

Specification for

Gas heated fish and chip frying ranges

UDC [643.334.024:641.714]:643.334:662.76

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

Cooperating organizations

The Gas Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following:

- British Combustion Equipment Manufacturers' Association
- British Gas Corporation*
- Chartered Institution of Building Services
- Department of Energy, Gas Standards
- Department of Industry, Mechanical Engineering
- Department of the Environment (PSA)
- Heating and Ventilating Contractors' Association
- Institution of Gas Engineers*
- Liquefied Petroleum Gas Industry Technical Association (UK)*
- Local Authorities Organization
- National Association of Plumbing, Heating and Mechanical Services Contractors
- National Gas Consumers' Council
- Society of British Gas Industries*
- Water-tube Boilermakers' Association

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

- Association of Teachers of Domestic Science
- British Telecommunications
- Catering Equipment Manufacturers' Association
- Chief and Assistant Chief Fire Officers' Association
- Cookery and Food Association
- Department of Education and Science
- Department of Health and Social Security
- Fire Offices Committee
- Fire Protection Association
- Greater London Council
- Health and Safety Executive
- Home Office
- Hospital Caterers' Association
- National Association of Restaurant Engineers
- National Coal Board
- National Federation of Fish Friers Ltd.
- Post Office

Amendments issued since publication

Amd. No.	Date of issue	Comments

This British Standard, having been prepared under the direction of the Gas Standards Committee, was published under the authority of the Board of BSI and comes into effect on 30 June 1983

© BSI 10-1999

The following BSI references relate to the work on this standard:
Committee reference GSE/19
Draft for comment 80/32276 DC

ISBN 0 580 11905 X

Contents

	Page
Cooperating organizations	Inside front cover
Foreword	ii
Section 1. General	
1 Scope	1
2 Definitions	1
3 General requirements	2
4 General conditions of test	2
Section 2. Safety requirements and associated methods of test	
5 Marking and instructions	2
6 Gas soundness	4
7 Heat input	4
8 Combustion	5
9 Ignition	5
10 Flame stability	8
11 Appliance extraction system	8
12 Fire hazard and limiting temperatures	8
13 Gas controls	10
14 Gas cocks and taps	11
15 Gas connections	12
16 Gas rate and aeration adjusters	12
17 Electrical	13
18 Design and construction	13
Section 3. Performance requirements and test methods	
19 Operational performance of controls	14
20 Functional performance of the appliance	14
Section 4. Additional requirements	
21 Construction and design	15
22 Finish	15
Appendix A Extract duct system	18
Figure 1 — Bubble leak indicator	4
Figure 2 — Apparatus for measuring floor and wall temperatures	9
Figure 3 — Types of tap handle	12
Figure 4 — Paint scratch test apparatus	17
Publications referred to	Inside back cover

Foreword

This British Standard has been prepared under the direction of the Gas Standards Committee to satisfy the need for a standard covering the requirements and associated methods of test of gas heated frying ranges burning 1st, 2nd and 3rd family gases,

Fish and chip frying ranges are items of specialized equipment that are made to customer specifications, sold directly to them and installed by the manufacturer or his appointed agent. They are often installed in small owner-occupied, owner-operated retail premises to meet a fluctuating local demand from customers who expect immediate service. The gaseous waste products are removed by integral forced extraction and discharged through an individually designed extract duct system to atmosphere. These conditions are therefore quite different from those for which BS 5314-4 is intended and an alternative standard is required.

The format of the standard follows that of BS 5314.

The contents are divided into four sections as follows:

Section 1. *General*

Section 2. *Safety requirements and associated methods of test*

Section 3. *Performance requirements and test methods*

Section 4. *Additional requirements*

The intention of the standard is to ensure:

- a) that all appliances claimed to be designed to it are safe in normal use when installed and maintained in accordance with the manufacturer's instructions;
- b) 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; and
- c) that the appliance will have a satisfactory standard of performance provided that it is used under the conditions for which it is intended.

It is recognized that it may not be possible to verify some of the requirements of this standard during type approval by a test authority and in this respect the footnote to 5.1.1 i) is relevant.

Particular attention is drawn to the necessity for regular inspection, cleaning and maintenance of catering equipment, particularly with regard to grease traps and safety devices, in order that it may be relied upon to give satisfactory service to the user.

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 and ii, pages 1 to 18, 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.

Section 1. General

1 Scope

This British Standard specifies requirements and tests for gas heated fish and chip frying ranges of the type used in establishments whose main purpose is the preparation of fried fish and chips.

This standard does not specify the additional requirements necessary for appliances with direct main burner ignition and fitted with electronic flame safeguards.

NOTE These will be subject to agreement between the manufacturer and the testing authority.

In specifying requirements for these appliances it is assumed that the gas supply pressure available at the inlet to the appliance will be within the following range under normal operating conditions.

Family	Inlet pressure
	^a mbar
1st	7.5 to 25
2nd	17.5 to 27.5
3rd	
butane	28 to 35
propane	37 to 45
^a 1 mbar = 10 ² N/m ² = 0.1 kPa.	

