ignition device or any other means of ignition is operated after a short delay. At the end of this test, the gas supply to the burner is interrupted, the compartment is ventilated and the appliance cooled to room temperature.

The test is repeated several times gradually increasing the delay until the most critical delay is reached. After each ignition test the compartment is ventilated and the appliance is cooled to room temperature.

The requirements of 5.2.12.2 are deemed satisfied if, on reaching the most critical delay:

- there is no damage to or distortion of the appliance;
- the compartment door does not open itself;
- no flame is emitted from the front of the appliance.

However, if at any time during the delayed ignition tests, one of the above phenomena is observed, the tests are halted and the appliance is deemed not to comply with the requirements of 5.2.12.2.

For these tests, devices for remotely controlling the ignition and the gas supply to the burner shall be used.

7.2.4 Appliances with a glass lid having a device for shutting off the gas to the hotplate burners

The appliance is installed in accordance with the requirements in 7.1.3.3 and supplied with the reference gas with the lowest Wobbe index of the category, in accordance with 7.1.1.1 under the normal test pressure.

It is adjusted in accordance with \overline{AC} 7.1.3.2.1 \overline{AC} . If necessary, it is supplied with electricity at the rated voltage.

With the lid open to the maximum permitted by the test installation, all the burners of the hotplate are ignited and operate for 5 min, with their control devices at their highest setting. The following tests are then carried out:

- 1) the lid is lowered until it has gone through an angle of 5° from its fully open position. With the lid in this position, it is verified that the requirements of 5.2.8.1 (paragraph 10, subdivision b) 1)) are respected;
- 2) the lid is lowered until it has gone through an angle of 45° from its fully open position. 5 s after the lid has reached this position, it is verified that the requirements of 5.2.8.1 (paragraph 10, subdivision b) 2)) are respected.

7.2.5 Food hygiene in time controlled ovens

The appliance is installed in a room in which the ambient temperature does not vary by $\pm 2^\circ\text{C}$ during the maximum period permitted by the oven programmer.

Using each of the reference gases at supply pressure, each oven pilot is adjusted in accordance with the technical instructions.

The test starts when the appliance has reached thermal equilibrium, at the ambient temperature. The oven pilot is ignited and the programmer is set to the position giving the maximum delay time.

The temperature at the centre of the oven and the ambient temperature are measured by means of thermocouples and recorded continuously. The appliance and the thermocouple measuring ambient temperature are protected from the effects of sun and draughts.

The test continues for the maximum period permitted by the programmer.

Using the temperature recording, a period of 1 h is chosen during which there are the fewest fluctuations in the oven temperature and ambient temperature.

The difference between the oven temperature and ambient temperature is then determined by the average of the temperatures measured during this 1 h period.

In these conditions, the specification of 5.2.13 shall be satisfied.

7.3 Verification of performance characteristics

7.3.1 General tests

7.3.1.1 Soundness

The gas carrying parts are tested under the following conditions:

- test no. 1: With all taps and shut-off devices closed;
- test no. 2: With all taps in the "on" position, the injectors of burners and pilots temporarily blocked and any shut-off devices, for example the valves of flame supervision devices, where present, in the open position.

The tests are carried out cold, with air.

For the tests, the pressure upstream of the appliance is adjusted to 150 mbar.

These tests are carried out:

- in the delivery condition;
- immediately after the strength tests described in 5.1.4;
- at the end of all the tests to which the appliance is subjected with its original equipment without changing any parts (injectors, pilots etc.);
- after the five disconnections and re-assemblies described in 5.1.5 and carried out after the above test.

The leakage shall be measured in such a way that the accuracy of measurement is within 0,01 l/h (0,01 dm³/h).

7.3.1.2 Obtaining the rates

7.3.1.2.1 Obtaining the nominal heat input

7.3.1.2.1.1 General

- a) The nominal heat input is verified by using the reference gas or gases indicated in 7.1.1.1 and 7.1.3 depending on the category of the appliance, at the appropriate test pressures defined in 7.1.2 corresponding to the pressure data on the appliance (see 8.1) and using the corresponding injectors.

The measuring equipment shall enable the rate to be determined to an accuracy of $\pm 1,7\%$.

The nominal heat input Q_n indicated by the manufacturer is given by one of the following equations:

$$Q_n = 0,278 M_n \cdot H_s \quad (4)$$

or :

$$Q_n = 0,278 V_n \cdot H_S \quad (5)$$

where

Q_n is expressed in kilowatts;

M_n is the mass flow rate of dry gas under reference conditions corresponding to the nominal heat input in kilograms per hour;

V_n is the volume rate of dry gas under reference conditions corresponding to the nominal heat input in cubic meter per hour;

H_S is the gross calorific value of the reference gas in Tables 7 and 8, given in megajoules per cubic meter or megajoules per kilogram.

- b) The mass (M_n and M_o) and volume (V_n and V_o) inputs correspond to a measurement and flow of the reference gas, under reference conditions, i.e. assuming a dry gas at 15 °C and under a pressure of 1 013,25 mbar. In practice, the values obtained during the tests do not correspond to these reference conditions, they shall therefore be corrected in order to bring them to the values which would actually have been obtained if these reference conditions had been achieved during the tests, at the injector outlet.

The corrected mass flow rate is calculated using the following formula, according to whether it has been determined by weighing or on the basis of a volume rate:

— determination by weighing:

$$\frac{M_o}{M} = \sqrt{\frac{1013,25 + p}{p_a + p} \cdot \frac{273,15 + t_g}{288,15} \cdot \frac{d_r}{d}} \quad (6)$$

— determination on the basis of volume rate:

$$\frac{V_o}{V} = \sqrt{\frac{1013,25 + p}{1013,25} \cdot \frac{p_a + p}{1013,25} \cdot \frac{288,15}{273,15 + t_g} \cdot \frac{d}{d_r}} \quad (7)$$

The corrected mass flow rate is calculated using the following equation:

$$M_o = 1,226 V_o \cdot d_r \quad (8)$$

where

M_o is the mass flow rate of dry gas which would have been obtained under reference conditions (see 3.1.3) in kilogram per hour;

M is the mass flow rate obtained under test conditions in kilograms per hour;

V_o is the volume rate of dry gas which would have been obtained under reference conditions (see 3.1.3) in cubic meter per hour under the same conditions;

V is the volume rate obtained and expressed under test conditions in cubic meter per hour;

p_a is the atmospheric pressure, in millibar;

p is the gas supply pressure at the measuring point in millibar;

- t_g is the gas temperature at the measuring point, in degrees Celsius;
- d is the relative density of the dry (or wet) test gas relative to dry air;
- d_r is the relative density of the dry reference gas relative to dry air.

These equations shall be used to calculate, from the mass input M or volume input V measured during the test, the corresponding rates M_0 or V_0 which would have been obtained under reference conditions.

It is these values M_0 and V_0 which shall be compared with the values M_n and V_n calculated from the nominal heat input using the equations given in a) of this subclause.

These equations are applicable if the test gas used is dry.

If a wet meter is used or if the gas used is saturated, the value d (relative density of dry gas in relation to dry air) shall be replaced by the value of the relative density of the wet gas d_h given by the following equation:

$$d_h = \frac{(p_a + p - p_{ws})d + 0,622 p_{ws}}{p_a + p} \quad (9)$$

where

p_{ws} is the saturation vapour pressure (expressed in mbar) at temperature t_g .

The saturation vapour pressure at t_g can be taken as equal to:

$$\boxed{A3} p_{ws} = \exp \left(21,094 - \frac{5,262}{273,15 + t_g} \right) \boxed{A3} \quad (10)$$

NOTE In the case of 2nd family gases, this correction is negligible.

7.3.1.2.1.2 Operating conditions

The measurements are taken with the burner operating under the following conditions.

— hotplate burners:

- a pan is placed on an uncovered burner in accordance with 7.1.4.1;
- with the appliance at ambient temperature, the burner is ignited and operated for 10 min;
- measuring begins at the end of the tenth minute and finishes at the latest at the end of the thirteenth minute, or when the highest number of complete revolutions of the meter have been made before the end of the thirteenth minute. The measurement shall be taken over at least one complete revolution of the meter.

— ovens with or without thermostat:

- measuring begins from ignition, with the thermostat or control device at the maximum setting and with the door open, and ends at the latest at the end of the fifth minute or when the highest number of complete revolutions of the meter have been made before the end of the fifth minute.

— grills:

- the burner is ignited and operates for 10 min, with the control device at its highest setting and the door open;
- measuring begins at the end of the tenth minute, and ends at the latest at the end of the thirteenth minute, or when the highest number of complete revolutions of the meter have been made before the end of the thirteenth minute.
- **for burners without gas rate adjusters:**
 - the heat input is measured for each reference gas supplying the appliance at a corresponding normal test pressure. The values obtained shall comply with the requirements of 6.1.2.1.
- **for burners with gas rate adjusters:**

test no. 1

- With the adjuster in the maximum flow position, the supply pressure is adjusted to the minimum value.
- The values obtained shall comply with the requirements of 6.1.2.1.

test no. 2

- This test is carried out immediately after test no. 1 without cooling down the appliance. With the adjuster in the minimum flow position, the test pressure is adjusted to the maximum value.
- The values obtained shall comply with the requirements of 6.1.2.1.
- If the adjustment of the gas rate is made by varying the pressure upstream of the injector, these verifications are carried out with gases G20, G25, G110.
- However, if the adjustment is made by varying the cross-section of the injector, test no.1 is only carried out with the reference gas with the lowest Wobbe index. It is verified with the reference gas with the highest Wobbe index, under the corresponding normal test pressure, that the injector size corresponds to the nominal heat input in accordance with the requirements of 6.1.2.1.
- The values obtained shall comply with the requirements of 6.1.2.1.

test no. 3

- The burner is adjusted according to the manufacturer's instructions under normal pressure. Using the reference gas or gases under normal test pressure, it is verified that the heat input complies with the requirements of 6.1.2.1 which apply to burners which are not fitted with a gas rate adjuster.

7.3.1.2.2 Obtaining the reduced heat input

7.3.1.2.2.1 General

The burner is supplied according to its category with the reference gas or gases in accordance with 7.1.1.1 and AC 7.1.3.2.1 AC, and at the normal test pressure given in 7.1.2.

The same vessels are used as for the measurement of nominal heat input.

The equations given in 7.3.1.2.1.1 for correcting the input values obtained during testing are applicable for verifying the requirements of 6.1.2.2.

7.3.1.2.2 Operating conditions

After operation under the conditions described below, the tap handle is moved to the reduced rate or minimum temperature position:

- a) hotplate burners and grills

The measurement is taken after 10 min of operation at nominal heat input, or immediately after the measurement for obtaining nominal heat input.

- b) oven

The door is closed. The oven operates according to 7.1.5.

The measurement is taken after 30 min of operation.

7.3.1.3 Flame supervision device

7.3.1.3.1 Opening and extinction delay times

The tests designed to verify the opening and extinction delay times of the flame supervision devices specified in 6.1.3 are carried out with the appropriate reference gas" corresponding to the appliance category, at the normal test pressure. With these supply conditions, the appliance is first adjusted to its nominal heat input, where adjusters are permitted.

Any pilot gas rate adjuster is adjusted as specified in the technical instructions.

After these adjustments, the appliance is shut off until it is cooled to ambient temperature. The gas supply is restored and any pilot is lit. The opening time is that between the moment when the gas is lit at the pilot or main burner (if there is no pilot) and that when the flame supervision device allows admission of the gas to the burner without manual interruption.

At the end of test no. 2 of 7.3.2.4.1 for hotplate burners or for the oven and grill burners the tests in 7.3.3.2.3 that require the use of the reference gases, the extinction delay time is measured between the moment when the pilot if any and burner are purposely extinguished by shutting off the gas supply and the moment when, after immediately restoring the supply, the flow of gas controlled by the supervision device ceases through the action of this device.

7.3.1.3.2 Pilot flames

The tests designed to verify the operating characteristics of pilot flame supervision devices are carried out using each of the reference gases at maximum and minimum pressures, verifying in each case that the flame supervision device only opens or remains open when ignition is possible or has taken place satisfactorily when following the manufacturer's instructions for ignition.

Test no. 1

With the appliance cold, reduce the gas rate to the pilot to the minimum energy required to keep open the gas supply to the burner. Check that the burner is correctly ignited by the pilot.

Test no. 2

After heating the oven to a stable temperature in accordance with 7.1.5, close the oven tap and after a period of 3 min check ignition with the actuating flame of the flame supervision device reduced to the most critical heat input found in the previous test.

Test no. 3

In the case of pilots with several flame ports susceptible to blockage, the previous tests are repeated with all the holes blocked except for the one which supplies the actuating flame for the sensing element of the flame supervision device.

7.3.1.4 Safety of operation

7.3.1.4.1 Resistance to overheating

a) For all appliances:

The appliance is first supplied with reference gas and then with the light back limit gas, or gases, for the category to which the appliance belongs, using the appropriate injector. The maximum heat input at which each gas will burn either at the injector or inside the burner is determined in the following way:

- the burners are covered with a pan in accordance with 7.1.4.1;
- a temporary griddle is only tested as a griddle;
- the gas is intentionally lit at the injector at normal test pressure (see 7.1.2), if necessary after temporary removal of the burner head and also, if possible, at the burner head;
- if combustion cannot be maintained at the injector or within the burner when the burner operates at its full rate, the test is carried out by reducing the pressure to a point where combustion can be maintained, but without, however, lowering the pressure below the minimum test pressure.

If a reduced rate position is provided on the taps, and if the preceding test has not allowed combustion to be maintained at the injector or within the burner, the heat input is reduced by turning the tap towards the reduced rate position until the point is reached where combustion can be maintained in the injector or inside the burner.

The test for resistance to overheating is then carried out supplying the appliance with the gas which can burn at the highest rate at the injector or inside the burner, leaving the flame to burn under these conditions for 15 min.

The requirements of 6.1.4.1 shall be satisfied.

b) Appliances with hotplate burners:

If an appliance has hotplate burners, an additional test is carried out with reference gas(es) at normal test pressure.

Each hotplate burner is operated according to the instructions for use and maintenance with its control set in the reduced rate position.

The burners are operated simultaneously for 1h with no pan over them.

The requirements of 6.1.4.1 shall be satisfied.

7.3.1.4.2 Escape of un-burnt gas

7.3.1.4.2.1 Soundness of burner parts

The test is carried out with reference gas or gases for the appliance category, supplied at normal test pressure.

Each burner having a body comprising several parts is ignited with its taps or thermostat in the fully open position.

A suitable means (e.g. a match, a mobile ignition burner) is then used to search for gas leaks from the joints of the assembly which could be ignited.

If necessary, components other than those of the burner may be removed, provided that this does not alter the test conditions.

Checks are made that the requirements of 6.1.4.2.1 are met.

7.3.1.4.2.2 Spillage of un-burnt gas

The tests are carried out with reference gas(es) of the appliance category at normal test pressure.

Each burner is first tested at its nominal heat input (see 4.3.2.4 \square ACI), then under the following conditions:

\square AC

a) Hotplate burners

The burner is supplied at the reduced rate obtained:

- 1) in the position specified for plug and disc type taps;
- 2) in the position giving the value indicated by the technical instructions for a needle type tap.

b) Oven burners

The oven is heated in accordance with 7.1.5.

The thermostat or tap is then moved to the position corresponding to the minimum temperature.

c) Grill burners

The tap is adjusted to the reduced rate position, if such exists.

When each burner is operated under the conditions described above, a combustible gas detector is used to search for un-burnt gas in the parts of the appliance where such gas could accumulate.

The requirements of 6.1.4.2.2 are satisfied if the maximum gas concentration in the air does not exceed 0,025 % by volume.

The concentration of gas in the air shall be determined to an accuracy of 0,005 % of the volume of the sample.

Care shall be taken to ensure that the sampling method used does not affect the flow of gas and air inside the burner. In particular, the sampling probe shall not be placed against the air inlet or burner body.

If the air is adjusted by closing it off inside the burner mixing tube, the test is carried out with this device adjusted to its maximum closed position. \square AC

7.3.1.4.3 Safety of operation at reduced pressure

The test is carried out in calm air and on each burner individually.

With the burner supplied with the reference gas G20, the requirements of 6.1.4.3 shall be verified under the following conditions:

Hotplate burners:

- Operate the burner initially for 10 min at full rate at normal test pressure;
- The burner tap is moved at normal speed to its reduced flow position and the appliance operates for 60 s under these conditions;
- The pressure is then reduced progressively to 14 mbar.

Oven burners:

- The burner is operated under normal test pressure with the thermostat in maximum position, or if there is no thermostat, with the tap set to the fully open position;
- After 30 min of operation, the control device is moved at normal speed to the position corresponding to minimum temperature and the appliance operates 60 s under these conditions;
- The pressure is then reduced progressively to 14 mbar.

Grill burners:

- Operate the burner initially for 10 min at full rate at normal test pressure;
- The burner tap is moved at normal speed to its reduced rate position, if any, and the appliance operates for 60 s under these conditions. If the reduced rate position does not exist, operation is maintained at full rate;
- The pressure is then reduced progressively to 14 mbar.

7.3.1.5 Heating

7.3.1.5.1 Test installation

7.3.1.5.1.1 All appliances

For these tests, the appliance is placed in the test installation specified in 7.1.3.3, but with the following alterations:

Unless otherwise indicated, if additional or replacement panels are specified, they shall be made of 19 mm to 25 mm thick wood and coated with matt black paint.

Temperature measurement on the panels is limited to the hottest zones with the thermocouple at the centre of a square of sides 100 mm on each of the panels. The thermocouples are introduced from the outside so that their junctions are 3 mm from the surface facing the appliance. Additional thermocouples may be added in areas susceptible to high temperatures.

This procedure applies for all classes of appliance.

In addition, the following supplementary installation conditions shall be complied with according to the class and subclass of the appliance.

7.3.1.5.1.2 Class 1 and class 2 subclass 1

- a) **For all appliances with a hotplate**, an additional panel is placed vertically at the side of the appliance which produces the greater heating effect, at the minimum distance (see X_1 in Figure 12) indicated in the instructions. This panel shall be of a sufficient depth to extend from the back panel to at least 50 mm

beyond the front and of a sufficient height to extend from the work top to the top of the back panel. The gap between the lower panel and the upper panel shall be filled in by a horizontal panel.

- b) **For wall-mounted grills**, additional panels are placed on each side of the appliance at the minimum distance indicated in the technical instructions. These panels are 600 mm deep and extend at least from the horizontal panel below the appliance to the horizontal panel described in c).
- c) **For all appliances**, a panel of sufficient depth to exceed the corresponding dimension of the appliance by at least 50 mm and of sufficient width to reach the vertical side panels (including the additional panel described in a) if fitted) is placed horizontally above the appliance at the minimum distance (see X2 in Figure 12) indicated in the instructions.
- d) **The back panel** is 1,8 m high or of such a height that it extends at least up to the horizontal panel described in c) and its width is such that it extends at least to the additional side panel described in a).
- e) **Insulating material**: however, if the instructions specify that as an alternative to the specified gaps, insulating material may be used with the appliance installed with a reduced gap, the test shall be repeated under these particular conditions.
- f) **Floor-standing appliances or appliances resting on a support** shall be placed on a horizontal panel representing the floor or the support and extending at least 100 mm beyond the corresponding dimensions of the appliance. All the vertical panels rest on the horizontal panel.

