BS EN 203-2-1:2014

BSI Standards Publication

Gas heated catering equipment

Part 2-1: Specific requirements — Open burners and wok burners

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National foreword

This British Standard is the UK implementation of EN 203-2-1:2014. It supersedes BS EN 203-2-1:2005 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GSE/19, Catering equipment (gas).

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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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 203-2-1:2014) 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of an identical text or by endorsement, at the latest by June 2015 and conflicting national standards shall be withdrawn at the latest by June 2016.

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

This document supersedes EN 203-2-1:2005.

The technical changes in comparison to the previous edition are:

- modification of the definition of wok burner in 3.3.2.103;
- modification of the text in 7.1.5.3 Conditions of supply and adjustment of the appliances;
- addition of a general subclause on 7.4.2 Limit temperatures;
- addition of a pan of 60 cm internal diameter in tables 101, 102 and 103;
- modification in 7.6.2.5 (7.6.2.103) of the adjustment of the sequential function control;
- modification of the test in 7.6.2.6 “abnormal use reasonably forseeable” (nominal heat output replaced by minimum heat input).

This European Standard specifies the safety and rational use of energy requirements for open and wok burners.

This European Standard has to be used in conjunction with EN 203-1 “Gas Heated Catering Equipment – Part 1: General safety rules”.

This sub-part of part 2 supplements or modifies the corresponding clauses of EN 203-1, so as to convert it into the European Standard for Commercial Gas Heated Open and Non- Enclosed Burners.

Enclosed and solid tops are covered by EN 203-2-9.

Subclauses and Figures which are additional to those in EN 203-1 are numbered starting with 101.

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.

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

1 Scope

Scope is applicable with the following addition:

This European Standard specifies requirements for the construction and operating characteristics relating to the safety, rational use of energy and marking, of atmospheric commercial gas heated open burners, non-enclosed covered burners.

It also states test methods to check those characteristics.

2 Normative references

Normative references are applicable with the following addition:

EN 203-1:2014, *Gas heated catering equipment - Part 1: General safety rules*

EN 631-1, *Materials and articles in contact with foodstuffs - Catering containers - Part 1: Dimensions of containers*

3 Terms and definitions

Terms and definitions are applicable with the following addition:

3.3.2.101
open burner
hot plate burner for which the pan is heated directly by the flame and the products of combustion are evacuated directly to atmosphere without following a specific way

3.3.2.102
non enclosed covered burner
burner for which the pan or the foodstuffs being heated is screened from direct flame contact by the interposition of a surface on which they rest and where all products of combustion are evacuated directly to the atmosphere (e.g. around the periphery of the plate) and the burner is designed so that partial visibility of the flame is possible in normal operation

EXAMPLE A non-enclosed burner may be:

— permanent, i.e. designed to be used only with the plate in position;

— dual purpose, i.e. designed so that it may also be used as an open burner after removal of the removable plate.

3.3.2.103
wok burner
open burner for which the environment and in particular the supports to accept a large bowl-shaped cooking pan which dimensions are stated in the operating instructions

3.3.101
working surface
surface on which the pans rest or the food is handled as well as the top horizontal surface of the appliance

4 Classification

Shall be according to EN 203-1:2014, 4.

5 Constructional requirements

5.1 General

5.1.1 Conversion to different gases

Shall be according to EN 203-1:2014, 5.1.1.

5.1.2 Materials and methods of construction

Shall be according to EN 203-1:2014, 5.1.2.

5.1.3 Use, cleaning and maintenance

Shall be according to EN 203-1:2014, 5.1.3.

5.1.4 Gas connections

Shall be according to EN 203-1:2014, 5.1.4.

5.1.5 Soundness

Shall be according to EN 203-1:2014, 5.1.5.

5.1.6 Supply of combustion air and evacuation of combustion products

5.1.6.1 General

EN 203-1:2014, 5.1.6.1 *is replaced by the following modification:*

Appliances shall be constructed so that, under normal conditions of use and maintenance, the supply of combustion air and the evacuation of combustion products is permanently guaranteed. Obstruction of the combustion air inlets and the evacuation of the products of combustion shall be made impossible (from the pans used).

5.1.6.2 Appliances equipped with a fan

Shall be according to EN 203-1:2014, 5.1.6.2.

5.1.6.3 Appliances fitted with an air/gas ratio control device

Shall be according to EN 203-1:2014, 5.1.6.3.

5.1.6.4 Appliances not intended to be connected to an evacuation duct of the combustion products (Type A)

Shall be according to EN 203-1:2014, 5.1.6.4.

5.1.6.5 Appliances intended to be connected to a an evacuation duct of the combustion products (Type B)

Shall be according to EN 203-1:2014, 5.1.6.5.

5.1.7 Flame visibility

5.1.7.1 Verification by the installer

Shall be according to EN 203-1:2014, 5.1.7.1.

