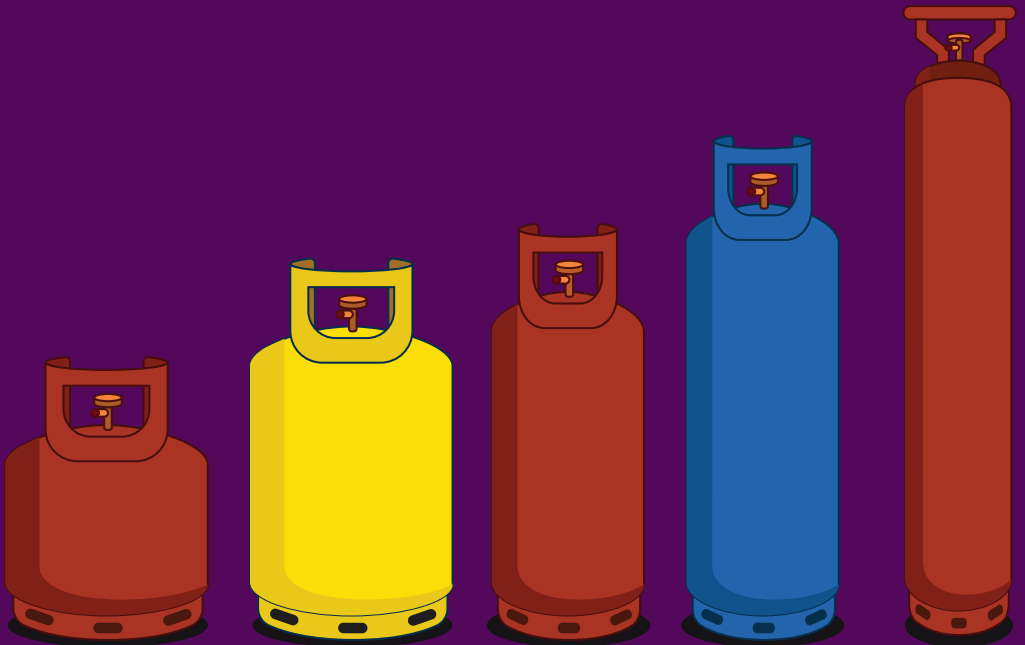




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GUIDE TO GAS USAGE AT EVENTS



This publication was made possible with the kind assistance from many people, but in particular, I would like to thank Mr. Tony Walsh and Mr. Declan Smith for their technical help, advice and for the pictures.

This is version 1 of this document January 2018.

Any comments, additions and suggestions to
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referencing this document in the correspondence.

This is a guidance document, which illustrates a minimum level of safety. However a comprehensive risk assessment by a suitably competent, experienced and qualified person along with suitable risk mitigation strategies may be considered, where there is divergence with this document. However this will be on a case by case basis and a person operating a gas catering unit shall be required to improve their unit so that it will comply with this document in a timely manner.

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INTRODUCTION

The mostly widely used forms of LPG are Propane and Butane. LPG is generally found in cylinders, which are portable and refillable up to 150 litres capacity.

LPG forms a flammable mixture in air between 2-10% by volume. It is colourless and heavier than air. The main hazards associated with LPG are fire, explosion and physical effects such as frost burns, asphyxiation and injuries from the manual handling of cylinders.

Leaking LPG in air can be seen as a shimmering effect and also a frosting at point of leak, due to it being heavier than air it may flow into drains and gulleys (more prevalent with butane). A suitably calibrated explosimeter may be used for testing the concentration of LPG in air.

An 'empty' LPG container is still potentially dangerous and shall be treated with the same respect as a 'full' LPG container.

When LPG burns in air, carbon dioxide, water vapour and heat are produced, but only if sufficient air is available. Inadequate appliance flueing and/or ventilation, or poor air-gas mixing e.g. due to poor maintenance can result in the production of toxic and lethal carbon monoxide.

LPG shall always be treated professionally and with respect. If in doubt don't start; if you have started then stop, make safe and ask.

MINIMUM SAFE RIG REQUIREMENTS

A rig is all parts making up a gas catering unit for the purposes of this document.

The appliance shall refer to the internal aspect of rig wherein cooking takes place.

The minimum distance shall not be less than 6 metres between gas rigs. (or any part thereto)

The suitably qualified and experienced gas engineer* shall satisfy themselves by an extensive review of all aspect of rig that it is safe, in good standing and compliant; a rig shall have only appliance(s), cylinders, regulators, manifolds, change-over devices and pipework.

The external components of a rig shall be gas tight to the interior of the units (a unit here means a purpose built fabricated solid structure and not a marquee, tent or other temporary structure/non units) i.e. the gas stored externally shall have no means via gap, duct or other such way to pass into the interior where cooking is being undertaken (appliance). The separation between the two shall have at least 30 minutes fire resistant wall or lining (BS: 476 Parts 20-22 or equivalent), this shall be true in all units, where this is not the case or in non-units there shall be a comprehensive risk assessment and mitigation. **(1,2)**

REGULATORS SHALL COMPLY WITH BS EN 16129:2013 (or equivalent).

Only electrical apparatus for use in 'Zone 2' area per BS EN 60079/10 or equivalent is allowed in the storage area or in the separation distance.

All fittings and threads, which connect to the cylinder, shall be clean and undamaged. Sealants shall never be used. If spanners are used, they shall be non sparking type appropriate for use with gas.

Fire blanket to BS 1869 1997 and extinguisher to I.S. 291 2015 and I.S. EN 3-7 shall be located near appliance(s) and shall be in position where it is safe and easily reached and seen.



