



SLOVENSKI STANDARD
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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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ICS:

97.040.20 97.040.20 Cooking ranges, working tables, ovens and similar appliances

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EUROPEAN STANDARD

EN 203-1:2005+A1

NORME EUROPÉENNE

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May 2008

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Gas heated catering equipment - Part 1: General safety rules

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

Großküchengeräte für gasförmige Brennstoffe - Teil 1: Allgemeine Sicherheitsanforderungen

This European Standard was approved by CEN on 21 April 2005 and includes Amendment 1 approved by CEN on 5 March 2008.

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COMITÉ EUROPÉEN DE NORMALISATION
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EN 203-1:2005+A1:2008 (E)**Foreword**

This document (EN 203-1:2005+A1:2008) has been prepared by Technical Committee CEN/TC 106 "Gas heated catering equipment", 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of an identical text or by endorsement, at the latest by November 2008 and conflicting national standards shall be withdrawn at the latest by December 2008.

This document includes Amendment 1, approved by CEN on 2008-03-05.

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.

This document supersedes A1 EN 203-1:2005 A1.

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

Questions relating to quality assurance systems, manufacturing tests and certificates of conformity of ancillary devices in particular, are not covered by this document.

This European Standard constitutes Part 1 of EN 203 "Gas heated catering equipment". It states the definitions, the requirements of construction and performance, the test requirements, the requirements of marking applicable to all professional catering equipment mainly on matters of safety. The particular requirements relative to safety and rational use of energy for each specific type of appliance is the subject of Part 2: *Rational use of energy*.

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, 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 and United Kingdom.

1 Scope

This document specifies the general requirements and the constructional and operating characteristics relating to safety¹⁾, marking, and the associated test methods for gas heated commercial catering and bakery appliances.

The specific requirements are given in Part 2.

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

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

This document covers type tests only, and only the net calorific value (H_i) and net Wobbe number (W_i) are used.

Annex C, informative, lists the main types of equipment entering into the field of application of this document.

NOTE This document does not really deal with rational use of energy. This aspect is mentioned in 6.10 only for the coherency with associated Part 2 (clauses numbering) and to remind that in case of not any Part 2 exist for a specific product, rational use of energy has however to be considered.

2 Normative references

The following referenced documents are indispensable for the application 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 (all parts), *Pressure regulators and associated safety devices for gas appliances* A1

EN 125, *Flame supervision devices for gas burning appliances – Thermo-electric flame supervision devices*

EN 126, *Multifunctional controls for gas burning appliances*

EN 161, *Automatic A1 shut-off valves A1 for gas burners and gas appliances*

EN 257, *Mechanical thermostats for gas burning appliances*

EN 297, *Gas-fired central heating boilers – Type B₁₁ and B_{11BS} boilers fitted with atmospheric burners of nominal heat input not exceeding 70 kW*

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

EN 437:2003, *Test gases – Test pressures – Appliance categories*

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

EN 12067-1, *Gas/air ratio controls for gas burners and gas burning appliances - Part 1: Pneumatic types*

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

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

1) The term "safety" includes not only the safety of the appliance gas line but also that of the overall cooking appliance during its normal use in catering.

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

EN 60730-2-9, *Automatic electrical controls for household and similar use – Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9:2000, modified)*

EN ISO 228-1, *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, *Codes for the representation of names of countries and their subdivision – Part 1: Country codes* ^[A1] (ISO 3166-1:2006) ^[A1]

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions, tolerances and designation*

ISO 301, *Zinc alloy ingots intended for casting*

3 Terms and definitions**3.1 General**

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

3.2 Terminology referring to gases and pressures**3.2.1 reference conditions**

15 °C, 1 013,25 mbar

3.2.2 units

calorific value and Wobbe number: (MJ/m³);

test pressures: 1 mbar = 10² Pa

3.2.3 gas supply pressure

p

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

NOTE Gas supply pressure is expressed in millibars (mbar).

3.2.4 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

[EN 437:2003]

3.2.5 calorific value

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

A distinction is made between:

- the gross calorific value H_g : 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 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

[EN 437:2003]

3.2.6

Wobbe index

gross Wobbe index W_g ; 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

[EN 437:2003]

3.3 General terminology referring to appliance design

3.3.1 Terminology referring to the gas circuit

3.3.1.1

gas circuit

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

3.3.1.2

inlet connection

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

3.3.1.3

mechanical soundness 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

3.3.1.4

restrictor or calibrated orifice

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

3.3.1.5

gas rate adjuster

component which allows the gas input to each burner to be set at a predetermined value according to supply conditions.

Adjustment may be continuous (screw adjuster) or discontinuous (changing restrictors).

The adjusting device of an adjustable governor is regarded as a gas rate adjuster.

EN 203-1:2005+A1:2008 (E)

The operation of setting this device is known as “setting the gas rate”

3.3.1.6**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 rate

3.3.1.7**touch control**

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

3.3.1.8**indirect control**

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

3.3.1.9**primary aeration adjuster**

device which allows the aeration of a burner to be set at a desired value, according to the supply conditions.

