

Code of practice for

Domestic butane- and propane- gas-burning installations —

Part 2: Installations in caravans and
non-permanent dwellings —

[formerly CP 339-2]

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Cooperating organizations

The Gas Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and professional 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 (UK)*
- National Association of Plumbing, Heating and Mechanical Services Contractors
- 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 committee entrusted with the preparation of this British Standard.

- British Compressed Gases Association
- Chief and Assistant Chief Fire Officers' Association
- Consumer Standards Advisory Committee
- Department of Trade
- Fire Offices Committee
- Fire Protection Association
- Home Office
- Institution of Fire Engineers
- National Caravan Council Ltd.
- Ship and Boat Builders' National Federation

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Foreword

This British Standard code of practice is a revision of CP 339-2:1956, and in its preparation the opportunity has been taken to incorporate propane gas requirements and to express values in SI units. In line with the policy to bring codes of practice into the numbering series for British Standards, this code is being published under the number BS 5482.

Particular care has been taken in this standard in the section on ventilation with the object of overcoming special problems with ventilation of motor caravans.

Reference should be made to the current requirements of the Motor Vehicles (Construction and Use) Regulations as applying to caravans, motor caravans and mobile catering units, etc.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

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 31 and a back cover.

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Section 1. General

1 Scope

This Part of BS 5482 deals with the installation in caravans and non-permanent dwellings, mobile catering or other non-industrial mobile units of systems using liquefied petroleum gases whether from cylinders or bulk supply at a pressure of 28 mbar¹⁾, for commercial butane and at 37 mbar for commercial propane. It gives guidance on the selection of materials, components and appliances, on design considerations, on installation requirements, on inspection and testing and on consumer instructions.

Appendix A contains basic user guidance on safe practice for inclusion in the consumer's manual.

This standard does not cover the installation on site of bulk supplies of LPG, for which guidance is given in Health and Safety Executive Guidance Notes CS 5.

Portable appliances incorporating their own gas supply, e.g. those covered by BS 3879, are not considered part of the installation and thus are outside the scope of this code.

The use of gas as an engine fuel for the propulsion of the vehicle is outside the scope of this code.

2 References

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

3 Definitions

For the purposes of this Part of this code the following definitions apply, together with the relevant terms in BS 1179 and BS 5264.

3.1

caravan

a generic term covering, for the purposes of this code, the following domestic types of caravan, whether on wheels or not: mobile home, motor caravan, touring caravan, touring residential caravan, residential caravan and permanent holiday caravan (i.e. one designed for holiday accommodation and intended to be sited permanently, or for a long period in one position)

NOTE Definition of these terms can be found in BS 5264.

3.2

non-permanent dwelling

any domestic dwelling not covered by BS 5482-1

3.3

liquefied petroleum gas (LPG)

this term as used in this code means and includes commercial butane and commercial propane as defined in BS 4250 (See A.1 for some general properties.)

3.4

high pressure stage

that part of the installation between the valve of the cylinder and the inlet of the pressure regulator

NOTE The high pressure stage and any intermediate stage of a bulk supply are outside the scope of this code.

3.5

intermediate pressure stage

that part of the installation between a first stage regulator sited at the tank or cylinder position and a second stage regulator

NOTE This system is used for propane bulk installations where the tank position is some distance from the point of usage; it can also apply to propane cylinder installations in similar circumstances and when the gas demand is heavy. The first stage regulator at the tank or cylinder position is set to deliver gas at a pressure within the range of 70 mbar to 300 mbar to a secondary regulator set at the appliance operating pressure, installed externally at the point of entry to the caravan or dwelling.

3.6

low pressure stage

that part of the installation between the outlet of the single stage pressure regulator (or intermediate stage regulator if used) and the inlet of the appliance

¹⁾ 1 mbar = 10² N/m² = 100 Pa.