5.1.7.2 Confirmation by the user

Shall be according to EN 203-1:2014, 5.1.7.2.

5.1.8 Electrical safety

Shall be according to EN 203-1:2014, 5.1.8.

5.1.9 Construction requirements for gas cylinder compartment

Shall be according to EN 203-1:2014, 5.1.9.

5.2 Particular requirements for components in the gas circuit

5.2.1 General

Shall be according to EN 203-1:2014, 5.2.1.

5.2.2 Gas rate control and shut-off device

5.2.2.1 General

Shall be according to EN 203-1:2014, 5.2.2.1.

5.2.2.2 Shut-off device

Shall be according to EN 203-1:2014, 5.2.2.2.

5.2.2.3 Control knob

Shall be according to EN 203-1:2014, 5.2.2.3.

5.2.2.4 Control signals and marking

Shall be according to EN 203-1:2014, 5.2.2.4.

5.2.3 Auxiliary equipment

Shall be according to EN 203-1:2014, 5.2.3.

5.2.3.1 General

Shall be according to EN 203-1:2014, 5.2.3.1.

5.2.3.2 Ignition device

Shall be according to EN 203-1:2014, 5.2.3.2.

5.2.3.3 Flame supervision device

Shall be according to EN 203-1:2014, 5.2.3.3.

5.2.3.4 Gas regulator

Shall be according to EN 203-1:2014, 5.2.3.4.

5.2.3.5 Regulating and overheat limit devices

Shall be according to EN 203-1:2014, 5.2.3.5.

5.2.3.6 Pressure test points

Shall be according to EN 203-1:2014, 5.2.3.6.

5.2.4 Burners

Shall be according to EN 203-1:2014, 5.2.4.

5.2.5 Gas rate adjusters

Shall be according to EN 203-1:2014, 5.2.5

5.3 Particular requirements

5.3.1 Food spillage

Shall be according to EN 203-1:2014, 5.3.1 *with the following addition:*

After the test described in 7.8.101, the burner shall be able to be re-ignited easily.

Possible food spillage shall not be able to cause modification to the air/gas mixture of the burner.

5.3.2 Stability and mechanical safety

Shall be according to EN 203-1:2014, 5.3.2 *with the following addition:*

The griddles and supports shall ensure the stability of pans which are intended to be used.

6 Performance requirements

6.1 Soundness

6.1.1 Soundness of the gas circuit

Shall be according to EN 203-1:2014, 6.1.1.

6.1.2 Soundness of combustion product circuit of type B appliances

6.1.2.1 General

Shall be according to EN 203-1:2014, 6.1.2.1.

6.1.2.2 Type B_1 appliances (with the exception of type B_{14} appliances)

Shall be according to EN 203-1:2014, 6.1.2.2.

6.1.2.3 Type B_{14} and B_2 appliances

Shall be according to EN 203-1:2014, 6.1.2.3.

6.2 Obtaining the gas rate

6.2.1 Nominal heat input (Q_n)

Shall be according to EN 203-1:2014, 6.2.1.

6.2.2 Full calorific rate

Shall be according to EN 203-1:2014, 6.2.2.

6.2.3 Reduced heat input

Shall be according to EN 203-1:2014, 6.2.3.

6.2.4 Ignition burner heat input

Shall be according to EN 203-1:2014, 6.2.4.

6.3 Safety of operation

6.3.1 Burners

6.3.1.1 Resistance to overheating

Shall be according to EN 203-1:2014, 6.3.1.1.

6.3.1.2 Escape of unburned gas

Shall be according to EN 203-1:2014, 6.3.1.2.

6.3.2 Temperature limits

6.3.2.1 Protection against risk of fire

6.3.2.1.1 Normal operation

Shall be according to EN 203-1:2014, 6.3.2.1.1.

6.3.2.1.2 Abnormal operation

Shall be according to EN 203-1:2014, 6.3.2.1.2.

6.3.2.2 Protection against risk of burns

6.3.2.2.1 Control knobs and other handles

Shall be according to EN 203-1:2014, 6.3.2.2.1.

6.3.2.2.2 Vertical panels of the appliance case

Shall be according to EN 203-1:2014, 6.3.2.2.2.

6.3.2.3 Regulating, control and safety devices

Shall be according to EN 203-1:2014, 6.3.2.3.

6.3.3 Ignition – cross-lighting - flame stability

6.3.3.1 Influence of supply conditions

Shall be according to EN 203-1:2014, 6.3.3.1.

6.3.3.2 Influence of winds and room draughts

6.3.3.2.1 Influence of winds and room draughts on type A and B appliances

Shall be according to EN 203-1:2014, 6.3.3.2.1.

6.3.3.2.2 Influence of down draught for type B appliances

Shall be according to EN 203-1:2014, 6.3.3.2.2.

6.3.4 Combustion products safety devices for type B_{11BS} appliances

Shall be according to EN 203-1:2014, 6.3.4.

