

Specification for

Safety of domestic gas appliances —

Part 2: Cooking appliances

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Co-operating organizations

The Gas Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government and scientific and industrial organizations:

- British Gas Corporation*
- Department of Energy
- Department of the Environment
- Heating and Ventilating Contractors' Association
- Institution of Gas Engineers*
- Institution of Heating and Ventilating Engineers*
- Liquefied Petroleum Gas Industry Technical Association*
- National Association of Plumbing, Heating and Mechanical Services Contractors
- Society of British Gas Industries*
- Water-tube Boilermakers' Association

The scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- Boiler and Radiator Manufacturers' Association
- British Non-ferrous Metals Federation
- Chief and Assistant Chief Fire Officers' Association
- Consumer Standards Advisory Committee
- Council of Scientific Management in the Home
- Institution of Fire Engineers
- National Brassfoundry Association
- Royal Society for the Prevention of Accidents.

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Foreword

BS 5258 has been prepared, under the authority of the Gas Industry Standards Committee, to meet the need for a standard specifying the safety requirements and associated methods of test for domestic gas appliances burning 1st, 2nd and 3rd family gases.

BS 1250 “*Domestic appliances burning town gas*” has specified safety and performance requirements for a range of domestic appliances burning 1st family gas while BS 2491 “*Domestic cooking appliances for use with liquefied petroleum gases*”, BS 2773 “*Domestic single-room space heating appliances for use with liquefied petroleum gases*” and BS 2883 “*Domestic instantaneous and storage water heaters for use with liquefied petroleum gases*” have similarly covered a limited range of appliances burning 3rd family gas. The increased distribution of 2nd family gas and the development of a new generation of appliances, often designed to burn more than one family of gas, have necessitated the publication of new British Standards which relate to appliances burning 1st, 2nd and 3rd family gases and in which the requirements and methods of test for the three gas families have been, where technically appropriate, harmonized. BS 5258 specifies safety requirements and associated methods of test and therefore supersedes, in part, BS 1250, BS 2491, BS 2773 and BS 2883. Other, non-safety aspects of appliances will be the subject of another British Standard now in course of preparation.

BS 5258 is being prepared in a number of Parts, each of which will apply to one particular type of appliance. In each Part, the sequence of the clauses and their subject matter are being arranged so that, as far as possible, a particular main clause number refers to the same aspect of the specification in all Parts.

Parts in course of preparation are:

- *Part 1: Central heating boilers and circulators;*
- *Part 2: Cooking appliances;*
- *Part 3: Drying cabinets;*
- *Part 4: Fanned-circulation ducted-air heaters;*
- *Part 5: Gas fires;*
- *Part 6: Refrigerators and food freezers.*

Some of the provisions of this standard are set deliberately high to make allowance for manufacturing tolerances and variations in the supply of fuel gases. Some of the tests are destructive and it follows that it is not practicable to check each appliance made against all the provisions of the standard. However, the intention of the standard is that if all its requirements are met when applied to a sample representing the average of production, this will ensure:

- that all appliances claimed to be designed to it are safe in normal use when installed and maintained in accordance with the relevant British Standard codes of practice and with the manufacturer’s instructions, and
- that such servicing as may be necessary to maintain the appliance in a safe condition can be carried out by a competent fitter without difficulty.

For this Part the relevant codes of practice are CP 334 “*Selection and installation of town gas cooking and refrigerating appliances*” — *Part 1 “Domestic cooking appliances*”, CP 338 “*Domestic propane-gas-burning installations in permanent dwellings*” and CP 339 “*Domestic butane-gas-burning installations*”.

Further, attention is drawn to the requirements of the Gas Safety Regulations, of the Building Regulations and of the Model Water Bye Laws issued by the Department of the Environment and of the Building Standards (Scotland) (Consolidation) Regulations issued by the Scottish Development Department.

Obsolescent (by Amendment No. 2)

With the publication in 1980 of BS 5386 “*Specification for gas burning appliances*” — Part 3 “*Domestic cooking appliances burning gas*”, it was intended that BS 5258-2 should be withdrawn after a period sufficient to allow the phasing out of models designed to it. An extended period was required because gas cookers are the subject of a certification scheme.