AC The floor or the support shall be slightly raised in order to allow natural circulation of air under the panel. **AC**

7.3.1.5.1.3 Class 2, subclass 2 and class 3

- a) **For all appliances**, the back wall of the building-in unit may be replaced by a panel which shall be at least as wide as the unit wall and shall be high enough to reach the horizontal panel described in b), or, if the panel is not required, to reach the top of the building-in unit, but, in all cases, has a height of not less than 1,80 m.
- b) **For all appliances with a hotplate**, a horizontal panel is placed above the appliance at the minimum distance indicated in the technical instructions. The panel shall be of a depth sufficient to extend from the back panel described in a) to at least 50 mm beyond the front of the building-in unit and shall be of a width sufficient to extend from the additional side panel described in c) to at least 50 mm beyond the opposite side of the building-in unit.
- c) **For all appliances with a hotplate**, an additional panel is placed vertically at the side of the appliance, which produces the greatest heating effect at the minimum distance indicated in the technical instructions. This panel shall be of a depth sufficient to extend from the back panel described in a) to at least 50 mm beyond the front of the building-in unit and of a height sufficient to extend from the work top to the top of the back panel described in a).

In order to ensure that the greater heating effect has been determined with respect to the surfaces mentioned in 6.1.5, it may be necessary to repeat the test with the above mentioned panel on the other side of the appliance.

- d) **Appliances intended to stand on the floor** shall be placed on a test floor. This shall be of depth sufficient to extend from the back panel to at least 50 mm beyond the front of the unit and of a width sufficient to extend at least 50 mm beyond the corresponding dimensions of the building-in unit. The floor shall be slightly raised to allow natural circulation of air under the panel.
- e) **For built-in hotplates**, if specified in the instructions, an additional horizontal panel made of 15 mm thick timber is placed below the appliance at the minimum distance from the work top recommended by the technical instructions.

This panel shall correspond to the critical dimensions which shall be stated in the technical instructions.

If the instructions do not require this horizontal panel to be installed, test no. 1a in 7.3.1.5.2.3 is carried out with and without this panel.

f) **For built-in hotplates**, thermocouples are fitted into the work top as described in 7.3.1.5.1.1.

7.3.1.5.2 Test methods

7.3.1.5.2.1 General

The appliance is supplied according to its category with the reference gas indicated in 7.1.1.1 giving the highest heat input at normal test pressure.

It is fitted and adjusted as prescribed in  7.1.3.1.1.

Where appropriate, it is supplied with electrical energy at nominal voltage.

7.3.1.5.2.2 General operating conditions of the different parts of the appliance

The tests are started from cold and, unless otherwise stated in 7.3.1.5.2.3, the measurements are carried out in accordance with 7.3.1.5.3 under the following conditions.

— Hotplate cooking elements

Pans are placed simultaneously on the burners, and on the electric cooking plates, if they exist, in accordance with 7.1.4.2.

At the start of the test, the burners and any electric cooking plates are put into operation, their control being at their highest setting. As soon as the water boils, the controls are adjusted so that they maintain light boiling (simmering) and the controls left at this setting until the end of the test.

During the test, the pan is covered by its lid and hot water is added to ensure a sufficient water level in order that boiling can be maintained.

When a burner can operate covered or uncovered, the test is carried out using the arrangement corresponding to the highest thermal output.

— Hotplate griddles

Gas or electric hotplate griddles are put into operation 30 min after the start of the test.

Griddles provided with means of reducing the power are put into operation with the control mechanism set so as to limit the temperature at the centre of the griddle plate to a value as close as possible to 275 °C but no lower than 245 °C, unless this condition cannot be obtained, in which case the control mechanism is set to its highest position.

If a burner can operate either under a pan or under a griddle, the test is carried out using the arrangement giving the highest thermal input.

— Ovens

At the start of the test, gas or electric ovens are put in operation without accessories, the thermostat, or the control knob if there is no thermostat, being set to the position permitting the maintenance of an average temperature at the centre of the oven of (200 ± 4) °C, or to the position corresponding to the nearest possible temperature above 200 °C.

If an appliance has two ovens, they are put in operation simultaneously with their control handles being placed in the positions permitting the maintenance of an average temperature of (200 ± 4) °C at the centre of each oven, or the positions corresponding to the nearest possible temperature above 200 °C.

— **Grills**

Grills are operated when this is specified in the tests given in 7.3.1.5.2.3.

Unless otherwise specified they are operated as described below.

The grill is put into operation 30 min after the start of the test with its control mechanism set to the highest position. After 15 min of operation, the control mechanism is adjusted to obtain half the nominal heat input or half the nominal electric power.

If the design of the control mechanism is such that it is not possible to reduce the full input or the electric power by half, but only to a value greater than half, then the control mechanism is adjusted to give the lowest input or electric power obtainable.

However, if the oven has a rotating spit, the duration of operation of the grill is 60 min with the control mechanism set to give the most unfavorable conditions specified in the instructions for use and maintenance.

— **Warming drawers and cupboards**

Gas or electric warming drawers and cupboards are put into operation for 30 min after the starting of the test with their control mechanisms set to the highest position.

7.3.1.5.2.3 Test conditions

Test no. 1a

The duration of test is 1 h.

The appliance is installed under the condition of 7.3.1.5.1 with the following exceptions:

- in the case of class 1 appliances, the side test panels are removed;
- in the case of class 2, subclass 1 appliances, the side test panels are removed unless the instructions state that the appliance cannot be used freestanding.

The appliance is operated in accordance with 7.3.1.5.2.2 with the exception that the grill(s) is (are) not operated.

Test no. 1b

The duration of test is 1 h.

The appliance is installed under the condition of 7.3.1.5.1 with the following exceptions:

- in the case of class 1 appliances, the side test panels are removed;
- in the case of class 2, subclass 1 appliances, the side test panels are removed unless the instructions state that the appliance cannot be used freestanding.

The appliance is operated in accordance with 7.3.1.5.2.2.

If the appliance has a grill, this is only operated if:

- the grill is situated in an oven compartment and
- the instructions for use and maintenance state that the grill, gas or electric, can be used with the oven door closed.

Such a grill is operated as described in 7.3.1.5.2.2, simultaneously with the oven if this is possible. If simultaneous operation is not possible, the test is repeated with the grill operating instead of the oven as described in 7.3.1.5.2.2.

Test no. 2

The duration of the test is 15 min.

The appliance is operated in accordance with 7.3.1.5.2.2 with the following exceptions:

- the control of the hotplate cooking elements remain in the fully open position throughout the test, a pan, in accordance with 7.1.4.1, being placed on each of the burners;
- the griddle operates with the control in maximum position throughout the test;
- the grill operates throughout the test with the tap in maximum position. Each compartment door is open or closed, according to the instructions for use and maintenance, and each grid in the highest possible position under the grill. A plate made of insulating material covers the surface of the grid;
- no oven or warming drawer shall be operated in this test.

Test no. 3

The duration of the test is 1 h.

The appliance is operated in accordance with 7.3.1.5.2.2 with the following exceptions:

- each oven is ignited at the start of the test and operates in accordance with 7.1.5;
- \square_{AC} if a separate grill can operate simultaneously with the oven, \square_{AC} it is operated for the last 15 min of the test, with its control in the maximum position and with its grill door open or closed in accordance with the instructions for use and maintenance;
- the grill pan is placed in the normal position indicated in the instructions for use and maintenance as soon as the grill is operated.

\square_{AC} If an electrical grill is situated in an oven and can be operated simultaneously with a gas burner in the same oven, the test is carried out without the grill in operation and then repeated under the following conditions:

- if the appliance has a control with a specific setting enabling the oven burner and electrical grill to operate simultaneously, these are put into operation utilising the setting enabling the grill to operate for the longest duration with its maximum setting, any separate oven thermostat being set in accordance with 7.1.5;
- if the appliance has separate controls for the oven burner and the electrical grill, the oven and grill are put into operation in accordance with 7.1.5.

If a gas or electrical grill is situated in an oven but cannot be operated simultaneously with the gas burner for the oven, the test is carried out without the grill in operation and then repeated with the grill in operation instead of the oven burner. The grill is operated in accordance with 7.1.5. \square_{AC}

Test no. 4

A test is carried out under the following conditions, with only the parts of the appliance mentioned in operation.

The oven(s) are operated in the cleaning position for 1 h, or according to the instructions for use and maintenance if these exceed 1 h.

During the last hour, the hotplate elements (gas or electric) are operated as described in 7.3.1.5.2.2 unless the instructions for use and maintenance forbid their use during the cleaning period.

If, under these conditions of test, the temperature at the centre of the oven is likely to exceed 350 °C the temperature at the centre of the oven is monitored during the test and after the burners have been turned off. If, at any time the temperature of the oven exceeds 350 °C then it shall be verified that the requirements of **AC** 5.2.9.1.5 **AC** are met and that the means provided prevents access to the interior of the oven while the temperature at the centre of the oven exceeds 350 °C.

Test no. 5

Only the ovens are operated for 1 h at the maximum control setting.

If an electrical grill is situated in an oven and can be operated simultaneously with a gas burner in the same oven, the test is carried out without the grill in operation and then repeated under the following conditions:

- if the appliance has a control with a specific setting enabling the oven burner and electrical grill to operate simultaneously, these are put into operation utilizing the setting enabling the grill to operate for the longest duration with its maximum setting, any separate oven thermostat being set to its maximum setting;
- if the appliance has separate controls for the oven burner and the electrical grill, the oven and the grill are put into operation at their maximum control settings.

If, under these conditions of test, the temperature at the centre of the oven is likely to exceed 350 °C the temperature at the centre of the oven is monitored during the test and after the burners have been turned off. If, at any time the temperature of the oven exceeds 350 °C then it shall be verified that the requirements of **AC** 5.2.9.1.5 **AC** are met and that the means provided prevents access to the interior of the oven while the temperature at the centre of the oven exceeds 350 °C.

Test no. 6

The appliance is installed without side panels, and operates under the conditions of test no. 3 in 7.3.1.5.2.3.

7.3.1.5.3 Measurements

7.3.1.5.3.1 General

During the heating tests, the ambient temperature in the room shall be between 20 °C and 25 °C.

The ambient temperature is measured with an appropriate instrument under the following conditions:

- at a height of (900 ± 50) mm from the floor;
- at a distance of between 1 m and 1,5 m from the appliance;
- using an instrument which is accurate to within $\pm 0,5$ °C;
- the instrument shall be protected against radiation from the appliance.

At the end of each test, it is checked that the appropriate requirements of 6.1.5 are satisfied.

7.3.1.5.3.2 Front and sides of the appliance

Temperatures are measured by means of an appropriate probe, such as that specified in Annex D.

The probe is applied to the surface with a force of (4 ± 1) N so as to ensure the best possible contact between the probe and the surface.

The probe is applied for a sufficient period of time for the temperature of the sensing element to be stabilized.

Any measuring instrument giving the same results as the probe shown in D.1 may be used.

Special care is required when the surfaces in question are not flat.

7.3.1.5.3.3 Other parts of the appliance, support and adjacent panels and housing unit

Suitable thermocouples are used with thermoelectric junctions which are accurate to within ± 2 K.

In order to measure the temperature of the "push-on" connector, thermocouples are inserted between the cylindrical part of the "push-on" connector and the flexible tube.

However, if the auxiliary equipment is itself likely to cause a rise in temperature (e.g. electromagnetic valves), the temperature of auxiliary equipment is not measured. In this case, thermocouples are placed so as to measure the air temperature close to the device.

The temperature measurements of the auxiliary equipment are deemed to be satisfactory if:

$$t_m \leq t_{\max} + t_a - 25 \quad (11)$$

where

t_m is the temperature measured, in degrees Celsius;

t_{\max} is the maximum temperature of the component, in degrees Celsius;

t_a is the ambient temperature in degrees Celsius.

7.3.1.6 Overheating of the LPG cylinder and its compartment

In order to produce conditions more severe than in practice, the tests described in 6.1.6 are carried out as follows:

- the oven burner and those of the hotplate are supplied with G30 gas by a cylinder outside the appliance;
- the controls for the hotplate burners and the electric cooking plates are in the full-on position, pans being placed according to 7.1.4.2; it is allowed to add water to the pans during the test, in order that boiling can continue for the time necessary for the test;
- the oven operates with its control in the maximum position;
- if a grill can operate simultaneously with the oven, it is supplied under the same conditions and put into operation during the last 15 min of oven operation, its control being in the maximum position;
- the cylinder placed in the appliance compartment is the largest of those recommended in the instructions for use and maintenance; it is filled to $\frac{4}{5}$ of its volumetric water capacity with gas G30 and supplies an external burner, not part of the appliance, at a heat input equal to the nominal heat input of the gas oven. If the appliance does not have a gas oven, the incorporated cylinder is not turned on during this test;
- the temperatures of the push-on connector and of the walls of the compartment are checked with thermocouples. The increase of pressure is measured with a manometer as shown diagrammatically in Figure 6.

For this test, account is taken of the existence of any means of guiding the flexible tube, of the appropriate instructions and of the warning notice, written in a legible and durable fashion, fixed inside the compartment on a non-removable part.

The measurement is carried out, after 1 h of operation and during the first 30 min which follow complete extinction.

However, in the case of an electric pyrolytic oven, the oven is put into operation at its cleaning setting for the maximum period specified by the manufacturer. During the last hour of oven operation the hotplate elements which can operate are operated with the burners supplied at half rate.

In the case of an electric oven or grill, the test is repeated without the hotplate burners in operation.

7.3.1.7 Total input rate of the appliance

Each burner is supplied with reference gas (see 7.1.1.1) at normal test pressure (see 7.1.2) and with the corresponding injector. If the appliance category includes several reference gases, the test is carried out only with the one having the lowest Wobbe index.

Each burner having been adjusted individually to give, with reference gas and at normal test pressure, the nominal heat input given by the manufacturer, this gas is replaced by air under the same conditions. The air rate is measured for each burner in turn, and then the total rate is measured with all the taps open simultaneously. If there is a flame supervision device, it shall be arranged so that air reaches the injectors (e.g. by separate heating of the sensing element).

It is verified that the requirements of 6.1.7 are satisfied by the air rates measured.

7.3.1.8 Regulator performance

For these tests, measurements are taken when the burner(s) are at thermal equilibrium.

With the appliance initially at ambient temperature, two tests are carried out using the reference gas(es). Each test begins with adjusting the gas rate in the following way at normal supply pressure using the appliance tap(s).

Test no. 1

For an appliance with several burners, the gas rate corresponds to $\frac{2}{3}$ of the sum of the nominal heat inputs of all the burners which can function simultaneously. For an appliance with only one burner, the gas rate corresponds to the nominal heat input.

Test no. 2

The appliance gas rate is adjusted to $0,08 \text{ m}^3/\text{h}$ for first family gases and to $0,05 \text{ m}^3/\text{h}$ for second family gases, and to $0,02 \text{ m}^3/\text{h}$ for third family gases.



For each test, the appliance inlet pressure is varied between the minimum and maximum values in Table 9 and it is checked that the requirements of 6.1.8 are satisfied.

7.3.2 Specific tests for hotplates

7.3.2.1 Ignition, cross-ignition, flame stability

7.3.2.1.1 General

The appliance is installed according to 7.1.3.3 in a suitably ventilated room.

Each burner is adjusted under the conditions described in  7.1.3.2.1  with each reference gas belonging to the appliance category.

The burner is lit in accordance with the instructions for use by means of the ignition system, or there is one, or with a match if the burner does not have an ignition system.

When the ignition system only delivers one spark at a time, for the purposes of the test it is operated at most three times at intervals of about 1 s. The first ignition attempt is made when the gas arrives at the burner ports.

In order to know the time of arrival of the gas at the burner ports, an auxiliary ignition flame is placed near to the burner ports. The time which elapses between the moment when the tap is placed in the full-on position and the moment when the burner ignites is measured.

Where the use of a pan is required on a burner in the following tests, a pan in accordance with 7.1.4 is used, preferably one made of glass so that the flame can be observed.

In the case of temporary griddles and temporary covered burners, the burner is tested firstly with the plate or griddle in place, then as an uncovered burner.

Where uncovered burners do not have an ignition system and covered burners are tested individually, the tests are carried out without a pan. The tests in which they operate simultaneously with other burners of the hotplate are carried out with the pans recommended in 7.1.4.2.

In the case of uncovered burners with an ignition system, the requirements regarding the use of pans are specified for each test.

In all cases, hotplate burners are tested successively in the following order: back right burner, back left burner, front left burner, front right burner, where the hotplate has four burners. If the hotplate has a different number of burners, the order of ignition is based on the order given for four burners.

In tests requiring the operation of ovens and grills placed beneath the hotplate, all these ovens and grills operate simultaneously if this is possible.

If simultaneous operation is not possible because there is an oven and grill in the same compartment, the tests are carried out once with the oven in operation and once with the grill in operation. If there is a second oven or grill beneath the hotplate, it operates in both cases.

The requirements for ignition, cross-ignition and flame stability in 6.2.1 are verified during the following tests. However, for independent hotplates, the tests in 7.3.2.1.2 second group, requiring the use of reference gases and those in 7.3.2.1.3 first group, do not apply.

7.3.2.1.2 Cold tests

With the appliance at ambient temperature, the correct ignition and flame stability of each of the hotplate burners is checked with them operating individually.

Two groups of tests are carried out under the following conditions.

First test group:

The appliance is cold at the start of the test.

Uncovered burners which have an ignition system are tested with and without a pan.

Correct ignition and cross-lighting of each burner are checked individually with the appliance supplied successively with each of the reference gases at the normal test pressure.

After 5 s operation, the tap is turned to the reduced rate position at normal speed¹²⁾ and it is verified that the burner is not extinguished.

¹²⁾ Operation at fairly constant speed, in a time of approximately 1 s.

The tap is turned to the maximum flow position and flame stability is verified.

After examining the flames, the tap is turned off.

Second test group:

1. The appliance is cold at the start of the test.

Any ovens and/or grills situated under the hotplate, whether gas or electric, are brought into operation for 3 min and continue to operate throughout the test.

Uncovered burners which have an ignition system are tested with and without a pan.

With the appliance supplied successively with each of the reference gases under normal test pressure, correct ignition and cross-lighting of each of the burners, tested individually, are verified between the end of the third and the end of the fifth minute after ignition of the oven and/or the grill.

Once each burner has been tested, the tap is returned to the closed position. At the end of the test, the appliance is cooled.

2. With the appliance cold at the start of the test, any ovens and/or grills are operated for 3 min and continue to operate throughout the test.

Uncovered burners are tested without a pan.

With the appliance supplied with the limit flame lift gas(es) of the category to which the appliance belongs under maximum test pressure, the ignition, cross-lighting and flame stability of each of the burners, tested individually, are verified between the end of the third minute and the end of the eighth minute after ignition of the ovens and/or grill.

Following examination of the flames of each burner, the tap is returned to the closed position. At the end of the test, the appliance is cooled.

7.3.2.1.3 Hot tests

Correct ignition of the burner and flame stability are verified for each hotplate burner tested individually.

Any ovens and/or grill placed beneath the hotplate, whether gas or electric, are operated in accordance with 7.1.5.

Ovens operate initially for 30 min, the grill, if it can operate alone, for 15 min. Where a separate oven and grill can operate simultaneously, the grill is put in operation 15 min after the oven.

Three groups of tests are carried out under the conditions described below.

If it is necessary during the execution of one group of tests to cool the appliance, for example in order to change gas, the initial conditions fixed for the corresponding group of tests shall be re-established before any further test is carried out.

First test group:

The ovens and/or grill are kept in operation.

The tests are carried out without a test pan on the burner.

1. With the appliance supplied successively with each of the reference gases under normal pressure, correct ignition and cross-lighting of each burner, tested individually in the order stated in 7.3.2.1.1, are verified.

2. With the appliance supplied with the flame lift gas(es) of the category to which the appliance belongs under maximum pressure, ignition, cross-lighting and flame stability are verified for each burner when tested individually.

