



A quick guide to
Gas Safety
for Mobile/Temporary
Catering Operations

This booklet provides advice to mobile catering operators on gas safety, but may be of general interest to event organisers and venue operators



Where can I get more information about Gas Safety?

1. LPG Guideline downloads from Nationwide Caterers Association www.ncass.org.uk
2. Guidance and Codes of Practice from UKLPG www.uklpg.org
3. National Guidance for Outdoor and Mobile Catering from the Chartered Institute of Environmental Health www.cieh.org/policy/guidance_outdoor_mobile_catering.html

Alternatively, further advice can be obtained by contacting the Food, Licensing and Occupational Safety Team:

Tel: 01423 556992

Email: fos@harrogate.gov.uk

(Note: The superscript numbers shown in magenta throughout the text refer to additional documents listed as 'references' on page 16 of this booklet. These documents give you additional information regarding the subject being discussed.)

What are my duties as an operator of a mobile catering facility?

Operators of mobile catering facilities have a legal duty to ensure that the gas installation (which includes appliances, pipework, fittings and ventilation systems etc.) is maintained in a safe condition, so as to prevent injury to any person.¹

How can I do this?

All operators must undertake a risk assessment for their work activities. As part of this process, clear controls should be identified to reduce the risk of fire and explosion, as far as possible. There may be a legal requirement for you to document the findings. Further general advice on risk assessment can be found on the Health and Safety Executive (HSE) website at www.hse.gov.uk/risk/index.htm and catering specific information can be found at www.hse.gov.uk/catering/faqs.htm. In addition the HSE has produced a leaflet entitled "Gas safety in catering and hospitality" www.hse.gov.uk/pubns/cais23.pdf which may help.

Does this guide replace the need for risk assessment?

No - this guide does not aim to replace the need to risk assess but serves to raise awareness and guide operators on the matters they must consider. The guide briefly covers the key features of:

- ◆ temporary/mobile gas installations;
- ◆ setting up on site;
- ◆ checks prior to use;
- ◆ instruction and training of staff; and
- ◆ maintaining equipment.



What are the main parts of a mobile gas installation which I need to consider?

The 10 key features of a typical installation are:

- ◆ Overall design of system/supply of gas;
- ◆ Gas store;
- ◆ High pressure connections;
- ◆ Regulator;
- ◆ Low pressure hosing;
- ◆ Emergency Isolation Valve (EIV);
- ◆ Internal pipework and jointing;
- ◆ Flame Failure Devices (FFDs) and Flame Supervision Devices (FSDs);
- ◆ Ventilation;
- ◆ Mechanical extraction.

How will I know how much gas I require?

Conversion of vehicles or the building of systems from scratch should be undertaken in accordance with the guidance and codes of practice from UKLPG and NCASS/CIEH referred to in this document and BS EN 1949:2011 Specification for the installation of LPG systems for habitation purposes in leisure accommodation vehicles and other vehicles. You must also be mindful of the Road Vehicles (Construction and Use) Regulations 1984.

Liquid Petroleum Gas (LPG) cylinders used in mobile catering will typically be 19kg or 47kg; propane (red cylinder) is the preferred and most common fuel used. The design of the installation i.e. the number and type of appliances in use, will determine the volume of gas required for all appliances to work correctly.

The size and number of cylinders and pipe size should be based on average use of gas, if an automatic changeover valve is fitted, or based on the maximum use without a changeover valve.² The diameter of the pipework should be sufficient to ensure that the flow and pressure at the appliance is in accordance with the manufacturer's instructions for each appliance under maximum flow rate conditions.

For a continuous supply, multiple cylinders may be installed in pairs or banks interconnected via an auto changeover valve which will switch supplies as cylinders empty.



What will happen if the supply of gas is insufficient?

If the volume of supply is insufficient, then gas will be drawn off too rapidly which can result in frosting on bottles. A single 19kg cylinder can comfortably supply an installation of 20kW and a single 47kg cylinder can run an installation of up to 33kW. Further guidance can be found in the NCASS Guide and UKLPG Codes.



Frosting on the bottle caused by excessive cooling effect due to gas being drawn off too quickly.