6.3.5 Pre-purge

6.3.5.1 General

Shall be according to EN 203-1:2014, 6.3.5.1.

6.3.5.2 Functioning of the permanent ignition burner when the fan stops during standby time

Shall be according to EN 203-1:2014, 6.3.5.2.

6.4 Influence of burners on each other

Shall be according to EN 203-1:2014, 6.4.

6.5 Auxiliary equipment

6.5.1 Flame shut off device

6.5.1.1 Thermoelectric flame shut off device

Shall be according to EN 203-1:2014, 6.5.1.1.

6.5.1.2 Automatic burner control system

6.5.1.2.1 Ignition safety time (TSA)

####### 6.5.1.2.1.1 General

Shall be according to EN 203-1:2014, 6.5.1.2.1.1.

####### 6.5.1.2.1.2 Alternative method to TSA measurement

Shall be according to EN 203-1:2014, 6.5.1.2.1.2.

6.5.1.2.2 Extinction safety time (TSE)

Shall be according to EN 203-1:2014, 6.5.1.2.2.

6.5.1.2.3 Spark restoration

Shall be according to EN 203-1:2014, 6.5.1.2.3.

6.5.1.2.4 Recycling

Shall be according to EN 203-1:2014, 6.5.1.2.4.

6.5.2 Ignition device

Shall be according to EN 203-1:2014, 6.5.2.

6.6 Air proving device

6.6.1 General

Shall be according to EN 203-1:2014, 6.6.1.

6.6.2 Supervision of the combustion air or combustion products rate

Shall be according to EN 203-1:2014, 6.6.2.

6.6.3 Supervision of the combustion air pressure or combustion products pressure

Shall be according to EN 203-1:2014, 6.6.3.

6.6.4 Air/gas ratio controls

Shall be according to EN 203-1:2014, 6.6.4.

6.7 Combustion

6.7.1 All appliances (in calm air)

Shall be according to EN 203-1:2014, 6.7.1.

6.7.2 Special conditions

6.7.2.1 Type B_{14} appliances

Shall be according to EN 203-1:2014, 6.7.2.1.

6.7.2.2 Type B_2 appliances

Shall be according to EN 203-1:2014, 6.7.2.2.

6.7.101 Abnormal use reasonably foreseeable

The CO concentrations in the dry, air-free products of combustion shall not exceed 0,20 % when the appliance is supplied with the reference gases test under the conditions of 7.6.2.104.

6.8 Particular requirements

6.8.1 Stability and mechanical safety

Shall be according to EN 203-1:2014, 6.8.1.

6.8.2 Pressurized parts

Shall be according to EN 203-1:2014, 6.8.2.

6.8.3 Lack of heat-bearing fluid

Shall be according to EN 203-1:2014, 6.8.3.

6.9 Auxiliary energy

6.9.1 General

Shall be according to EN 203-1:2014, 6.9.1.

6.9.2 Electrical energy fluctuation

Shall be according to EN 203-1:2014, 6.9.2.

6.9.3 Other auxiliary energy

Shall be according to EN 203-1:2014, 6.9.3.

6.10 Rational use of energy

EN 203-1:2014, 6.10 *is replaced by the following:*

Wok burners and non-enclosed covered burners are not subject to these requirements.

6.10.101 Open burners

Under the test conditions of 7.101 the efficiency shall not be less than 50 %.

6.11 Operating requirements - Temperature of the LPG cylinder and its compartment

6.11.1 Temperature of the walls of the compartment

Shall be according to EN 203-1:2014, 6.11.1.

6.11.2 Temperature of the LPG cylinder

Shall be according to EN 203-1:2014, 6.11.2.

7 Test conditions

7.1 General

7.1.1 Characteristics of the test gases

Shall be according to EN 203-1:2014, 7.1.1.

7.1.2 Requirements for making up test gases

Shall be according to EN 203-1:2014, 7.1.2.

7.1.3 Test room

Shall be according to EN 203-1:2014, 7.1.3.

7.1.4 Preparation of the appliance

Shall be according to EN 203-1:2014, 7.1.4.

7.1.5 Practical method of test

7.1.5.1 Verification of constructional requirements

Shall be according to EN 203-1:2014, 7.1.5.1.

7.1.5.2 Use of test gases

Shall be according to EN 203-1:2014, 7.1.5.2.

7.1.5.3 Conditions of supply and adjustment of the appliances

Shall be according to EN 203-1:2014, 7.1.5.3 *with the following addition:*

For appliances fitted with griddles or pan-supports suitable for more than one position, the tests for combustion and efficiency are carried out in every possible position.

7.1.6 Test pressures

Shall be according to EN 203-1:2014, 7.1.6.

7.1.7 Carrying out the tests

7.1.7.1 Tests requiring all the gases to be used

Shall be according to EN 203-1:2014, 7.1.7.1.

7.1.7.2 Other tests

Shall be according to EN 203-1:2014, 7.1.7.2.

