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Gas heated catering equipment - Part 1: General safety rules

Großküchengeräte für gasförmige Brennstoffe - Teil 1: Allgemeine Sicherheitsanforderungen

Appareils de cuisine professionnelle utilisant les combustibles gazeux - Partie 1: Règles générales de sécurité

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97.040.20	Štedilniki, delovni pult, pečice in podobni aparati	Cooking ranges, working tables, ovens and similar appliances
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EUROPEAN STANDARD

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Gas heated catering equipment - Part 1: General safety requirements

Appareils de cuisine professionnelle utilisant les combustibles gazeux - Partie 1 : Exigences générales de sécurité

Großküchengeräte für gasförmige Brennstoffe - Teil 1: Allgemeine Sicherheitsanforderungen

This European Standard was approved by CEN on 3 October 2021.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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EN 203-1:2021 (E)**European foreword**

This document (EN 203-1:2021) has been prepared by Technical Committee CEN/TC 106 “Large kitchen appliances using gaseous fuels”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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

This document supersedes EN 203-1:2014.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

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

This document constitutes Part 1 of EN 203, *Gas heated catering equipment*. Particular requirements are given in the relevant Part 2: *Specific requirements*.

The main changes compared to the previous edition are the following:

- Update of the scope to further clarify that appliances are to be used indoors;
- Alignment with the Gas Appliances Regulation and the Vademecum on European standardization in support of Union legislation and policies based on Standardization Request/Mandate (under drafting);
- Introduction of reference to EN 1672-2:2005+A1:2009 for the verification of materials and parts in contact with food and other hygiene aspects as consequence of the withdrawal of EN 203-3:2009;
- Revision of the text in Clause 5 for clarification of its contents and addition of specific compliance criteria when missing;
- Addition of the adjustment of the sequential function control (7.6.2.1);
- Addition of the accuracy of measuring instruments (7.1.8).

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies the requirements and test methods for the construction and operating characteristics relating to safety and rational use of energy for gas heated commercial catering and bakery appliances intended to be used indoor.

This document applies to all professional cooking and bakery appliances using gas for preparing food and drink.

Only appliances of types A₁, A₂, A₃, B₁ and B₂, as defined in Clause 4, are considered in this document.

Only the net calorific value (H_i) and net Wobbe index (W_i) are used.

The requirements concerning specific types of appliances are given in the relevant Part 2.

Annex C (informative) lists the main types of equipment covered by the scope of this document.

Appliances covered by this document are not intended to use gases containing carbon monoxide or other toxic components.

NOTE For appliances intended to be used in vehicles, in trailers or on-board ships, additional requirements can be necessary.

2 Normative references

The following documents are referred to in the text in such a way that some or all their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 88-1:2011+A1:2016, *Pressure regulators and associated safety devices for gas appliances - Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*

EN 88-2:2007, *Pressure regulators and associated safety devices for gas appliances - Part 2: Pressure regulators for inlet pressures above 500 mbar up to and including 5 bar*

EN 125:2010+A1:2015, *Flame supervision devices for gas burning appliances - Thermoelectric flame supervision devices*

EN 126:2012, *Multifunctional controls for gas burning appliances*

EN 161:2011+A3:2013, *Automatic shut-off valves for gas burners and gas appliances*

EN 257:2010, *Mechanical thermostats for gas-burning appliances*

EN 298:2012, *Automatic burner control systems for burners and appliances burning gaseous or liquid fuels*

EN 437:2021, *Test gases - Test pressures - Appliance categories*

EN 549:2019, *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*

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

EN 1672-2:2005+A1:2009, *Food processing machinery – Basic concepts – Part 2: Hygiene requirements*

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EN 1717:2000, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

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 12067-2:2004, *Gas/air ratio controls for gas burners and gas burning appliances - Part 2: Electronic types*

EN 13611:2019, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

EN 16340:2014, *Safety and control devices for burners and appliances burning gaseous or liquid fuels - Combustion product sensing devices*