Following examination of the flame of each burner, the tap is returned to the closed position.

Second test group:

For the purposes of the test, the second test group is carried out immediately after the first group, with the ovens still in operation.

However, if the first test group includes the operation of a grill, the appliance is allowed to cool down then is put into operation again under the conditions stated in the first test group.

A pan is placed centrally on each of the burners and the electric cooking plates, according to 7.1.4.2.

All the hotplate burners or electric cooking plates are operated initially at reduced rate for 10 min then each burner is successively:

- extinguished;
- ignited in accordance with the instructions for use.

If there is an ignition system, the pan is not removed. If ignition is carried out with a match, the pan is removed in order to light the burner and then replaced.

For these tests, the following procedure shall be used:

1. with the appliance supplied successively with each of the reference gases under normal test pressure, the correct ignition and cross-lighting of each burner, tested individually, are verified.
2. with the appliance supplied with the flame lift limit gas(es) of the category to which the appliance belongs under maximum test pressure, ignition, cross-lighting and flame stability are verified for each burner when tested individually.

Following examination of the flame, the tap is turned from the full-on position to the reduced rate position at normal speed¹³⁾. In the course of this operation, extinction shall not occur.

3. with the hotplate burner taps adjusted to the reduced rate position, it is then verified that, with the reference gas under normal test pressure, no extinction or light-back is observed:
 - during opening or closing the oven door at normal speed¹⁴⁾;
 - during opening or closing at normal speed¹⁵⁾ of the door of the housing unit or each of the doors of the housing unit in succession, if there are several.

An interval of 15 s is observed between opening and closing a door.

Third test group:

For the purposes of the tests, the third test group is carried out immediately after the second group, with the ovens and electric cooking plates still in operation.

13) Operation at fairly constant speed, in a time of approximately 1 s.

14) Operation at fairly constant speed, in a time of approximately 1 s.

15) Operation at fairly constant speed, in a time of approximately 1 s.

However, if the second test group includes the operation of a grill, the appliance is allowed to cool down, then is put into operation again under the conditions stated for the second test group.

A pan is placed centrally on each of the burners and the electric cooking plates in accordance with 7.1.4.2.

Each hotplate burner is supplied with the light back limit gas(es) under minimum test pressure. On turning the tap at normal speed¹⁶⁾ from the full-on position to the reduced rate position, it is checked that no light back or extinction occur.

7.3.2.1.4 Multi-ring hotplate burners having a single tap or control

This test is carried out using each of the reference gases supplied at the corresponding maximum and minimum pressures. Each test is carried out without a pan over the burner.

Any multi-ring hotplate burner with sectional control is tested individually. With the appliance cold, reduce the gas rate supplied to the supervised ring of burner ports until it corresponds to that obtained when the tap or control is set to its lowest marked position. Turn the burner control¹⁷⁾ in accordance with the manufacturer's instructions to open the gas supply to the other ring(s) of burner ports and verify that ignition and cross-lighting at any unsupervised ring of burner ports from the supervised ring of burner ports occurs smoothly within 5 s.

Any multi-ring hotplate burner with simple control is tested individually. With the appliance cold, ignite the burner with its tap or control set to the lowest marked position for which ignition of the supervised ring of burner ports is possible. Verify that ignition and cross-lighting at any unsupervised ring of burner ports occurs smoothly within 5 s.

7.3.2.2 Resistance to draught

For the resistance to draught test, the upper side panels mounted above the level of the hotplate are not installed.

Each uncovered multi-ring hotplate burner equipped with a single flame supervision device is operated successively according to the conditions of **AC** 7.1.3.2.4 **AC** for each reference gas of the category to which it belongs.

The test is carried out with the burner hot. For this purpose, a pan, in accordance with 7.1.4.1, is placed on the burner which is operated at its nominal heat input for 10 min. The reference gas is then replaced by the flame lift limit gas.

The control tap handle is moved to the reduced rate position.

The pan is removed and the test device shown in Figure 7 is so placed that the blade of the pendulum is centred over the burner, the distance between the lower edge of the pendulum and the plane of the pan supports being 25 mm. The pendulum is set in an initial position 30° to the vertical, its plane of oscillation being parallel to the front of the appliance. The pendulum is allowed to swing in one direction and then, separated by an interval of at least 10 s, it is allowed to swing in the other direction. The appliance is then tested successively with the flame lift limit gas or gases corresponding to each reference gas of the category to which it belongs and at the normal test pressure corresponding to these limit gases (see 7.1.1.1 and 7.1.2).

Complete extinction of the burner is tolerated if the gas supply to the burner is shut off under the control of its flame supervision device. Partial extinction is tolerated provided that re-ignition and cross-lighting occurs spontaneously within 5 s.

16) Operation at fairly constant speed, in a time of approximately 1 s.

17) Operation at fairly constant speed, in a time of approximately 1 s.

7.3.2.3 Resistance to liquid spillage

This test is carried out for each uncovered multi-ring hotplate burner that is equipped with a single flame supervision device.

The burners, operating individually at their nominal heat input and supplied only with the reference gases under the conditions specified in **AC** 7.1.3.2.4 **AC**, are used to bring to the boil and maintain at boiling point a clean 160 mm diameter (see C.1) pan, without a lid, filled with water to 10 mm below the rim; this diameter is increased to 220 mm for burners of nominal heat input equal to or greater than 3,5 kW.

The test is continued until there is no more spillage.

Complete extinction of the burner is tolerated if the gas supply to the burner is shut off under the control of its flame supervision device. Partial extinction is tolerated provided that re-ignition and cross-lighting occurs spontaneously within 5 s. After this test, spilled liquid shall be removed and the burner shall be capable of being re-lit easily.

7.3.2.4 Combustion

7.3.2.4.1 Supply conditions

The appliance shall be installed according to the conditions defined in 7.1.3.3, **AC** each of the burners when operating individually and having previously been adjusted to their nominal heat input according to the conditions specified in 7.1.3.2.4 **AC**.

The requirements of 6.2.2 are verified in the course of the tests given in Table 11.

Table 11 — CO concentration in the combustion products

Test no.	Burners in operation ^a	Gas used	Position of tap handles	Maximum CO concentration % / Vol
1	Each burner individually	Each reference gas	Full on	0,10
2	Each burner individually	Each reference gas	Position corresponding to ½ nominal heat input	0,15
3	Each burner individually	Limit gas for incomplete combustion	Full on	0,15
4	All hotplate burners and (if possible) oven and/or grill simultaneously ^b	Each reference gas	Full on	0,20
5	Each burner individually	One of the reference gases ^c	Full on	0,20
6	Each multi-ring burner with sectional control individually	Each reference gas	Position corresponding to the maximum rate obtainable when the smallest number of burner sections are in use	0,15

^a Tests no. 1, 2, 3, 4 and 5 also apply to multi-ring hotplate burners. Where a multi-ring hotplate burner has separate taps enabling each ring of burner ports to be controlled independently, tests no.1, 2, 3 and 5 are carried out with each ring of burner ports in operation on its own as a separate burner. Test no. 4 is carried out with all rings of the burner ports in operation together. Test no. 6 is only applicable to multi-ring hotplate burners with sectional control by means of a single gas tap or control.

^b For the operation of the oven and grill, see test no. 4.

^c The reference gas giving the highest CO concentration in test no. 1.

Tests no. 1, 2, 3, 4 and 6 are carried out with and without the special removable supports for small pans on the burners for which the instructions for use and maintenance specify their use.

Test no. 5 is only carried out when the appliance has a mains electricity supply. Any special support for small pans is not used.

For test no. 1

For appliances that have no gas rate adjuster or regulator, or for appliances fitted with these devices where their function has been annulled, the test pressure is the maximum pressure indicated in 7.1.2, corrected in accordance with 7.1.3.2.4, for the test gases used (see 7.1.3.2.1) as appropriate to the appliance category.

For appliances with gas rate adjusters but without regulators, the test is carried out by adjusting the burner to give a rate equal to 1,10 times the nominal heat input.

For governed appliances, the test is carried out with the burner heat input raised to a value of 1,075 times the nominal heat input.

For test no. 2

This test is carried out immediately after test no. 1 without cooling down the appliance.

The heat input of the burner is adjusted to half the nominal heat input using the burner tap.

For griddles, this test is carried out using the position corresponding to half the nominal heat input, or, if this is not possible, using the position corresponding to the heat input which is as close to this as can be obtained.

For test no. 3

The incomplete combustion limit gas(es) is used without changing the adjustments and pressures used for the corresponding reference gas used in test no. 1.

For test no. 4

The test is carried out with each of the reference gases, supplied at the normal test pressure, under the following conditions of simultaneous operation \overline{AC} (see 7.1.3.2.1) \overline{AC} :

- a) all hotplate elements (gas and electric) are operated full-on;
- b) ovens are operated with their controls in the position corresponding to the maximum cooking temperature;
- c) with the exception of a high level grill, which is not operated during this test, grills situated in separate compartments are operated with their controls in the position corresponding to half the nominal heat input (electric power), or, if this is not possible, using the position corresponding to a heat input (electric power) as close to this as possible;
- d) in the case of a grill situated in the same compartment as an oven, the test is repeated with the grill operating, as described in c), instead of the oven. All other elements of the appliance, including any other oven, are operated under the conditions mentioned in b).

For test no. 5

If fluctuations of the main electrical voltage can have an influence on the operation, ignition and/or combustion the test is carried out individually on each burner with one of the reference gases (see Table 11) at the normal test pressure, the appliance being supplied with electricity at 1,10 times the maximum nominal voltage specified on the appliance.

The test is repeated with the appliance supplied with electricity at 0,85 times the minimum nominal voltage.

For test no. 6

This test is only applicable to multi-ring hotplate burners with sectional control by means of a single gas tap or control. The test is carried out with each of the reference gases, supplied at the normal test pressure.

7.3.2.4.2 Sampling the products of combustion

For tests no. 1, 2, 3, 5 and 6

The sampling of combustion products is carried out with each burner in turn.

A pan is placed on the burner in accordance with 7.1.4.1. However, no pan shall be placed on covered burners if the plate would not be entirely covered by the pan.

When a round pan of 220 mm diameter is used it is covered with a sampling device as shown in Figure 9. When a round pan of 300 mm is used it is covered with a sampling device as shown in Figure 8. In the other cases, the sampling device is a 500 mm × 300 mm hood as shown in Figure 10, placed at a distance of between 20 mm and 80 mm above the level¹⁸⁾ of the pan supports or of the griddle plate.

The combustion products are sampled by drawing off some of these gases in the upper part of the sampling device. The requirement shall be verified 20 min after the start of the test.

The CO₂ concentration of the sample shall be greater than 1 % by volume.

A restrictor may be used to obtain this CO₂ concentration. If it is impossible to obtain a CO₂ concentration of 1 % by volume without compromising the result, a value of less than 1 % is acceptable but the laboratory shall ensure that the sample taken is representative.

For test no. 4

Each of the hotplate burners and electric cooking plates is covered with a pan in accordance with 7.1.4.2. However, no pan is placed on covered burners if the plate would not be entirely covered by the pan.

Accessories for the oven or grill situated under the hotplate are put in the normal position for use.

The combustion products are sampled 20 min after the start of the test.

A sampling device is placed over the appliance such as those shown as examples in Figure 10, selected according to the shape of the hotplate. The device shall overlap the hotplate by at least 40 mm. If the appliance has a shut-down lid or a high level grill which renders this arrangement impossible, the device is slid between the lid and the back panel of the test installation. It shall overlap the other three sides of the hotplate by at least 40 mm.

This device shall collect all the products of combustion (including those from any oven or grill in operation) but shall not alter their course to the extent where this is likely to affect the quality of combustion. In particular, the distance between the base of the device and the level of the pan supports shall be such that it does not affect the quality of combustion of the burners, there is no escape of products of combustion from the base of the sampling device and that the CO₂ concentration is greater than 1 % by volume. This distance shall be between 20 mm and 80 mm.

If the CO₂ concentration in the combustion products is less than 1 % by volume, a restrictor is placed in the upper part of this device in order to bring this quantity to a value slightly over 1 %. However, this restrictor is

18) If the CO₂ concentration is greater than 2 %, it shall be checked that the quality of combustion is not affected by the sampling method.

not used if it affects combustion quality or if, as a result of its presence, the combustion products spill outside the device, but the laboratory shall then ensure that the sample is representative.

7.3.2.4.3 Analysis of the products of combustion

The volumetric concentration of CO in the air and water vapor free products (neutral combustion) is given by the following equation:

$$(CO)_N = (CO)_M \cdot \frac{(CO_2)_N}{(CO_2)_M} \tag{12}$$

where

$(CO)_N$ is the volumetric percentage of carbon monoxide content relative to the dry, air-free products of combustion;

$(CO_2)_N$ is the volumetric percentage of carbon dioxide calculated for the dry, air-free products of combustion;

$(CO)_M$ and $(CO_2)_M$ are the volumetric percentages of carbon monoxide and carbon dioxide measured in the dry sample during the combustion test.

The % values of $(CO_2)_N$ for the test gases are given in Table 12.

Table 12 — Percentage by volume of CO2 (dry products of neutral combustion)

Designation of gas	G110	G120	G130	G150	G20	G21	G25	G26	G30	G31
% (CO ₂) _N (neutral combustion)	7,6	8,35	13,7	11,8	11,7	12,2	11,5	11,9	14,0	13,7

For all the tests, the CO is measured using a selective method allowing the detection with certainty of a concentration of 0,005 % by volume and measurement with a relative error not exceeding 6 %.

CO₂ is measured using a method with a relative error not exceeding 6 %.

NOTE The use of infra-red absorption analysers is recommended.

7.3.2.4.4 Sooting test

At the end of test no. 3 of 7.3.2.4.1, the sooting limit gas(es) is(are) substituted for the incomplete combustion gas(es) and the pressure is adjusted to the normal test pressure value corresponding to the category of appliance.

The pan covering the burner is replaced by an identical clean pan and the requirements of 6.2.2, paragraph 3, are verified after 10 min operation.

7.3.3 Specific tests for ovens and grills

7.3.3.1 Ignition, cross-lighting and flame stability

7.3.3.1.1 General

The appliance is installed according to the conditions in 7.1.3.3 in a suitably ventilated room.

Each burner is adjusted in accordance with the conditions of ^{AC} 7.1.3.2.1 with each reference gas of the appliance category.

Unless otherwise stated:

- the oven doors are closed if ignition can be carried out under these conditions;
- the grill door is closed if allowed by the instructions for use and maintenance;
- the tests are carried out without oven and grill accessories.

The burner is lit by means of the ignition system, if there is one. When the burner does not have an ignition system, it is lit by a match.

When the ignition system only delivers one spark at a time, for the purposes of the test it is operated at most three times at intervals of about 1 s. The first ignition attempt is made when the gas arrives at the burner ports.

In order to determine the time of arrival of the gas at the burner ports, an auxiliary ignition flame is placed near to the burner ports. The time which elapses between the moment when the tap is moved to the full-on position and the moment when the burner ignites is measured.

The requirements of 6.3.1 are verified in the course of the following tests.

7.3.3.1.2 Cold ignition and cross-lighting

With the appliance at ambient temperature, correct ignition and flame stability of each oven or grill burner, when operating individually, are checked under the following conditions:

- the burner is cold;
- the gas circuit is initially purged up to the injector;
- the tap is placed in the ignition position indicated in the instructions for use and maintenance.

The requirements of 6.3.1 concerning ignition and cross-lighting shall be verified with:

- each reference gas at normal test pressure;
- the flame lift limit gas or gases for the appliance category under maximum test pressure;
- the incomplete combustion limit gas or gases for the appliance category at the normal test pressure.

7.3.3.1.3 Hot ignition and cross-lighting

With the appliance at ambient temperature, the oven or grill are operated separately for 10 min with the control device in the maximum position and the door closed if the instructions for use and maintenance do not forbid this. Return the control to the closed position. After 1 min, place the control in the ignition position indicated in the instructions for use and maintenance and light the burner.

The tests are carried out with:

- each reference gas at the normal test pressure;
- the flame lift limit gas(es) for the appliance category under maximum test pressure;
- the light back limit gas(es) for the appliance category at minimum test pressure;
- the incomplete combustion limit gas(es) for the appliance category at the normal test pressure.

7.3.3.1.4 Rate reduction

After previously operating the oven or grill for 10 min under the conditions of 7.3.3.1.3 with the following gases:

- each reference gas at the normal test pressure;
- the flame lift limit gas(es) for the appliance category at minimum test pressure;
- the light back limit gas(es) for the appliance category at minimum test pressure.

The control handle is turned at normal speed¹⁹⁾ towards the minimum position, if there is one.

If the appliance has two ovens or grills, gas or electric, which can operate simultaneously and affect each other, the burners are adjusted successively, if this is possible, to their reduced rate position after 10 min of simultaneous operation, the setting for the other oven or grill, gas or electric, remaining in the maximum position.

7.3.3.1.5 Operation of the oven door

The resistance of the oven burner flames to movements of the oven door is verified as follows under the same gas supply conditions as in 7.3.3.1.4.

With the oven door open and the pilot, if any, lit, light the oven burner, with the oven tap in the ignition position indicated in the instructions for use and maintenance. Close the oven door and check that the oven burner and pilot remain alight.

After 30 min of operation in accordance with 7.1.5, the control is turned at normal speed²⁰⁾ to the minimum position:

- after 15 s approximately, open the oven door and observe the flames;
- approximately 15 s later, close the door;
- after 15 s, open the door and observe the flames;
- close the door and approximately 15 s later, turn the control to its maximum position at normal speed²¹⁾;
- after 15 s approximately, open the door and check that the burner and any pilot, if any, are operating normally.

19) Operation at fairly constant speed, in a time of about 1 s.

20) 21) Operation at fairly constant speed, in a time of about 1 s.

The movement of the door is carried out at normal speed²²⁾.

If the appliance has ovens or grills which can operate simultaneously and which can have an effect on one another, they are also tested during simultaneous operation. The effect of opening the door of the oven or ovens is examined after the ovens and/or grills have been operated as described in 7.3.2.1.2.

7.3.3.1.6 Operation of the building-in unit door

Class 3 ovens are installed in a tall building-in unit having one or several doors in accordance with 7.1.3.3.2 b).

After pre-heating the oven for 30 min and turning down the control under the conditions of 7.3.3.1.5, the cupboard door(s) are opened to 90° and then closed successively at normal speed²³⁾.

7.3.3.1.7 Grill in an oven compartment

If an oven is equipped with a grill, it is tested under the following conditions:

- after operating the oven for 30 min under the conditions of 7.1.5, it is turned off;
- a grill burner ignition test is carried out immediately using reference gas.

7.3.3.1.8 High level grill

If a grill is so situated that it can be affected by the operation of the hotplate burners and/or oven burners, the following test shall be carried out:

- ignite the hotplate burners with their taps set in the full on position, using each of the reference gases at normal test pressure;
- on each burner, place a pan in accordance with 7.1.4.2;
- as soon as the water boils, adjust the burner tap so that the water is just kept boiling;
- light the oven burners at the same time as the hotplate burners and operate in accordance with 7.1.5;
- put the grill pan in its normal position and 30 min after the start of the test, check that the grill ignition is satisfactory. Repeat the ignition without the grill accessories;
- during these tests, observe the grill flame stability with and without the accessories;
- the tests are repeated with the flame lift limit gas(es) at maximum test pressure.