7.2 Soundness

7.2.1 Soundness of the gas circuit

Shall be according to EN 203-1:2014, 7.2.1.

7.2.2 Soundness of the combustion circuit and correct evacuation of the combustion products for type B appliances

7.2.2.1 Type B_1 appliances other than type B_{14}

Shall be according to EN 203-1:2014, 7.2.2.1.

7.2.2.2 Type B_{14} and B_2 appliances

Shall be according to EN 203-1:2014, 7.2.2.2.

7.3 Obtaining gas rates

7.3.1 General

Shall be according to EN 203-1:2014, 7.3.1.

7.3.2 Nominal heat input

7.3.2.1 General

Shall be according to EN 203-1:2014, 7.3.2.1.

7.3.2.2 Verification of the calibrated injector rate of unregulated appliances without gas rate adjusters or where these devices are put out of action

Shall be according to EN 203-1:2014, 7.3.2.2.

7.3.2.3 Verification of the performance of gas rate adjusters for unregulated appliances

Shall be according to EN 203-1:2014, 7.3.2.3.

7.3.2.4 Regulated appliances

Shall be according to EN 203-1:2014, 7.3.2.4.

7.3.3 Full rate

Shall be according to EN 203-1:2014, 7.3.3.

7.3.4 Reduced rate

Shall be according to EN 203-1:2014, 7.3.4.

7.4 Operational safety

7.4.1 Burners

7.4.1.1 Resistance to overheating

Shall be according to EN 203-1:2014, 7.4.1.1.

7.4.1.2 Escape of unburned gas

Shall be according to EN 203-1:2014, 7.4.1.2.

7.4.2 Limit temperatures

7.4.2.1 General

Shall be according to EN 203-1:2014, 7.4.2.1 *with the following addition:*

Each burners are covered with pan described in Table 101 and Figure 101. A distance of at least 10 mm shall be kept between the side surface of each pan and all other pans and between the side surface of each pan and any test panel. If this arrangement is not possible with the pans mentioned above for the heat input of the burners, the test shall be done with the bigger pans allowing that arrangement. In this case, and if necessary, the input of the burner is adjusted, with the corresponding control knob, in order not to have flames touching the sides of the pans.

During the test, the pan is covered by its lid and hot water is added to ensure a sufficient water level in order the 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.

7.4.2.2 Protection against risk of fire

Shall be according to EN 203-1:2014, 7.4.2.2.

7.4.2.3 Protection against risk of burns

Shall be according to EN 203-1:2014, 7.4.2.3.

7.4.2.4 Regulating, control and safety devices

Shall be according to EN 203-1:2014, 7.4.2.4.

7.4.2.5 Abnormal operation

Shall be according to EN 203-1:2014, 7.4.2.5.

7.4.3 Ignition - cross- lighting - flame stability

7.4.3.1 General

Shall be according to EN 203-1:2014, 7.4.3 *with the following addition:*

The tests are carried out with and without pans. For open burners, the pans are those described in Table 101 and Figure 101.

In the case of a possible covering of several burners by the same pan, the tests are carried out with the largest pan recommended in the instructions.

7.4.3.2 Influence of the supply conditions

Shall be according to EN 203-1:2014, 7.4.3.2.

7.4.3.3 Influence of wind and draughts

Shall be according to EN 203-1:2014, 7.4.3.3 *with the following addition:*

When a reduced input exists, the test shall be repeated at this reduced input.

Table 101 – Pans to be used according to the heat input of the burner

Internal diameter cm	Input on net calorific value kW	Mass of water to be introduced kg
22	1,79	3,7
24	2,13	4,9
26	2,50	6,1
28	2,91	7,8
30	3,33	9,4
32	3,80	11,8
34	4,28	13,6
38	5,35	18,7
42	6,53	24,9
46	7,84	32,4
50	9,26	41,2
60	$\geq$12	50

7.4.3.4 Specific tests for type B appliances

7.4.3.4.1 Test with a down draught and blockage

Shall be according to EN 203-1:2014, 7.4.3.4.1.

7.4.3.4.2 Combustion products discharge safety device for type B_{11BS} appliances

7.4.3.4.2.1 Operating tests

Shall be according to EN 203-1:2014, 7.4.3.4.2.1.

7.4.3.4.2.2 Shut-down with total blockage

Shall be according to EN 203-1:2014, 7.4.3.4.2.2.

7.4.3.4.2.3 Shut-down with partial blockage

Shall be according to EN 203-1:2014, 7.4.3.4.2.3.

7.4.3.5 Effectiveness of the pre-purge

Shall be according to EN 203-1:2014, 7.4.3.5.

7.4.3.6 Functioning of a permanent ignition burner when the fan is stopped during standby time

Shall be according to EN 203-1:2014, 7.4.3.6.

7.4.3.7 Influence of burners on each other

Shall be according to EN 203-1:2014, 7.4.3.7.

