TECHNICAL SPECIFICATION

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Domestic gas cooking appliances — Safety —

Part 21: Particular requirements for gas hobs, gas grills and gas griddles

Appareils de cuisson domestiques utilisant les combustibles gazeux — Sécurité —

Partie 21: Exigences particulières pour les tables de cuisson à gaz, grils à gaz et grils par contact à gaz

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Contents

Page

Foreword ..... **vi**
Introduction ..... **vii**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **2**
3.1 Definitions relating to components 2
4 Components in gas cooking appliances **2**
4.1 General 2
4.2 Manual gas shut-off valves (Taps) 2
4.2.1 Taps for multi-ring burners 3
4.3 Knobs 3
4.3.1 Design of knobs 3
4.4 Multifunctional controls 3
4.5 Thermoelectric flame supervision controls 3
4.6 Thermostats 3
4.7 Pressure regulators 3
4.8 Automatic shut-off valves 3
4.9 Injectors and adjusters 3
4.10 Ignition systems 3
4.11 Thermal cut-outs 3
4.12 Multi-ring burners 3
4.13 Overheating safety devices 4
4.13.1 Requirement 4
4.13.2 Test 5
5 General conditions of test **5**
6 Heat input **5**
6.1 General 5
6.2 Obtaining the nominal heat input 5
6.2.1 Test of hob burner 5
6.2.2 Test of multi-ring hob burner 6
6.2.3 Test of surface grill and griddle without a thermostat 6
6.2.4 Test of surface grill and griddle with a thermostat 6
6.3 Measurements and calculations 6
6.4 Obtaining the reduced heat input 6
6.4.1 Requirement 6
6.4.2 Test 6
6.4.3 Test of hob burner, surface grill and griddle burner 6
6.5 Total heat input 7
7 Heating **7**
7.1 General 7
7.2 Operating conditions 7
7.3 Heating tests 7
7.4 Abnormal operation 7
7.4.1 Hob burner 7
7.4.2 Gas griddles 7
8 Combustion **8**
8.1 Measurement of all burners simultaneously 8
8.2 Blocked combustion products outlet 8
8.3 Analysis of the combustion products 8
8.4 Single burner 8
8.4.1 General requirement 8

8.4.2 Hob burner, surface grill burner and griddle burner ... 8
8.4.3 Tests of multi-ring burner ... 10
8.4.4 Additional test of Type II and Type V multi-ring burners ... 10
8.4.5 Sampling the combustion products ... 10
8.5 Sooting ... 13
8.5.1 Requirement ... 13
8.5.2 Test ... 13

9 Ignition, cross-lighting and flame stability ... 14
9.1 General ... 14
9.2 Movement of oven/grill door or cabinet door ... 14
9.3 Hob burner, surface grill burner and griddle burner ... 14
9.3.1 General ... 14
9.3.2 Cold conditions ... 14
9.3.3 Hot conditions ... 15
9.4 Multi-ring hob burner ... 16
9.4.1 Requirement ... 16
9.4.2 Additional test for Type I multi-ring burners ... 16
9.4.3 Additional test for Type II and Type V multi-ring burners ... 16
9.4.4 Resistance to draught ... 16

10 Accumulation of unburnt gas and leak tightness ... 17

11 Construction ... 17
11.1 General ... 18
11.2 Materials ... 18
11.2.1 General ... 18
11.2.2 Burner material test ... 18
11.2.3 Sealings ... 18
11.2.4 Resistance for non-metallic feet of pan supports ... 18
11.3 Gas inlet connections ... 18
11.4 Conversion to different gases ... 18
11.5 Pull forces of knobs for manual gas shut-off valves (taps) ... 18
11.6 Appliances that enable the user to program the start or the end of the cooking cycle ... 18
11.7 Compartment for one gas cylinder ... 18
11.8 Touch controls ... 18
11.8.1 Requirement ... 19
11.8.2 Test ... 19
11.9 Resistance to spillage ... 19
11.9.1 Requirement ... 19
11.9.2 Test ... 19
11.10 Specific hob parts and hob accessories ... 19
11.10.1 Pan supports ... 19
11.10.2 Removable devices for small pans ... 20
11.10.3 Special supports for convex-based pans ... 20
11.10.4 Covered burners ... 20
11.11 Shut down lids ... 21
11.11.1 Requirement ... 21
11.11.2 Test ... 21
11.11.3 Glass shut down lids ... 21
11.11.4 Shut-off device ... 21

12 Mechanical strength ... 21
12.1 Parts made of glass and glass-ceramic ... 21
12.1.1 General ... 22
12.1.2 Spring hammer test ... 22
12.1.3 Punch test ... 22
12.1.4 Thermal stress resistance for glass and glass-ceramic hob surfaces ... 22
12.2 Pan support ... 22
12.2.1 Requirement ... 22

12.2.2 Test 22
12.3 Pan support in contact with the glass or glass ceramic of the hob 22
13 Electrical safety **22**
14 Marking and instructions **22**
Annex A (informative) **National deviations in various countries** **23**

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 291, *Domestic gas cooking appliances*.

A list of all parts in the ISO 21364 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document provides general requirements for safety of domestic gas cooking appliances.

This document can also be applied, so far as is reasonable, to appliances not mentioned in this specific document and to appliances designed on the basis of new principles, in which case additional requirements may be necessary.

Where no specific International Standard for an appliance exists, the appliance can be tested according to this document and further tests which take into account the intended use.

Gas burning appliances using fuel gases need to withstand the type of gas which is specified. Other ISO technical committees, e.g. ISO/TC 193, Natural gas, deal with the testing and properties of fuel gases.

Note that, due to the differing properties of fuel gas depending on its source/region of origin, certain differences in regulations exist at present in different regions; some of these differences are presented in Annex A.

This document covers type testing.

This document series is structured as follows:

ISO 21364 Domestic gas cooking appliances – Safety

— Part 1: General requirements

— Part 21: Particular requirements for hobs, surface grills and griddles

— Part 22: Particular requirements for ovens and compartment grills

This document of ISO 21364 is designed to be used in combination with ISO/TS 21364-1. Together, they establish the full requirements as they apply to the product covered by this document. Where needed, this document adapts ISO/TS 21364-1 by stating in the corresponding clause:

— “with the following modification”;

— “with the following addition”;

— “is replaced by the following”;

or

— “is not applicable”.

In order to identify specific requirements that are particular to this document, that are not already covered by ISO/TS 21364-1, this document may contain clauses or subclauses that are additional to the structure of ISO/TS 21364-1.

