

BS 6896:2011



BSI Standards Publication

Specification for installation and maintenance of gas-fired overhead radiant heaters for industrial and commercial heating (2nd and 3rd family gases)

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Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 June 2011. It was prepared by Panel GSE/30/-/17, *Non Domestic Radiant Heaters*, under the authority of Technical Committee GSE/30, *Gas Installations (1st, 2nd and 3rd family gases)*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 6896:2005, which is withdrawn.

Information about this document

This is a full revision of the standard. The standard has been updated to reflect changes in installation practice and legislation.

This standard allows manufacturer's instructions to specify a method of installation, testing, commissioning or maintenance which differs in points of detail from this standard. This reference to manufacturer's instructions is allowed only where it results in at least an equivalent level of safety. It is important that the manufacturer's instructions are followed. This standard is applicable where manufacturers' instructions do not give specific advice.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

In particular, attention is drawn to the following regulations which may be amended from time to time. The commentary in this British Standard reflects the state of the regulations in 2010.

- The Gas Appliances (Safety) Regulations [1];

This standard only applies to appliances falling within the scope of these regulations.

- The Gas Safety (Installation and Use) Regulations [2];

These control all aspects of the ways in which gas-fired appliances and systems may be installed, maintained and used, mainly in domestic and commercial premises, and the classes of persons who may undertake gas work.

NOTE These regulations currently do not apply to industrial premises, except those parts used for domestic purposes and sleeping accommodation.

- The Gas Safety (Installation and Use) Regulations 1994, as amended and applied by the Gas Safety (Application) Order (Isle of Man) 1996 [3];
- The Gas Safety (Installation and Use) (Northern Ireland) Regulations 2004 [4];
- The Health and Safety (Gas) (Guernsey) Ordinance 2006 [5];

- The Building Regulations [6], [7], [8] (for the appropriate legislative region);
These control work carried out in the construction of new buildings or the extension and/or refurbishment of existing buildings. Detailed advice for England and Wales is given in approved documents [9], [10] and for Northern Ireland, in technical booklets [7]. The Building Standards (Scotland) [8] are accompanied by methods that are deemed to satisfy them.
- The Water Supply (Water Fittings) Regulations [11];
- The Health and Safety at Work etc. Act 1974 [12];
- The Electricity at Work Regulations [13].

1 Scope

This British Standard specifies the installation requirements for gas-fired overhead radiant heaters and systems for the environmental heating of premises other than domestic dwellings. This standard only applies to appliances falling within the scope of the Gas Appliances (Safety) Regulations 1995 [1].

It is applicable to the installation of heaters that are designed to use gases of group H of the 2nd family (e.g. natural gas), gases of group P of the 3rd family (e.g. propane) as well as gases of group B of the 3rd family (e.g. butane) (see BS EN 437+A1).

NOTE 1 This standard does not specifically cover LPG/air for which additional requirements might be necessary.

It is applicable to the installation of gas-fired overhead luminous radiant heaters conforming to BS EN 419-1, single burner gas-fired overhead radiant heaters conforming to BS EN 416-1 and multi-burner gas-fired overhead radiant tube heater systems conforming to BS EN 777-1, BS EN 777-2, BS EN 777-3 and BS EN 777-4.

NOTE 2 For the purposes of this standard, installation includes design, inspection and commissioning. It is recognized that each of these tasks may, at times, be performed by the same persons.

NOTE 3 The heat inputs and ventilation rates in cm^2/kW of heat input given in this standard are based on the net calorific value.

It is not applicable to the installation of gas-fired overhead radiant heaters and systems:

- a) to which the Gas Appliances (Safety) Regulations 1995 [1] do not apply;
- b) that are designed for use in domestic premises;
- c) that are supplied with a heated fluid from a separate source; or
- d) that are portable or transportable.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS 669-2, *Flexible hoses, end fittings and sockets for gas burning appliances – Part 2: Specification for corrugated metallic flexible hoses, covers, end fittings and sockets for catering appliances burning 1st, 2nd and 3rd family gases*

BS 5440-1, *Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) – Part 1: Specification for installation of gas appliances to chimneys and for maintenance of chimneys*

BS 5482 (all parts), *Code of practice for domestic butane- and propane-gas-burning installations*