7.5 Auxiliary equipment

7.5.1 Flame shut off device

7.5.1.1 Thermoelectric flame cut-off device

Shall be according to EN 203-1:2014, 7.5.1.1.

7.5.1.2 Automatic burner control system

7.5.1.2.1 Ignition safety time (TSA)

7.5.1.2.1.1 General

Shall be according to EN 203-1:2014, 7.5.1.2.1.1.

7.5.1.2.1.2 Alternative method to TSA measurement

Shall be according to EN 203-1:2014, 7.5.1.2.1.2.

7.5.1.2.2 Extinction safety time (TSE)

Shall be according to EN 203-1:2014, 7.5.1.2.2.

7.5.1.2.3 Spark restoration

Shall be according to EN 203-1:2014, 7.5.1.2.3.

7.5.1.2.4 Recycling

Shall be according to EN 203-1:2014, 7.5.1.2.4.

7.5.2 Ignition device

Shall be according to EN 203-1:2014, 7.5.2.

7.6 Combustion

7.6.1 General

Shall be according to EN 203-1:2014, 7.6.1.

7.6.2 Tests carried out under normal conditions

7.6.2.1 General test conditions

Shall be according to EN 203-1:2014, 7.6.2.1.

7.6.2.2 Supplementary test

Shall be according to EN 203-1:2014, 7.6.2.2.

7.6.2.101 Open burners

Each burner supplied and adjusted under the conditions of 7.6.2.1 of EN 203-1, is successively tested, covered by the largest pan which can be placed on the burner, similar to those defined in Table 101 and Table 102 and Figure 101.

The products of combustion shall be sampled using the corresponding ring defined in Table 103 and Figure 102.

If in this position the flame comes in contact with the ring, it is adjusted in height to avoid disturbance of the flame, and to conserve the level of sampling of CO_2 similar to that defined in EN 203-1.

In the case of open burners, the burners adjoining the burner under test can be covered by pans of a diameter smaller than that corresponding to the output, however, pans with the biggest possible diameter shall be used.

Distance between the pans and between the pans and the rings shall be at least 1 cm.

If the instructions specify a smaller pan support for use with smaller diameter pans, a combustion test is carried out with a pan as determined in Table 102, directly greater than the pan diameter stated by the instructions.

Table 102 – Characteristics of pans required for combustion tests

Repair	Units	Designation												Tolerance
		22	**24**	**26**	**28**	**30**	**32**	**34**	**38**	**42**	**46**	**50**	**60**	
A	mm	220	240	260	280	300	320	340	380	420	460	500	600	±1 %
H	mm	140	150	160	170	180	190	200	220	240	260	280	300	±1 %
Cmin	mm	2	2	2,5	2,5	2,5	2,5	2,5	3,0	3,0	3,0	3,0	3,0	
Dmin	mm	1,5	1,5	1,8	1,8	1,8	1,8	1,8	2,1	2,1	2,1	2,1	2,1	
E	mm	3	3,5	3,5	3,5	3,5	3,5	4	4,0	4,0	4,0	4,0	4,0	±2 mm
NOTE The pans and covers are made of aluminium alloy.														

Table 103 – Sampling of combustion products by rings

Pans int. diameter	**Heat input**	**Ring int. diameter**	**Centering shim thickness** [a]	**Height**	**Tube external dia.**	**Length**
	Hi	***r***	***e***	***h***	***R***	***d***
mm	**kW**	**mm**	**mm**	**mm** [b]	**mm**	**mm** [b]
220	1,79	235	4	40	10	245
240	2,13	255	4	40	10	245
260	2,50	275	4	40	10	245
280	2,91	295	4	40	10	245
300	3,33	315	4	40	10	245
320	3,80	335	4	60	14	365
340	4,28	355	4	60	14	365
380	5,35	395	4	60	14	365
420	6,53	435	4	60	14	365
460	7,84	475	3	60	14	365
500	9,26	515	3	60	14	365
600	≥ 12	615	3	60	14	365

a) Taking account of tolerances in the inside diameter of the pans and rings, the shim thickness may be reduced, if necessary, by arranging the four shims so as to centre the ring.

b) Dimensions given by way of indication.

7.6.2.102 Wok burners and non-enclosed covered burners

Non enclosed covered burners are tested with the plate in its normal working position.

Wok burners shall be tested using the utensil specified in the instructions.

The utensil shall be provided to the laboratory.

The appliance under test is covered with a hood the dimension of which allow to reach at least 1 % of CO_2 sampling without disturbing the combustion and designed in such way that the flame is never in contact with the sides of the hood. The hood is placed above the hotplate at a distance of 80 mm in such a way that the hood does not influence the combustion of the burner.

The products of combustion are sampled at the upper part of the hood with a cross shape probe as described in Figure 7 of EN 203-1:2014.

The sampling of combustion products shall be made as soon as the water in the utensil starts to boil.