7.3.3.1.9 Influence between two ovens or grills

If two ovens or grills can operate simultaneously and if the operation of one can affect the ignition, cross-lighting or flame stability of the other, the following test is carried out with one of the reference gases at normal test pressure under the following conditions:

- if it is an oven that is likely to affect another oven or grill, it is first operated for 30 min in accordance with 7.1.5;
- if it is a grill that is likely to affect another oven or grill, it is first operated for 15 min at full rate.

22) 23) Complete opening and closure, at fairly constant speed, in a time of about 1 s.

7.3.3.1.10 Built-in ovens

If an appliance has an oven, the following test is carried out except in the case of a class 1 appliance which, in accordance with the technical instructions, can only be installed with one side adjacent to a wall or to another unit.

For this test, the appliance is installed under the conditions defined in 7.1.3.3 with the following exceptions:

- the building-in unit for a class 3 appliance is provided with the ventilation specified by the manufacturer in the technical instructions (see 8.3.2.4). The ventilation located below the oven burner shall have the minimum cross-section stated in the instructions; ventilation located above the oven burner shall have the largest permitted cross-section;
- if, according to the technical instructions, a class 4 appliance is capable of being installed under the hotplate and in a tall kitchen unit, the test is carried out in the tall unit only.

The test is carried out with the appliance supplied with one of the reference gases under normal test pressure.

The oven is ignited then operates with the door closed for 30 min with the oven control in the position corresponding to the specifications of 7.1.5. The control is then moved to its maximum position and returned in stages to its minimum position, ensuring the flames are observed at all the intermediate heights. If disturbance in the flames is observed, the control is then held in position, so as to check, if under these conditions, the appliance is damaged or if safety of operation is affected.

With the control having been in its minimum position for 15 s, the door is opened and the control is returned in stages to its maximum position, ensuring that the flames are observed at all their intermediate heights. If disturbance in the flames is observed, the control is then held in position, so as to check whether, under these conditions, the appliance is damaged or if safety of operation is affected.

7.3.3.2 Combustion

7.3.3.2.1 Compliance with 6.3.2

Compliance with the requirements of 6.3.2 is checked under the following conditions.

7.3.3.2.2 General

The products of combustion are analyzed in accordance with 7.3.2.4.3.

The appliance is installed under the conditions of 7.1.3.3.

The oven and grill burners are supplied successively and initially adjusted under the conditions given in **AC** 7.1.3.2.1 **AC**. Any adjusters are immobilized in the previously determined positions.

The tests are carried out under the following conditions:

- the thermostat or tap of the oven or grill is set in the position giving the highest temperature;
- the shut-down lid is open;

NOTE In the case where the shut-down lid in its closed position can disturb the path of the products of combustion from any oven or grill which can operate in these circumstances, the tests are repeated with the shut-down lid closed.

- the oven door is closed;
- the grill door is open or closed according to the instructions for use and maintenance;

- the oven or grill accessory supplied by the manufacturer that has the greatest area opposing the circulation of the products of combustion is placed as close as possible to the middle of the oven;
- the sampling of the products of combustion is carried out in such a way that the sample taken is representative, i.e. as close as possible to the average composition of all the products of combustion. The CO₂ content shall be greater than 1 % by volume.

For example, for a high level grill, a hood similar to that described in Figure 11 can be used. In all cases, the hood is placed at a distance of not less than 25 mm above the grill. This device shall collect all products of combustion but shall not affect their course especially in the zone likely to have an effect on combustion quality.

7.3.3.2.3 General supply requirements

Unless instructed to the contrary, tests are carried out with each reference gas, then with the incomplete combustion limit gas(es) specified in 7.1.1.1 according to the appliance category.

For burners that have no gas rate adjuster or pressure regulator, or for appliances fitted with these devices where their function has been annulled, the test pressure is the maximum pressure specified in 7.1.2, corrected as indicated in 7.1.3.2.4, for the test gases used (see 7.1.1.1), corresponding to the appliance category.

For burners with gas rate adjuster but without pressure regulator, the test is carried out by adjusting the burner to an input 1,10 times the nominal heat input with the reference gas.

For regulated appliances, the test is carried out with the burner heat input raised to value 1,075 times the nominal heat input with the reference gas.

7.3.3.2.4 Appliances having a mains electrical supply

If fluctuation of the mains electrical voltage can influence the operation, ignition and/or combustion, the test is carried out with each oven and grill burner operating individually with one of the reference gases (that giving the highest CO concentration during the test carried out in accordance with 7.3.3.2.2), at the normal test pressure, the appliance being supplied at 1,10 times the nominal maximum voltage specified on the appliance.

The test is repeated with the appliance supplied at 0,85 times the nominal minimum voltage specified on the appliance.

7.3.3.2.5 Combustion products outlet

Ovens and grills located below a hotplate, when operating with each of the reference gases at the normal test pressure under the following conditions, shall meet the requirements of 5.2.9.3.

The thermostat is set in at the maximum position or, if there is no thermostat, the tap is set in the full-on position.

Two 220 mm diameter pans are placed flat on the pan support of the hotplate. They are then moved as far off-centre from their respective burners as possible in order, whilst retaining their stability on the pan supports, to cause the maximum obstruction to the flow of combustion products from the oven or grill.

7.3.3.2.6 Operation of a grill

7.3.3.2.6.1 Adjustable rate grill

A test is carried out using each of the reference gases for the range of heat inputs between 100 % and 50 % of the nominal heat input or the minimum heat input allowed by the controls when this is greater than 50 % of the nominal heat input.

7.3.3.2.6.2 Fixed rate grill

If the design of the tap only allows the operation of the grill at the nominal heat input, or if it is clear from the marking and from the instructions given in the manufacturer's instructions for use and maintenance that the grill shall only be used at its nominal heat input, a test is carried out using each of the reference gases at the corrected minimum pressure p'_{\min} in accordance with 7.1.3.2.4.

7.3.3.2.7 Operation of high-level grills

The combustion of high-level grills, if they can be affected by the operation of the oven or hotplate burners, shall meet the requirements of 6.3.2 when the appliance is operated with each reference gas under the conditions of 7.3.3.1.8, with the grill accessories in place.

Sampling of the combustion products is carried out with the hood described in Figure 11 after the grill has been lit and has been operated for 15 min.

7.3.3.2.8 Grill burner intended to be operated with compartment door open tested with the compartment door closed

The test is carried out with the appliance supplied according to its category with each reference gas at the corresponding normal pressure. The test is carried out with the grill burner operated individually.

The test is carried out first without any oven or grill accessories in place.

For a grill in an oven compartment the test is repeated with the oven or grill accessory supplied by the manufacturer that has the greatest area opposing the circulation of the products of combustion in place as close as possible to the middle of the oven, any detachable handle having been removed.



For a separate grill compartment the test is repeated with its grill accessory in place but only if it is possible to close the grill compartment door when this accessory, any detachable handle having been removed, is in place under the grill.

With the appliance at ambient temperature, the grill burner is ignited with its control in the maximum position and then the compartment door is immediately closed²⁴⁾. After 15 min, begin sampling the products of combustion. The test is continued for a further 45 min, or until the maximum CO content of the air- and water vapour-free products of combustion is achieved, whichever the shorter.

If the grill burner flames have been extinguished before sampling begins open the compartment door and re-ignite the burner and operate it for 10 min with its control in the maximum position. The compartment door is then closed²⁴⁾ and after 15 min begin sampling the products of combustion. The test is continued for a further 45 min, or until the maximum CO content of the air- and water vapour-free products of combustion is achieved, whichever the shorter.

For a grill burner with a reduced rate position, the test is repeated with the grill burner control adjusted to its reduced rate position.

In the case of a fixed rate grill burner, repeat the test at minimum supply pressure. 

24)  Where the appliance has a factory-fitted means that does not rely on user for its operation to physically prevent closure of the grill door whilst the grill burner is in operation, the test is performed with the door closed to the position allowed by this device. 

8 Marking and instructions

8.1 Appliance marking (including any type 2 hand-operated control)

All specifications referred to in this clause shall be given in the technical instructions.

8.1.1 All appliances shall bear in a way which is visible, legible for the installer and indelible²⁵⁾ at least the following information on one or more data plates and/or labels fixed securely and durably onto the appliance:

- the name of the manufacturer²⁶⁾ and/or his identification symbol;
- the commercial designation of the appliance;
- the type of electricity supply used, where appropriate;
- the type of gas and the pressure and/or pressure couple for which the appliance is adjusted; any reference to pressure shall be identified in relation to the corresponding category index;
- the direct country or countries of destination;
- the appliance category or categories: if more than one category is specified, each of these categories shall be identified in relation to the direct country or countries of destination;
- the nominal heat input of all the burners, expressed in kilowatts based on the gross calorific value and, for liquefied petroleum gas, the gas rate in grams per hour.

This information shall be written with the aid of symbols in accordance with Annex E.

No other information shall be given on the appliance if it is likely to cause confusion regarding the current adjustment setting of the appliance, the corresponding category or categories and the direct country or countries of destination.

For example, if it is necessary to adjust the appliance in order to convert it from one pressure to another within a third family pressure couple, only the pressure corresponding to the actual adjustment shall be indicated.

8.1.2 All appliances shall bear, in a legible manner which is visible to the installer and the user, one or more warnings, drafted in the official language(s) of the direct country or countries of destination of the appliance.



The following warning shall appear on every appliance:

"This appliance shall be installed in accordance with the regulations in force and only used in a well ventilated space. Read the instructions before installing or using this appliance."

In addition, for appliances having a third family gas cylinder compartment, the interior of the compartment door shall bear a warning, specifying the dimensions of the cylinders to be used in the countries where the appliance can be sold and, where necessary, the notice shall describe the means of assuring a particular path for the flexible tube used for connection.

8.1.3 Where the appliance is designed for remote operation of type 2, the hand held remote control supplied with the appliance shall be marked with:

- the appliance manufacturer's name and/or symbol,

25) The indelibility of the markings is verified by a test carried out in accordance with  EN 60335-1:2002 .

26) "Manufacturer" is taken to mean the company or organization which assumes responsibility for the product.

- the type of cooking appliance and
- a serial number which shall also be specified in the manufacturer's instructions for use and maintenance.

8.2 Marking of the packaging

The packaging shall bear at least the following information:

- the type of gas and the pressure and/or pressure couple for which the appliance is adjusted; any reference to pressure, shall be identified in relation to the corresponding category index;

NOTE If it is necessary to adjust the appliance in order to convert from one pressure to another within a third family pressure couple, only the pressure corresponding to the current adjustment needs to be indicated.

- the direct country or countries of destination of the appliance;
- the appliance category or categories: If more than one category is specified, each of these categories shall be identified in relation to the appropriate direct country or countries of destination.

This information shall be written with aid of symbols in accordance with Annex E.

No other information shall be given on the packaging if it is likely to cause confusion regarding the current adjustment setting of the appliance, the corresponding category or categories and the direct country or countries of destination.

In addition, the following warning, drafted in the official language(s) of the country or countries of direct destination of the appliance, shall be given on the packaging:

"This appliance shall be installed in accordance with the regulations in force and only used in a well ventilated space. Read the instructions before installing or using this appliance."

8.3 Instructions

8.3.1 General

The appliance shall be accompanied by technical instructions intended for the installer and by instructions for use and maintenance intended for the user.

They may be presented together but their texts shall not be confused.

These instructions shall contain information relating to the class of the appliance and also the address of the manufacturer²⁷⁾ and the respective information given in 8.3.2 and 8.3.3.

They shall be written in the official language or languages of the country or countries of direct destination of the appliance and shall be valid for this country or countries.

If the instructions are written in an official language that is used by more than one country, the country or countries for which they are valid shall be identified using the symbols given in Annex E.

Instructions for countries other than those mentioned on the appliance may be supplied with the appliance on condition that each set of instructions includes the following initial statement: "These instructions are only valid if the country symbol appears on the appliance. If the symbol does not appear on the appliance, it is necessary to refer to the technical instructions which will provide the necessary instructions concerning modification of the appliance to the conditions of use of the country".

²⁷⁾ "Manufacturer" is taken to mean the company or organization which assumes responsibility for the product.

8.3.2 Technical instructions

8.3.2.1 General

The technical instructions intended for the installer shall give all instructions for installation, adjustment and maintenance.

8.3.2.2 Specifications applicable to all appliances

In addition to the information given in 8.1, the technical instructions may include information, where appropriate, that the appliance has been certified for use in countries other than those stated on the appliance. If such information is given, the instructions shall include a warning stipulating that modification of the appliance and its method of installation are essential in order to use the appliance safely and correctly in all the additional countries. This warning shall be repeated in the official language(s) of each of these countries. Furthermore, the technical instructions shall state how to obtain the information, instructions and parts necessary for safe and correct use in the country concerned.

As a preamble, they shall include the following warnings:

- a) "prior to installation, ensure that the local distribution conditions (nature of the gas and gas pressure) and the adjustment of the appliance are compatible";
- b) "the adjustment conditions for this appliance are stated on the label (or data plate)";
- c) "this appliance is not connected to a combustion products evacuation device. It shall be installed and connected in accordance with current installation regulations. Particular attention shall be given to the relevant requirements regarding ventilation".

The technical instructions shall include:

- the nominal rates of the different burners, expressed in kilowatts based on the gross calorific value and in grams per hour for liquefied petroleum gas;
- adjustment devices;
- lubrication of taps, where necessary;
- method for verifying correct operation of the burners.

For an appliance that is likely to operate with several gases, these instructions shall also state the operations and adjustments to be carried out when converting from one gas to another. It should give, for each of the interchangeable injectors and calibrated orifices, the markings for each gas and pressures that may be used.

For appliances intended to operate exclusively with the factory-fitted injector, the instructions shall where necessary, give information concerning the use of products for making pressure-tight joints on the thread in the event of the injectors concerned being dismantled.

These instructions shall also give precise indications for connecting the appliance to the gas and a reference to the installation regulations in force in the country in which the appliance is to be used. In particular, the technical instructions shall specify the type, length and position of any flexible tubing which may be used for supplying gas and details for the fitting and use of gas connection adaptors.

If the temperature rise above ambient temperature of a part of the appliance likely to be in contact with the flexible tube exceeds 70 K, the maximum temperature shall be stated and a label shall be fixed adjacent to the gas inlet connection stating that an appropriate connecting tube shall be used in accordance with the corresponding national installation regulations.

If the appliance is connected to an electrical supply, the technical instructions shall include a wiring diagram (for connection purposes) unless the appliance is equipped with a connection cord fitted with a plug.

8.3.2.3 Particular specifications for appliances of class 1 and class 2 subclass 1

The technical instructions shall state:

- a) the minimum vertical distance separating the appliance from adjacent horizontal walls located above it;
- b) the minimum horizontal distances separating the appliance from adjacent vertical walls below the minimum distance defined in a). All horizontal distances are measured from the vertical plane which coincides with that of the side of the appliance.

For class 1 appliances, with the exception of high-level grills, these stated minimum distances shall not exceed 20 mm for walls adjacent to the sides which are:

- below the hotplate, excluding the plane of the pan supports, or
- below the shut-down lid in its closed position, for appliances fitted with a shut-down lid and designed so that the lid is at the same level as the work top of adjacent units, or
- below the height of the appliance in the case of freestanding ovens.

The technical instructions shall also give information concerning the fixing of the appliance, where this is specified by the manufacturer or required by the installation regulations in force in the country or countries in which the appliance may be used.

8.3.2.4 Particular specifications for appliances of class 2, subclass 2, and class 3

The technical instructions shall give all necessary information for building-in and fixing the appliance, and in particular:

- a) for all appliances concerned, information giving the critical dimensions of the space in which the appliance is to be installed;
- b) precise instructions that are to be observed for the evacuation of combustion products, and for ventilation when flueing and ventilation components are not supplied with the appliance, or where they are supplied but not fitted to the appliance;
- c) in the case of an appliance incorporating a hotplate, information on the minimum distances from each adjacent wall above the level of the hotplate:
 - 1) the minimum vertical distance above the hotplate is measured from the plane of the pan supports;
 - 2) the minimum horizontal distances are measured from the vertical planes passing through the edges of the hotplate;
- d) in the case of built-in hotplates, where the manufacturer specifies that a horizontal separation shall be included below the base of the hotplate, the critical dimensions of this separation. In addition, the minimum distance between this separation and the underneath of the worktop shall be stated and this minimum distance declared shall not exceed 150 mm;
- e) in the case of appliances with an oven, information stating that the unit housing the appliance shall be appropriately fixed.

Also, where the use of a flexible tube is specified, the instructions shall state that the flexible tube shall be fitted in such a way that it cannot come into contact with a moveable part of the housing unit (e.g. a drawer) and does not pass through any space susceptible of becoming congested.

8.3.3 Instructions for use and maintenance

The instructions for use and maintenance intended for the user shall give all necessary information for the appliance to be used safely and sensibly. They shall include in particular:

- indications of the nominal heat input of each of the burners;
- instructions on lighting and re-ignition (see 5.2.12);
- instructions for the use of the oven: use of the thermostat, position of accessories, if necessary maximum authorized load for the pastry tray etc.; in particular, these instructions shall include the steps to be taken for using programmable ovens taking into account food hygiene (e.g. deterioration of food in hot weather);
- where appropriate (see 6.1.10.1), the instruction on the need to have the thermostat checked in case where its failure would cause an abnormal drift in the cooking temperature of the oven;
- in the case where the appliance is fitted with a thermostat fault indicator (see 6.1.10.2.3) the instructions shall include all information necessary concerning its use and the actions to be taken by the user in the event of a fault indication;
- instructions for use of the grill (in particular the position of accessories); they shall state in particular if the grill is only to be used at its nominal heat input;
- the minimum dimensions of the pans to be used on the various burners of the hotplate, and, where appropriate, specifications on the use of pans with concave or convex bases;
- the profile and maximum dimension of the pan to be used with fish burners of useful length greater than 140 mm;
- for appliances having one or more burners that are capable of remote operation, a description of type of remote operation (type 1 or type 2), together with instructions on the use of the burners concerned both manually and remotely;
- instructions on how to shut off the burner or burners quickly when operating in the remote mode using a) the remote means and b) the manual controls on the appliance to override the remote means;
- a description of the way in which the user can recognise visually whether the burner or burners are in the remote operation mode;
- information, warning the user against the use of cooking vessels on the hotplate that overlap its edges.

The instructions for use and maintenance shall warn the user against incorrect use of the appliance. To this end, it shall list any applicable restrictions on the use of the appliance resulting from this European Standard.

A3 The instructions for use shall state that the use of inappropriate hob guards can cause accidents.

When the manufacturer of the appliances considers that hob guards can be used, the instructions for use and maintenance shall warn to use only hob guards designed by the manufacturer of the cooking appliance or declared by the manufacturer of the appliance as suitable or hob guards incorporated in the appliance. **A3**

In the case of appliances with a cooling fan, the instructions shall include the steps to be taken by the user in the event of a fault with the fan. If the appliance is fitted with a fan fault indicator, the necessary information concerning this indicator shall also be specified.

If for cleaning, the manufacturer instructs the user to set the control device to a higher position than for normal cooking operations, the instructions for use and maintenance shall contain a statement that, under these conditions, the surfaces may become hotter than in normal use and that children shall be kept away.

For appliances having a gas cylinder compartment, the instructions shall specify the dimensions of cylinders to be used in the countries in which the appliance may be sold. If necessary, the instructions shall describe the means of assuring a particular path for the flexible tube used for connection; In addition, the instructions shall indicate the obligation to replace any means of connection which carry a date limit for use.

The instructions for use and maintenance shall contain the following warnings:

"**A1** **CAUTION:** **A1** The use of a gas cooking appliance results in the production of heat, moisture and products of combustion **A1** in the room in which it is installed. Ensure that the kitchen **A1** is well ventilated especially when the appliance is in use **A1**: keep natural ventilation holes open or install a mechanical ventilation device (mechanical extractor hood).

