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Domestic cooking appliances burning gas - Safety - Part 1-4: Appliances having one or more burners with an automatic burner control system

Haushalt-Kochgeräte für gasförmige Brennstoffe - Sicherheit - Teil 1-4: Geräte mit einem oder mehreren Brenner(n) mit Feuerungsautomat

Appareils de cuisson domestiques utilisant les combustibles gazeux - Sécurité - Partie 1-4: Appareils comportant un ou plusieurs brûleurs avec système automatique de commande des brûleurs

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EUROPEAN STANDARD

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English Version

Domestic cooking appliances burning gas - Safety - Part 1-4: Appliances having one or more burners with an automatic burner control system

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This European Standard was approved by CEN on 7 April 2012.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 30-1-4:2012) 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of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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 supersedes EN 30-1-4:2002.

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.

It is intended to use this European Standard with EN 30-1-1:2008+A2:2010, on which the requirements and methods of test for appliances having one or more burners with an automatic burner control system are based. In particular, this European Standard identifies the requirements and methods of test specific to these appliances, which are in addition to, or replace, those given in EN 30-1-1:2008+A2:2010.

This present part is intended to be used together with any other part of EN 30-1-x related to “Safety”, whenever the appliances covered by this other part includes a burner with an automatic burner control system.

Requirements relating to ‘Rational use of energy’ are given in other appropriate parts of this standard, EN 30-2-x.

Matters relating to quality assurance systems, production testing and certificates of conformity, including those for auxiliary devices, are not dealt with in this European Standard.

NOTE For countries requesting special categories (specified in EN 437:2003+A1:2009), the absence of specific information concerning A.3.3 and A.3.4 implies that the general requirements (see 5.2.4 and 5.1.1) also apply for particular categories.

Other European Standards covering domestic cooking appliances burning gas are as follows:

— EN 30-1-1, *Domestic cooking appliances burning gas — Part 1-1: Safety — General*;

— EN 30-1-2, *Domestic cooking appliances burning gas — Part 1-2: Safety — Appliances having forced-convection ovens and/or grills*;

— EN 30-1-3, *Domestic cooking appliances burning gas — Part 1-3: Safety — Appliances having a glass ceramic hotplate*;

— EN 30-2-1, *Domestic cooking appliances burning gas — Part 2-1: Rational use of energy — General*;

— EN 30-2-2, *Domestic cooking appliances burning gas — 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 organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, 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 domestic cooking appliances, capable of using the combustible gases defined in EN 30-1-1:2008+A2:2010, that have one or more burners with an automatic burner control system, referred to in the text as "appliances".

This European Standard includes specific requirements and methods of test that are applicable to burners having an automatic burner control system, whether or not the appliance is equipped with a fan for the supply of combustion air to, and/or the evacuation of the products of combustion from the burner concerned. These specific requirements and methods of test are only applicable when the burner has an automatic burner control system and do not apply to burners having automatic ignition that fall within the scope of EN 30-1-1:2008+A2:2010.

This European Standard is intended to be used in conjunction with EN 30-1-1:2008+A2:2010 and, where appropriate, other parts of EN 30-1 covering appliances having:

- forced-convection ovens and/or grills;
- a glass ceramic hotplate.

It does not cover all of the safety requirements and methods of test that are specific to forced-convection ovens and/or grills and glass ceramic hotplates.

Unless specifically excluded hereafter, this 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 of their associated equipment[1].

This European Standard does not apply to:

- outdoor appliances;
- appliances connected to a combustion products evacuation duct;
- appliances having a pyrolytic gas oven;
- appliances having automatic burner control systems that:
  - have a second safety time (see EN 298:2003), or
  - control one or more burners that incorporate a separate ignition burner;
- appliances having an uncovered burner or a non-enclosed covered burner (see 3.1.1) that utilises a fan for the supply of its combustion air;
- appliances having enclosed covered burners that are not equipped with an automatic burner control system;
- appliances having one or more burners that are capable of remote operation (type1), unless the burner(s) concerned are:

1) Refer to the electrical safety rules.

- oven burners equipped with an automatic burner control system, or
- oven burners of time-controlled ovens that are designed for a delayed start without the user being present;

- appliances having one or more burners that are capable of remote operation (type 2), unless the burner(s) concerned are:
  - oven, grill or hotplate burners equipped with automatic burner control systems, or
  - oven burners of time-controlled ovens that are designed for a delayed start without the user being present;
- appliances supplied at pressures greater than those defined in 7.1.3;
- appliances equipped with air-gas ratio controls;
- appliances incorporating one or more hotplate or grill burners that enable the user to program the delayed start of a cooking cycle.