7.6.2.103 Burners with sequential controls

In the case of burners with sequential controls, a first test is carried out with the burner functioning in a continuous manner if this position is possible.

When the burner functions in cycles (on/off or full input/reduced input) the CO and CO_2 concentration samples shall be recorded every five seconds and the CO/CO_2 ratio (dry free air) calculated during at least five

complete cycles of the gas rate control to the burner. For each cycle the CO/CO_2 (dry free air) arithmetic mean is calculated. None of these Five CO/CO_2 values shall exceed limits specified in 6.7.1 respectively with the test gas used (reference and limit).

The sequential function control is adjusted in a manner to obtain minimum setting of the control range, and then 40 %, and 80 % of the adjusting range.

7.6.2.104 Abnormal use reasonably foreseeable

An additional test is carried out using the largest standardised pan according to EN 631-1, type GN 2/1, 100 mm high, filled with water (50 mm high) and placed on the burners.

The pan is located in a manner so as to obtain a maximum covering of the pan support(s).

Only the burners which are entirely covered by the pan are operating at their minimum heat output with each reference gases.

The CO concentration measured after 15 min according to EN 203-1:2014, 7.6.2.1 with an adequate probe (for example several probes as the one described in EN 203-1:2014, Figure 6 may be used for the same sampling) shall comply the requirement of EN 203-1:2014, 6.7 relating to the references gases test.

NOTE 1 It is recommended to verify that the pan does not put out of shape during the test.

NOTE 2 The water level is adjusted during the test if necessary.

7.6.3 Specific test for type B appliances

7.6.3.1 General

Shall be according to EN 203-1:2014, 7.6.3.1.

7.6.3.2 Type B_1 appliances not including type B_{14}

Shall be according to EN 203-1:2014; 7.6.3.2.

7.6.3.3 Type B_{14} appliances

Shall be according to EN 203-1:2014, 7.6.3.3.

7.6.3.4 Type B_2 appliances

Shall be according to EN 203-1:2014, 7.6.3.4.

7.6.4 Test with sooting limit gas

Shall be according to EN 203-1:2014, 7.6.4.

7.7 Air-proving device

7.7.1 General

Shall be according to EN 203-1:2014, 7.7.1.

7.7.2 Supervision of the combustion air or the combustion products rate

Shall be according to EN 203-1:2014, 7.7.2.

7.7.3 Supervision of the combustion air or the combustion products pressure

Shall be according to EN 203-1:2014, 7.7.3.

7.8 Special tests

7.8.1 Stability and mechanical safety

Shall be according to EN 203-1:2014, 7.8.1.

7.8.2 Pressurized parts

Shall be according to EN 203-1:2014, 7.8.2.

7.8.3 Lack of heat bearing fluid

Shall be according to EN 203-1:2014, 7.8.3.

7.8.101 Spillage

The burners functioning individually, adjusted to their nominal rate and supplied only with one reference gas, are used to maintain boiling water filled to within 10 mm of the top edge of the pans corresponding to the heat input (defined in Table 101), not covered.

The test is continued until there is no further spillage.

7.9 Test method - Overheating of the LPG cylinder and its compartment

Shall be according to EN 203-1:2014, 7.9.

7.101 Rational use of energy

7.101.1 General

For this test the ambient temperature shall be maintained between 20 °C and 25 °C.

The burner is adjusted to its maximum nominal rate with the corresponding reference gas.

The test is carried out with the pan support in place.

Aluminium pans are used which have a matt base polished sides and the characteristics described in Table 101, Table 102 and Figure 101.

The test is carried out with the pan cover in place.

The required area of the base of the pan is given by the following formula:

$$S = 212 \times Q_n \qquad (1)$$

where

Q_n is the nominal heat input based on the net calorific value, kilowatts

S is the area of the base in centimetres squared.

If there is no pan corresponding to the heat input of the burner, two tests are carried out, one with a pan having the immediate greater diameter and one with a pan having the immediate smaller diameter. The results are plotted on a graph, and a result is obtained by interpolation.

Because of the construction, it is allowed to off-centring the pan defined in Table 102 from the burner during this test.

7.101.2 Test

The pan is filled with the quantity of water corresponding to the heat input stated in Table 101.

The initial temperature of the water is measured at the centre of the volume of water, using an appropriate thermometer, fixed by a correctly adjusted stopper through the cover. The initial temperature of the water shall be (20 ± 1) °C.

The burner is extinguished as soon as the rise in temperature of the water reaches 70 K.

The pan previously used is replaced with the standard pan (see Table 102 and Figure 101) containing the corresponding mass of water at (20 ± 1) °C.

As soon as the water temperature reaches 70 K above its initial value, the burner is extinguished and the gas consumption and maximum water temperature attained are measured.