Prolonged intensive use of the appliance may call for additional ventilation, for example opening of a window, or more effective ventilation, for example increasing the level of mechanical ventilation where present".

If the manufacturer instructs the user to use the grill with the door open, the instructions for use and maintenance shall state in emphasis (e.g. by colour or underlined) the following warning:

"**CAUTION:** Accessible parts may be hot when the grill is in use. Young children should be kept away".

A1 "**CAUTION:** This appliance is for cooking purposes only. It must not be used for other purposes, for example room heating." **A1**

When the appliance does not comply with 6.1.5.1.1.2 as delivered, the instructions shall contain the substance of the following:

"An additional protective means to avoid contact with the oven door is available. This part should be fitted when young children are likely to be present."

The reference number of the part and information on how to obtain it shall be given in the instructions.

If a glass shut-down lid, according to the requirements in 5.2.8.1, carries the symbol described in Annex F, this symbol shall be reproduced in the instructions for use and maintenance together with an explanation of its meaning.

If a glass shut-down lid, according to the requirements in 5.2.8.1, carries a warning, this warning shall be reproduced in the instructions for use and maintenance.

A3 When an appliance is provided with a cooking hotplate made of glass or glass ceramic, user instructions shall bear the following:

CAUTION: "In case of hotplate glass breakage:

- shut immediately off all burners and any electrical heating element and isolate the appliance from the power supply
- do not touch the appliance surface,
- do not use the appliance." **A3**

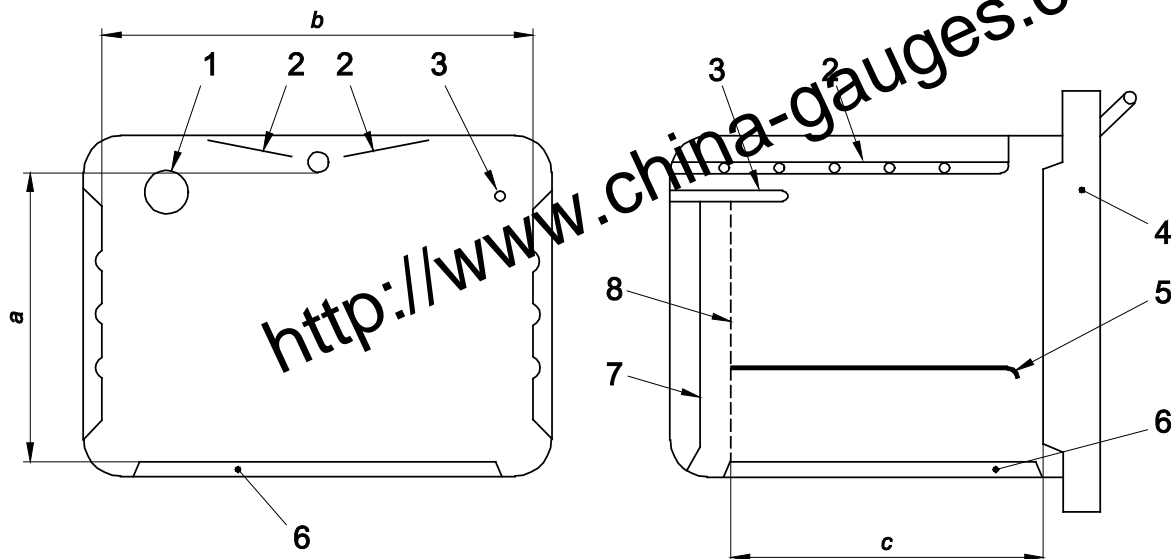
8.3.4 Instructions for conversion to other gases

On delivery of parts intended for conversion to another type of gas or to another pressure, the manufacturer shall supply adequate and clear instructions for changing the parts and also for cleaning, adjustment and control of the appliance and renewal of seals following intervention.

After conversion of the appliance to another type of gas or to another pressure than that for which it was previously adjusted, information on the new adjustment shall be given in place of the previous information, so as to permit unambiguous identification of the state of the appliance after modification.

If, in order to comply with this requirement, a new plate or label is required, this shall be supplied with the conversion parts and it shall comply with the requirements of legibility and durability in 8.1.1.

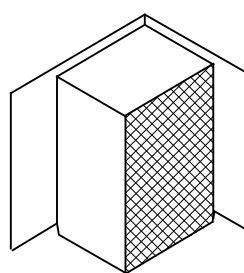
Where appropriate, instructions written in the official language or languages of the country or countries of destination corresponding to the new adjustment state of the appliance shall be supplied.



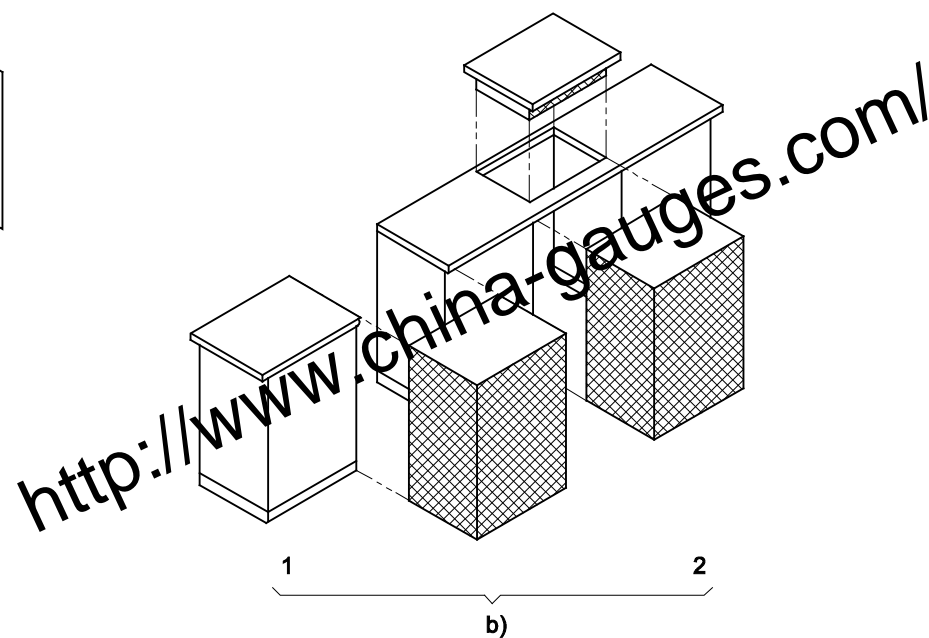
Key

- 1 light
- 2 grill burner
- 3 thermostat probe
- 4 door
- 5 oven accessory in position at the rear stop
- 6 base
- 7 back wall
- 8 rear vertical plane of the cooking zone
- a useful height
- b useful width or door aperture whichever is smaller
- c useful depth

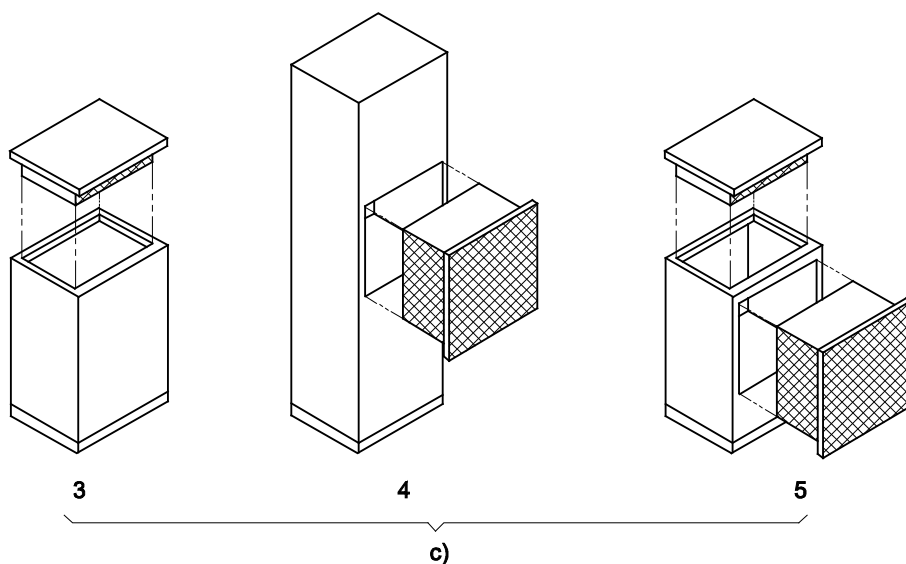
Figure 1 — Useful volume of the oven (3.4.3.12)



a)



1 2
 b)

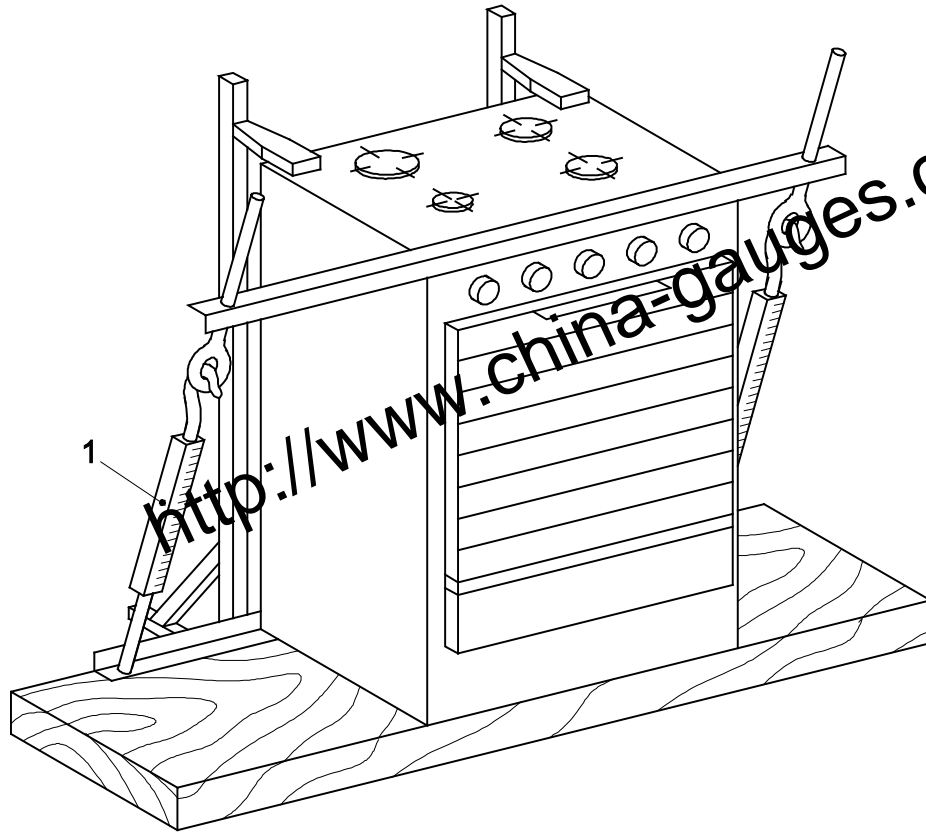


3 4 5
 c)

Key

- a Class 1. Free standing appliance
- b Class 2. Appliances for building-in between two kitchen units
- c Class 3. Appliances built into kitchen unit
- 1 Class 2, subclass 1
- 2 Class 2, subclass 2
- 3 hotplate
- 4 oven
- 5 combined oven and hotplate

Figure 2 — Classes of appliances (4.3)



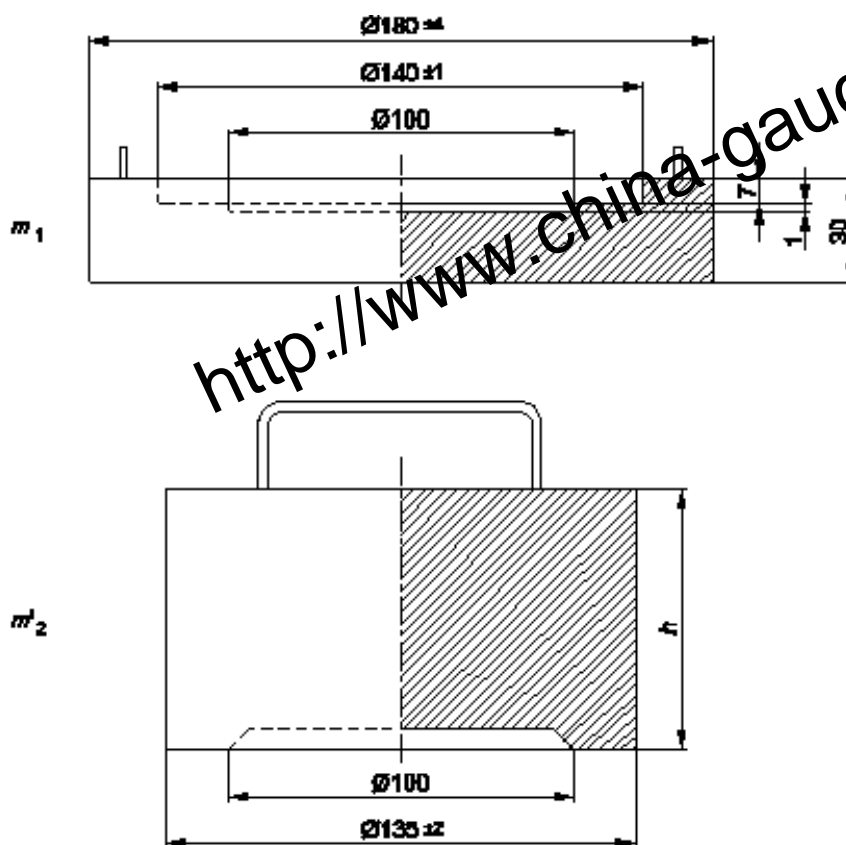
Key

- 1 spring balance

Figure 3 — Strength test for cooker bodies (7.2.1.2)

Dimensions in millimetres

AC



<http://www.china-gauges.com/>

AC

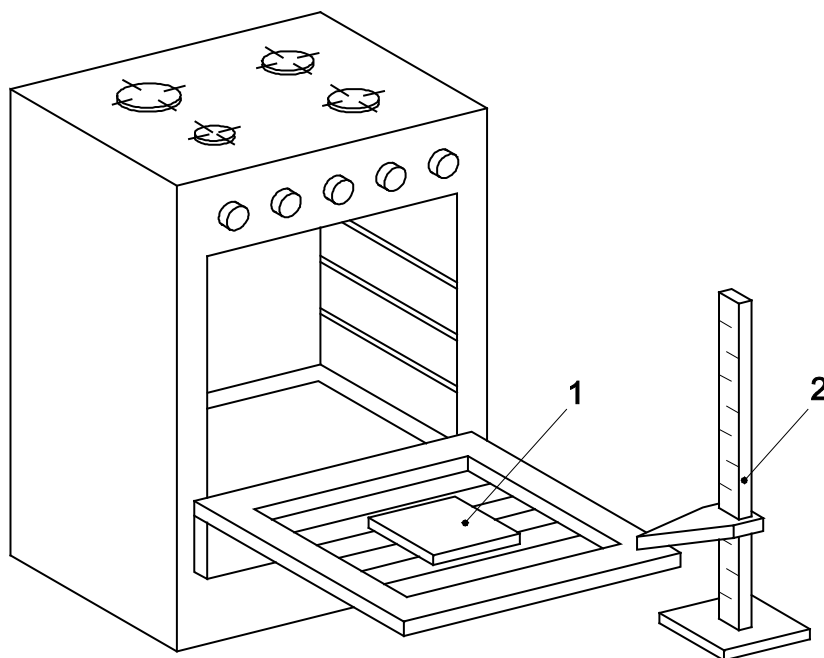
NOTE External angles are rounded or have a chamfer of about 1 mm.

Figure 4 — Masses m_1 and m_2 — Examples (7.2.1.3)

Table 13 — Dimensions of test masses

Nominal mass kg	h^a mm
2,5	24
3,3	31
4,1	38
5	47
6	56
7	65
8	74
9,3	86
10,5	97

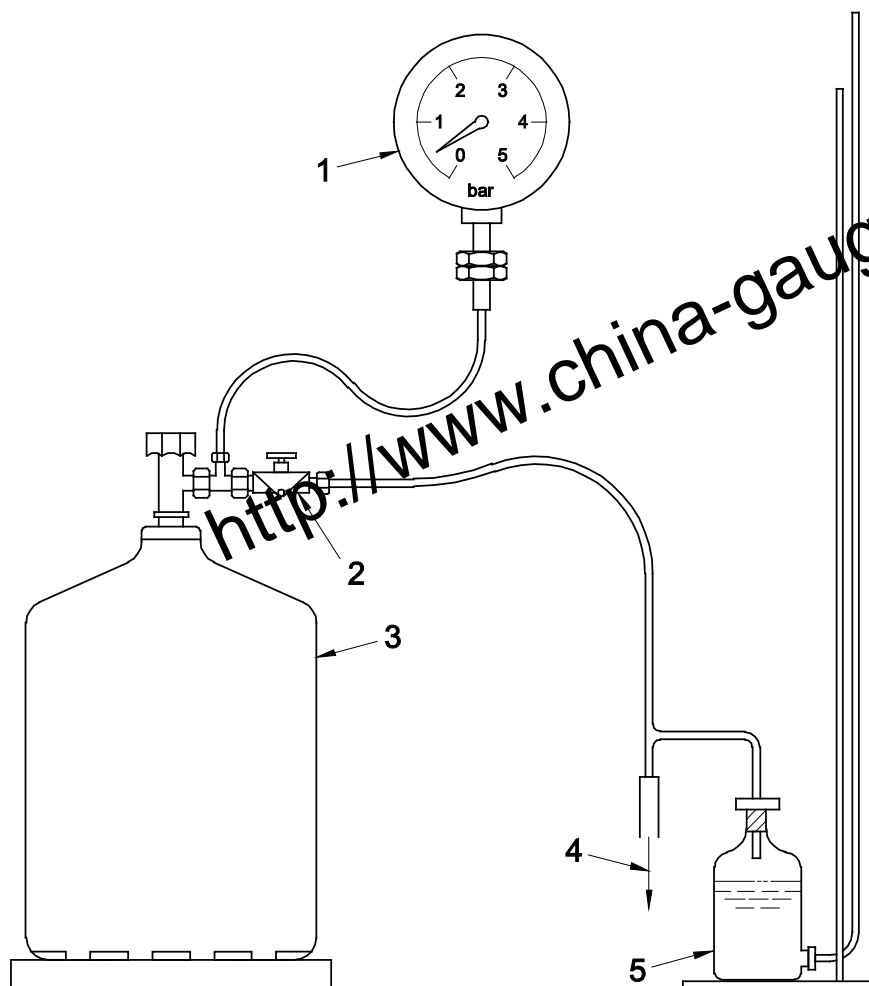
^a The values 30 and h are calculated for a material of relative density $7,8 \text{ kg/dm}^3$.