Where should I locate cylinders which are connected and in use?

Current guidance is that gas cylinders connected to an installation should preferably be located outside of a mobile unit or marquee, between 0.5m and 1.0m from the outer wall of the trailer/marquee (ideally 1.0m).² Cylinders shall be stored upright in a cage/tamper proof enclosure which has low and high level ventilation. If the cylinders are less than 0.5m from the wall of the marquee or mobile, then the wall of the enclosure facing the van or marquee should have a 30 minute fire resistance.

Is there anything else I need to remember?

Yes - in the case of cylinders sited outside of a purpose-designed cylinder compartment, they should be placed on flat ground, on a non-combustible surface and cylinders over 19kg should be secured to soft ground by pegging at the base as there is a risk of toppling. Cylinders shall be at least 1.0m from any window/door into buildings or ignition source and at least 2.0m from any open drain or gulley.^{3, 4}

My vehicle has a storage compartment within it where I keep the cylinders whilst they are in use. Is this OK?

Yes - in some instances cylinders will be connected and in use in a gas storage compartment within a vehicle. Although, where practicable, the cylinders in use should be located outside of the vehicle. If cylinders are used whilst in a compartment then the compartment must be ventilated at high and low level; through vents in the door of the compartment and

not the floor (as vents in the floor would allow gas to escape below the vehicle).

Also, the wall between the gas compartment and the trailer must have a 30 minute fire resistance and there shall be no gaps around pipework passing through this wall. Electrical cables/switches etc. must not be located within the compartment as these are a potential source of ignition.



High and low level ventilation, in storage compartment door.

**I understand that pressure in the LPG gas cylinder is high!
Do I need special connections because of this?**

The gas pressure in LPG cylinders is high, in the order of 10 bar. Consequently, any connections between the cylinders and the regulator must be made with high pressure hosing conforming to type 2 of BS 3212.⁵ High pressure hoses between the cylinders and regulators are commonly known as “pigtailed”.

Pigtails should be fitted with a non-return/excess flow valve, should not be greater than 2.0m in length and run uphill to avoid ingress of oil residues into the regulator.² Hoses must have factory swaged (photo below left) or factory crimped connections. Home-made crimps are not acceptable.

(Note: Hoses should be inspected regularly and replaced where there are signs of deterioration. Date of manufacture should be found on the hose. It is recommended that pigtails, where in regular use, should be replaced five years from the date of their manufacture.)

High pressure hose.



Close-up of factory swaged connections on high pressure hoses.



I know that a regulator needs to be fitted within the installation. Where is the best place for it to be fitted?

The regulator reduces the pressure of gas from 10 bar, at the cylinder, to 37 mbar, maintaining a constant operating pressure for the appliances.

It can be fitted to the wall of the cylinder compartment or secured to a post but must not be left loose. In some installations the regulator may be fitted directly to the cylinder.

What about the hosing leading from the regulator to the fixed installation?

Gas from the regulator is at a low pressure and therefore low pressure hosing and connections may be used between the regulator and the fixed installation.

Low pressure flexible hosing must conform to BS 3212 type 1 or 2 and should be marked accordingly.

Low pressure hosing.



Regulator suitable for direct connection to a gas cylinder.

What kind of connections do I need on my low pressure hoses?

Low pressure hoses shall have either swaged connections or crimped connections. Crimp clips must be of the correct diameter for the flexible hosing in use.



Crimp clip and home crimping device.

The use of worm driven clips, although common, is not recommended as there is the potential to over-tighten the clip and damage the hosing.



Worm driven clip

What damage is likely to occur on flexible hosing?

The main type of damage which can occur to the hosing is either damage or deterioration of the hosing. Regular checks should be made to ensure all sections of the hosing are in good condition.

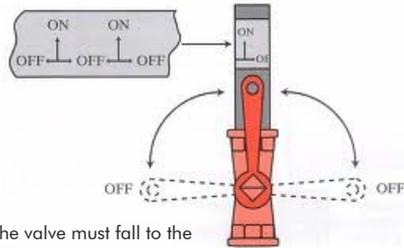


Damage to low pressure hosing leading from regulator.