This European Standard does not cover the requirements relating to automatic on-off cycling multi-ring hotplate burners for which specific requirements are under consideration.

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.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 30-1-1:2008+A2:2010, *Domestic cooking appliances burning gas — Part 1-1: Safety — General*

EN 30-1-2:2012, *Domestic cooking appliances burning gas — Safety — Part 1-2 — Appliances having forced-convection ovens and/or grills*

EN 30-1-3:2003+A1:2006, *Domestic cooking appliances burning gas — Part 1-3: Safety — Appliances having a glass ceramic hotplate*

EN 88-1:2011, *Pressure regulators and associated safety devices for gas appliances — Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*

EN 126, *Multifunctional controls for gas burning appliances*

EN 161, *Automatic shut-off valves for gas burners and gas appliances*

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

EN 298:2003, *Automatic gas burner control systems for gas burners and gas burning appliances with or without fans*

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/A1:2008, modified)*

EN 60335-2-102:2006 + A1:2010, *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 60730-2-9, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature-sensing controls (IEC 60730-2-9, modified)*

3 Terms and definitions

For the purposes of this document, unless specifically modified as described in 3.1, hereafter the definitions of EN 30-1-1:2008+A2:2010, Clause 3 apply, as well as the additional definitions given in 3.2.

3.1 Definitions concerning parts of the appliance

3.1.1
manually operated burner control
device to isolate the gas supply to a burner and possibly to adjust its thermal function during use.

Note 1 to entry: A manually operated burner control may be:

— **direct-acting:** in which case the device is mechanical in operation (e.g. a tap or cock) and the gas flow is controlled directly by manipulation of a control handle as defined in EN 30-1-1:2008+A2:2010, 3.4.3.1;

— **indirect:** in which case the opening and closing of the gas supply to the burner is achieved indirectly by means of one or more automatic shut off valves. This control may incorporate means of adjusting the thermal function of the burner. For example:

  — by adjusting the gas flow (e.g. high-low thermostat);
  — by on-off cycling (e.g. on-off thermostat, gas energy regulator).

3.1.2
remote operation (type 1)
operation by means of a control intended to be actuated out of sight of the appliance

Note 1 to entry: For example, by telecommunications or bus systems.

3.1.3
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

3.2 Additional definitions concerning appliances having burners with an automatic burner control system

3.2.1 Definitions concerning the appliance and its components

3.2.1.1
combustion circuit
assembly comprising the air supply circuit, the combustion chamber and the products of combustion circuit up to the outlet of the appliance

3.2.1.2
fully pre-mixed gas and air burner
burner in which the gas and a quantity of air, corresponding to at least that theoretically required to achieve complete combustion, are mixed upstream of the burner ports

3.2.2 Definitions concerning adjusting, control and safety devices

3.2.2.1
total air adjuster
device enabling the total air flow required for the burner or, where appropriate, the burners to be set to predetermined value according to the supply conditions

Note 1 to entry: The operation of changing the setting of this device is termed the “adjustment of the total air”.

3.2.2.2
touch control
indirect manually operated burner control actuated by contact or the close proximity of a finger, with little or no movement of the contact surface

3.2.2.3
touch control pad
one of the contact surfaces of a touch control by which it is actuated

3.2.2.4
gas energy regulator
indirect manually operated burner control that cycles the burner on and off periodically

Note 1 to entry: The thermal function of the burner can be controlled by adjusting the duration of the “on” and/or “off” cycles times.

3.2.2.5
automatic single burner control system
automatic single burner control system comprising at least a single burner programming unit and all the elements of a flame detector device

Note 1 to entry: The various functions of an automatic burner control system may be in one or more housings.

Note 2 to entry: Similarly, the automatic burner control systems for several burners may be in the same housing. In this case the single burner programming units and all elements of the flame detector devices for these burners are so arranged as to provide independent control of each burner.

3.2.2.6
single burner programming unit
programming unit that reacts to signals from control and safety devices, gives control commands, controls the start-up sequence, supervises the burner operation and causes controlled shut-down, and if necessary safety shut-down and lock-out

Note 1 to entry: The programming unit follows a predetermined sequence of actions and always operates in conjunction with a flame detector device.

3.2.2.7
automatic multi-burner control system
automatic multi-burner control system capable of controlling two or more burners simultaneously

Note 1 to entry: It comprises at least a multi-burner programming unit and all the elements of the flame detector devices for the burners controlled. The various functions of this automatic burner control system may be in one or more housings.

3.2.2.8
multi-burner programming unit
programming unit that reacts to signals from control and safety devices, gives control commands, controls the start-up sequences of the burners, supervises their operation and causes controlled shut-down, and if necessary safety shut-down and lock-out of the burner or burners

Note 1 to entry: The programming unit follows predetermined sequences of actions and always operates in conjunction with a flame detector device for each of the burners controlled.