Key

- 1 test mass
- 2 graduated scale

Figure 5 — Strength of the oven door (7.2.2.2)

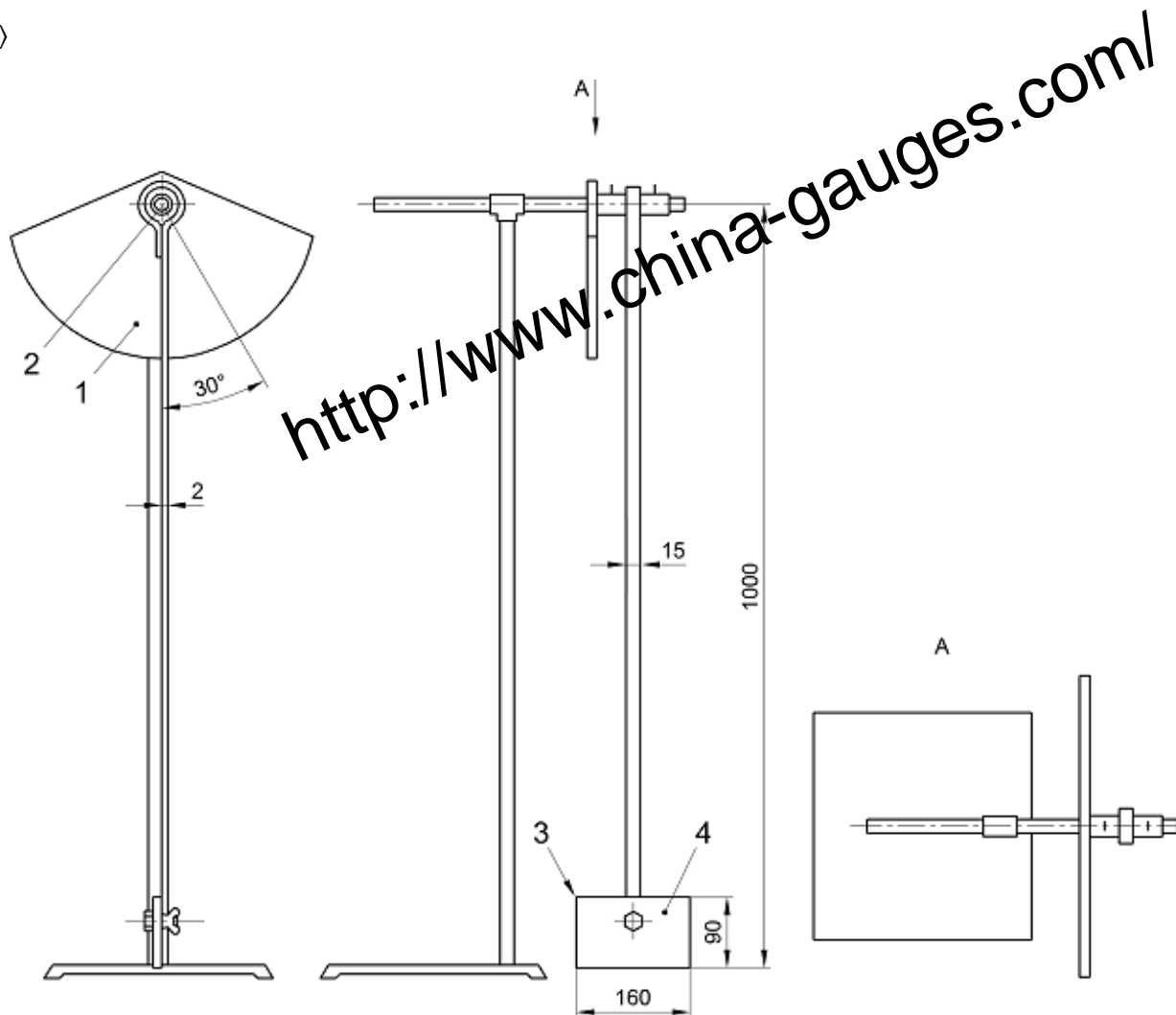


Key

- 1 pressure of the gas cylinder
- 2 pressure regulator
- 3 gas cylinder
- 4 supply to external burner
- 5 manometer for the supply pressure

Figure 6 — Measurement of rise in vapour pressure (7.3.1.6)

Dimensions in millimetres



Key

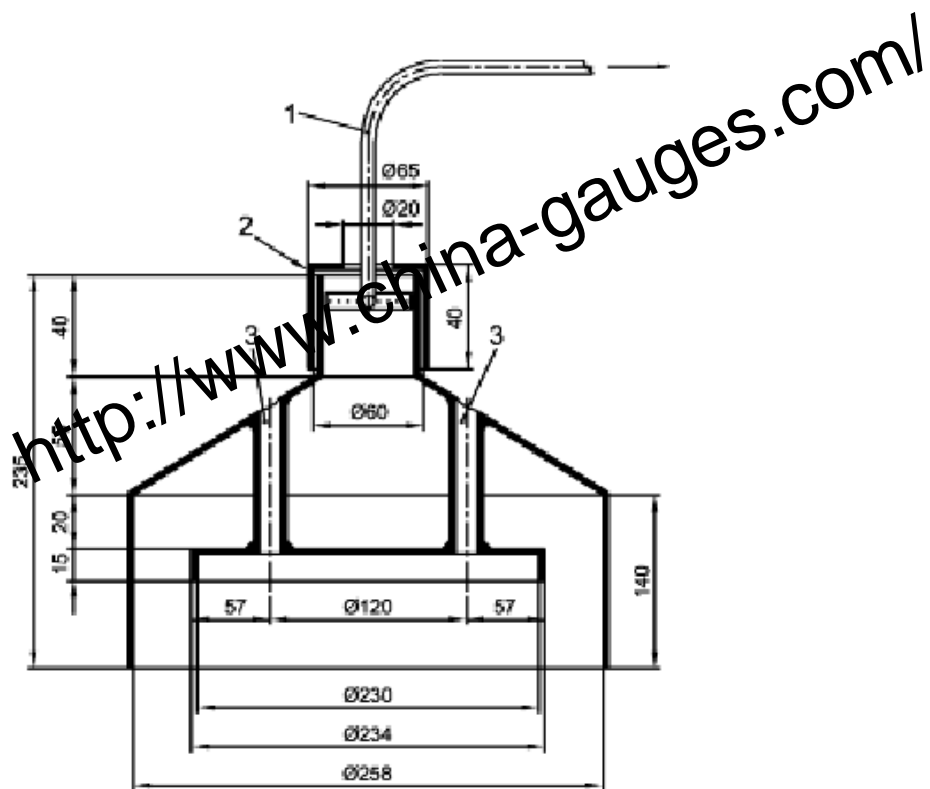
- 1 material: steel 15/10
- 2 ball bearing
- 3 nickel-chrome sheet steel
- 4 blade
- A top view



Figure 7 — Pendulum for testing the draught resistance of hotplate burners (7.3.2.2)

Dimensions in millimetres

AC



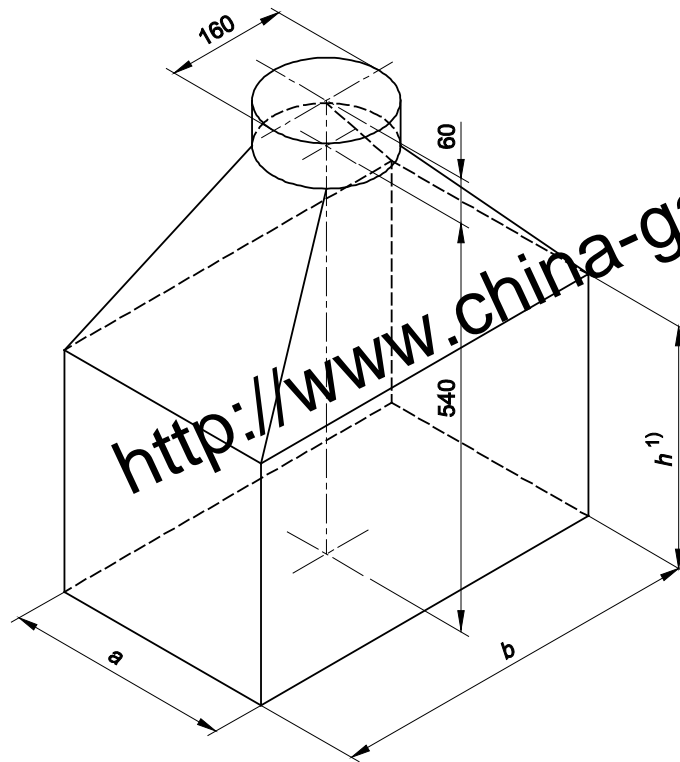
AC

Key

- 1 copper tube diameter 8 thickness 1
- 2 restrictor
- 3 steel tube diameter 22 thickness 1

Figure 9 — Sampling device when a round pan of 220 mm diameter is used

Dimensions in millimetres



1) $h \geq 320$ 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 10 — Verification of combustion of all the burners together - Sampling device (7.3.2.4.2)

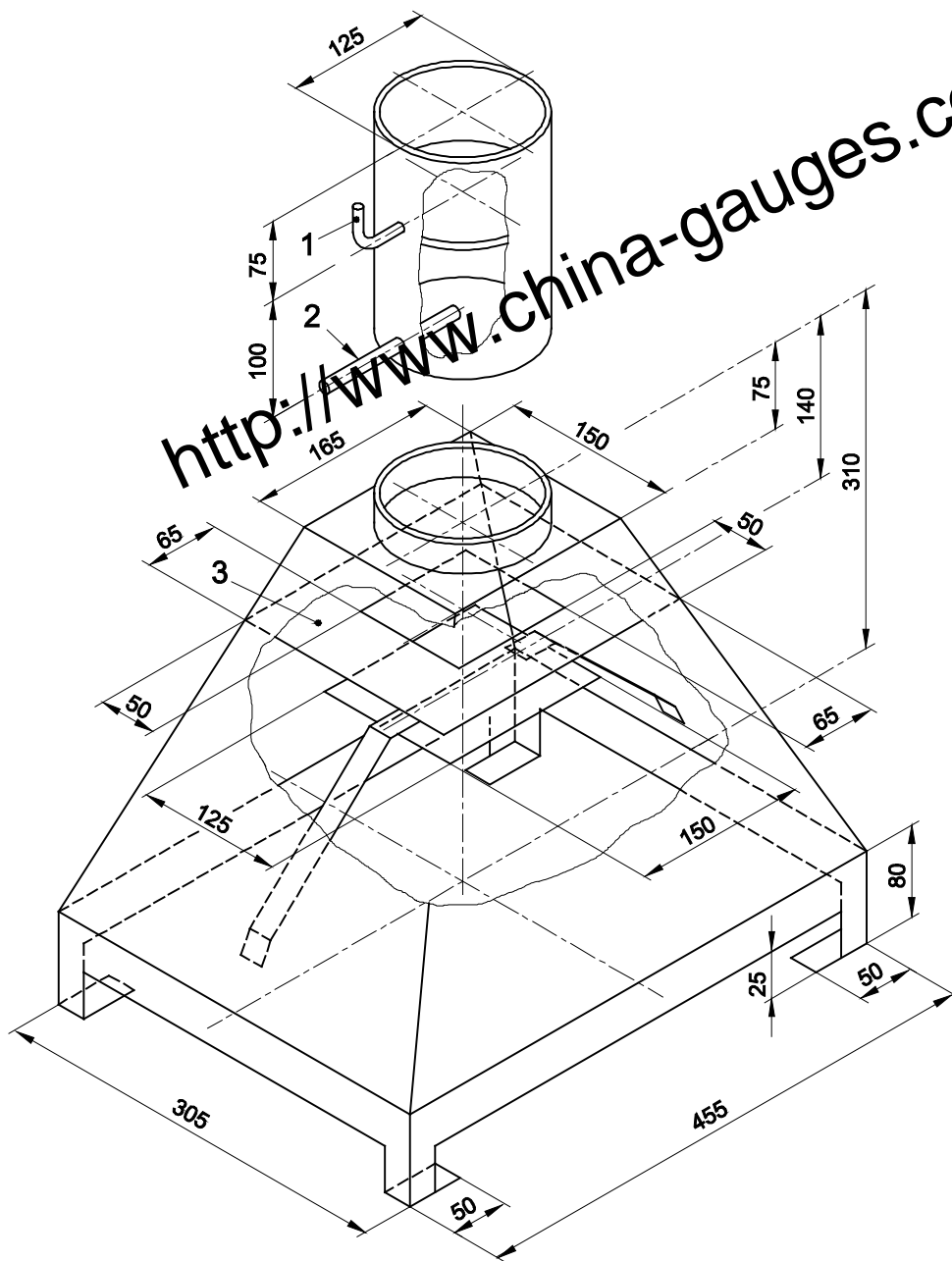
Table 14 — Dimensions of the sampling device for all the burners

Value	Dimensions in mm						
<i>a</i>	300	500	580	680	710	630	790
<i>b</i>	500	600	700	680	780	1 140	1 000

Dimensions *a* and *b* of the sampling hood are shown according to the requirements of 7.3.2.4.2.

The seven examples for which dimensions are given above cover the majority of hotplates encountered.

Dimensions in millimetres

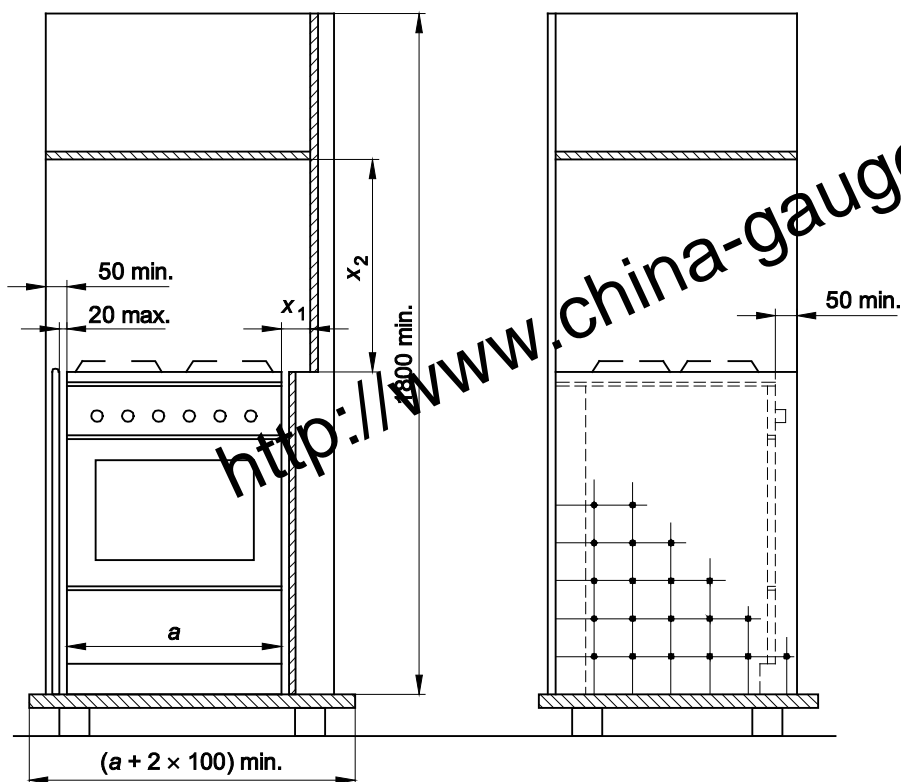


Key

- 1 regulator with friction spring
- 2 \varnothing 8 sampling tube
- 3 annular baffle

Figure 11 — Sampling hoods for high-level grills (7.3.3.2.7)

Dimensions in millimetres

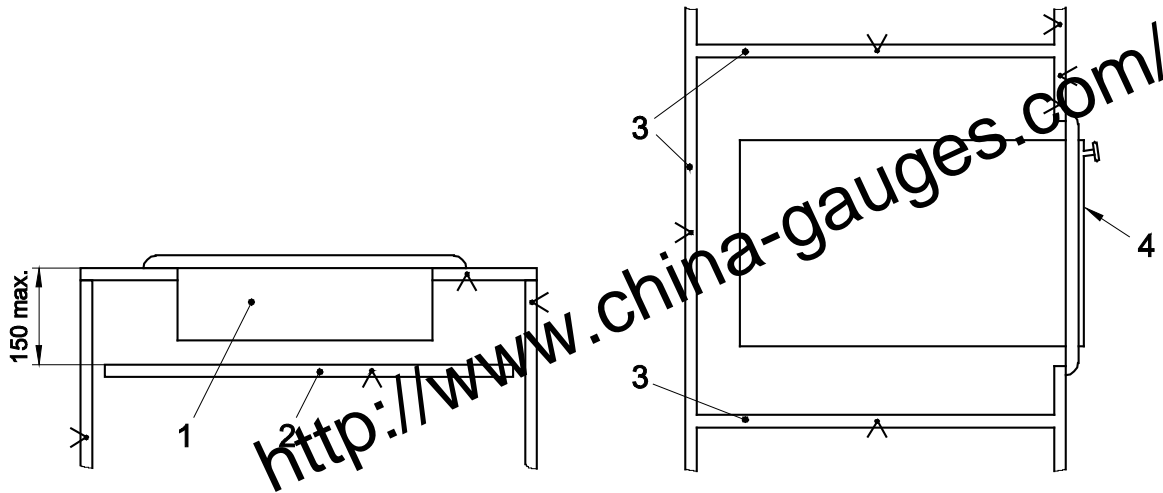


Key

- a appliance width
- x₁ see 7.3.1.5.1.2.
- x₂ see 7.3.1.5.1.2

Figure 12 — Example of test installation for appliances of class 1 and class 2 sub-class 1 (7.1.3.3.1, 7.1.3.3.2.1, 7.3.1.5.1.2)

Dimensions in millimetres



Key

- 1 hotplate
- 2 the horizontal partition shall have critical dimensions specified by the manufacturer
- 3 position and dimensions according to manufacturer's instructions
- 4 oven

Figure 13 — Example of housing units for appliances of class 3 (7.1.3.3.3)

Annex A
(informative)

National situations

A.1 General

In each country in which this European Standard applies, appliances may be marketed only if they comply with the particular national supply conditions of that country.

In order to permit, both at the time of testing the appliance and at the time of its sale, the correct choice to be made from all the situations covered, the various national situations are summarised in Tables A.1, A.2, A.3, A.4, A.5 and A.6.

[AC] Some of the tables in this annex are incomplete or may include data that are not fully up to date. This is because the CEN/TC 49 Secretariat has not received the relevant information from the CEN member countries concerned prior to the publication of this European Standard.

Attention is drawn on the fact that specific queries concerning updated information should be directly addressed to the relevant CEN member country.

Some guidance can also be found in EN 437, but the information collected should be checked with the specific CEN Member Country to verify they are applicable to the appliances covered by this European Standard. **[AC]**

A.2 Marketing in different countries of the categories listed in the text of the standard

Tables A.1 and A.2 give the situations concerning the marketing, in various countries, of the categories of appliance listed in the text of the standard.

The information given in these tables does not mean that these categories can be marketed throughout the territory of the country concerned; A.4, shall be consulted for the purposes of verification.

In case of doubt, the local gas distributor shall be consulted on the categories which apply.

Table A.1: Category I (single categories) marketed

Table A.2: Category II (double categories) marketed

Table A.1 — Category I (single categories) marketed

Country code	I _{2H}	I _{2L}	I _{2E}	I _{2E+}	I _{2N}	I _{2R}	I _{3B/P}	I ₃₊	I _{3P}	I _{3B} ^a	I _{3R} ^a
AT	x						x				
BE				x				x			
BG ^b											
CH	x						x		x		
CY ^b											
CZ	x						x	x	x		
DE			x				x		x		
DK	x						x				
EE ^b											
ES	x							x	x		
FI	x						x		x		
FR				x				x			
GB	x						x ^c	x	x		
GR	x						x	x	x		
HU ^b											
IE	x							x	x		
IS	x										
IT	x							x			
LT ^b											
LU			x								
LV ^b											
MT ^b											
NL		x					x		x		
NO							x				
PL ^b											
PT	x							x			
RO ^b											
SE	x						x				

AC

SI	x				x	x	x	x	x		
SK	x						x		x		

AC

^a Category not selected by any country; for the definition of the category see EN 437:2003+A1:2009.

^b Information on categories to be supplied by new CEN member.

^c Category applicable only for appliances installed in Touring and Motoring Caravans.