To ensure global relevance of this document, the differing requirements resulting from practical experience and installation practices in various regions of the world have been taken into account. The variations in basic infrastructure associated with appliances have also been recognized, some of which are addressed in ISO/TS 21364-1:2021, Annex E and ISO/TS 21364-1:2021, Annex A. This document intends to provide a basic framework of requirements that recognize these differences.

Domestic gas cooking appliances — Safety —

Part 21: Particular requirements for gas hobs, gas grills and gas griddles

1 Scope

This document specifies particular requirements for safety, construction and materials of household gas surface cooking appliances. For general requirements for safety, construction and materials of gas hobs, see ISO/TS 21364-1:2021.

This document covers the following:

— surface cooking appliances:

  — hobs;

  — surface grills;

  — griddles;

  being built-in, part of a cooking appliance or table top;

— hobs accessories.

It does not cover surface cooking appliances intended for outdoor use and/or commercial use as well as electrical heated elements as part of the appliance. It also does not cover appliances with automatic burner control systems.

NOTE 1 For requirements of electrical safety refer to the IEC 60335 standard series.

NOTE 2 Attention is drawn to the fact that

— for appliances intended to be used in vehicles or on board of ships or aircrafts, additional requirements could be necessary;

— in many countries additional requirements are specified by the national health authorities, the national water supply authorities and similar authorities.

This document does not cover requirements relating to gas cylinders, their pressure regulators and their connections.

This document does not cover requirements for gas installation.

2 Normative references

The following documents are referred to in the text in such a way that some or all of 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.

ISO/TS 21364-1:2021, *Domestic gas cooking appliances – Safety- Part 1: General requirements*

ISO 23551-8:2016+A1:2019, *Safety and control devices for gas burners and gas-burning appliances — Particular requirements — Part 8: Multifunctional controls*

IEC 60730-2-9:2015+A1:2018, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature sensing controls*

3 Terms and definitions

For the purposes of this document, the terms and definitions of ISO/TS 21364-1:2021 apply with the following additions.

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 http://www.electropedia.org/

3.1 Definitions relating to components

3.1.1
open burner
hob burner with the flame in direct contact with the pan

3.1.2
multi-ring burner
hob burner assembly having two or more rings of burner ports

Note 1 to entry: The term ring includes any distribution of burner ports around the central axis of the burner.

Note 2 to entry: A detailed description of the different types of multi-ring burners and their operating modes is given in Table 1.

3.1.3
multi-ring burner with sectional control
multi-ring burner (3.1.2) that is so designed that one or more of its rings of burner ports can be utilised independently

3.1.4
multi-ring burner with simple control
multi-ring burner (3.1.2) that is so designed that its rings of burner ports cannot be utilised independently

3.1.5
overheating safety device
temperature sensing device which is intended to keep temperature below one particular value during abnormal operating conditions of the appliance and which has no provision for setting by the end user

Note 1 to entry: These devices usually use a thermistor or a bimetal sensing part (element).

[SOURCE: ISO 23551 8:2016+A1:2019, Annex B]

4 Components in gas cooking appliances

Clause 4 of ISO/TS 21364-1:2021 applies, with the following additions.

4.1 General

Clause 4.1 of ISO/TS 21364-1:2021 applies.

4.2 Manual gas shut-off valves (Taps)

ISO/TS 21364-1:2021, 4.2 applies with the following additions.

4.2.1 Taps for multi-ring burners

The "off" position of a single sectional control with two closing directions for multi-ring hob burners shall be designed to make it impossible for the tap knob to be inadvertently moved from one adjustment range to another. However, if each ring of such multi-sectional hob burner is supervised by a flame supervision device, the single sectional control shall stop in its "off" position.

4.3 Knobs

ISO/TS 21364-1:2021, 4.3 applies with the following additions.

4.3.1 Design of knobs

ISO/TS 21364-1:2021, 4.3.1 applies with the following additions.

4.3.1.1 Multi-ring burner knobs

If the control knob operates by turning, the closing direction shall only be clockwise. This does not apply to multi-ring hob burners with a single sectional control and two closing directions.

4.4 Multifunctional controls

ISO/TS 21364-1:2021, 4.4 applies.

4.5 Thermoelectric flame supervision controls

ISO/TS 21364-1:2021, 4.5 applies.

4.6 Thermostats

ISO/TS 21364-1:2021, 4.6 applies.

4.7 Pressure regulators

ISO/TS 21364-1:2021, 4.7 applies.

4.8 Automatic shut-off valves

ISO/TS 21364-1:2021, 4.8 applies.

4.9 Injectors and adjusters

ISO/TS 21364-1:2021, 4.9 applies.

4.10 Ignition systems

ISO/TS 21364-1:2021, 4.10 applies.

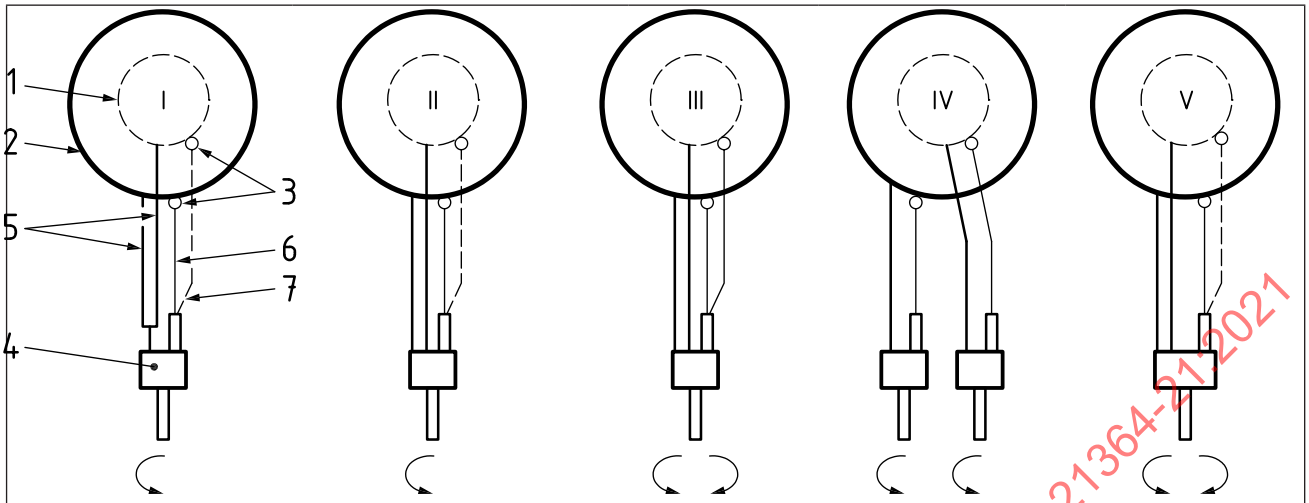
4.11 Thermal cut-outs

ISO/TS 21364-1:2021, 4.11 applies.