Note 2 to entry: According to predetermined sequences it may enable the burner to start up independently, or in combination with other burners, even when one or more burners are already in operation. It supervises their operation independently and causes controlled shut-down, safety shut-down and, if appropriate, lock-out of one or all of the burners under its control.

3.2.2.9
programme
sequence of control operations determined by the programming unit involving switching on, starting up, supervising and switching off the burner

3.2.2.10
flame detector device
device by which the presence of a flame is detected and signalled

Note 1 to entry: It can consist of a flame sensor, an amplifier and a relay for signal transmission. These parts, with the possible exception of the actual flame sensor, may be assembled in a single housing for use in conjunction with a programming unit.

3.2.2.11
flame signal
signal given by the flame detector device, normally when the flame sensor senses a flame

3.2.2.12
flame simulation
condition that occurs when the flame signal indicates the presence of a flame when in reality no flame is present

3.2.2.13
automatic shut-off valve
valve which opens when energized and closes automatically when de-energized

3.2.2.14
air proving device
device that monitors the air provided by a fan and which causes safety shut-down of the burner(s) controlled by the device in the event of there being inadequate combustion air

3.2.2.15
thermal cut-out
device which during abnormal operation limits the temperature of the controlled part automatically by shutting off the gas supply to the burner or by reducing its heat input, and which is constructed so that its setting cannot be altered by the user

3.2.2.16
self-resetting thermal cut-out
thermal cut-out which as appropriate initiates automatic recycling of the burner or automatic restoration of the full heat input of the burner after the relevant part of the appliance has cooled down sufficiently

3.2.2.17
non-self-resetting thermal cut-out
thermal cut-out which requires a manual operation, or the replacement of a part, in order as appropriate to restart the burner or to restore its full heat input

3.2.3 Definitions concerning the operation of the appliance

3.2.3.1
start gas rate
mean volume rate or mass rate during the safety time where this gas rate is limited by design for the purposes of ignition

3.2.3.2
start gas flame
flame that can only be established at the start gas rate of the burner

3.2.3.3
main flame
flame established, or capable of being established, at the full-on gas rate of the burner for the purposes of ignition

3.2.3.4
running condition of the system
either:

condition of the automatic single burner control system in which the burner is in normal operation under the supervision of the single burner programming unit and its flame detector device,

or:

conditions of the automatic multi-burner control system in which one or more burners are in normal operation under the supervision of the multi-burner programming unit and their individual flame detector devices

3.2.3.5
ignition energy restoration
process by which, after disappearance of the flame signal in the running condition or ,where appropriate, in the event of failure to ignite, the ignition device is energized again without the gas supply having been totally interrupted

Note 1 to entry: This process ends with the restoration of the running condition or, if there is no flame signal at the end of the safety time:

either:

with volatile or non-volatile lock-out of the system,

or:

according to the design of the automatic multi-burner control system, with volatile or non-volatile lock-out of the burner

3.2.3.6
automatic recycling (of the system)
process by which, following accidental interruption of the operation of the automatic burner control system, loss of flame signal during the running condition or, where appropriate, failure to ignite, the gas supply to all of the burners controlled by the automatic burner control system is interrupted and the complete start sequence is automatically re-initiated

Note 1 to entry: This process ends with the restoration of the running condition or, if there is no flame signal at the end of the safety time, or if the cause of the accidental interruption has not disappeared, with volatile lock-out or non-volatile lock-out of the system.

3.2.3.7
automatic recycling (of the burner)
process within an automatic multi-burner control system by which, following loss of flame signal during the running condition or, where appropriate, failure to ignite, the gas supply to the burner concerned is interrupted and the burner start sequence is automatically re-initiated

Note 1 to entry: This process ends with the restoration of the running condition or, if there is no flame signal at the end of the safety time, with volatile lock-out or non-volatile lock-out of the system or with volatile or non-volatile lock-out of the burner.

3.2.3.8
controlled shut-down
process by which the power to the automatic shut-off valve(s) is removed in order to shut off the supply of gas to a burner under the control of an automatic burner control system within the extinction safety time, e.g. as a result of the action of a controlling function

3.2.3.9
safety shut-down (of the system)
process which is effected immediately following the detection of a fault in the burner control system or the response of a safety limiter or sensor and which shuts off the gas supply to all burners under the control of the automatic burner control system within the extinction safety time by removing the power to all of their automatic shut-off valves

3.2.3.10
safety shut-down (of the burner)
process which is effected immediately following the response of a safety limiter or sensor and which shuts off the gas supply to the burner concerned within the extinction safety time by removing the power to its automatic shut-off valve(s)