Table A.2 — Category II (double categories) (part 1)

Country code	II _{1a2H}	II _{2H3B/P}	II _{2H3+}	II _{2H3P}	II _{2L3B/A}	II _{2L3P}	II _{2E3B/P}	II _{2E+3+}	II _{2R3R} ^a
AT		X							
BE								X	
BG ^b									
CH		X	X	X					
CY ^b									
CZ		X	X	X					
DE							X		
DK	X	X							
EE ^b									
ES			X	X					
FI		X							
FR								X	
GB			X	X					
GR		X	X	X					
HU ^b									
IE			X	X					
IS ^b									
IT	X		X						
LT ^b									
LU ^b									
LV ^b									
MT ^b									
NL					X	X			
NO									
PL ^b									

Table A.2 (continued)

Country code	_{1a2H}	_{2H3B/P}	_{2H3+}	_{2H3P}	_{2L3B/A}	_{2L3P}	_{2E3B/P}	_{2E+3+}	_{2R3R} ^{a)}
PT			X						
RO ^b									
SE	X	X							
AC									
SI		X	X	X					
SK		X		X					

^a Category not selected by any country; for the definition of the category see AC EN 437:2003+A1:2009 AC.

^b Information on categories to be supplied by new CEN member.

A.3 Supply pressures for the appliances (see 7.1.2)

Table A.3 gives the national situations regarding normal supply pressures of appliances belonging to the categories given in A.2.

<http://www.china-gauges.com/>

Table A.3 — Supply pressure

Gas	G 110	G 20	G 25		G 20 + G 25	G 30		G 31			G 30 + G 31	
Pressure (mbar)	8	20	20	25	Couple 20/25	30 ^a	50	30 ^a	37	50	Couple ^a 28-30/37	Couple 30/67
Country												
AT		X					X					
BE					X						X	X
BG ^b												
CH		X							X	X	X	
CY ^b												
CZ		X ^c						X	X	X ^d	X	
DE		X					X			X		
DK	X	X				X		X				
EE ^b												
ES	X	X							X	X	X	
FI		X				X		X				
FR					X						X	
GB		X				X			X		X	
GR		X				X		X	X	X		
HU ^b		X				X		X				
IE		X							X		X	
IS ^b												
IT	X	X									X	
LT ^b												
LU												
LV ^b												
MT ^b												
NL				X		X		X		X		
NO						X		X				
PL ^b												
PT		X				X			X		X	
RO ^b												
SE	X	X				X		X				

(AC)

SI		X				X			X		X	
SK		X						X	X	X	X	

(AC)

^a See Table 9, footnote to table b.

^b Information on supply pressures to be supplied by new CEN members.

^c Currently 18 mbar.

^d For certain types of system (CZ to clarify).

A.4 Particular categories marketed nationally or locally

A.4.1 National distribution

The national or local distribution conditions (composition of gases and supply pressures) result in the definition of particular categories which are sold nationally or locally in certain countries, in accordance with Table A.4.

Table A.4 — Categories sold nationally or locally

Category	Reference gas	Incomplete combustion gas	limit	Light back limit gas	limit gas	Sooting gas	limit	Country
I _{2ELL}	G 20, G 25	G 21		G 222	G 231, G 271	G 21		DE
I _{2S}	G 25.1	G 26.1		G 222	G 27.1	G 26.1		HU ^a
I _{2HS}	G 20, G 25.1	G 21, G 26.1		G 222	G 27.1	G 21, G 26.1		HU ^a
II _{1c2E+}	G 20, G 130	G 21		G 132, G 222	G 231	G 21		FR
II _{2ELL3B/P}	G 20, G 25, G 30	G 21, G 30		G 222, G 32	G 231, G 271	G 30		DE
II _{2S3B/P}	G 25.1, G 30	G 26.1, G 30		G 32	G 27.1, G 31	G 26.1, G 30		HU ^a
II _{2S3P}	G 25.1, G 31	G 26.1, G 30		G 32	G 27.1, G 31	G 26.1, G 31, G 32		HU ^a
II _{2S3B}	G 25.1, G 30	G 26.1, G 30		G 32	G 27.1, G 31	G 26.1, G 30		HU ^a
II _{2HS3B/P}	G 20, G 30, G 25.1	G 21, G 26.1, G 30		G 222, G 32	G 23, G 27.1, G 31	G 21, G 26.1, G 30		HU ^a
II _{2HS3P}	G 20, G 31, G 25.1	G 21, G 26.1, G 30		G 222, G 32	G 23, G 27.1, G 31	G 21, G 26.1, G 31, G 32		HU ^a
II _{2HS3B}	G 20, G 30, G 25.1	G 21, G 26.1, G 30		G 222, G 32	G 23, G 27.1, G 31	G 21, G 26.1, G 30		HU ^a
III _{1a2H3+}	G 110, G 30, G 20	G 21		G 112, G 222, G 32	G 23, G 31	G 30		IT
III _{1a2H3B/P}	G 110, G 30, G 20	G 21		G 112, G 222, G 32	G 23, G 31	G 30		DK
III _{1c2E+3+}	G 130, G 30, G 20	G 21		G 132, G 222, G 32	G 231, G 31	G 30		FR
III _{1ab2H3B/P}	G 110, G 20, G 30, G 120	G 21		G 112, G 222, G 32	G 23, G 31	G 30		SE

^a Hungary to confirm selection.

A.4.2 Categories

The categories from Table A.4 are defined in accordance with the information in 4.2, observing the characteristics of the gases distributed regionally as shown in Table A.5.

A.4.2.1 Category I

A.4.2.1.1 Appliances designed for use with gases attached to the first family

Category I_{1B}: Appliances using only gases of group b attached to the first family, at fixed supply pressure (this category is not used).

Category I_{1C}: Appliances using only gases of group c attached to the first family, at fixed supply pressure (this category is not used).

A.4.2.1.2 Appliances designed for use with gases of the second family or gases attached to it

Category I_{2LL}: Appliances using only gases of group LL attached to the second family, at fixed supply pressure. Provided that the Wobbe index of the gas distributed from the second family does not exceed the upper value of 43,7 MJ/m³, the appliance may be adjusted according to a lower nominal value (this category is not used).

Category I_{2ELL}: Appliances likely to be used with gases of group E of the second family, and gases of group LL attached to the second family. Gases of the second family of group E are used under the same conditions as for category I_{2E}. Gases of the second family of group LL are used under the same conditions as for category I_{2LL}.

AC Category I_{2S} **AC**: appliances using only gases of group S linked to the second family, at the defined supply pressure.

AC Category I_{2HS} **AC**: appliances using only gases of group H of the second family and gases of group S linked to the second family. The group H second family gases are used under the same conditions as for category I_{2H}. The group S second family gases are used under the same conditions as for category I_{2S}.

A.4.2.2 Category II

A.4.2.2.1 Appliances designed for use with gases of the first family or gases attached to it, and gases of the second family or gases attached to it

Category II_{1C2E+}: Appliances likely to be used with gases of group c attached to the first family and gases of group E of the second family. Gases attached to the first family are used under the same conditions as for category I_{1C}. Gases of the second family are used under the same conditions as for category I_{2E+}.

A.4.2.2.2 Appliances designed for use with gases of the second family or gases attached to it and gases of the third family

Category II_{2ELL3B/P}: Appliances likely to be used with gases of group E of the second family, gases of group LL attached to the second family and gases of the third family. Gases of the second family or gases attached to it are used under the same conditions as for category I_{2ELL}. Gases of the third family are used under the same conditions as for category I_{3B/P}.

Category II_{2S3B/P}: appliances capable of using gases of group S linked to the second family and gases of the third family. The gases linked to the second family are used under the same conditions as for category I_{2S}. The third family gases are used under the same conditions as for category I_{3B/P}.

Category II_{2S3P}: appliances capable of using gases of group S linked to the second family and gases of group P of the third family. The gases linked to the second family are used under the same conditions as for category I_{2S}. The third family gases are used under the same conditions as for category I_{3P}.

Category II_{2S3B}: appliances capable of using gases of group S linked to the second family and gases of group B of the third family. The gases linked to the second family are used under the same conditions as for category I_{2S}. The third family gases are used under the same conditions as for category I_{3B}.

Category II_{2HS3B/P}: appliances capable of using gases of group H of the second family, gases of group S linked to the second family and gases of the third family. Gases of the second family or gases linked to it are used under the same conditions as for category I_{2HS}. The third family gases are used under the same conditions as for category I_{3B/P}.

Category II_{2HS3P}: appliances capable of using gases of group H of the second family, gases of group S linked to the second family and gases of group P of the third family. Gases of the second family or gases linked to it are used under the same conditions as for category I_{2HS}. The third family gases are used under the same conditions as for category I_{3P}.

Category II_{2HS3B}: appliances capable of using gases of group H of the second family, gases of group S linked to the second family and gases of group B of the third family. Gases of the second family or gases linked to it are used under the same conditions as for category I_{2HS}. The third family gases are used under the same conditions as for category I_{3B}.

A.4.2.3 Category III

Category III_{1a2H3+}: appliances capable of using gases of group a of the first family, gases of group H of the second family and gases of the third family. The first family gases are used under the same conditions as for category I_{1a}. The second family gases are used under the same conditions as for category I_{2H}. The third family gases are used under the same conditions as for category I₃₊.

Category III_{1a2H3B/P}: appliances capable of using gases of group a of the first family, gases of group H of the second family and gases of the third family. The first family gases are used under the same conditions as for category I_{1a}. The second family gases are used under the same conditions as for category I_{2H}. The third family gases are used under the same conditions as for category I_{3B/P}.

Category III_{1c2E+3+}: appliances capable of using gases of group c linked to the first family, gases of group E of the second family and gases of the third family. The gases linked to the first family are used under the same conditions as for category I_{1c}. The second family gases are used under the same conditions as for category I_{2E+}. The third family gases are used under the same conditions as for category I₃₊.

Category III_{1ab2H3B/P}: appliances capable of using gases of group a of the first family, \overline{AC} gases of group b linked to the first family (\overline{AC}), gases of group H of the second family and gases of the third family. The first family gases or the gases linked to it are used under the same conditions as for categories I_{1a} and I_{1b}. The second family gases are used under the same conditions as for category I_{2H}. The third family gases are used under the same conditions as for category I_{3B/P}.

A.4.3 Gas rate adjusters

The presence of gas rate adjusters is:

- a) optional for categories: II_{1c2E+}, III_{1c2E+3+}

For these appliances, annulment of the function of nominal rate adjusters is obligatory in the second and third family, annulment of the function of reduced gas rate adjusters is obligatory in the third family.

- b) forbidden in the following cases:

- 1) for adjustment of the nominal rate for categories I_{2ELL}, II_{2ELL 3B/P};
- 2) for adjustment of the reduced rate for categories I_{2ELL}, II_{2ELL 3B/P}.

- c) obligatory in the following cases:

No obligatory requirements have been notified by the CEN Members.

The presence of primary air intake adjusters is optional for all categories, with the exception of categories for which it is prohibited²⁸⁾.

A.4.4 Permitted operations for changing gas

For categories II_{IC2E+}, III_{IC2E+3+}, the requirements of 5.1.1.3 and 5.1.1.4 are applicable.

For categories I_{2ELL}, III_{2ELL3B/P}, the following measures are applicable:

- change of injectors;
- adjustment of the primary air.

A.5 Test gases corresponding to the particular categories given in A.4

The characteristics of national or local gas supplies and the corresponding test gases are given in Table A.5 (reference conditions, dry gas).

²⁸⁾ No exceptions have been notified by the CEN Members.

Table A.5 — Gas characteristics (dry gas at 15 °C and 1 013,25 mbar) and test pressures corresponding to national and local situations

Gas family and group		Nature of gas	Designation	Composition Volume %	W_1 MJ/m ³	W_2 MJ/m ³	W_s MJ/m ³	H_s MJ/m ³	d	Test Pressure mbar	Country
Gases linked to the first family	Group b	Reference Incomplete combustion Sooting	G 120	H ₂ = 47 CH ₄ = 32 N ₂ = 21	24,40	15,68	27,64	17,77	0,413	$p_n = 8$ $p_{min} = 6$	SE
		Light back	G 112	H ₂ = 59 CH ₄ = 17 N ₂ = 24	19,48	11,81	22,36	13,56	0,367	$p_{max} = 15$	
	Group c	Reference (Propane-air)	G 130	C ₃ H ₈ = 26,9 Air = 73,1 ^a	22,14	23,66	24,07	25,72	1,142	$p_n = 8$ $p_{min} = 6$	FR
		Light back	G 132	C ₃ H ₈ = 13,8 C ₃ H ₆ = 13,8 Air ^a = 72,4	22,10	23,56	23,84	25,41	1,136	$p_{max} = 15$	
Gases Linked to the second family	Group LL	Reference	G 25	CH ₄ = 86 N ₂ = 14	37,38	29,25	41,52	32,49	0,612	$p_n = 20$	DE
		Incomplete combustion Sooting	G 26	CH ₄ = 80 C ₃ H ₈ = 7 N ₂ = 13	40,52	33,36	44,83	36,91	0,678	$p_{min} = 18$	
		Flame lift	G 271	CH ₄ = 74 N ₂ = 26	30,94	25,17	34,36	27,96	0,662	$p_{max} = 25$	
Group S	Reference	G 25.1	CH ₄ = 86 CO ₂ = 14	35,25	29,30	39,11	32,51	0,691	$p_n = 25$ $p_{min} = 20$ $p_{max} = 33$	HU	
	Incomplete combustion Sooting	G 26.1	CH ₄ = 80 C ₃ H ₈ = 6 CO ₂ = 14	37,61	32,60	41,58	36,04	0,751	or $p_n = 85$ $p_{min} = 73$		
	Lift limit	G 27.1	CH ₄ = 82 CO ₂ = 18	32,70	27,94	36,29	31,00	0,730	$p_{max} = 100$		

^a Composition of the air (%): O₂ = 20,95; N₂ = 79,05.

A.6 Particular conditions for Belgium

Appliances of category I2E+ sold in Belgium shall have passed an ignition, cross-lighting and flame stability test with limit gas G231 at a minimum pressure of 15 mbar.

A.7 Connection requirements in force in various countries (see 5.1.6)

The various national situations with regard to the connection cases given in 5.1.6 are defined in Table A.6.

<http://www.china-gauges.com/>

Table A.6 — Inlet connections permitted

Country	Category I ₃₊ , I _{3P} , I _{3B} , I _{3B/P}				Other categories		
	without threads	Threaded		Push-on connections	Threaded		Push-on connections
		EN 10226-1:2004 AND EN 10226-2:2005	EN ISO 228-1:2003		EN 10226-1:2004 AND EN 10226-2:2005	EN ISO 228-1:2003	
AT	Yes	Yes ^a	No	No	Yes ^a	No	No
BE	Yes	Yes	Yes	Yes	Yes ^a	No	No
BG							
CH	Yes	Yes ^a	No	Yes	Yes ^a	No	No
CY							
CZ							
DE	Yes	Yes ^a	No	No	Yes ^a	No	No
DK	Yes	Yes	No	No	Yes	No	No
EE							
ES	No	Yes ^{a,b}	Yes	Yes	Yes ^{a,b}	Yes	Yes
FI	Yes	Yes	Yes	No	Yes	Yes	No
FR	No	No	Yes	No ^c	No	Yes ^d	No ^c
GB	Yes	Yes ^{a,b}	No	No	Yes ^{a,b}	No	No
GR	Yes	Yes ^a	No	No	Yes ^a	No	No
HU							
IE		Yes ^{a,b}		Yes	Yes ^{a,b}		Yes
IS							
IT	Yes	Yes	Yes	Yes	Yes ^a	Yes	Yes
LT							
LU							
LV							
MT							
NL	No	Yes ^a	No	Yes	Yes ^a	No	No
NO	Yes	Yes	No	No	No	No	No
PO							
PT	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RO							
SE	No	Yes	Yes	Yes	Yes	Yes	No

AC

SI	No	Yes ^b	Yes	Yes	Yes ^b	Yes	Yes
SK	Yes	Yes	Yes		Yes	Yes	

AC

- ^a Taper - parallel threads.
^b Taper - taper threads.
^c Except push-on connectors attached with an EN ISO 228-1:2003 thread.
^d Only G ½.

Annex B
(informative)

Guidelines for extension to other categories

When an appliance meets the requirements of one or more categories, in order to establish its conformity with one or more other categories, it is necessary to verify that the appliance satisfies all the requirements of this new category or categories.

To this end, the tests required for the new category or categories shall be compared with those carried out for the previous category or categories, in order to determine which additional tests are required.

These additional tests will be limited to the minimum necessary to ensure that the appliance will meet the requirements applicable to the new category or categories.

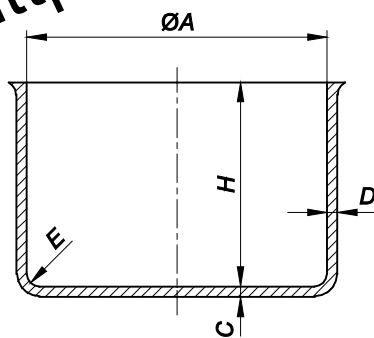
Annex C
(normative)

Characteristics of the pans required

C.1 Pans required for testing on gas burners

The pans required for testing are aluminium sauce pans of commercial quality.

The pans required for testing on gas burners shall comply with Figure C.1 and their dimensions shall comply with Table C.1.



Key

- A internal diameter measured at the top
- H internal height
- C thickness of base
- D thickness of the side
- E internal radius

Figure C.1 — Pans required for testing on gas burners

Table C.1 — Characteristics of pans necessary for testing of gas burners

Dimension	Unit	Pan designation															Tolerances
		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	
A	mm	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	± 1 %
H	mm	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	± 1 %
C min.	mm	1,2	1,4	1,4	1,6	1,6	1,8	2	2	2	2	2,5	2,5	2,5	2,5	2,5	
D min.	mm	1,1	1,3	1,3	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,8	1,8	1,8	1,8	1,8	
E	mm	1	1,5	1,5	2	2	2,5	2,5	2,5	3	3,5	3,5	3,5	3,5	3,5	4	+ 0,5 mm 0 mm
Area of base	cm ²	28,3	50,3	78,5	113	154	201	254	314	380	452	531	615	707	804	907	
Mass	g	42,9	82,4	120	220	270	340	440	540	680	800	965	1 130	1 350	1 520	1 800	± 5 %
Mass of lid ^a	g				58	70	86	105	125	149	177	208	290	323	360	402	

^a Mass without handles calculated for lids in aluminium (relative density 2 700 kg/m³) and given for guidance.

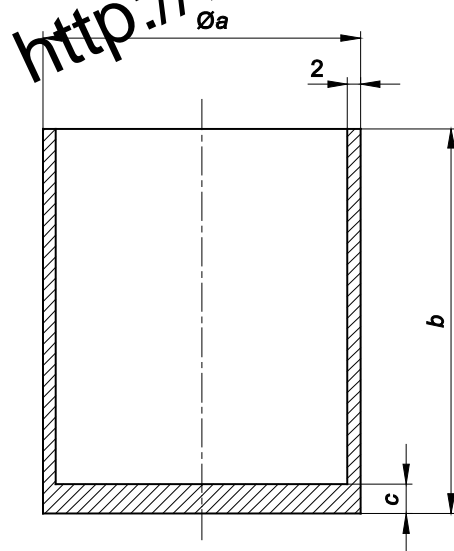
C.2 Characteristics of pans for testing on electric cooking plates

The test pan is an aluminium saucepan, of commercial quality, not specially polished and with a flat bottom. If the cooking plate has a nominal diameter equal to one of those given in Table C.2, the diameter of the bottom of the pan is approximately equal to the nominal diameter of the cooking plate.