4.12 Multi-ring burners

Table 1 shows examples of multi-ring burners and their operating modes.

Table 1 — Examples of types of multi-ring burners and their operating modes



Key

1 Inner Burner-ring
2 Outer Burner-ring
3 Flame supervision sensor
4 Burner control (tap)
5 Gas supply
6 Connection to FSD
7 Alternative connection to FSD

FSD at inner **or** outer burner ring	FSD at inner **or** outer burner ring	FSD at inner **and** outer burner ring	FSD at inner **and** outer burner ring	FSD at inner **or** outer burner ring
Type I Simple control	**Type II** Sectional control	**Type III** Sectional control with two turning directions	**Type IV** Two single burners	**Type V** Sectional control with two turning directions
Multi-ring burner that is so designed that its rings of burner ports cannot be utilized independently, controlled by a tap with one outlet for common supply of all burner rings with one turning direction.	Multi-ring burner that is so designed that one or more of its rings of burner ports can be utilized independently, controlled by a tap with two or more outlets for separate supply of the burner rings with one turning direction.	Multi-ring burner that is so designed that one or more of its rings of burner ports can be utilized independently, controlled by a tap with two or more outlets for separate supply of the burner rings with two turning directions. The two rings cannot be operated together.	Multi-ring burner that is so designed that it has two or more taps each with one outlet for separate supply of the burner rings and same turning direction.	Multi-ring burner that is designed so that it has two turning directions. One direction is for utilizing one burner ring. The other direction is to utilize both burner rings.

4.13 Overheating safety devices

4.13.1 Requirement

An overheating safety device, if any, shall conform with the requirements in ISO 23551-8:2016+A1:2019, Annex B.

Electrical safety requirements for the overheating safety device shall be according to IEC 60730-2-9:2015+A1:2018+A2:2020.

An overheating safety device for a gas hob shall be as follows:

a) when tested according 4.13.2, the overheating safety device (OSD) shall prevent that the oil temperature exceeds 300 °C;

b) when the thermal sensing part is damaged, the gas passage to the burner shall be closed and shall not be reopened automatically;

c) for circuit failure or short-circuit, the gas passage to the burner shall be closed and shall not be reopened automatically;

d) the temperature sensing part of the OSD shall be secured firmly, in a way that it cannot be easily moved to a wrong position;

e) the overheating safety device shall have a structure in which it cannot be easily altered;

NOTE If a special tool or dedicated terminal is used this requirement is deemed to be fulfilled.

f) after applying a load according to 12.2 to a cooking appliance, the temperature sensing part shall normally operate.

4.13.2 Test

Select test pan according to ISO/TS 21364-1:2021, Table 1. Fill the pan with unused cooking oil to a depth of 10 mm.

A thermocouple is placed in the centre of the oil volume.

Use reference gas at normal pressure.

Operate the burner at nominal heat input. Measure the highest temperature of oil as the overheating safety device is functioning.

5 General conditions of test

Clause 5 of ISO/TS 21364-1:2021 apply.

6 Heat input

Clause 6 of ISO/TS 21364-1:2021 applies with the following additions.

6.1 General

ISO/TS 21364-1:2021, 6.1 applies.

6.2 Obtaining the nominal heat input

ISO/TS 21364-1:2021, 6.2 applies, with the following additions.

6.2.1 Test of hob burner

The measurements are taken with the burner operating under the following conditions:

— a pan is placed on an open burner in accordance with ISO/TS 21364-1:2021, 5.7 without a lid and filled with water to a level of (50 ± 2) mm above the bottom of the pan;

— with the appliance at ambient temperature, the burner is ignited and operated at full rate at normal pressure for 10 min;

— measurement starts at the end of the tenth minute and finishes at the latest at the end of the thirteenth minute, with a minimum measurement time of one minute or when the highest number of complete revolutions of the meter have been made before the end of the thirteenth minute. For analogue meters, the measurement shall be taken over at least one complete revolution.

Then the heat input is calculated under reference conditions according to ISO/TS 21364-1:2021, 6.3.

6.2.2 Test of multi-ring hob burner

All burner rings are measured according to 6.2.1 when operated together. Multi-ring burners with separate controls for each burner ring (Type IV, see 4.12) are measured separately.

6.2.3 Test of surface grill and griddle without a thermostat

The burner of a surface grill and a griddle without a thermostat is tested under the following conditions:

— surface grills and griddles are tested without a pan;

— with the appliance at ambient temperature, the burner is ignited and operated at full rate at normal pressure for 10 min;

— measurement starts at the end of the tenth minute and finishes at the latest at the end of the thirteenth minute, with a minimum measurement time of one minute or when the highest number of complete revolutions of the meter have been made before the end of the thirteenth minute. For analogue meters, the measurement shall be taken over at least one complete revolution.

Then the heat input is calculated under reference conditions according to ISO/TS 21364-1:2021, 6.3.

6.2.4 Test of surface grill and griddle with a thermostat

Surface grills and griddles are tested without a pan. Measuring begins from ignition, with the thermostat or control device at full rate and terminates at the end of the fifth minute or when the highest number of complete revolutions of the analogue meter have been made before the end of the fifth minute. The test shall be finished before the thermostat starts cycling.

Then the heat input is calculated under reference conditions according to ISO/TS 21364-1:2021, 6.3.

6.3 Measurements and calculations

ISO/TS 21364-1:2021, 6.3 applies.

6.4 Obtaining the reduced heat input

ISO/TS 21364-1:2021, 6.4 applies with the following additions.

6.4.1 Requirement

ISO/TS 21364-1:2021, 6.4.1 applies.

6.4.2 Test

ISO/TS 21364-1:2021, 6.4.2 applies.

6.4.3 Test of hob burner, surface grill and griddle burner

The reduced heat input shall be measured after the nominal heat input according to ISO/TS 21364-1:2021, 6.4.

6.5 Total heat input

ISO/TS 21364-1:2021, 6.5 applies.

7 Heating

Clause 7 of ISO/TS 21364-1:2021 applies with the following additions.