Since 1980, however, it has been necessary to prepare an appendix to BS 5386-3 which makes many references to criteria and test methods given in BS 5258-2. It has therefore been decided not to withdraw BS 5258-2 at the present time but to declare it obsolescent thus preserving its availability as a reference document while implying that it is no longer suitable for new designs.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 28, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

This Part of BS 5258 has been prepared by revising those clauses of BS 1250-1 and BS 1250-2 and BS 2491 that relate to safety and adding requirements appropriate to appliances burning 2nd family gas. During the preparation of this standard the United Kingdom has become involved in the work of CEN Working Group 49 which is developing a European Standard for cooking appliances. However, since that work has yet to be completed and since lengthy procedures will be involved in the implementation of such a European Standard, the appropriate technical committee has advocated the publishing of a revised British Standard to provide an up-to-date specification for cooking appliances for the intervening period. While the requirements and methods of test of this revised standard follow existing UK practice, they are in no way intended to prejudice the current negotiation of a European Standard.

The constructional requirements for gas taps, specified in clause 19, to ensure continued safe operation of these components, are based on those in BS 1250. It is, however, recognized that with modern materials and methods of manufacture it is possible to obtain the desired level of performance by other designs and, in particular, without strict adherence to the dimensional criteria specified in 19.4. The Gas Industry Standards Committee has therefore agreed that the technical committee responsible for gas cocks should prepare a separate standard for appliance gas taps, which will eventually supersede these requirements.

Section 1. General

1 Scope

This Part of BS 5258 specifies safety requirements and associated methods of test for domestic gas cookers, hotplates, grillers, ovens and boiling burners.

In specifying requirements for appliances burning 2nd family gases it is assumed that a meter governor will be fitted and for appliances burning 3rd family gases it is assumed that the gas supply from the container will be governed by a pressure regulator complying with the requirements of BS 3016.

Requirements for controls, given herein, relate to controls fitted as part of, or supplied with, particular appliances; they do not necessarily provide a complete specification for controls intended for general use.

This standard does not take into account the special hazards which exist in nurseries and other places where there are young children or aged or infirm persons without supervision; in such cases additional requirements may be necessary.

2 References

The titles of the British Standards and of the International Standard referred to in this standard are listed on the inside back cover.

3 Definitions

For the purposes of this Part of this British Standard the following definitions, together with those in BS 1179 and in the relevant British Standard codes of practice, apply.

3.1

centre of oven

the point that would be at the centre of the cake tray if it were lying in its normal position on a shelf which is at a height exactly half the oven height above the oven base

3.2

nominal operating pressure

the gas pressure, measured at a point specified by the manufacturer, at which the appliance is designed to operate

3.3

oven height

the vertical distance from the oven base to the top of the door opening or to any obstruction (such as the thermostat rod or roof lining), whichever is the lower

3.4

oven temperature

the temperature in an empty oven, i.e. with the shelves, cake trays and meat tin removed. This temperature is measured at the centre of a 50 mm diameter hollow copper sphere with a matt black outer surface

3.5

rated heat input

the manufacturer's declared heat input for the appropriate reference gas

3.6

setting of thermostat

the action of turning a thermostat down from a higher mark to the mark required

3.7

satisfactory ignition

lighting of the relevant flame ports on the burner smoothly and without undue noise

3.8

automatic ignition

automatic lighting of the appropriate burner when the tap is turned on, if necessary with the separate actuation of a fixed integral ignition device

3.9

manual ignition

lighting of the burner by hand, e.g. with a match, gas taper or portable battery lighter. This type of ignition includes systems for which the ignition source has to be applied to a flash tube in order to ignite the burner

4 Classification of appliances

4.1 By category. BS 4947 describes the category system of appliance classification by which an appliance is denoted by a category number, I, II or III, according to the number of gas families that it is designed to burn, and the families are identified by subscripts T, N and L for the 1st, 2nd and 3rd gas families respectively.

For the purposes of this Part, there are no restrictions on the categories of appliances that are permitted, but within a given category the changes that are allowed in adapting an appliance from operation on one gas or gas family to operation on another are limited as follows.

- a) Change of gas family.
 - 1) adjustment of governor setting or exchange of governor springs or immobilization of the governor (when fitted).
 - 2) Exchange or adjustment of injectors.
 - 3) Adjustment of aeration.
 - 4) Exchange or adjustment of auxiliary components (e.g. pilots, igniters, restrictors, etc.).
- b) Change of gas group within 1st family.
 - 1) Adjustment of governor setting.
 - 2) Exchange of injectors.
 - 3) Adjustment of aeration.
- c) Change of gases within 3rd family
 - 1) Adjustment of aeration.