BS 6501-1, *Metal hose assemblies – Part 1: Guidance on the construction and use of corrugated hose assemblies*

BS 7671, *Requirements for electrical installations – IEE Wiring Regulations – Seventeenth edition*

BS 7967-5, *Carbon monoxide in dwellings and other premises and the combustion performance of gas-fired appliances – Part 5: Guide for using electronic portable combustion gas analysers in non-domestic premises for the measurement of carbon monoxide and carbon dioxide levels and the determination of combustion performance*

BS 8487, *The design and construction of gas boosters used in association with combustion equipment – Specification*

BS EN 416-1, *Single burner gas-fired overhead radiant tube heaters for non-domestic use – Part 1: Safety*

BS EN 419-1, *Non-domestic gas-fired overhead luminous radiant heaters – Part 1: Safety*

BS EN 777-1, *Multi-burner gas-fired overhead radiant tube heater systems for non-domestic use – Part 1: System D – Safety*

BS EN 777-2, *Multi-burner gas-fired overhead radiant tube heater systems for non-domestic use – Part 2: System E – Safety*

BS EN 777-3, *Multi-burner gas-fired overhead radiant tube heater systems for non-domestic use – Part 3: System F – Safety*

BS EN 777-4, *Multi-burner gas-fired overhead radiant tube heater systems for non-domestic use – Part 4: System H – Safety*

BS EN 13410, *Gas-fired overhead radiant heaters – Ventilation requirements for non-domestic premises*

BS EN 60079-10-1, *Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas atmospheres*

Other publications

[N1] EH 40, *Occupational exposure limits*. Sudbury: HSE Books, ¹⁾ 2005 as amended

[N2] IGEM/UP/2, *Installation pipework on industrial and commercial premises*. Kegworth: IGEM. ²⁾

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS EN 416-1, BS EN 419-1, BS EN 777-1, BS EN 777-2, BS EN 777-3, BS EN 777-4 and the following apply.

3.1 hazardous area

space in which explosive gas-air mixtures are present or are expected to be present in quantities such as to require special precautions for the construction, installation, and use of electrical apparatus and fuel-fired appliances

NOTE See BS EN 60079-10-1 which also defines hazardous areas.

3.2 high-level ventilation

ventilation above the level of the heater

3.3 low-level ventilation

ventilation below the level of the heater

¹⁾ Obtainable from HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 2WA.

²⁾ Obtainable from Publications Sales, IGEM, IGEM House, Kegworth, Derbyshire DE74 2DA.

3.4 overhead radiant heater

gas-fired appliance intended for overhead installation and designed to heat, mainly by radiation, the space in which it is installed

3.5 overhead radiant tube heater

overhead radiant heater in which a tube or series of connected tubes are heated by the internal passage of combustion products

3.6 overhead luminous radiant heater

overhead radiant heater in which the heat is produced by means of burning the fuel gas at or near the outer surface of a material such as a ceramic plaque or metal gauze

4 Competence

4.1 Non-gas competence

Persons carrying out work that will have an impact on work covered by the scope of this standard shall ensure that they have the competence relevant for the task such as not to compromise the requirements/recommendations of this standard and in particular the safe installation, commissioning and operation of gas equipment.

COMMENTARY ON 4.1

Competence requires sufficient knowledge, practical skill and experience to carry out the job in hand safely, with due regard to good working practice. Any installation should also be left in a safe condition for use. Knowledge should be kept up to date with changes in law, technology and safe working practice.

4.2 Gas competence

Persons carrying out any gas installation, commissioning, servicing and/or maintenance work shall be competent to do so.

COMMENTARY ON 4.2

It is a statutory requirement that all gas work be carried out by a business or self-employed person(s) that is a member of a "class of persons" registered with a registration body which has been approved by an approval body to operate and maintain such a register.

The statutory regulations, registration bodies and approval bodies applicable to Great Britain, the Isle of Man, Northern Ireland and Guernsey are given in Table 1.

The qualifications which persons need to have to be deemed competent to carry out gas work relevant to this standard are given in Table 2.