EN 60335-1:2012¹, *Household and similar electrical appliances - Safety - Part 1: General requirements (IEC 60335-1:2010, modified)*

EN 60335-2-102:2016, *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 60730-1:2016², *Automatic electrical controls for household and similar use - Part 1: General requirements (IEC 60730-1:2013, modified)*

EN IEC 60730-2-9:2019³, *Automatic electrical controls - Particular requirements for temperature sensing control (IEC 60730-2-9:2015)*

EN 61770:2009⁴, *Electric appliances connected to the water mains - Avoidance of backsiphonage and failure of hose-sets (IEC 61770:2008)*

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)*

¹ As impacted by EN 60335-1:2012/AC:2014, EN 60335-1:2012/A11:2014, EN 60335-1:2012/A13:2017, EN 60335-1:2012/A1:2019, EN 60335-1:2012/A2:2019 and EN 60335-1:2012/A14:2019.

² As impacted by EN 60730-1:2016/A1:2019.

³ As impacted by EN IEC 60730-2-9:2019/A1:2019 and EN IEC 60730-2-9:2019/A2:2020.

⁴ As impacted by EN 61770:2009/AC:2011, EN 61770:2009/A11:2018 and EN 61770:2009/A1:2019.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Terminology referring to gases and pressures

3.1.1

gas family

group of gaseous fuels with similar burning behaviour linked together by a range of Wobbe indices

[SOURCE: EN 437:2021, 3.18]

3.1.2

gas group

specified range of Wobbe index within that of the family concerned

Note 1 to entry: See EN 437:2021, Table 1.

Note 2 to entry: This range is determined on the general principle that appliances utilizing this gas group would operate safely when burning all gases within this range without adjustment.

Note 3 to entry: Adjustment of the appliance may be permitted in accordance with the special national or local conditions that apply in some countries.

[SOURCE: EN 437:2021, 3.19]

3.1.3

appliance category

means of identifying the gas families and/or gas groups for which a gas appliance is designed to operate safely and to the desired performance level

[SOURCE: EN 437:2021, 3.20]

3.1.4

gas supply pressure

p

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

Note 1 to entry: Gas supply pressure is expressed in millibars (mbar).

3.1.5

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

EN 203-1:2021 (E)**3.1.6****calorific value**

quantity of heat produced by the complete combustion, of a unit volume or mass of dry gas, the constituents of the combustible mixture being taken at reference conditions of 15 °C, 1 013,25 mbar and the products of combustion being brought back to the same conditions

Note 1 to entry: 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 2 to entry: The calorific value is expressed:

- either in megajoules per cubic metre (MJ/m³) of dry gas under the reference conditions of 15 °C, 1 013,25 mbar;
- or in megajoules per kilogram (MJ/kg) of dry gas.

3.1.7**Wobbe index**

gross Wobbe index W_s : net Wobbe index W_i ratio of the calorific value of a dry gas per unit volume and the square root of its relative density under the reference conditions of 15 °C, 1 013,25 mbar

Note 1 to entry: 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 2 to entry: The Wobbe indices are expressed:

- either in megajoules per cubic metre (MJ/m³) of dry gas under the reference conditions of 15 °C, 1 013,25 mbar;
- or in megajoules per kilogram (MJ/kg) of dry gas.

3.2 Terminology referring to appliance design**3.2.1 Terminology referring to the gas circuit****3.2.1.1****gas circuit**

part of an appliance, between the gas inlet connection and the burner(s), which conveys or contains the gas

3.2.1.2**inlet connection**

part of the appliance which is intended to be connected to the gas supply

3.2.1.3**mechanical joint (or mechanical means of obtaining soundness)**

assembly of several parts, generally metallic, which achieves soundness by use of mechanical means such as metal-to-metal joints, toroidal sealing rings (O rings) or flat joints

3.2.1.4**restrictor**

device with one or more orifices that is placed in the path of the gas flow between the appliance inlet connection and the burner to create a pressure drop, and thus reduces the gas pressure at the burner to a predetermined value for a given supply pressure and rate

3.2.1.5**gas rate adjuster**

component which allows the gas input to each burner to be set at a predetermined value according to supply conditions by continuous (screw adjuster) or discontinuous (changing restrictors) action

Note 1 to entry: The operation of setting this device is known as “setting the gas rate”.