5 General requirements

The appliance shall comply with the requirements of this standard when tested using the specified test gases of the appropriate gas family. Full details of the test gases are given in BS 4947.

Any 1st family gas appliance tested and found satisfactory according to this standard will be suitable for use on gases in groups G4 and G5.

Appliances for use on 3rd family gases may be designed for use with either commercial butane or commercial propane, or both.

Notwithstanding the requirements specified in this standard, any new designs, materials and methods of assembly giving at least equivalent results are acceptable.

Any new features incorporated in an appliance, for which no provision for testing is made in this standard, shall be examined in the light of the manufacturer's claims and instructions. The claims shall be checked against the instructions and shall be valid.

6 General conditions of test

6.1 Test room. The test room shall be adequately ventilated but free from draughts likely to affect the performance of the appliance. If the test results are influenced by the temperature of the ambient air, the room temperature shall be maintained at 20 ± 5 °C.

6.2 Preparation of appliance. The appliance shall be installed and adjusted in accordance with the manufacturer's instructions, using the appropriate reference test gas at the following inlet pressure.

Family	Test gas	Inlet pressure
1st	TGA	mbar ^a 17.5
2nd	NGA	20
3rd	LPGA	28
	LPGC	37

^a 1 mbar = 0.1 kPa = 10^2 N/m².

Before any tests are made the appliance shall be operated at its full working temperature for a period sufficient to dry the insulation and remove any temporary finish which might interfere with observations.

6.3 Test procedure. The gas connections and system up to and including the burner shall be examined for soundness both before and after test. The test results are deemed invalid unless the system is sound (see 8.1).

The appliance shall be at room temperature at the start of each test, unless otherwise stated.

During testing, the initial adjustment of the appliance shall not be altered unless specifically required by the test method.

Precautions shall be taken to prevent thermostats or other variable controls from acting to interfere with the gas flow, except as necessitated by the test.

Any overloads which are specified are obtained by increasing the inlet pressure with any governor rendered inoperative, and, generally, any reduced rates are obtained by operating the appropriate tap(s).

Test pressures shall be measured correct to 0.2 mbar and controlled so that the variation does not exceed ± 0.2 mbar.

BS 4947 gives guidance on the measurement of heat input rates.

Tables giving details of the test gases (and where appropriate their conditions of application) to be used for each of the gas families are inserted in relevant clauses. For 3rd family gas appliances, test gases LPGA and LPGB are used with the appliance adjusted for butane, and test gases LPGC and LPGE with the appliance adjusted for propane.

Section 2. Safety requirements and associated methods of test

7 General design and construction

7.1 Materials, fittings and finishes. Materials, fittings and finishes, the failure of which may affect the safe operation of the appliance, shall comply with relevant British Standards and shall be appropriate to the conditions arising in the part of the appliance in which they are used. The appliance shall be free from swarf, grit or other foreign matter.

7.2 Removal and reassembly of parts by user. Parts that are intended to be removable by the user, e.g. for cleaning, shall be readily accessible, shall not require the use of tools for their removal, shall be easy to assemble correctly and difficult to assemble incorrectly.

Parts that are not intended to be removed by the user, e.g. injector jets, shall require the use of tools for their removal.

7.3 Materials in contact with gas

7.3.1 Copper tubing. Copper tubing shall not be used where it would be exposed to temperatures above 100 °C.

7.3.2 Non-metallic materials: 3rd family gases. Diaphragms shall comply with the requirements of 3.3 1) and 3.3 6) of BS 3016:1972.

Valve pads shall comply with the requirements of 3.4 1), 3.4 4) and 3.4 5) of BS 3016:1972.

All non-metallic materials shall show no marked deterioration when subjected to an accelerated ageing test for 7 days at a temperature of 20 °C in excess of the manufacturer's maximum recommended temperature.

NOTE The requirements of the above three paragraphs may not be met by materials made of some silicone rubbers, although these rubbers are claimed to be satisfactory. Criteria for testing silicone rubber materials are still under consideration and, in the meantime, components and appliances containing such a material will be considered acceptable provided that the appropriate manufacturer can demonstrate that it has proved satisfactory in use.