7.1 General

ISO/TS 21364-1:2021, 7.1 applies.

7.2 Operating conditions

ISO/TS 21364-1:2021, 7.2 applies.

7.3 Heating tests

ISO/TS 21364-1:2021, 7.3 applies.

7.4 Abnormal operation

ISO/TS 21364-1:2021, 7.4 applies with the following additions.

7.4.1 Hob burner

7.4.1.1 Requirement

During the following test, the temperature rise shall not exceed the values specified in ISO/TS 21364-1:2021, 7.4, Table 5.

7.4.1.2 Test

Pans with the biggest diameter allowed in the instruction for use and maintenance are placed according ISO/TS 21364-1:2021, 7.3.2.2. If no maximum pan size is given in the instructions for use, use a pan with a diameter 60 mm bigger than the one given in ISO/TS 21364-1:2021, 5.7, Table 1. The pans are placed on each hob burner and electric cooking plate, starting with the special pans. No pan shall overlap the edges of the hob. A distance of at least 10 mm shall be provided between the side surface of each pan and all other pans. If this arrangement is not possible, pans with a smaller diameter according to ISO/TS 21364-1:2021, 5.7, Table 2 are used.

During the test, the pans are used with lids. Hot water is added to ensure that water is always present in the pans.

All hob burners are operated for 1 h or up to steady conditions, whichever is shorter, with one of the reference gases (according to the corresponding Table of ISO/TS 21364-1:2021, Annex A) at nominal heat input with normal pressure, their control being at full rate.

NOTE Steady conditions are deemed to have been achieved when the measured temperatures do not vary by more than 1 K in 15 min.

7.4.2 Gas griddles

7.4.2.1 Requirement

During the following test, the temperature rise shall not exceed the values specified in ISO/TS 21364-1:2021, 7.4, Table 5.

7.4.2.2 Test

Griddles are operated without a pan for 1 h or up to steady conditions, whatever is shorter, with one of the reference gases at nominal heat input, their control being at full rate.

8 Combustion

Clause 8 of ISO/TS 21364-1:2021 applies, with the following additions.

8.1 Measurement of all burners simultaneously

ISO/TS 21364-1:2021, 8.1 applies.

8.2 Blocked combustion products outlet

ISO/TS 21364-1:2021, 8.2 applies.

8.3 Analysis of the combustion products

ISO/TS 21364-1:2021, 8.3 applies.

8.4 Single burner

8.4.1 General requirement

Under the conditions described below, the CO concentration in the air-free- and dry combustion products for each of the burners shall not exceed:

— 0,10 % for Test no. 1;

— 0,15 % for Tests no. 2 and 3;

— 0,20 % for Test no. 4.

Burners or burner sections having a maximum heat input less than 600 W are not subjected to combustion testing.

The requirements are verified in the course of the tests given in Table 2.

8.4.2 Hob burner, surface grill burner and griddle burner

8.4.2.1 General

The appliance shall be installed according to ISO/TS 21364-1:2021, 5.6, but without the horizontal wooden panel or range hood above the appliance. An additional panel is installed on that side of the appliance where the burner with the highest heat input is located, or whichever side results in the worst-case test condition. Any gaps allowing air to pass through between the side panel and the back panel are sealed with adhesive tape.

Each of the burners shall be operated individually and shall be previously adjusted to its nominal heat input.

Table 2 — Conditions and limits for combustion tests

Test no.	Burners in operation	Gas used	Heat input rate	Test pressure	Maximum CO concentration % / Vol
1	Each burner individually	Each reference gas	Full rate	p_{max}	0,10
2	Each burner individually	Each reference gas	½ nominal heat input	p_n	0,15
3	Each burner individually	Limit gas for incomplete combustion [b]	Full rate	p_{max}	0,15
4	Each burner individually	One of the reference gases [a]	Full rate	p_n	0,20

[a] The reference gas giving the highest CO concentration in Test no. 1.

[b] Test no. 3 is only applicable, if in ISO/TS 21364-1:2021, Annex A a limit gas for incomplete combustion is specified.

Tests no. 1, 2 and 3 shall be carried out both with and without the special support for small pans, if this special support is specified in the instructions for use and maintenance.

In case the appliance is delivered with other special supports the appliance shall be tested according to the use described for these supports in the instruction for use and maintenance.

Test no. 4 is only carried out when the appliance has a mains electricity supply. Any special support for small pans is not used.

8.4.2.2 Tests

8.4.2.2.1 Test number 1

For appliances that have no pressure regulator, or for appliances fitted with this device where their function has been annulled, the test pressure is the maximum pressure of the test gas used. Test gases and pressures are indicated in the corresponding Table of ISO/TS 21364-1:2021, Annex A. For appliances with a regulator, the test is carried out with the test pressure adjusted to achieve a burner heat input of 1,075 times the nominal heat input.

8.4.2.2.2 Test number 2

This test shall be carried out at normal pressure immediately after Test no. 1 without cooling down the appliance. The heat input of the burner is adjusted to half the nominal heat input using the burner tap.

For griddles and surface grills, this test is carried out using the position corresponding to half the nominal heat input, or, if this is not possible, using the position, which is as close as possible to half the nominal heat input.

8.4.2.2.3 Test number 3

The incomplete combustion limit gas is used without changing the adjustments and pressures used for the corresponding reference gas used in Test no. 1.

8.4.2.2.4 Test number 4

If fluctuations of the main electrical voltage can have an influence on combustion of any burner, the test is carried out individually on each burner with one of the reference gases (see the corresponding Table of ISO/TS 21364-1:2021, Annex A) at normal pressure. The appliance being supplied with electricity at 1.10 times the maximum nominal voltage specified on the appliance. The test is repeated with the

appliance supplied with electricity at 0,85 times the minimum nominal voltage. It shall be verified that each hob burner ignites and continues to function during the test.

8.4.3 Tests of multi-ring burner

An overview of the types of multi-ring burners is given in 4.12, Table 1.

Type I

A multi-ring burner with a simple control is tested with all the rings in operation together as one single burner (see 8.4.2).

Type II

A multi-ring burner with a sectional control is tested with all the rings in operation together as one single burner (see 8.4.2). The additional test described in 8.4.4 shall be performed.

Type III

For multi-ring burners with a sectional control with two turning directions, each section is tested as a single burner (see 8.4.2).

Type IV

A multi-ring burner with separate controls for each burner ring is tested first considering each burner ring as a single burner (see 8.4.2), and later tested with all burner rings in operation together as one single burner.