The efficiency is given by:

$$R = M \times C_p \times [(t_2 - t_1) / V_c \times H_i] \times 100 \quad (2)$$

where

R is the efficiency in percent;

M is the mass of water in kilograms;

C_p is the specific heat of water [4,186 kJ/(kg.°C)];

t_1 is the initial water temperature in degrees Celsius;

t_2 is the final water temperature in degrees Celsius;

V_c is the volume or mass of gas burned in cubic metres or kilograms;

H_i is the net calorific value of the gas in megajoules per cubic metre or megajoules per kilogram.

The volume of gas consumed determined from the volume measured is given by:

$$V_c = V_{mes} \times ((p_a + p - p_s) / 1013{,}25) \times (288{,}15 / (273{,}15 + t_g)) \quad (3)$$

where

V_{mes} is the volume of gas measured in cubic metres;

p_a is the atmospheric pressure in millibars;

p is the supply pressure of the gas at the point of measurement of the heat input in millibars;

p_s is the partial pressure of water vapour in millibars;

t_g is the temperature of the gas at the point of measurement of heat input in degrees Celsius.

8 Designation

Shall be according to EN 203-1:2014, 8.

9 Marking and instructions

9.1 General

Shall be according to EN 203-1:2014, 9.1.

9.2 Marking on the appliance

9.2.1 Data plates and labels

Shall be according to EN 203-1:2014, 9.2.1.

9.2.2 Other marking on the appliance

Shall be according to EN 203-1:2014, 9.2.2.

9.3 Instructions

9.3.1 General

Shall be according to EN 203-1:2014, 9.3.1.

9.3.2 Instructions for use and maintenance

Shall be according to EN 203-1:2014, 9.3.2 *with the following addition:*

The instructions for use shall indicate the maximum and minimum sizes of the pans which can be used with regard to stability and satisfactory combustion with or without the reduce pan support.

For wok burners the instructions shall indicate the type of utensil which shall be used.

9.3.3 Instructions for installation and adjustment

Shall be according to EN 203-1:2014, 9.3.3 *with the following addition:*

The instructions for installation shall draw the installer's attention about the particular attention to be paid in order to not disturb the air combustion admission nor the combustion products evacuation of appliances fitted with open burners.

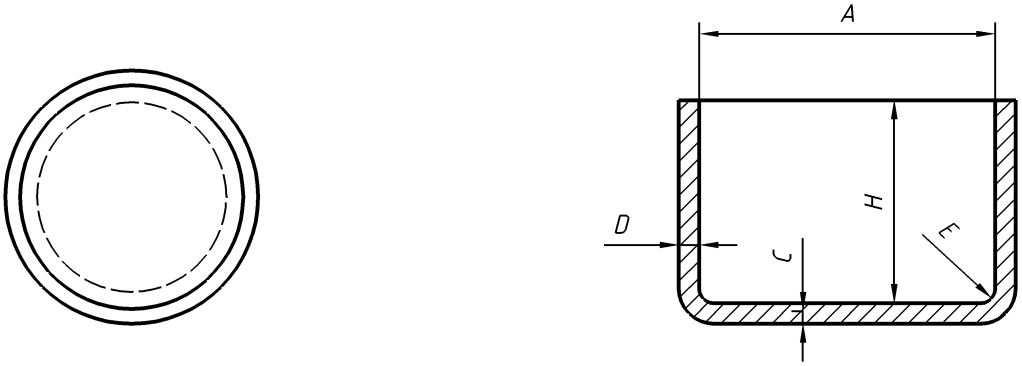
9.3.4 Instructions for conversion to different gases

Shall be according to EN 203-1:2014, 9.3.4.

9.4 Packaging

Shall be according to EN 203-1:2014, 9.4.