7.4 Aeration adjusters. Any aeration adjuster shall not be liable to inadvertent movement, shall not be capable of closing the air inlet completely and shall not be capable of being set in such a manner as to cause gas to spill from the burner venturi throat.

7.5 Insulation. Thermal insulation shall be non-combustible (see BS 476-4), shall be securely located and shall be protected against mechanical damage, condensate, spillage and vermin.

7.6 Stability

7.6.1 Freestanding cookers. When tested by the method given in 7.6.1.1 the cooker shall not tilt.

7.6.1.1 Method. With the cooker standing freely on a level floor with its oven shelves, grill pan, etc. in position, hang a piece of string, with a 7 kg weight attached to each end, over the oven door and 25 mm in from its outer edge, the door being opened to the most unfavourable position.

7.6.2 Table-top appliances. When installed in accordance with the manufacturer's instructions, the appliance shall not tilt when tested by the method given in 7.6.2.1 a) and shall not overturn when tested by the method given in 7.6.2.1 b).

7.6.2.1 Method

a) For appliances normally used on a table or similar support and having drop-down doors that have a projection of 225 mm or more from the hinge to the opening edge, apply a load of 10 kg to the centre of the open door. If the manufacturer of the appliance claims that a load greater than 10 kg may be cooked in the oven at any one time, the test load is increased to equal that of the claimed cooking load.

b) For appliances normally used on a table or similar support and having doors that have a projection of less than 225 mm from the hinge to the opening edge, place the appliance, facing any direction, on a plane inclined at an angle of 10° to the horizontal, the door(s) being opened to the most unfavourable position.

7.6.3 Cookers raised on castors, etc. When a means is incorporated to enable the cooker to be easily moved and when this means is in use, the cooker shall still comply with the requirements of 7.6.1 unless it is obvious to the user that the means is in use.

7.7 Provision for securing. For built-in and table-top appliances excluding single boiling rings, provision shall be made for the appliance to be suitably secured when it is installed.

7.8 Burners. Burners shall not melt or distort under any normal conditions of use (including the turned-low condition) nor when lit back to the injector for 15 min at any rate up to the full-on rate, provided the flame can burn unaided in this condition. The test gas and pressure are as follows.

Family	Test gas	Test pressure
1st	TGA	Nominal operating pressure
2nd	NGA	
3rd	LPGA LPGC	

7.9 Hotplate design

7.9.1 Pan supports. The design of the hotplate shall be such that saucepans of diameter 100 mm to 200 mm will remain stable over each burner both centrally and up to 15 mm off centre. For the purposes of this test, each saucepan shall be filled with water to a depth of 40 mm. The design and the condition of each saucepan shall be such that it is stable when placed empty on a flat surface.

To test the means of support provided for rim-based vessels, a series of test rings of various outside diameters from 150 mm to 200 mm, of height 25 mm and of thickness not more than 3 mm is tried over each burner, both centrally and off-centre up to 25 % of the ring diameter, but excluding positions in which the corresponding vessel would be obviously tilted or unstable. All the rings shall be found to be supported at a level not lower than the base of the standard 190 mm test vessel when it is in position over the burner.

7.9.2 Boiling over test. When tested by the method given in 7.9.2.2, under the following conditions, there shall be no escape of unignited gas from any burner port, aeration port or ignition jet.

Family	Test gas	Test pressure
1st	TGA	Nominal operating pressure
2nd	NGA	
3rd	LPGA LPGC	

7.9.2.1 Apparatus. The vessel used is a 125 mm diameter pan of polished aluminium with parallel sides and with a radius between the sides and bottom not exceeding 6 mm. There is no lip or handle on the pan and its capacity is 1.15 litres.

7.9.2.2 Method. Position the vessel containing 570 ml of milk centrally over the burner so that the top is horizontal. Turn the burner full on and allow the milk to boil over once. Turn off, remove the vessel and attempt to relight in the usual manner after allowing the burner to cool.

7.10 Oven design

7.10.1 The runners and shelves shall be designed so that the shelves are horizontal when in the oven and, when drawn forward to the extent of two thirds of their depth or to any stop which may be provided, they do not tilt sufficiently for dishes to slide forward. For this test, a round glass casserole, 1.15 litres in volume, containing water to a depth of 35 mm is used.