Type V

A multi-ring burner with a sectional control with two turning directions is tested with all the rings in operation together as one single burner (see 8.4.2). The additional test described in 8.4.4 shall be performed.

8.4.4 Additional test of Type II and Type V multi-ring burners

8.4.4.1 Requirement

In the following test the CO concentration in the air and dry combustion products shall not exceed 0,15 % by volume.

8.4.4.2 Test

A test is carried out with each of the reference gases, supplied at normal test pressure. Each multi-ring burner is tested in a position corresponding to the maximum rate obtainable when the smallest number of burner rings is in use.

8.4.5 Sampling the combustion products

The sampling of the combustion products is carried out with each burner in turn.

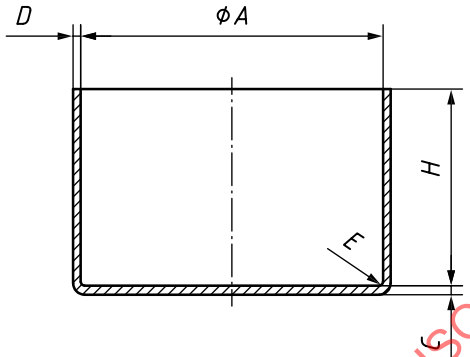
A pan in accordance with Table 3 is placed on the burner:

— 220 mm diameter pan, filled with 2 kg of water at ambient temperature, is used on a hob burner having a nominal heat input not exceeding 4,2 kW and on a fish burner of useful length equal to, or less than, 140 mm;

— 300 mm diameter pan, filled with 3 kg of water at ambient temperature, is used on a hob burner having a nominal heat input greater than 4,2 kW.

Table 3 — Pans for combustion test with the sampling hoods in Figure 2 and 3

Dimension	Unit	Pan		Tolerances
A	mm	220	300	±1 %
H	mm	140	180	±1 %
$C_{min.}$	mm	2	2,5	
$D_{min.}$	mm	1,5	1,8	
E	mm	3	3,5	+0,5 mm



Key

A internal diameter measured at the top
H internal height
C thickness of base
D thickness of the side
E internal radius

Figure 1 — Pans for hob burner combustion test

When a round pan of 220 mm diameter is used, it is covered with a sampling hood as shown in Figure 2. When a round pan of 300 mm diameter is used, it is covered with a sampling hood as shown in Figure 3.

A pan, filled with 2 kg of water at ambient temperature, is used on a fish burner of useful length greater than 140 mm. This pan shall have a height of 140 mm and a width and length sufficient to overlap all sides of the burner by at least 60 mm and at most 80 mm. If such a pan is not available, a standardized pan with circular ends shall be used (see ISO/TS 21364-1:2021, 7.3.2.2, Figure 5).

A suitable wok pan as described in the instructions for use and maintenance, filled with water at ambient temperature up to the half of height, is used on a burner intended to be used with pans having a concave or convex base.

No pans are placed on surface grills and griddles.

For sampling the combustion products of a wok burner, a fish burner, a surface grill or a griddle a suitable hood is used. For this the smallest possible sampling device as shown in ISO/TS 21364-1:2021, 8.1.2, Figure 6, Table 6 is placed at a distance of between 20 mm and 80 mm above the level of the pan supports.

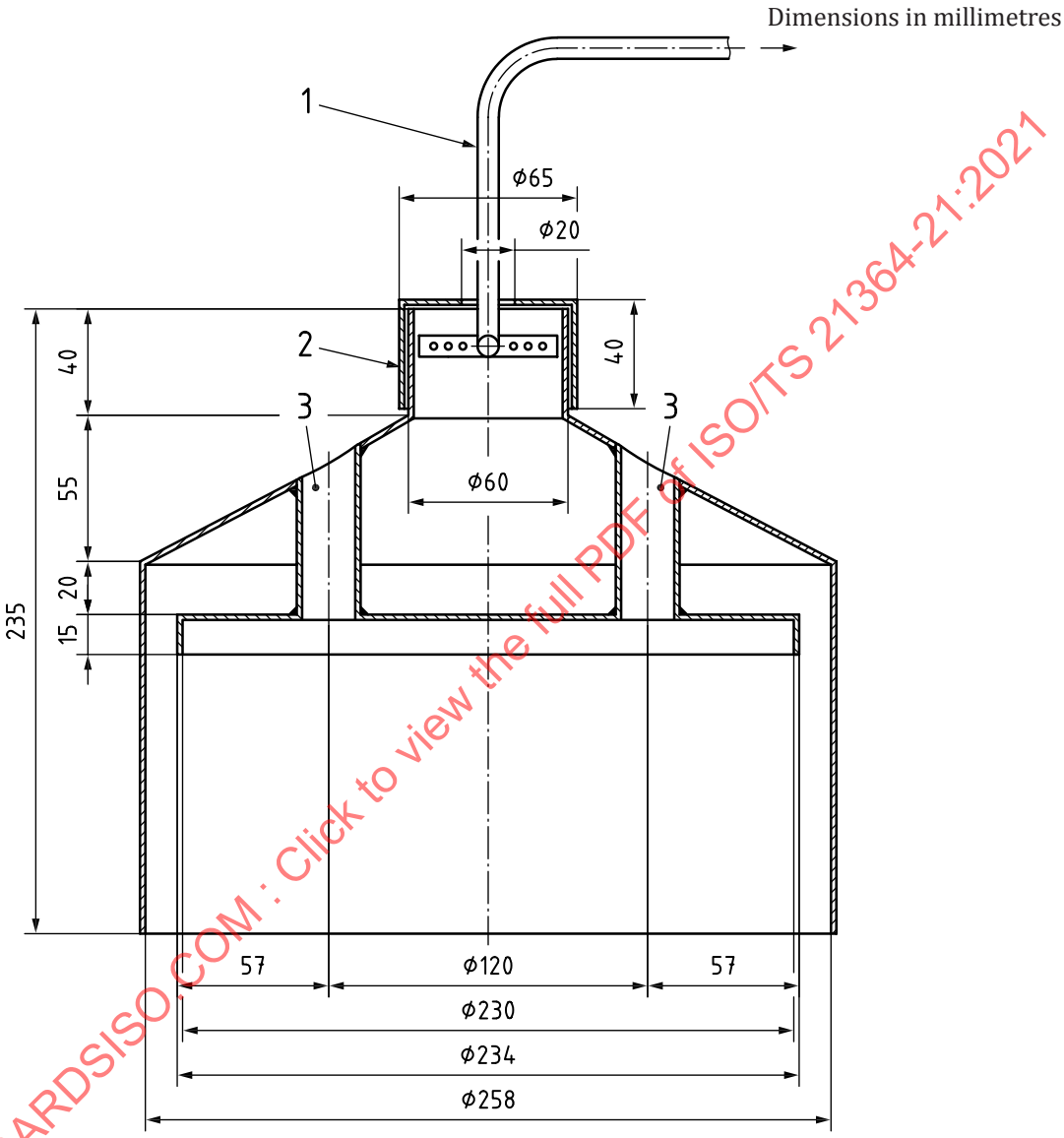
The combustion products are sampled by drawing off some of these gases in the upper part of the sampling device.