3.7**cylinder**

a portable and refillable vessel of approved design containing LPG under pressure

3.8**bulk tank**

a permanently installed vessel of approved design containing liquefied petroleum gas under pressure

3.9**low pressure regulator**

an apparatus for automatically maintaining a constant outlet pressure at the level recommended for the appliances in use

3.10**gas meter**

an apparatus for measuring the volume of LPG in vapour form passing through it. Gas meters can be either of a “credit” or “prepayment” type. The latter incorporates means, in the low pressure line, by which a preset volume of gas is delivered on insertion of a coin or token

3.11**manual reset low pressure cut-off valve**

an item of equipment which automatically shuts off the gas supply in the event of the supply pressure falling below a predetermined value and requiring a manual operation to re-establish the supply. The device is normally fitted in conjunction with a prepayment meter

3.12**catalytic space heater**

a space-heating appliance in which neat gas diffuses through a catalytic bed and is flamelessly oxidized by oxygen which has diffused into the bed from the surrounding atmosphere at a temperature below that at which combustion would occur in the absence of the catalyst

NOTE This definition does not include catalytic heaters in which fuel premixing of gas and air is effected before the catalytic bed is reached, nor does it include appliances employing after-burners in which products of incomplete combustion from normal flames are further oxidized over a catalyst.

3.13**atmosphere sensitive cut-off device**

a device which is designed to shut off the main gas supply to an appliance when the CO₂ content of the surrounding atmosphere exceeds a given level. Such devices normally comprise a vitiation sensitive pilot in conjunction with a suitable flame failure device

3.14**low bed-temperature cut-off device**

a device, actuated by the temperature of the catalytic bed, which is designed to shut off the main gas supply to an appliance when the catalytic bed drops below the temperature of good catalytic oxidization

3.15**pressure relief valve**

a valve incorporated to protect a system against excessive pressure. It will vent to atmosphere when a predetermined maximum pressure is attained

Section 2. Materials, components and appliances

4 Materials

4.1 Pipework materials

4.1.1 Recommended. The following materials are recommended for general use for installation pipework.

- a) Solid drawn copper tube used with copper or copper alloy fittings.
- b) Steel tube used with wrought iron, low-carbon steel or malleable cast iron fittings, or steel compression couplings and protected against corrosion, e.g. by galvanizing and painting.
- c) Stainless steel tube and appropriate compression or screwed fittings.

4.1.2 Not recommended. The following materials are not recommended for general use for installation pipework for the reasons shown.

- a) Aluminium (corrosion).
- b) Composition and lead (creep).
- c) Brass tubing (of a kind that is subject to season cracking).

NOTE Brass tubes that comply with the requirements of BS 2871-2 designation CZ 126 and CZ 110 which have been given a final drawing operation after annealing are considered suitable.

- d) Plastics (low melting point and low-temperature embrittlement).

NOTE Tubing of the type fabricated from sheet steel, coated internally and externally and wrapped should not be used externally because it is subject to atmospheric corrosion.

4.2 Material used for other than pipework. Plastics fittings are not recommended.

4.3 Selected materials. The materials used should comply with the requirements of the relevant British Standards, e.g.

BS 2871, *Copper and copper alloys, tubes — Part 1: Copper tubes for water, gas and sanitation — Part 2: Tubes for general purposes.*

BS 864, *Capillary and compression tube fittings of copper and copper alloy — Part 2: Metric units.*

BS 1387, *Steel tubes and tubulars suitable for screwing to BS 21 pipe threads.*

BS 143 & BS 1256, *Malleable cast iron and cast copper alloy screwed pipe fittings for steam, air, water, gas and oil.*

BS 1740, *Wrought steel pipe fittings (screwed BSP thread).*

BS 4368, *Carbon and stainless steel compression couplings for tubes — Part 1: Heavy series — Part 3: Light series.*

BS 3601, *Steel pipes and tubes for pressure purposes: carbon steel with specified room temperature properties.*

BS 3605, *Seamless and welded austenitic stainless steel pipes and tubes for pressure purposes.*

BS 1494, *Fixing accessories for building purposes.*

BS 5292, *Jointing materials and compounds for water, low-pressure steam installations, 1st, 2nd and 3rd family gases.*

BS 3212, *Flexible rubber tubing and hose (including connections where fitted and safety recommendations) for use in LPG vapour phase and LPG/air installations.*

NOTE Gas cock lubricants should be suitable for use with LPG, e.g. those having a 25 % molybdenum disulphide base.

5 Components

Components should comply with the requirements of the relevant British Standards, e.g.

BS 1552, *Control plug cocks for low-pressure gases*.

BS 3016, *Pressure regulators and automatic changeover devices for liquefied petroleum gases*.