Shall be according to EN 203-1:2014, Figure 1 to Figure 7



Key

A internal diameter measured on the upper part

H internal height

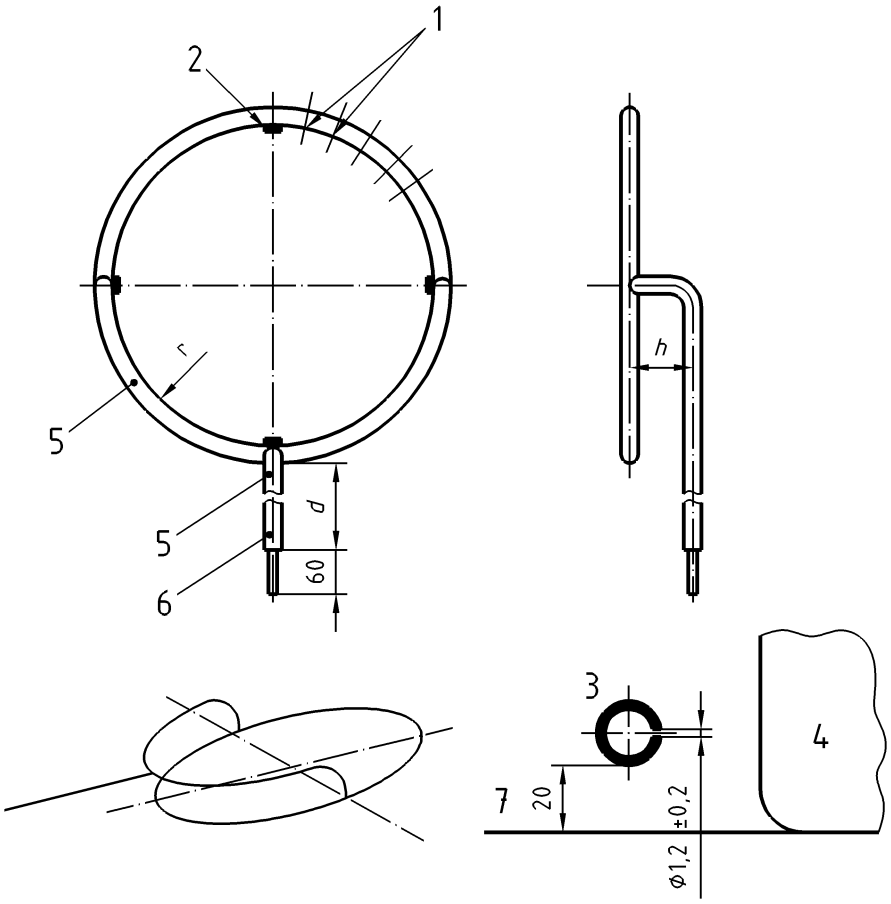
C bottom thickness

D side thickness

E internal radius

NOTE Dimensions are given in Table 102

Figure 101 - Characteristics of the pans required for the tests



Key

1	distance between holes axis ≈20 mm	5	tube R
2	4 centring blocks thickness e (no holes at the block levels)	6	tube 6 × 8
3	drilling angle from horizontal $\left(0\,^{0}_{-30}\right)°$	7	grid plan
4	pan		

NOTE The ring dimensions are given in Table 103

Figure 102 - Sampling of combustion products by rings - Principles of design

Annex A
(informative)

National situations

Shall be according to EN 203-1:2014; Annex A.

Annex B
(normative)

Use of symbols on appliances and packaging

Shall be according to EN 203-1:2014; Annex B.

Annex C
(informative)

Trilingual list of appliances in the scope of EN 203-1 and corresponding Part 2

Shall be according to EN 203-1:2014; Annex C.

Annex D
(normative)

Non pneumatic air/gas control devices

Shall be according to EN 203-1:2014; Annex D.

Annex E
(informative)

Composition of the gas circuit

Shall be according to EN 203-1:2014; Annex E.

Annex ZA
(informative)

Clauses of this European Standard EN 203-2-1 addressing essential requirements or other provisions of EU Directives.

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.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1

Essential Requirements	**Subject**	**Requirements of the standard EN 203–2-1 complementing EN 203–1**	**Comments**
1	Annex I General conditions		
1.1	Operating safety	5.1.6 - 5.3.1 - 5.3.2	
1.2	Marking and instructions Instructions for installer Instructions for user Warnings Official languages	9.3.2	
1.2.1	Information for technical instructions		
1.2.2	Contents of the instructions for use and maintenance		
1.2.3	Marking on appliances and packaging		
1.3	Fittings		NA
2	Materials		
2.1	Characteristics		
2.2	Guarantee		
3	Design and construction	5.3.2	
3.1	General		
3.1.1	Stress resistance		
3.1.2	Condensation		
3.1.3	Risks of explosion		
3.1.4	Penetration by air and		“Water

	water		penetration” not applicable
3.1.5	Auxiliary energy normal fluctuation		
3.1.6	Auxiliary energy abnormal fluctuation		
3.1.7	Electrical hazards		
3.1.8	Pressurized parts		NA
3.1.9	Safety device failure; - flame supervision device - shut off device - gas governor - shut off components - regulating and limiting device		
3.1.10	Safety/adjustment		
3.1.11	Protection of parts adjusted by the manufacturer		
3.1.12	Marking of control levers		
3.2	Release of unburnt gas		
3.2.1	Risk of gas leak		
3.2.2	Risk of accumulation in appliance		
3.2.3	Risk of accumulation in room		
3.3	Ignition	5.3.1	
3.4	Combustion		
3.4.1	Flame stability Concentration of harmful substances in combustion products	6.7.101	
3.4.2	Release of combustion products	5.1.6,	
3.4.3	Release of combustion products in room (for appliance connected to a flue, with abnormal draught)		NA
3.4.4	CO limit in room (heating appliance and water heater not connected)		NA
3.5	Rational use of energy	6.10	
3.6	Temperature		
3.6.1	Floor and adjacent panels		

3.6.2	Adjustment levers		
3.6.3	Temperature of external surfaces		
3.7	Foodstuffs and sanitary water		“Water for domestic use” not applicable

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