3.2.1.6**pressure regulator**

device which maintains a constant downstream pressure within a fixed range, independent of the upstream pressure and/or the gas rate

Note 1 to entry: Only appliances with pressure regulator are considered regulated appliances.

3.2.1.7**gas rate control**

tap or equivalent component which allows the gas supply to one or more burners to be opened or closed, and possibly, the burner or burners to be adjusted to a gas input lower than the nominal heat input

3.2.1.8**touch control**

indirect manual burner control resulting from finger contact or light touch, with or without movement on the contact surface

3.2.1.9**indirect control**

control that commands a shut-off or gas regulating device via some auxiliary energy (e.g. electric, pneumatic, etc.)

3.2.1.10**primary air**

air entrained in the burner by gas flow and which is mixed upstream of the burner

3.2.1.11**primary aeration adjuster**

device which allows the primary air rate to be set at a desired value, according to the supply conditions

Note 1 to entry: The operation of changing the setting of the device is called “adjusting the primary aeration”.

3.2.1.12**injector**

component which admits gas into a burner

3.2.1.13**heat bearing fluid**

intermediary fluid that indirectly conveys the heat from a burner to the food or cooking container

3.2.2 Terminology referring to the burner**3.2.2.1****main burner**

burner which performs the heating function of the appliance and is often called simply “burner”

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3.2.2.2

auxiliary burner

burner which allows, by means of an ignition burner or pilot, ignition of a main burner

3.2.2.3

ignition burner or pilot

burner intended to ignite the main burner or at first an auxiliary burner

Note 1 to entry: If a burner operates independently of the main burners, it is called "pilot".

3.2.2.4

alternating ignition burner

ignition burner which goes off as soon as the main burner is ignited and is ignited from the main burner just before the main burner is extinguished

3.2.2.5

permanent ignition burner

ignition burner which remains ignited even when the main burner is in use

3.2.3 Terminology referring to the combustion circuit

3.2.3.1

combustion circuit

circuit including the air supply duct, if it exists, the combustion chamber, the heat exchanger and the combustion products evacuation duct, if it exists

3.2.3.2

combustion products circuit

circuit including the combustion chamber, the heat exchanger and the combustion products evacuation duct if it exists

3.2.3.3

combustion chamber

enclosure in which the air/gas mixture burns

3.2.3.4

flue outlet

part of an appliance intended to be connected to a combustion products evacuation duct

3.2.3.5

draught diverter

device placed in the combustion products circuit of type B₁ appliances, which is intended to reduce the influence of the flue pull and down draught on the burner performance and combustion

3.2.3.6

combustion products outlet or flueway extension

part of an appliance not connected to a flue, through which products of combustion are discharged into a room

3.2.3.7

combustion products discharge safety device

device that at least shuts off the main burner when there is an unacceptable spillage of combustion products at the draught diverter of type B_{11BS} appliances

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3.2.3.8**purging**

act of forcing air into the combustion circuit to expel any remaining gas/air mixture or products of combustion

Note 1 to entry: Pre-purging is a purging that takes place between the starting demand and the activation of the ignition device.

3.2.3.9**control device for aeration or evacuation of combustion products**

device which causes shutdown in the event of abnormal aeration or combustion products evacuation conditions

3.2.3.10**gas/air ratio device**

device which automatically adjusts the combustion air flow to the gas flow and vice versa

3.2.4 Terminology referring to the auxiliary equipment**3.2.4.1****auxiliary equipment**

all the devices of an appliance which act directly or indirectly on the gas rate (e.g. gas rate control, flame supervision device, governor, thermostat, etc.)