BS 5045, *Transportable gas containers — Part 2: Steel containers up to 130 litres water capacity with automatically welded circumferential seams*.

Where no British Standard exists, components should be of standard types recommended by manufacturers or wholesale gas distributors.

6 Selection of appliances

6.1 General. Appliances should comply with the requirements of the relevant British Standards, in particular BS 5258 and BS 5386.

6.2 Selection of cooking appliances. Cooking appliances should comply with the requirements of:

BS 5258, *Safety of domestic gas appliances — Part 2: Cooking appliances*.

BS 5386, *Specification for gas burning appliances — Part 3: Domestic cooking appliances burning gas*.

BS 5314, *Specification for gas heated catering equipment*.

BS 6350, *Specification for gas heated fish and chip frying ranges*.

6.3 Selection of space heaters. Each of the following points should be taken into consideration.

- a) Space heaters should comply with the requirements of BS 5258-5, BS 5258-10 or BS 5258-11 as applicable and BS 6332-2 or BS 6332-4.
- b) Only fixed heaters should be selected.
- c) A space heater, other than a catalytic heater, should be selected only if its burners are protected by a flame failure device.
- d) The output of the heating appliance should be sufficient to meet the likely climatic conditions and usage. (Guidance is given in Figure 1 and Figure 2.)
- e) The mode of heat dissipation and physical size of the appliance should be suited to the application and siting.
- f) A flueless heater, other than a catalytic heater, should comply with the requirements of BS 5258-10 and should be selected only if it is fitted with an atmosphere sensitive cut-off device to shut off the gas supply at a CO₂ concentration of not more than 1.5 % (by volume).
- g) A catalytic heater should comply with the requirements of BS 5258-11.
- h) The input rating of a flueless heater should not exceed 100 W/m³ of free room space.

6.4 Selection of water heaters. Each of the following points should be taken into consideration.

- a) Water heaters should comply with the requirements of BS 5258-7 and BS 5386-1 and BS 5386-2.
- b) In general, a water heater serving only a sink or wash basin does not require a flue; any other water heater should be connected to a flue. However an instantaneous sink water heater should be flued if fitted in a confined space. (See 12.5 on the use of water heaters with showers.)
- c) Preference should always be given to the use of room sealed appliances.
- d) A water heater should be selected only if it is fitted with a flame failure device, arranged to shut off the main and pilot (where fitted) gas supplies in the event of flame failure.

6.5 Selection of central heating systems

As an alternative to individual appliances providing separate heating and hot water services, consideration may be given to the installation of a wet type central heating and/or hot water system.

6.5.1 Wet systems. These should comply with the requirements of BS 5258-1.

The rating of the boiler may be determined by reference to Figure 1 and Figure 2 which give the input required for the space heating portion. An additional 3 kW should be added to this rating if the caravan is equipped with a bath, while an additional 1.5 kW should be added if a sink and a shower are to be supplied with hot water.

Preference should be given to the use of a room sealed boiler particularly when the input rating exceeds 9 kW. (See clause 11.)

6.5.2 Ducted warm air systems. The following points should be taken into consideration.

- a) Ducted warm air systems should comply with the requirements of BS 5258-4.
- b) A ducted warm air system may be considered instead of individual space heating appliances.
- c) Preference should be given to the use of a room sealed appliance (see clause 13).

6.6 Selection of refrigerators. Refrigerators should comply with the requirements of BS 5258-6. The following three main types are available:

- a) free-standing
- b) wall-mounting
- c) built-in

Some refrigerator models, particularly those of the built-in type, are available with either a left or right hand opening door as alternatives.

Refrigerators of type c) can have either integral inlet and outlet ventilating louvres or inlet and outlet louvres positioned remote from the refrigerator, provided there is adequate provision for air circulation (see 19.3).

Preference should always be given to a refrigerator with provision for the discharge of the products of combustion to outside air (see clause 13). If it is intended for the refrigerator to be used whilst the caravan is in motion on the road, then the foregoing becomes an essential requirement.

A refrigerator should be selected only if it is fitted with a flame failure device.

Refrigerators installed in caravans and motor caravans should preferably have provision for operation on 12 V battery supply for use while in motion on a road.

6.7 Selection of lighting appliances. Lights should comply with the requirements of BS 2977.