The-combustion products shall be measured 20 min after the start of the test. The measurement shall last 2 min and the mean value during this time is taken for the calculation.

If the CO concentration is calculated according to 8.3.2 of ISO/TS 21364-1:2021 the following shall be ensured:

The CO_2 concentration of the sample shall be greater than 1 % by volume.

If the CO_2 concentration in the combustion products is less than 1 % by volume, a restrictor is placed in the upper part of the sampling hood in order to bring this quantity to a value over 1 %. This restrictor is not used if it affects combustion quality or if, as a result of its presence, the combustion products spill outside the sampling hood, but it shall be ensured that the sample is representative.

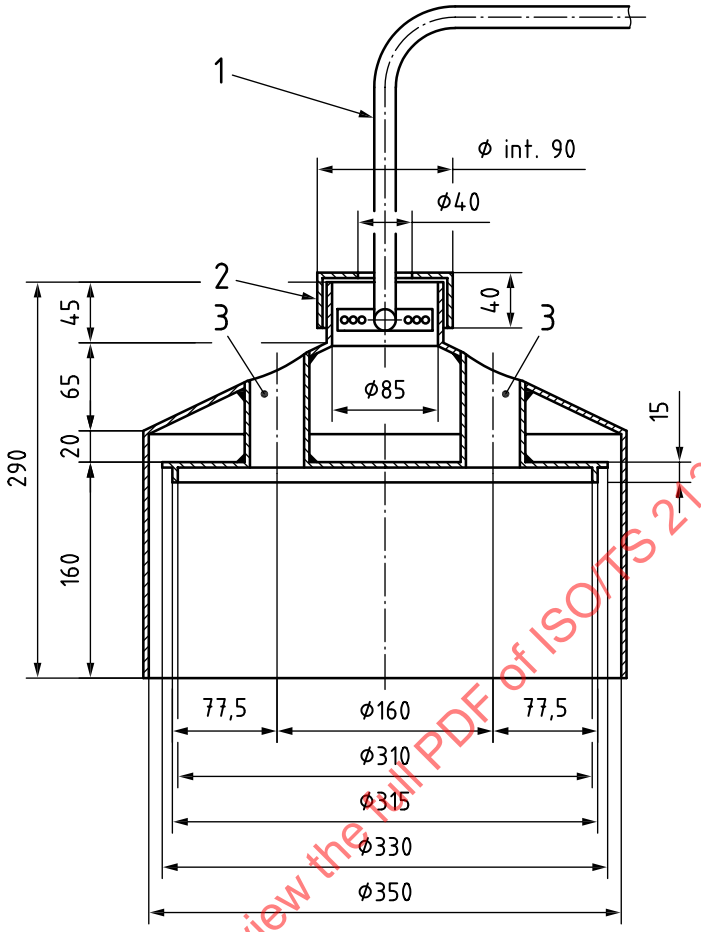


Key

1 copper tube Ø 8, thickness 1
2 restrictor
3 steel tube Ø 22, thickness 1

Figure 2 — Sampling hood when a round pan of 220 mm diameter is used

Dimensions in millimetres



Key

1 copper tube Ø 8, thickness 1
2 restrictor
3 steel tube Ø 22, thickness 1

Figure 3 — Sampling hood when a round pan of 300 mm diameter is used

8.5 Sooting

8.5.1 Requirement

After the following test there shall be no soot deposit on the clean pan and on the spark electrode.

8.5.2 Test

The test starts from cold burner conditions and a pan in accordance with ISO/TS 21364-1:2021, 5.7, Table 1 and 2 filled with water to a level of (50 ± 2) mm above the bottom of the pan at ambient temperature is placed on each burner.

The duration of the test is 30 minutes.

The first 20 min will be performed with one of the reference gases at normal pressure. After that the reference gas is replaced by the corresponding sooting limit gas at normal pressure.

The pan covering the burner is replaced by an identical clean pan filled with water to a level of (50 ± 2) mm above the bottom of the pan and the test is continued for the remaining 10 minutes.

If there is no sooting limit gas specified in the corresponding Table of ISO/TS 21364-1:2021, Annex A, the test shall be performed for 30 min with reference gas and a heat input increased to 112 % (e.g. by test pressure increase).

9 Ignition, cross-lighting and flame stability

Clause 9 of ISO/TS 21364-1:2021 applies, with the following additions.

9.1 General

ISO/TS 21364-1:2021, 9.1 applies.

9.2 Movement of oven/grill door or cabinet door

ISO/TS 21364-1:2021, 9.2 applies.

9.3 Hob burner, surface grill burner and griddle burner

9.3.1 General

Where the use of a pan is required, a pan according to ISO/TS 21364-1:2021, 5.7, Table 1 and 2 is used. The pans are filled with water. Surface grill burner and griddle burner are tested without pans.

9.3.2 Cold conditions

9.3.2.1 General

The tests start from cold conditions (see ISO/TS 21364-1:2021, 5.4).

Unless otherwise specified, the following tests are performed with pans according ISO/TS 21364-1:2021, 5.7, Tables 1 and 2, and also without pans.

9.3.2.2 Ignition

9.3.2.2.1 Requirement

During the following test correct ignition is checked. After ignition, a smooth cross lighting shall occur within 4 s for open burners, 6 s for surface grill and griddle burners. A slight tendency to flame lift is permitted but flames shall be stable within 60 s after ignition. The test shall be repeated five times. At least four ignition attempts shall be successful.

9.3.2.2.2 Test

Each of the burners is supplied with each reference gas at normal pressure and ignited at full rate or at the ignition position defined by the manufacturer, if any.

9.3.2.3 Light back

9.3.2.3.1 Requirement

During the following test sequence there shall be

— no extinction or light back by turning the control from full rate to low rate. Full extinction of the burner is allowed provided that the flame supervision device cuts the gas flow to the burner;

— a stable flame when turning the control from low rate to full rate.