7.10.2 It shall be possible for the oven flames to be seen either directly or with the aid of a mirror when the oven door is shut. It is permissible to remove the front plinth or drawer when viewing from the front.

7.10.3 Side hinged doors shall open through at least 100°. Drop doors shall be approximately horizontal when open.

7.10.4 The rise in temperature above ambient caused by a pilot in a time-controlled oven shall not exceed 8 °C during the maximum delay period when the appliance is tested as given in 7.10.4.1, under the following conditions

Family	Test gas	Inlet pressure
1st	TGA	mbar 17.5
2nd	NGA	20
3rd	LPGA LPGC	28 37

7.10.4.1 Method. Carry out tests with any appliance governor remaining in operation and any adjustable pilot adjusted in accordance with the manufacturer's instructions, at the inlet pressure given above. Starting with the appliance at thermal equilibrium at ambient temperature, light the oven pilot and set the oven timing device to give the maximum delay period.

Measure the temperature at the centre oven position and the ambient temperature (preferably using a recording instrument) by means of thermocouples positioned at the centre of a 50 mm diameter hollow copper sphere with a matt black outer surface. The thermocouples measuring the ambient temperature and the appliance itself should be shielded from the effects of direct sunlight and draughts.

7.11 Appliances incorporating a butane container.

An appliance incorporating a butane container shall have a compartment in which the butane container is stored. The compartment shall comply with the following requirements.

- a) Effective ventilation shall be provided by openings in the base and upper section of the compartment, the total area of the openings of the base and the total area of the openings in the upper section each being at least 1 % of the floor area of the compartment.
- b) The butane container shall rest on a support and not directly on the ground. The support shall have sufficient mechanical strength to resist deformation under the load of a full butane container.
- c) The compartment shall have no sill higher than the base on which the butane container rests.
- d) The butane container shall be easily insertable in or removable from the compartment.
- e) The butane container tap shall be readily accessible and shall remain easy to manipulate when the butane container is in place.
- f) Overflow of liquid from pans on the hotplate shall not fall onto the butane container or its accessories.
- g) Where the butane container may be connected to the appliance by a flexible tube, the flexible tube shall not come into contact with any sharp edges.
- h) No internal communication shall exist between the butane container compartment and the parts of the appliance where burners are placed (e.g. a closed compartment or spillage tray).
- i) The ventilation openings of the compartment shall not be able to be obstructed when the appliance is placed in position.

7.12 Grill pan design. Any grill pan handle shall be so designed that in normal use, e.g. when held to carry the grill pan or to pour out fluid contents from a pan filled to 25 % of its capacity, it does not collapse or become loose.

7.13 Provision for ventilation. For built-in appliances, any ducts or grilles required for the access of combustion air shall be incorporated in the appliance. Any additional components necessary for the evacuation of the products of combustion or for ventilation of the cabinet shall be supplied with the appliance or suitably defined in the manufacturer's instructions.

8 Soundness

8.1 Gas soundness

8.1.1 General. All gas-carrying parts of the appliance shall be sound and, when connected, shall form a complete assembly which is sound. The basic tests shall be carried out on the complete assembly but additional and more stringent tests may be required by other standards for certain components to ensure an adequate margin of safety.

8.1.2 Complete assembly. The fully assembled appliance shall be sound at the internal pressure given in the following table.

Family	Air pressure
	mbar
1st	30
2nd	40
3rd	150

Appliances for use on more than one gas family shall be tested at the highest appropriate pressure.

The requirement shall be deemed to be met if the leakage rate (see note) does not exceed 85 cm³/h over a period of 1 min.

NOTE One convenient method of measuring the leakage rate is by the bubble leak indicator illustrated in Figure 1. A rate of 6 bubbles per minute should be equivalent to 85 cm³/h but this should be checked before the indicator is used.

The method of test is as follows. Connect to the appliance inlet an air supply maintained constant at the appropriate pressure and embodying a suitable meter for measuring air flow.

Carry out the tests under the following conditions:

- a) With all gas taps in the OFF position.
- b) With all gas taps turned to the ON position, any flame failure device maintained by suitable means in the open position and all injectors and pilots capped off.

Care shall be taken to ensure that any means (e.g. thermal or mechanical) used to maintain the flame failure device in the open position is compatible with the normal operation of the device.