Is an Emergency Isolation Valve (EIV) necessary?

YES - an Emergency Isolation Valve should be fitted either:

- at the point the low pressure pipework enters the cooking area (this may be located within the cylinder cupboard if one exists);
- Alternatively, the valve may be located next to the point of exit from the cooking area.



The valve must fall to the off position, as shown in the diagram.⁶

GAS EMERGENCY CONTROL

IN THE EVENT OF AN EMERGENCY OR AN ESCAPE OF GAS

- Shut off the supply at this valve and open windows.
- Contact the Gas Supplier.
- Do not re-open this Emergency Control, until all necessary steps have been taken to prevent any further escape of gas.

Name of Gas Supplier	<input type="text"/>
Emergency Tel No.	<input type="text"/>
Gas Operative name	<input type="text"/>
Registration No.	<input type="text"/>
Date	<input type="text"/>

Written instructions on how to turn the gas off and what to do in the event of an emergency should be located next to the valve.

How should any internal pipework and jointing be constructed?

Internal pipework within the mobile catering facility must be constructed from solid drawn copper, stainless steel or steel. Internal pipework must be secured in place along its length to reduce flexing/movement whilst in transit and therefore the potential for failure of the connections and joints.

I have some flexible pipework present in my catering area. Is this OK?

Whilst flexible pipework may be present within the catering area, it should be as short as possible and must conform to BS 3212, type 1 or 2. Flexible hosing must not be located in a vulnerable position such as where there is the potential for mechanical damage or where it is likely to be exposed to temperatures in excess of 60°C. In such cases, the flexible pipework would be classed as 'at risk' and must be replaced with fixed pipework before the installation is used.

(Note: 'at risk' is a term used by gas engineers where one or more recognised faults are present which could constitute a danger to life.)

What about the joints between pipes?

Joints on the rigid pipework may be soft solder, compression or malleable iron fittings. Copper pipework with soft soldered fittings/joints must not be used where temperatures are likely to exceed 100°C. In addition, compression joints can loosen in transit and should be checked each time for gas tightness before the gas supply to the installation is turned on.



Compression joint sometimes used on gas pipework.

Is it advisable to have flame failure devices fitted on my gas appliances?

Yes - if practicable, Flame Failure Devices (FFDs), sometimes known as Flame Supervision Devices (FSDs), should be fitted to all gas appliances, especially those with enclosed burners e.g. ovens etc. Such devices ensure that the gas supply is cut off to the appliance if the flame on a gas burner is extinguished.

These devices are particularly important in the case of appliances where the flame is not visible, such as with ovens or refrigerators etc. Where it is practicable, older appliances should have an FFD or FSD retrofitted by a competent Gas Safe Registered Engineer.

How do these devices work?

Typically FFDs comprise a valve on the gas supply to a burner/appliance



Thermocouple - when the heat is removed, this cools and causes a valve to close, cutting off the gas feed.

which is linked to a thermocouple such as a short length of copper wire. When the flame is extinguished, the thermocouple cools and the valve closes, preventing the escape of gas. However, there can potentially be a delay of up to 90 seconds between the flame being extinguished and the gas supply being cut off. Consequently, it is important to ensure that there is adequate ventilation within the unit when in operation.

What type of ventilation is necessary?

There must be adequate **natural ventilation** in cooking areas to ensure the safe combustion and dilution of combustion and cooking fumes. It should be split equally between high and low levels, through the provision of suitably located ventilation grilles. This is in addition to any ventilation provided by the door/hatch being open on mobile units, as gas appliances may be used when these are closed.

Natural ventilation should be provided at a rate of at least 25 sq cm for each 1kW input rating of all appliances or 100 sq cm, whichever is the greatest.³

(NOTE: Appliances must be installed in accordance with manufacturer's instructions. This will include the provision and installation of dedicated flues to appliances where required.)

Is mechanical extraction necessary?

Not always - the type of appliance will determine whether mechanical extraction is required. The manufacturer's instructions should be followed in all circumstances. Where a mechanical extract canopy is provided, it should extend beyond the appliance cooking area on all sides by at least 150mm and it should be 'interlocked' with the gas supply. 'Interlocked' means that if the mechanical extraction is switched off then the gas supply to the appliance in question is automatically cut off.