The test sequence shall be repeated five times. All tests shall be successful.

9.3.2.3.2 Test

Each of the burners is supplied with light back limit gas at minimum pressure and ignited at full rate or at the ignition position defined by the manufacturer, if any.

The control is turned from full rate to low rate in a time of approximately 1 s. No extinction or light back shall occur. Full extinction of the burner is allowed providing that the flame supervision device cuts the gas flow to the burner. After 4 s the control is turned back to full rate. There shall be a stable flame. Then the burner is turned off.

9.3.2.4 Flame lift

9.3.2.4.1 Requirement

During the following test correct ignition is checked. After ignition, a smooth cross lighting shall occur within 4 s for open burners, 6 s for surface grill and griddle burners. A slight tendency to flame lift is permitted but flames shall be stable within 60 s after ignition. The test shall be repeated five times. At least four ignition attempts shall be successful.

9.3.2.4.2 Test

Each of the burners is supplied with flame lift limit gas at maximum pressure, and ignited at full rate or at the ignition position defined by the manufacturer, if any. The test is only performed without pans.

9.3.3 Hot conditions

9.3.3.1 Light back

9.3.3.1.1 Requirement

During the following test sequence there shall be

— no extinction or light back by turning the control from full rate to low rate. Full extinction of the burner is allowed provided that the flame supervision device cuts the gas flow to the burner;

— no light back, when the burner is ignited immediately after it was turned off.

The test sequence shall be repeated five times. All tests shall be successful.

9.3.3.1.2 Test

Each of the burners is supplied with light back limit gas at minimum pressure. The burner is ignited and operated until hot conditions (see ISO/TS 21364-1:2021, 5.4) are reached. The test is performed with pans.

The control is turned from full rate to low rate in a time of approximately 1 s. No extinction or light back shall occur. Complete extinction is allowed when the gas supply to the burner is shut off by the flame supervision device.

The control is then turned to off position. The burner is ignited again immediately after complete extinction of the flame at full rate or at the ignition position defined by the manufacturer, if any. No light back shall occur. The control is then turned to off position.

9.4 Multi-ring hob burner

9.4.1 Requirement

When the appliance incorporates a multi-ring hob burner for which each ring of burner ports is controlled independently by a means of a separate tap or control (e.g. Type IV), the requirements of 9.3 shall be met with each ring of burner ports being operated as if it is a separate burner.

When the appliance incorporates a multi-ring burner that is controlled by a single tap or control (e.g. Types I, II, III and V), the requirements of 9.3 shall be met with this burner operating as described for hob burners.

Multi-ring burners Types I, II and V shall be additionally tested according 9.4.2, 9.4.3 and 9.4.4.

For tests described in 9.4.2 and 9.4.3 it shall be verified that ignition and cross-lighting at any unsupervised ring of burner ports occurs smoothly within 4 s.

For the test described in 9.4.4 partial extinction is tolerated provided that re-ignition and cross-lighting occurs spontaneously within 4 s.

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

9.4.2 Additional test for Type I multi-ring burners

The test is carried out with each of the reference gases supplied at the corresponding maximum and minimum pressures, and with and without a pan on the burner.

Any multi-ring burner with simple control is tested individually. With the appliance cold, ignite the burner with its tap or control set to the lowest marked position for which ignition of the supervised ring of burner ports is possible.

9.4.3 Additional test for Type II and Type V multi-ring burners

The test is carried out with each of the reference gases supplied at the corresponding maximum and minimum pressures, and with and without a pan on the burner.

Any multi-ring burner with sectional control is tested individually. With the appliance cold, reduce the gas rate supplied to the supervised ring of burner ports until it corresponds to that obtained when the tap or control is set to its lowest marked position. Turn the burner control in accordance with the instructions for use and maintenance to open the gas supply to the other ring(s) of burner ports.

9.4.4 Resistance to draught

For the test, the upper side panels that are mounted above the level of the hob are not installed.

Each uncovered multi-ring burner equipped with a single flame supervision device (Type I, II and V, see 4.12) is operated successively with each reference gas of the gas group to which it belongs.

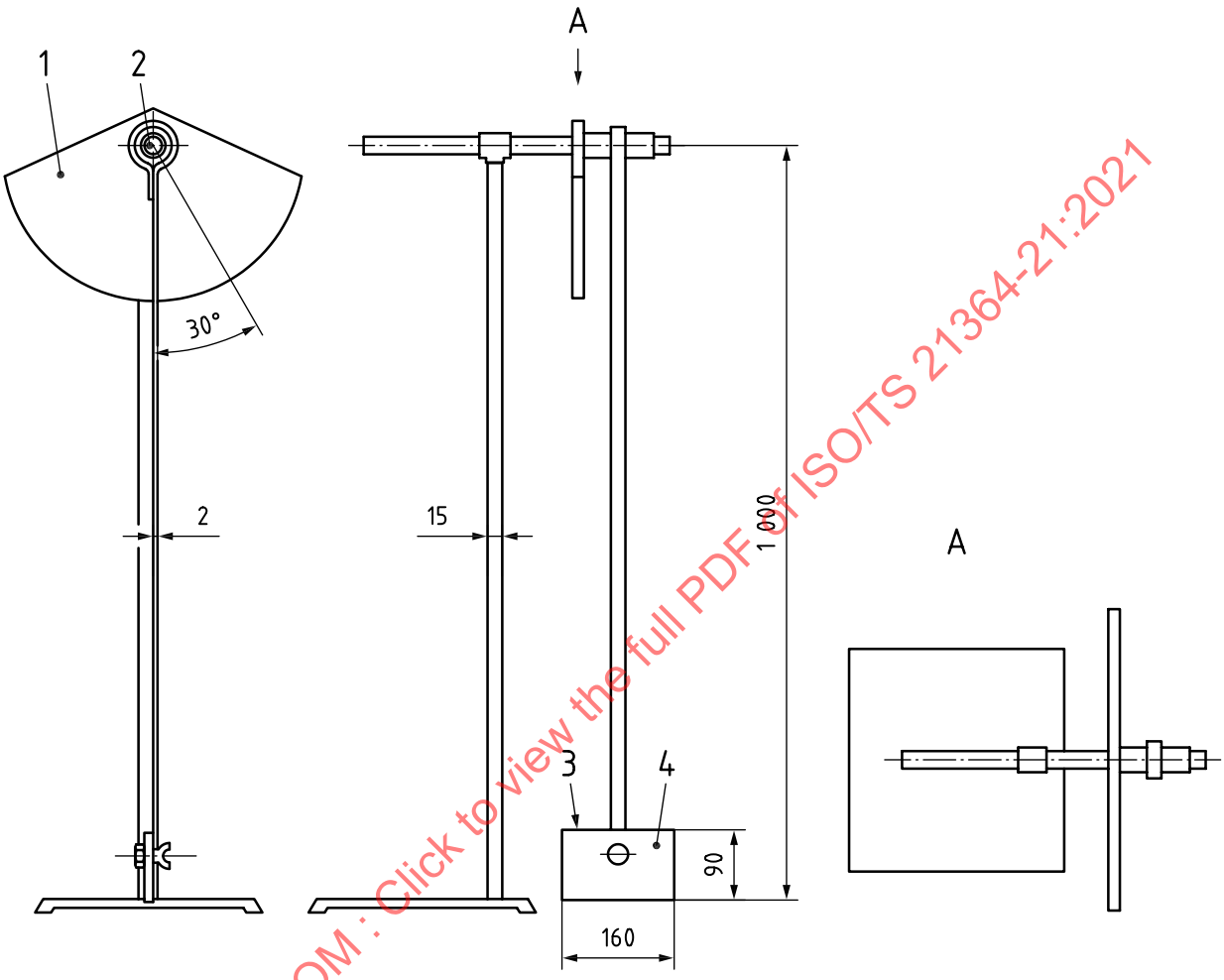
The test is carried out with the burner hot. For this purpose, a pan in accordance with ISO/TS 21364-1:2021, 5.7, Table 1 and Table 2 filled with water is placed on the burner which is operated at its nominal heat input for 10 min.