The operation of changing the setting of the device is called “adjusting the primary aeration”

3.3.1.10**injector**

component which admits gas into an atmospheric burner

3.3.1.11**heat bearing fluid**

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

3.3.2 Terminology referring to the burner

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3.3.2.1**atmospheric induction burner**

burner in which part of the air necessary for combustion, called primary air, is entrained by the gas flow and is mixed upstream of the burner. The remainder of the air, called secondary air, is taken up downstream of the burner

3.3.2.2**main burner**

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

3.3.2.3**auxiliary burner**

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

3.3.2.4**ignition burner or pilot**

burner intended to ignite the main burner. If a burner operates independently of the main burners, it is called a “pilot”

3.3.2.5**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

3.3.2.6**forced draught burner**

burner in which the combustion air is introduced by means of a fan

3.3.2.7**pre-mixed burner**

burner in which the gas and at least the quantity of air necessary for complete combustion is pre-mixed before the burner ports

3.3.3**purging**

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

Pre-purging is a purging that takes place between the starting demand and the activation of the ignition device

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

device which causes shut-down in the event of abnormal aeration or combustion products evacuation conditions

3.3.5**air/gas ratio device**

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

3.3.6 Terminology referring to the combustion circuit**3.3.6.1****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

3.3.6.2**combustion products circuit**

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

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3.3.6.3**combustion chamber**

enclosure in which the air/gas mixture burns

3.3.6.4**flue outlet**

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

3.3.6.5**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

3.3.6.6**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

3.3.6.7**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

3.3.7**auxiliary equipment**

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

EN 203-1:2005+A1:2008 (E)**3.3.7.1****ignition device**

means used to light gas admitted to the ignition burner or main burner

This can be intermittent or permanent

3.3.7.1.1**intermittent ignition device**

means, which may or may not be fixed to the appliance, to assure ignition of the initial flow of gas only to the ignition burner or main burner

3.3.7.1.2**permanent ignition device**

means which, at any time when the gas rate controls are open, assures ignition or re-ignition of the gas admitted to ignition burners or main burners

3.3.7.2**flame supervision device**

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

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

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

3.3.7.2.1**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

3.3.7.2.2**ignition safety times****3.3.7.2.2.1****ignition safety time (TSA)**

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

[EN 297:1994]

3.3.7.2.2.2**maximum ignition safety time (TSA_{MAX})**

ignition safety time measured under the least favourable conditions of ambient temperature and variation in supply voltage

[EN 297:1994]

3.3.7.2.3**extinction safety time (TSE)**

time that elapses between extinction of the supervised flame and the order to shut off the gas supply to the burner

[EN 297:1994]

3.3.7.2.4**closing time**

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

[EN 297:1994]

3.3.7.2.5**ignition rate** (Q_{ign})

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

[EN 297:1994]

3.3.7.2.6**spark restoration**

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

[EN 297:1994]

3.3.7.2.7**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

[EN 297:1994]

3.3.7.2.8**flame supervision burner**

burner which acts on a flame detector

3.3.7.2.9**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

3.3.7.2.10**non-volatile lockout (of the system)**

safety shut-down of the system, such that a restart can only be accomplished by manual reset of the system and by no other means

3.3.7.2.11**volatile lock-out (of the system)**

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

3.3.7.2.12**non volatile lock-out (of the burner)**

safety shut-down of the burner, such that a restart can only be accomplished by a manual reset of the burner and by no other means

3.3.7.2.13**volatile lock-out (of the burner)**

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

3.3.7.3**pressure governor**

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

3.3.7.4**temperature regulator (thermostat)**

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

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EN 203-1:2005+A1:2008 (E)**3.3.7.5****overheat limit device**

manually reset device which enables temperature to be limited to a predetermined safe value

3.3.7.6**control knob**

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

3.3.8**working surface**

part of the appliance which has to be hot in order for the appliance to fulfil its function.

For specific appliance, this definition is completed in Part 2.

3.3.9**marking**

permanent indication on the appliance

3.3.10**display**

dynamic indication on the appliance

3.4 Terminology referring to appliance operation**3.4.1 Terminology referring to gas rates****3.4.1.1****heat input,**

Q

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

NOTE Heat input is expressed in kilowatts (kW).

3.4.1.2**nominal heat input**

Q_n

value of the heat input declared by the manufacturer

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

3.4.1.3**mass flow rate**

M

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

NOTE The mass flow rate is expressed in kilograms per hour (kg/h) or grams per hour (g/h).

3.4.1.4**volumetric flow rate**

V

volume of the gas consumed by the appliance divided by the operating time, the gas being taken under reference conditions

NOTE 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).

3.4.2 Terminology referring to gas combustion

3.4.2.1 combustion

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

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

incomplete; in this case at least one combustible constituent is present in significant proportions in the products of combustion.

It is the amount of carbon monoxide (CO) in the dry air-free products of combustion which is used as the criterion to distinguish between complete and incomplete combustion.

The maximum CO limits according to the circumstances of the test are defined in 6.7. In each case, combustion is regarded as complete (or hygienic) if the CO concentration is below the maximum allowed; if not, it is regarded as incomplete (or non hygienic).

3.4.2.2 aerated flame

flame produced by the combustion of gas previously mixed with air

3.4.2.3 non-aerated flame

flame produced by the combustion of gas which comes into contact with air at the moment of its combustion

3.4.2.4 flame stability

condition of the flame firmly attached to the burner ports or the contact area provided by the design, with no risk of flame lift or light back

3.4.2.5 flame lift

phenomenon characterized by the total or partial lifting of the base of the flame from the burner port or the flame contact area provided by the design. Flame lift may cause the extinction of the flame

3.4.2.6 light back

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

3.4.2.7 light back at the injector

phenomenon characterized by the ignition of the gas at the injector, either as a result of the flame returning into the burner or by the propagation of a flame around the outside of the burner

3.4.2.8 sooting

phenomenon appearing with incomplete combustion and characterized by the deposit of soot on the surfaces or parts of the appliance in contact with the products of combustion or with the flame

3.4.2.9 aeration rate

ratio of the air rate entrained at the burner to the minimum air rate necessary for complete combustion

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