What about equipment which requires a flue?

The manufacturer's instructions should indicate clearly whether the appliance requires its own flue.



Cylinder compartment showing cylinders unrestrained in transit. Compartment also being used for storage of other items.

How should I transport gas cylinders safely?

Gas cylinders should be:

- Disconnected from the installation;
- Restrained in place during transport through appropriate strapping to keep them in an upright position;
- Transported in a purpose built compartment which contains nothing more than a spanner/pigtails etc.

Is there anything I need to know about this purpose-built compartment?

Yes - the internal walls of the compartment must have a 30 minute fire resistance.

It should be ventilated at high and low level, with a minimum level of ventilation equating to 10 per cent of the internal surface area of compartment. These ventilation openings should be located in the



This shows a gas compartment venting and opening into the cooking area in a unit.



This shows warning signage on a locked gas compartment but no evidence of ventilation.

external surface of the compartment and must not ventilate into the cooking area. Ventilation openings in the base of the compartment are not ideal as they allow any gas to collect underneath the vehicle. The compartment must be lockable and have appropriate warning signage.

What are the important considerations when setting up my catering unit on site?

When arriving on site it is important to set up the catering facility safely, in accordance with the event organiser/site operator's instructions. You must take into account the requirements of neighbouring traders, as well as maintaining routine and emergency access routes.

Are there any guidelines which will help me do this?

Yes - you should do the following:

- ◆ Position your unit in the allocated space - it must be level and stable;
- ◆ Site the secure cylinder enclosure, where this is used, ideally at 1.0m from the wall of the unit/marquee, or at least 0.5m and clear of traffic routes. As a general rule ensure that a minimum separation distance of 1.0m from buildings, windows, doors and ignition sources and 2.0m from untrapped drains or unsealed gullies etc. is also achieved. More detailed advice is available in UKLPG CoP;
- ◆ Treat empty and full cylinders in the same way and store upright in a ventilated location which is secure;
- ◆ Make sure that any flues to appliances are unobstructed. Check to ensure they are not obstructed by surrounding foliage and overhanging trees etc. In addition, ensure that the natural ventilation grilles within the cooking area are kept free from obstruction both in the unit and outside;
- ◆ If you are using stand-alone generators site them well away from any gas store or compartment on your vehicle and position them to prevent combustion gases entering the working area.



How can I ensure that the staff setting up the unit carry out all the relevant safety checks?

Any person setting up a gas catering installation on site or undertaking pre-use checks on the unit must be competent to do so.

What can I do to make sure they are competent?

You need to make sure they have received appropriate information, instruction and training as necessary. Staff required to set up a unit must be clear on the following:

1. The dangers associated with LPG;
2. How to site the unit correctly;
3. How to trace gas leaks and ensure joints and connections are gas tight;
4. Correct combustion - what to look out for;
5. The dangers of ineffective ventilation/flues;
6. Action to be taken in the event of an emergency - this must include knowing the location of the emergency isolation valve and how to use it.

(NOTE: In the case of single cylinder installations it is sufficient to rely upon the cylinder valve as the Emergency Isolation Valve but this is not acceptable where multiple cylinders are in use.)

7. How to change a cylinder/how to check when it needs changing;
8. Acceptable pipework connections and how to spot damage/defects and the significance of these;
9. Safety features on the installation such as Flame Failure Devices and their correct operation;
10. Fire safety measures;
11. What to do if the user/operator smells, or suspects, a gas leak. (Note: it may be helpful to have written 'safe systems of work' for staff.)



Should the unit operator who is competent check anything before turning on the gas?

Yes - It is important that prior to turning on the gas and firing the installation up, the checks listed below are routinely undertaken, namely:

1. Check the condition of the cylinders, regulator, changeover device - are they stable/secure and free from any obvious damage?
2. Check the condition of hoses and connections - clean and free from damage/deterioration - hoses free from cuts, abrasion, cracking, stretching, blistering etc. Are the connections correct for their location and are crimp clips the correct size for the hosing in use?
3. Ventilation - is it adequate and are flues unobstructed?
4. Visual check of pipework - is it still secure, are vulnerable joints such as compression joints tight?
5. Are all fire safety measures in place?