If the cooking plate has a diameter other than those indicated in the table, the diameter of the saucepan and the quantity of water, at ambient temperature, will be as specified for the next higher nominal diameter.

In case of doubt, standard test saucepans of commercial aluminium, having the dimensions given in Table C.2 and as shown in Figure C.2 below, are used.

Dimensions in millimetres



Key

- a external diameter
- b external height
- c thickness of base

Figure C.2 — Characteristics of pans for testing on electric cooking plates

Table C.2 — Dimensions of test saucepans on electric cooking plates

Nominal diameter of cooking plate	a	b	c	Quantity of water
mm	mm	mm	mm	l
110	110	140	8	0,6
145	145	140	8	1
180	180	140	9	1,5
220	220	120	10	2
300	300	100	10	3

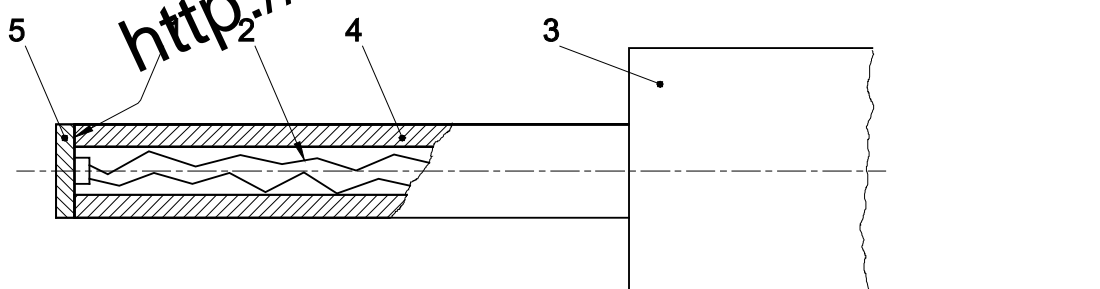
NOTE The base of the saucepan is flat with a tolerance of 0,05 mm in the concave direction only.

Annex D (normative)

Surface temperature probe (7.3.1.5.3.2)

D.1 Design

The temperature probe used to measure surface temperatures complies with Figure D.1.



Key

- 1 adhesive
- 2 thermocouple wires 0,3 diameter to EN 60584-1:1995 type K (chrome alumel) total length $(1\ 500 \pm 2)$
- 3 handle arrangement permitting contact force of (4 ± 1) N, length (100 ± 2) , external diameter (25 ± 2)
- 4 polycarbonate tube inside diameter 3, outside diameter 5. In output position (100 ± 2) in length
- 5 tinned copper disc 5 diameter 0,5 thick

The contact surface of the disk shall be flat. The thermocouple shall be welded with care using the minimum of solder to ensure that the temperature of the disk is measured.

Figure D.1 — Surface temperature probe

D.2 Validation test

D.2.1 Principle

The probe is applied to the centre of a flat glass plate, the lower surface of which is in contact with the water vapour.

D.2.2 Procedure

Distilled water is placed in a "beaker-type" container with a pouring lip, approximately 260 mm high and 165 mm in diameter.

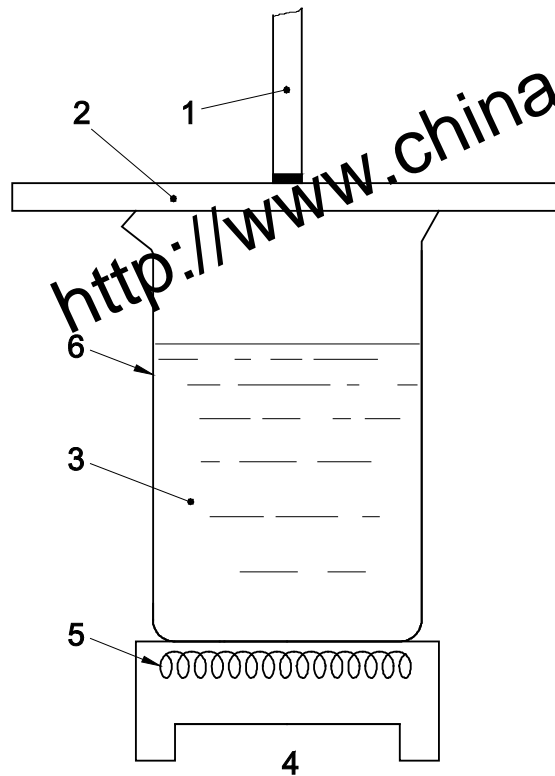
A flat glass plate, 5 mm thick, is placed over the beaker.

The water is brought to the boil by means of an electric plate of diameter 145 mm.

D.2.3 Validation

The probe is suitable for use when it indicates at equilibrium a value of $(85 \pm 3) \text{ }^\circ\text{C}$ after a contact time not exceeding 150 s.

Dimensions in millimetres



Key

- 1 surface temperature probe
- 2 flat, toughened glass plate $5 \pm 0,2$ thick
- 3 distilled water height $200 \pm 2,5$
- 4 ambient temperature = $20 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$, Ambient air speed $\leq 0,1 \text{ m/s}$
- 5 electric cooking plate of output $1\ 000 \text{ W} \pm 100 \text{ W}$ diameter ≈ 145
- 6 beaker with pouring spout. Capacity 5 L. Height ≈ 260 . Internal diameter ≈ 165

The probe shall be placed at not less than 30 mm from the rim of the beaker, not in the path of condensation droplets.

Figure D.2 — Test apparatus for the validation of the surface temperature probe

Annex E
(normative)

Use of symbols on the appliance and packaging

E.1 Information having to appear on the appliance and packaging, in accordance with Clause 8

E.1.1 Electricity supply

The specifications relating to electricity voltages shall comply with EN 60335-1:2002.

E.1.2 Type of gas

In order to represent all the numbers of categories corresponding to an appliance adjustment, the reference gas symbol common to all these numbers shall be used, as shown in Table E.1.

Table E.1 — Symbols representing types of gas

Symbol of the type of gas	Numbers of the corresponding categories
1st family ^a : G 110 G 120 G 130 G 150	1a 1b 1c 1e
2nd family: G 20 G 25	2H, 2E, 2E+, 2ELL ^b 2L, 2ELL ^c
3rd family: G 30 G 31	3B/P, 3+ ^{d f} 3+ ^{e f} , 3P
<p>^a If the appliance, in its adjusted state, can use gases of different groups, reference shall be made to all the reference gases corresponding to these groups.</p> <p>^b If the appliance is adjusted for G 20.</p> <p>^c If the appliance is adjusted for G 25.</p> <p>^d Only applies to appliances which do not require adjustment between G 30 and G 31 or to appliances which require an adjustment and which are adjusted for G 30.</p> <p>^e Only applies to appliances which require adjustment between G 30 and G 31 and which are adjusted for G 31.</p> <p>^f For appliances which require adjustment between G 30 and G 31, the label showing adjustment to a different gas and pressure couple shall be supplied with the technical instructions.</p>	
NOTE The table needs to be modified to take account of gases distributed in new CEN member states.	

E.1.3 Pressure

The unit (mbar) may be considered sufficient to identify this value. However, if a symbol has to be used for pressure, p should be used.

E.1.4 Country

In accordance with EN ISO 3166-1:2006, the names of countries shall be represented by the following codes:

AT	Austria	IE	Ireland
BE	Belgium	IS	Iceland
BG	Bulgaria	IT	Italy
CH	Switzerland	LT	Lithuania
CY	Cyprus	LU	Luxembourg
CZ	Czech Republic	LV	Latvia
DE	Germany	MT	Malta
DK	Denmark	NL	Netherlands
EE	Estonia	NO	Norway
ES	Spain	PL	Poland
FI	Finland	PT	Portugal
FR	France	RO	Romania
GB	United Kingdom	SE	Sweden
GR	Greece	SK	Slovakia
HU	Hungary	SI	Slovenia

E.1.5 Category

The category may be identified solely by its designation in accordance with A1 EN 437:2003+A1:2009 A1 . Nevertheless, if an explanation is necessary, the term "Category" shall be symbolised by "Cat."

E.2 Other optional information

E.2.1 General

The symbols given below are not obligatory, but are recommended as preferential, and to the exclusion of any other symbol, to avoid the use of many various markings.

E.2.2 Nominal heat input of a burner Q_n

E.2.3 Nominal heat input of all appliance burners $\sum Q_n$

E.3 Information having to appear on the appliance and its packaging, in accordance with 8.1 and 8.2

For the time being, in order to satisfy the needs expressed by CEN Members (see Table E.1), it is permitted that their declared means of identification appears, in addition to the symbol for the type of gas.

Table E.2 — Means of identification of the types of gas in force in the various countries

Type of gas	G 110	G 120	G 130	G 150	G 20	G 25	G 30	G 31
Country code ^b								
AT					Erdgas		Flüssiggas	
BE					Aardgas, Gaz naturel	Aardgas, Gaz naturel	Butaan, Butane	Propaan, Propane
CH					Erdgas H		Butan	Propan
BG								
CY								
CZ								
DE					Erdgas E W ₀ (12,0 – 15,7) kWh/m ³ 0 °C	Erdgas LL W ₀ (10,0 – 13,1) kWh/m ³ 0 °C	Flüssiggas B/P Butan	Propan
DK	Bygas				Naturgas		F-Gas	F-Gas
EE								
ES	Gas manufacturado		Aire propanado	Aire metanado	Gas natural		Butano	Propano
FI					Maakaasu, Naturgas		Butaani, Butan	Propaani, Propan
FR ^a			Air propané/ Air butané		Gaz naturel Lacq	Gaz naturel Groningue	Butane	Propane
GB					Natural Gas		Butane	Propane
GR					Κυσικό Αέριο		Υγραέριο Μείγμα	Προπανιο
HU								
IE					Natural Gas		Butane	Propane
IS								
IT	Gas di Città				Gas naturale/ Gas metano		GPL	
LT								
LU								
LV								
MT								
NL						Aardgas	Butaan	Propaan
NO							Butan	Propan
PL								
PT					Gás Natural		Butano	Propano
SE								
RO								

Table E.2 (continued)

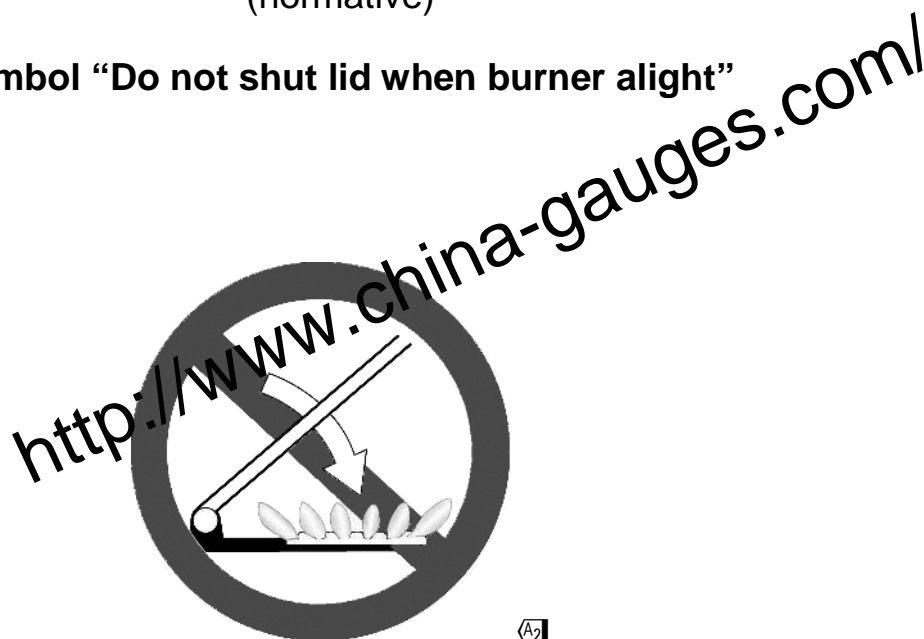
SK					Zemný plyn		Bután	Propán
SI					Zemeljski plin		Butan	Propan
^a The meaning of the symbol corresponding to the type of gas shall be explained in detail in the technical instructions. Concerning the system and its packaging, if an additional marking is intended by the manufacturer to explain the symbol, this text shall be in conformity with the description given in this table. In the case of pressure couples, the two descriptions of the family shall be mentioned.								
^b See E.1.4 for codes.								

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Annex F
(normative)

Symbol “Do not shut lid when burner alight”

A2



A2

Key

Diameter: at least 50 mm

A2 deleted text A2

Figure F.1 — Symbol “Do not shut lid when burner alight”

Annex G
A₃ (normative)

Fragmentation requirement for toughened soda-lime glass

G.1 Requirement

Under the conditions of test in G.2, the number of glass fragments contained within a square of side 50 mm shall be more than 60.

G.2 Test method

The following test is carried out on the glass component itself:

- frames and/or other parts attached to the glass shall be removed;
- the whole surface of the glass is placed on a 30 mm deep wooden horizontal flat work top;
- in order to prevent the broken pieces from scattering, contain the edges of the sample with a frame, adhesive tape or the like, in such a manner that the broken pieces remain in place after breakage but without hindering expansion of the sample;
- the glass is shattered by means of a centre punch (see Figure G.1) placed half way along one of the longest edges of the glass, 13 mm from the edge.

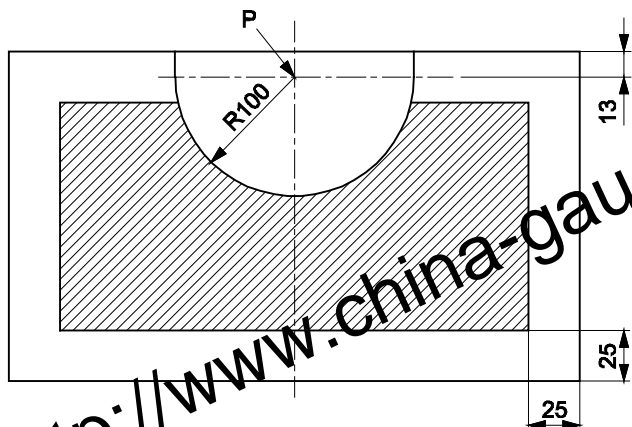
In the 5 min following the fracture, and without an aid to vision except spectacles or contact lenses if these are normally worn, a count is made of the number of pieces contained within a square of sides 50 mm long located in the area of the largest pieces (the aim is to obtain the minimum value). The assessment is made on the glass except within a peripheral margin of 25 mm from the edge of the sample and an area having 100 mm radius from the point of impact (see hatched area in Figure G.1).

To achieve this, one could, for example, place a transparent sheet over the 50 mm square and draw an ink-spot for each fragment to be counted.

NOTE In the case of curved glass, plane pieces of the same material can be used for the test.

Under these conditions, the requirement of G.1 shall be satisfied.

Dimensions in millimetres





Key

P= point of impact



Figure G.1 — Point of impact and area of assessment \square_{A3}

Annex ZA
(informative)

**Relationship between this European Standard and the Essential
Requirements of EU Directive  2009/142/EC **

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive  2009/142/EC  on the approximation of the laws of Member States concerning gas appliances.

WARNING : Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard

The following clauses of this standard are likely to support requirements of  2009/142/EC  Directive on the approximation of the laws of Member States concerning gas appliances.

Compliance with clauses of this standard provides one means of conforming to the specific essential requirements of the Directive concerned and associated EFTA regulations.

Table ZA.1

Essential requirement	Subject	Requirements of the standard	Comments
1	Annex 1 General conditions		
1.1	Safety of operation	5.1.1, 5.1.3, 5.1.9, 5.1.11, 5.2.2.2), 5.2.3, 6.1.2, 6.1.7 and 6.1.8 (except	
1.2.1	Information in the technical instructions	8.3.1 and 8.3.2	
1.2.2	Content of the instructions for use and maintenance	8.3.1 and 8.3.3	
1.2.3	Marking on the appliance and packaging	8.1 8.2	
1.3	Fittings	5.2.4, 5.2.6 and 5.2.7	
2	Materials		
2.1	Characteristics	5.1.2	
3	Design and construction		
3.1	General		
3.1.1	Safety of construction and durability	5.1.2, 5.1.4, 5.1.6, 5.1.7, 5.1.8, 5.2.1, 5.2.8, 5.2.9, 5.2.10 and 6.1.4.1	
3.1.2	Condensation	5.1.2.1, 2nd paragraph, 2nd indent	
3.1.3	Risk of explosion	5	
3.1.4	Penetration of water and air	5.1.5 and 6.1.1	"Penetration of water" : not applicable
3.1.5	Normal fluctuation of auxiliary energy	5.1.10, 6.2.2 and 6.3.2	
3.1.6	Abnormal fluctuation of auxiliary energy	5.1.10, 6.2.2 and 6.3.2	
3.1.7	Hazards of electrical origin	5.1.11	
3.1.8	Parts under pressure	5.1.2 and 6.1.6.2	Only applicable to appliances with an incorporated cylinder
3.1.9	Failure of a safety device: - flame supervision device - regulator - thermostat - cooling fan - remote control	5.2.6 and 6.1.3 5.2.7 and 6.1.8 5.2.4, 6.1.5.1.5, 6.1.10 5.2.11 and 6.1.9 5.3	
3.1.10	Safety/control Remote control	5.2.6, 5.3	
3.1.11	Protection of parts adjusted by the manufacturer	5.2.3 and 5.2.7	
3.1.12	Marking of adjusting and control devices	5.2.2.2, 5.2.4, 5.3 and 7.2.3	
3.2	Un-burnt gas release		
3.2.1	Risk of gas leakage	5.1.5, 5.1.6, 6.1.1.1 and 6.1.4.2.1	

3.2.2	Risk of accumulation in the appliance	5.2.6, 5.2.9.1.4, AC 5.2.12.2 AC , 6.1.3, 6.2.1, 6.3.1 and 6.1.4.2.2	
3.2.3	Risk of accumulation in the space	5.2.6, AC 5.2.12.1, AC 6.1.3, 8.1, 8.2, 8.3.2.2 and 8.3.3	
3.3	Ignition Ignition Re-ignition Cross-lighting	5.2.5, 5.2.9.2, 5.2.12.2, 6.1.9.2, 6.1.9.3, 6.2.1, 6.3.1, 5.2.12.3, 6.2.1, 6.3.1 (tests 7.3.2.1.3 and 7.3.3.1.3) 6.2.1 and 6.3.1	
3.4	Combustion		
3.4.1	Flame stability Concentration of harmful substances in the combustion products	6.2.1 and 6.3.1 5.2.5, 6.1.9.2, 6.1.9.3, 6.2.2 and 6.3.2	
3.4.2	Release of combustion products		Not applicable
3.4.3	Release of combustion products into the space (for appliances having a flue, in the event of abnormal draught)		Not applicable
3.4.4	CO limit in the space (Heating appliance and non connected water heater)		Not applicable
3.5	Rational use of energy	See EN 30-2-1:1998	
3.6	Temperatures		
3.6.1	Floor and adjacent surfaces	6.1.5.2 and 6.1.9	
3.6.2	Control handles	6.1.5.1.6 and 6.1.5.1.7	
3.6.3	External surface temperatures	6.1.5.1.1 and 6.1.5.1.2	
3.7	Foodstuffs and water used for sanitary purposes	5.1.2 and 5.2.13	"Water used for sanitary purposes": not applicable

Bibliography

- [1] EN ISO 6976:2005, *Natural gas — Calculation of calorific value, density, relative density and Wobbe index from composition (ISO 6976:1995 including Corrigendum 1:1997, Corrigendum 2:1997 and Corrigendum 3:1999)*

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