Table 1 Registration and approval bodies by country/territory

Country/territory	Gas registration body	Approval body	Statutory regulations
Great Britain	Gas Safe Register	Health and Safety Executive (HSE)	The Gas Safety (Installation and Use) Regulations 1998 [2]
Isle of Man	Gas Safe Register	Health and Safety at Work Inspectorate (HSWI)	The Gas Safety (Installation and Use) Regulations 1994, as amended and applied by the Gas Safety (Application) Order 1996 [3]
Northern Ireland	Gas Safe Register	Health and Safety Executive Northern Ireland (HSENI)	The Gas Safety (Installation and Use) Regulations (Northern Ireland) 2004 [4]
Guernsey	Gas Safe Register	Health and Safety Executive for the States of Guernsey [HSE (Guernsey)]	The Health and Safety (Gas) (Guernsey) Ordinance 2006 [5]

Table 2 Competence requirements by country/territory

Qualifications	Great Britain and Isle of Man	Northern Ireland	Guernsey
Current certificate(s) of competence in the type of gas work to be conducted, issued by an awarding body accredited by the United Kingdom Accreditation Service (UKAS) (ACS certification)	✓	✓	✓
National/Scottish Vocational Qualification (N/SVQ accredited by Ofqual), which is aligned in matters of gas safety	✓	✓	✓
National/Scottish Vocational Qualification (N/SVQ accredited by Ofqual), which is aligned under the HSC ACoP arrangement ^{A)} as approved with the registration body	✓	✓	x
Any other scheme recognized by the gas registration body for registration purposes	✓	✓	✓

^{A)} Guidance on the individual competency required for gas work is given in the Health and Safety Commission's *Standards of training in safe gas installation. Approved Code of Practice (ACoP) (COP 20)* [14].

At the time of publication, the body with HSE approval to operate and maintain a register of businesses who are a "member of a class of persons" is the Gas Safe Register.

Persons deemed competent to carry out gas work are those who hold a certificate of gas safety competence acceptable to the Gas Safe Register which includes (without limitation) the National Accredited Certification Scheme for Individual Gas Fitting Operatives' (ACS) and the Gas Services SINVO that has been aligned with ACS. However, some ACoP certification for industrial installations might continue for some time.

5 Selection of equipment and pre-installation

5.1 Exchange of information and planning

5.1.1 Design considerations

The design shall be such that the installation is in accordance with the heater or system manufacturer's instructions.

NOTE 1 It is essential that persons who design the system or installation have a knowledge and understanding of the standards and regulations that apply to ensure that the completed plans produce a safe and satisfactory installation.

NOTE 2 In case of doubt contact the manufacturer.

NOTE 3 Collaboration is essential between those concerned with the design, installation and operation both at the planning stage and during the execution of the work. Particular matters to be taken into account are as follows:

- a) the heater or system manufacturer's installation instructions;³⁾
- b) human resource for installation, clearances to combustible materials, planning for location of supports and provision of access for servicing;
- c) type of building and form of construction;
- d) sizes, layout and purposes of rooms and working areas;
- e) size, height and route of flue (if any);
- f) provision of adequate air for combustion and ventilation;
- g) correct assessment of heat losses and heat gains to ensure ambient environmental conditions for occupants of building;
- h) gas types, pressures and availability of supplies;
- i) electricity requirements;
- j) liaison between the various trades carrying out the work;
- k) liaison with fire insurers;
- l) liaison with building owner/operator;
- m) transmission of noise and vibration;
- n) any hazardous area classification of the location for the heater or system; and
- o) the position of any drains for condensate.

Attention is drawn to statutory regulations and local by-laws, e.g. The Building Regulations Approved Document L [15] and Local Air Quality Management.

Designers should make customers aware, by providing them with the following list in writing, that it is the customer's responsibility to ensure that:

- 1) the local authority is consulted with regard to planning application requirements;
- 2) the fire authority and/or the enforcing authority under the Health and Safety at Work etc. Act 1974 [12], as appropriate, is consulted in respect of fire precautions in accordance with BS 9999;
- 3) the fire insurers are notified of any proposed changes in the means of heating;
- 4) the responsible gas conveyor is advised of the proposed installation of any gas booster or compressor which is either part of the heater, or an addition to it; and

³⁾ The manufacturer of the appliance or system should be contacted if there is any doubt about whether the design conforms to the installation instructions.