Once the above matters have been checked and deemed satisfactory then the gas can be turned on and appliances can be lit to ensure that they are operating correctly.

(NOTE: If an appliance is found to be faulty it should be disconnected via the appliance isolation valve, if one exists, or using the quick release coupler. If it is not possible to isolate the appliance then the installation should be shut down and dealt with by a competent Gas Safe Registered Engineer before it is brought back into use.)

Does the gas installation in my unit need to be inspected?

Yes - there are occasions when an inspection by a competent Gas Safe Registered Engineer is necessary:

- ◆ Any new factory built trailers/mobile units must be certified as safe, prior to being brought into use for the first time;
- ◆ In the case of mobile units/trailers it is recommended that the gas installation is inspected at least every 12 months;



- ◆ In the case of marquee installations, it is recommended that the installation (including appliances/rigid pipework and associated fittings) is inspected every 12 months. In this type of installation the amount of flexible pipework must be minimal;
- ◆ Bespoke installations should be inspected prior to bringing the installation into use.



How do I select a competent Gas Safe Registered Engineer?

Gas Safe Registered Engineers inspecting and working on mobile catering equipment must be registered for both LPG **AND non-domestic** catering and mobile catering equipment (assuming that appliances are commercial and not domestic). You can check an engineer's or company's credentials at www.gassaferegister.co.uk by entering either the engineer's ID number or the company's registration number. If you are still uncertain, then contact Gas Safe on 0800 4085500.

(NOTE: Gas Safe Registration numbers for businesses remain the same. However ID cards are renewed annually and individual engineer serial numbers are changed annually.)

Can I carry out maintenance or alterations to the gas installation in my catering unit?

No! - By law only a competent Gas Safe Registered Engineer can carry out any maintenance or alterations to a system.

(NOTE: this requirement will not prevent you from forming crimped joints and renewing flexible hoses and changing cylinders.⁷)

Safe Registered Engineer and a further certificate issued. Any necessary works can be conducted only by a Gas Safe Registered Engineer.

(NOTE: It is not acceptable to continue to use the installation, ignoring the need for remedial works, even though the system may have been assessed as being safe.)

The end result is to have an appropriate Inspection Record that records the installation as safe and with no improvements/works being required.

What about hiring equipment?

If you or a contractor has cause to hire in gas appliances then they should be accompanied by a current Gas Safe Registered Engineer's Inspection Record.

The equipment supplier should be able to confirm this and supply a copy.

(NOTE: Whilst the hirer may undertake brief checks on delivery to your site this is not a Gas Safe Inspection Record.)

If you have a number of gas appliances and extensive bespoke pipework then the installation must be inspected and certified by a competent Gas Safe Registered Engineer prior to the installation being brought into use.

As a venue operator, what information regarding LPG safety do I need to obtain from the catering business prior to them arriving on my site?

You will need to see the following documents:

- ◆ Insurance in accordance with your requirements
- ◆ A certificate relating to the LPG installation in the vehicle carried out by a competent Gas Safe Registered Engineer. The inspection should have been carried out within the last 12 months. This should indicate that the installation is safe.

You should also check that the engineer is authorised to inspect LPG Catering equipment. You can do this by checking the engineer's ID number on www.gassaferegister.co.uk

REFERENCES

1. Regulation 35 - Gas Safety (Installation and Use) Regulations 1998
2. NCASS Guidance for the Installation of LPG and LPG Fired Equipment in Catering Trailers etc.
3. UKLPG: CoP 24 - Use of LPG Cylinders Part 3: 2000 Use of LPG in Mobile Catering Vehicles and Similar Commercial Units
4. UKLPG: CoP 7 – Storage of Full and Empty LPG Cylinders and Cartridges
5. BS 3212:1991 Specification for flexible rubber tubing, rubber hose and rubber hose assemblies
6. Regulation 9 (2) - Gas Safety (Installation and Use) Regulations 1998
7. Regulation 3(4) - Gas Safety (Installation and Use) Regulations 1998

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