Requirements for controls given in this standard relate to those fitted as part of, or supplied with, particular appliances; they do not necessarily provide a complete specification for controls intended for general use and tested separately.

The attention of manufacturers and installers of equipment covered by this standard is drawn to additional requirements contained in the Fire Precautions Act, 1971, in the Health and Safety at Work etc. Act 1974, in local authority regulations, in the Gas Safety Regulations, in the Building Regulations issued by the Department of the Environment and in the Building Standards (Scotland) (Consolidation) Regulations issued by the Scottish Development Department.

Guidance on preferred dimensions may be found in PD 6444.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the following definitions apply. Definitions of other terms are to be found in BS 1179:1967 and in BS 1179-6:1980.

2.1

rated heat input

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

2.2

adjustment pressure

the pressure, measured at the test point, that is required to obtain the rated heat input using the reference test gas

2.3

setting pressure

the pressure, measured at the test point, that is specified by the manufacturer for the purpose of adjusting the appliance heat input

2.4

jet

a device containing one or more orifices from which a stream of gas is discharged

2.5

injector jet

a jet through which gas passes into the burner mixing tube of an aerated burner, thereby entraining primary air

2.6

burner jet

a jet on which gas is burnt; it is usually screwed into a gas manifold

2.7

indicated levels

two marks on a pan showing the minimum and maximum oil levels for safe operation

2.8

gaseous waste products

products of combustion and cooking fumes

2.9

minimum operational rate

- For an appliance fitted with an automatic temperature control. The by pass rate.
- For an appliance controlled by a fully adjustable tap. 20 % of the rated heat input.
- For an appliance controlled by a tap with a fixed "low position". The low rate.

2.10
gas rate adjuster

a device intended for use by the installer or service engineer that enables the appliance gas rate to be set or readjusted in accordance with the manufacturer's instructions

3 General requirements

Compliance with the relevant clauses of this standard shall be checked by carrying out the specified tests and, where appropriate, by inspection. The specified test gases of the appropriate gas family shall be used; full details of the test gases are given in BS 4947.

NOTE 1 Notwithstanding the requirements specified in this standard, any new designs, materials and methods of assembly giving at least equivalent results may be considered as complying with this standard when approved by a representative and recognized authority.
NOTE 2 Any new features incorporated for which no provision for testing is made in this standard have to be examined and approved by a recognized and representative authority in the light of the manufacturer's claims.

4 General conditions of test

4.1 Test room. The room shall be adequately ventilated but free from draughts likely to affect the performance of the appliance. The tests shall be carried out at an ambient temperature of 20 ± 5 °C.

4.2 Preparation of appliance for testing. Appliances shall be installed and adjusted by the manufacturer or adjusted in accordance with the installation instructions.
The reference test gas of the appropriate gas family (and gas group) shall be used, at the following appliance inlet pressure.

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

Before any tests are made, the appliance shall be operated at its full working temperature for a period sufficient to dry the insulation and to remove any temporary finish which might interfere with observations.
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.
Test pressures shall be measured correct to 0.2 mbar and controlled so that the variation does not exceed ± 0.2 mbar.

Unless otherwise specified, appliances with regulating or limiting devices shall be tested with those devices at their maximum setting if the setting is intended to be altered by the user.

NOTE BS 4947 classifies combustible gases into 1st, 2nd and 3rd families and specifies for each of these families the requirements for the composition and characteristics of gases which are suitable for the testing of gas appliances and BS 1041 gives guidance on the measurement of temperature.

Section 2. Safety requirements and associated methods of test

5 Marking and instructions

5.1 Marking

5.1.1 Data plate. A data plate shall be fitted to the appliance in a readily accessible position for inspection and shall provide the following information.

- a) Identification of the manufacturer.
- b) Type or model number.
- c) Serial number and/or date of manufacture.
- d) The gas family for which the appliance is supplied. The letters T, N and L for 1st, 2nd and 3rd gas families are acceptable and shall not appear on the badge for any other purpose.
- e) For 1st family gas the gas group and for 3rd family gases the gas or gases for which the appliance is adjusted. Appliances suitable for butane only or propane only shall be marked accordingly.
- f) The rated heat input.
- g) The setting pressure(s) at the pressure test point of the gas or gases for which the appliance is adjusted.
- h) The jet identification of the main burner.
- i) The number of this British Standard, i.e. BS 6350¹⁾.

5.1.2 Name badge. The manufacturer's name and the appliance type name and/or number may also be shown on a separate name badge.

¹⁾ Marking BS 6350 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, BSI, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ for certification marks administered by BSI or to the appropriate authority for other certification marks.

5.1.3 Electrical. Any appliance intended for connection to a mains electricity supply shall also be marked in accordance with the requirements of BS 4167-4 relating to the rated voltage, nature of supply and rated input.