The control knob is moved to the reduced rate position of the unsupervised ring.

The pan is removed, and the test device shown in Figure 4 is so placed that the blade of the pendulum is centred over the burner, the distance between the lower edge of the pendulum and the plane of the pan supports being 25 mm. The pendulum is set in an initial position 30° to the vertical, its plane of oscillation being parallel to the front of the appliance. The pendulum is allowed to swing in one

direction and then, separated by an interval of at least 10 s, it is allowed to swing in the other direction. The appliance is then tested successively with the flame lift limit gas or gases corresponding to each reference gas to which it belongs and at the normal pressure corresponding to these limit gases (see corresponding Table of ISO/TS 21364-1:2021, Annex A).

Dimensions in millimetres



Key

1 material: steel 15/10
2 ball bearing
3 nickel-chrome sheet steel
4 blade
A top view

Figure 4 — Pendulum for testing the draught resistance of multi-ring burners

10 Accumulation of unburnt gas and leak tightness

Clause 10 of ISO/TS 21364-1:2021 applies.

11 Construction

Clause 11 of ISO/TS 21364-1:2021 applies with the following additions.

11.1 General

ISO/TS 21364-1:2021, 11.1 applies.

11.2 Materials

ISO/TS 21364-1:2021, 11.2 applies with the following additions.

11.2.1 General

ISO/TS 21364-1:2021, 11.2.1 applies.

11.2.2 Burner material test

ISO/TS 21364-1:2021, 11.2.2 applies.

11.2.3 Sealings

ISO/TS 21364-1:2021, 11.2.3 applies.

11.2.4 Resistance for non-metallic feet of pan supports

11.2.4.1 Requirement

Deformation affecting the stability of the pan support is not allowed. The requirement is checked by visual inspection after the following test.

11.2.4.2 Test

Immerse non-metallic feet into vegetal oil (e.g. soya-bean oil or sunflower oil) at (20 ± 15) °C for 24 h.

11.3 Gas inlet connections

ISO/TS 21364-1:2021, 11.3 applies.

11.4 Conversion to different gases

ISO/TS 21364-1:2021, 11.4 applies.

11.5 Pull forces of knobs for manual gas shut-off valves (taps)

ISO/TS 21364-1:2021, 11.5 applies.

11.6 Appliances that enable the user to program the start or the end of the cooking cycle

ISO/TS 21364-1:2021, 11.6 applies.

11.7 Compartment for one gas cylinder

ISO/TS 21364-1:2021, 11.7 applies.

11.8 Touch controls

ISO/TS 21364-1:2021, 11.8 applies, with the following additions.

11.8.1 Requirement

Gas hobs having touch controls shall incorporate visual means to indicate when each hob burner is switched on. They shall be constructed so that inadvertent operation of touch controls is unlikely if this could give rise to a hazardous situation due to

— spillage of liquids, including that caused by a pan boiling over;

— a damp cloth placed on the control panel.

During the test below, it shall be possible to switch off any hob burner by the touch control, unless it switches off automatically. There shall be no operation of any hob burner for longer than 10 s.

11.8.2 Test

The appliance is supplied with reference gas at normal pressure.

The test is carried out with each hob burner switched on in turn and then with every hob burner switched off.

Sufficient water to completely cover the control panel to a depth not exceeding 2 mm, with a minimum of 140 ml, is poured steadily over the control panel so that bridging occurs between combinations of touch pads.

A white cloth having a mass between 140 g/m^2 and 170 g/m^2, and dimensions approximately 400 mm × 400 mm, is folded four times into a square pad, saturated with water and placed over the control panel in any position. In case of doubt, different coloured cloths can be used.

11.9 Resistance to spillage

11.9.1 Requirement

During the following test complete or partial extinction of the burner is permitted, if the gas supply to the burner is shut off under the control of its flame supervision device or if re-ignition and cross-lighting occurs within 4 s.

At the end of the following test, each burner shall be capable of being re-lit once the spilled water was removed.

11.9.2 Test

The burners are supplied with reference gas at normal pressure and they are operated at their nominal heat input.

For burners below 3,6 kW a pan with a diameter of 160 mm, and for burners with 3,6 kW and greater a pan with a diameter of 220 mm is used. Each pan is filled with water up to 10 mm from the rim and is placed on each burner. Pans are used without lids.

The water is brought to boil over. The test is continued until the spillage stops. The test may be terminated after 1 hour if the water fails to boil.

After this, burners are shut off, spilled water is removed, and each burner is dried. Then each burner shall be ignited.

11.10 Specific hob parts and hob accessories

11.10.1 Pan supports

There shall be an adequate number of points of support for pans to rest stable on the supports of each of the uncovered burners. Except where rim-based or convex-based pans are required, one of the pans