3.2.4.2**ignition device**

means used to light gas admitted to the ignition burner, auxiliary burner or main burner, which may or may not be fixed to the appliance

3.2.4.3**flame supervision device**

device which, on the extinguishment of the supervised flame, shuts off the gas supply

Note 1 to entry: It is described as having "simple control" if it shuts off the gas supply to the main burner only.

Note 2 to entry: It is described as having "complete control" if it shuts off the gas supply to the main burner and to the ignition burner.

3.2.4.3.1**ignition time**

time interval between the ignition of the supervised flame and the moment when the force thus produced is sufficient to keep the valve open

3.2.4.3.2**ignition safety time****TSA**

time that elapses between the input to open the gas supply to the burner and the gas supply being shut off in the event no flame has been detected

3.2.4.3.3**flame detector**

part of the flame supervision device sensing element on which the supervised flame acts directly and transforms the flame effect into a signal which is transmitted directly or indirectly to a shut off valve

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3.2.4.3.4**extinction safety time****TSE**

time that elapses between extinguishment of the supervised flame and the input to shut off the gas supply to the burner

3.2.4.3.5**closing time**

time interval between the interruption of the auxiliary energy or the voltage and the achievement of the closed position

3.2.4.3.6**ignition rate** Q_{ign}

average heat input during the ignition safety time, expressed as a percentage of the nominal heat input

3.2.4.3.7**spark restoration**

automatic process by which, following flame failure, the ignition device is switched on again without total interruption of the gas supply

3.2.4.3.8**recycling**

automatic process by which, after loss of flame during operation, the gas supply is interrupted, and the full start procedure is re-initiated automatically

3.2.4.3.9**non-volatile lockout of the appliance**

safety shutdown such that a restart can only be accomplished by manual reset and by no other means

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3.2.4.3.10**volatile lock-out of the appliance**

safety shutdown such that a restart can only be accomplished by either the manual reset, or an interruption of the electrical supply and its subsequent restoration

3.2.4.4**temperature regulator (thermostat)**

device which controls the operation of the appliance (by on/off, on/low or modulating control), maintaining a predetermined temperature within the given limits of operation

3.2.4.5**overheat limit device**

manually reset device which ensures that temperature is limited to a predetermined safety value

Note 1 to entry: Overheat limit device is not a regulating device.

3.2.4.6**control knob**

component which is moved by hand and operates an appliance control device (e.g. tap, thermostat, etc.)

3.2.5**functional surface**

part of the appliance which is hot for the appliance to fulfil its function

3.2.6**marking**

permanent indication on the appliance

3.2.7**removable part**

part that can be removed or opened without the aid of a tool, a part that is removed or opened in accordance with the instructions for use, even if a tool is needed for removal

3.3 Terminology referring to appliance operation**3.3.1 Terminology referring to gas rates****3.3.1.1****heat input** Q

quantity of energy used in unit time corresponding to the volumetric or mass flow rates, the calorific value to be considered in this document being the net calorific value

Note 1 to entry: Heat input is expressed in kilowatts (kW).

3.3.1.2**nominal heat input** Q_n

value of the heat input declared by the manufacturer

Note 1 to entry: Nominal heat input is expressed in kilowatts (kW).

3.3.1.3**mass flow rate** M

mass of gas consumed by the appliance divided by the operating time

Note 1 to entry: The mass flow rate is expressed in kilograms per hour (kg/h) or grams per hour (g/h).

3.3.1.4**volumetric flow rate** \dot{V}

volume of the dry gas consumed by the appliance divided by the operating time, the gas being taken under reference conditions of 15 °C, 1 013,25 mbar

Note 1 to entry: Volumetric flow rate is expressed in cubic metres per hour (m³/h), litres per minute (l/m), cubic decimetres per hour (dm³/h) or cubic decimetres per second (dm³/s).

3.3.2 Terminology referring to gas combustion**3.3.2.1****combustion**

oxidation phenomena of combustible gases by the oxygen of air, taking place throughout the burners

Note 1 to entry: The combustion may be:

— complete; in this case only traces of combustible constituents (hydrogen, carbon monoxide, carbon etc.) remain in the products of combustion; or