5.1.4 Burner and injector jets. All burner and injector jets shall be permanently marked for identification.

5.1.5 Indicated levels. Pans shall bear two permanent marks showing the manufacturer's recommended minimum and maximum oil levels for safe operation. The marks shall refer to the oil levels of the uncharged pan. The minimum level shall be such that temperature sensing probes are adequately covered with oil when the pan is not charged with food. The maximum level shall be such as to ensure compliance with **12.3**.

5.2 Instructions

5.2.1 General. The manufacturer shall provide with each appliance:

- a) installation instructions for appliances which are not installed by him;
- b) servicing instructions;
- c) user instructions in accordance with the requirements of the Health and Safety at Work etc. Act 1974.

5.2.2 Installation instructions. The installation instructions shall state the minimum clearances round the appliance necessary for compliance with the floor, wall and, where appropriate, ceiling temperature requirements specified in **12.1**. If the appliance is intended to be fitted only on a protective base, this shall be stated and recommendations shall be made. The instructions shall also state the precautions to be adopted to minimize any fire hazard arising from high temperatures above the appliance. Unless the instructions require the appliance to be fitted under a ventilation canopy, the minimum height allowable between the top of the appliance and the ceiling shall, where appropriate, be specified. The installation instructions shall contain, as appropriate, full details of the method to be adopted for the setting of any gas rate adjusters, aeration adjusters and adjustable by-passes on controls.

NOTE For the purposes of this British Standard "ceiling" includes any overhead shelf, made of combustible material, permitted by the installation instructions.

These instructions shall bring to the attention of the installer the need to be conversant with the Fire Precautions Act 1971. They shall also draw his attention to the requirements of the Gas Safety Regulations 1972 and of the Health and Safety at Work etc. Act 1974.

The installation instructions shall give guidance as to the nature and siting of the extract ducting (see Appendix A).

5.2.3 Servicing instructions. The servicing instructions shall state that the automatic high temperature limit device and automatic temperature control or alarm bell thermometer should be checked at the regular service intervals, and shall include details of the recommended method of carrying out this check.

Servicing instructions shall contain, as appropriate, full details of the method to be adopted for the setting of any gas rate adjusters, aeration adjusters and adjustable by-passes on controls.

NOTE The names of parts should preferably agree with those given in BS 1179:1967 and in BS 1179-6:1980.

5.2.4 User's instructions. The instructions shall include:

- a) the instructions for correct operation of the equipment;
- b) warnings regarding the fire and personnel hazards consequent upon:
 - 1) overheating of the oil;
 - 2) unattended operation of the fryer;
 - 3) replenishment of the oil while the fryer is hot;
 - 4) the use of flammable solvents and cleaning aids;
 - 5) over and underfilling of the pan;
- c) the need for regular servicing of the appliance and regular servicing and testing of the high temperature limit device and the necessity for frequent cleaning of filters, extraction equipment and ductwork from both hygienic and fire viewpoints;
- d) the statement that any adjustment shall only be carried out in accordance with the Gas Safety Regulations 1972.

The instructions shall bring to the attention of the user the need to be conversant with the Fire Precautions Act 1971 and the requirements of the Gas Safety Regulations 1972.

Information shall be given to the user regarding action to be taken with respect to the appliance in the event of fire. The user's attention shall be drawn to the desirability of consulting the local fire prevention officer and the fire insurer regarding the fire precautions to be adopted.

The names of parts should preferably agree with those given in BS 1179:1967 and in BS 1179-6:1980.

5.2.5 Permanent warning instructions. A permanent lighting instruction label shall be fixed to the appliance in a prominent position.

Notices shall be fitted to the appliance to warn operators of the danger of removing panels that cover live electrical components.

Other essential instructions shall be fixed to the appliance in a conspicuous position.

6 Gas soundness

6.1 General. All gas-carrying parts of the appliance shall be sound and when connected shall form a complete assembly which is sound.

6.2 Complete assembly

6.2.1 Requirement. The fully assembled appliance shall be sound at the internal pressure given in the following table.

Family	Pressure
	mbar
1st	30
2nd	40
3rd	150

This requirement shall be deemed to be met if the leakage rate (see note) does not exceed 85 cm³/h measured over a period of 1 min when tested in accordance with the method given in 6.2.2.

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 confirmed before the indicator is used.

6.2.2 Method of test. Connect to the appliance inlet an air supply maintained at the appropriate pressure and embodying a suitable meter for measuring air flow. Subject all gas-carrying parts of the appliance to this pressure by opening gas taps, governor valves and flame failure valves and by capping off the ports or injectors of main and pilot burners.

7 Heat input

7.1 Definition and method of measurement

7.1.1 Definition. For the purposes of this clause, the heat input is that which would be obtained with a reference gas of the following Wobbe number.

Family	Test gas	Wobbe number
		MJ/m ³
1st	TGA(4)	27.6
	TGA(5)	25.2
2nd	NGA	50.8
3rd	LPGA	87.5
	LPGC	77.0

The heat input shall be measured in accordance with the method given in 7.1.2.