Photograph 1: Regulators

Before beginning set up, the food operator shall undertake a risk assessment to include a visual examination of all cylinders, pipework, appliance(s), vents and flues on a daily basis. Complete safety check list shall be available for inspection.

A full review and service of entire rig and recertification shall be undertaken regularly but at least once a year by suitably qualified and experienced gas engineer*. They shall also review and retrain the operator in the hazards associated with LPG, safe methods of cylinder changing and using soapy water to test for leak when changing bottles at cylinder connection (see appendix 1), the proper and safe use of the appliance, and what to do if there is a fire i.e. they shall ensure the food operator is familiar with and competent using the rig.

Written details of emergency procedures shall be kept accessible in the unit (place where operator is i.e. van, marquee). As part of the certification and review they shall check the condition of all components e.g. hosing to ensure that it has not been subject to conditions that have deteriorated it i.e. such as water leading to rusting; if any concerns arise the hosing (or component) it shall be replaced immediately. The cylinder shall have their hosing renewed every five years (pigtailes see picture below); the hosing shall have a tag or date stamp to indicate when it was made and when it has to be replaced, other components as per wear and tear, but in line with manufacture's guidelines. Copy of certificates shall be easily seen on rig.



Photograph 2: Hosing

Gas shall be stored externally (i.e. well ventilated area) in gas cage (made from metal i.e. non combustible ideally 12 gauge 50 X 50 mm or similar), which prevents tampering or public access but allows operation of shut off/isolation valve. Gas cylinders shall be securely restrained and secured to the ground or fixed object to prevent movement. Stored where they are not vulnerable to hazards caused by impact, e.g. from vehicles such as fork-lift trucks.

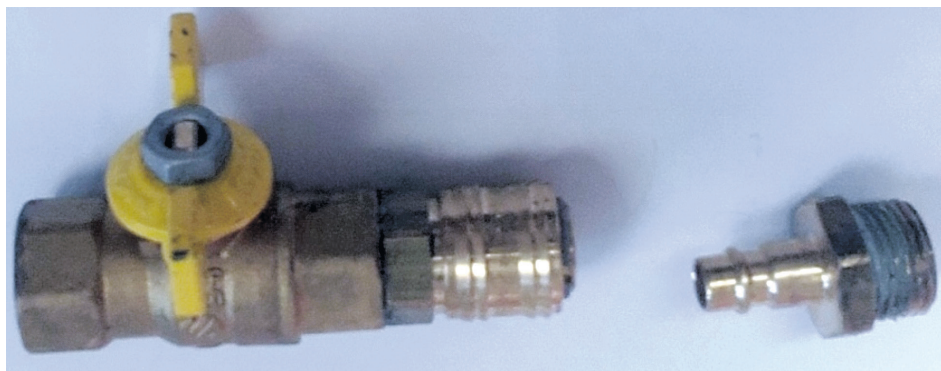
All appliances to have flame failure; non return valves on pigtailes. The appliances shall be piped by gun metal, the use of limited i.e. less than 1 metres of high pressure armoured hose may be acceptable; they shall be fitted with integrally threaded end connections.

All pipes shall be protected and located such that they are not exposed to abrasion or mechanical damage. Each and every LPG supply shall terminate with an accessible shut off valve before the appliance.

Crimp clip only.



Photograph 3: Crimp Clips



Photograph 4: Bayonet connections all points i.e. plug and play

Restraining chain as and where required.

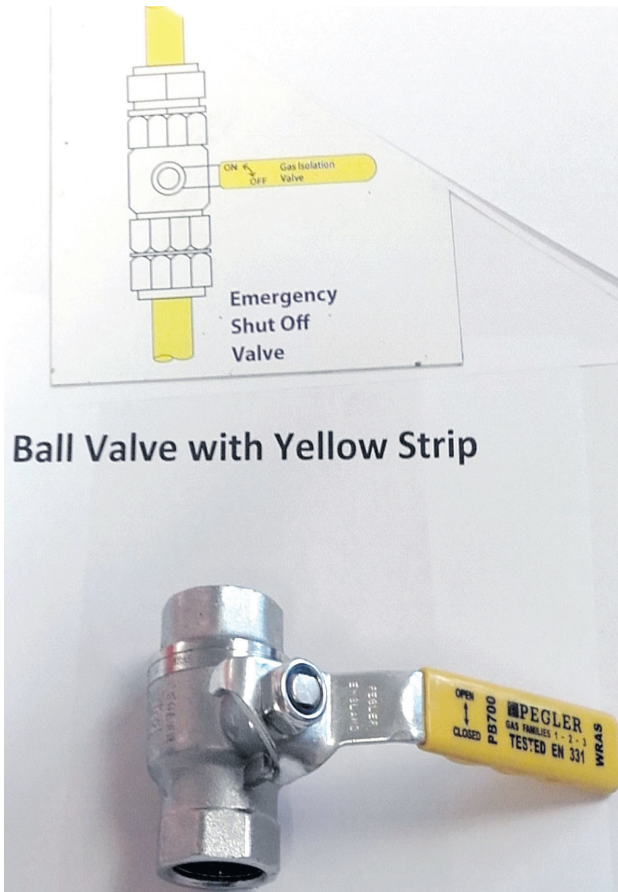
No domestic appliances only those in accordance with the European Communities (Appliances Burning Gaseous Fuels) Regulations, 1992 to 1995, i.e. such appliances having the CE mark and flame failure device; appliances shall be fitted as the manufacturer recommends (refer BS 5482, BS 6173 and BS 6891).

The appliance(s) and the venting thereto in a unit (a unit here means a purpose built fabricated solid structure and not a marquee, tent or other temporary structure/non units) shall be fitted with a properly designed flue, have canopies or extractor hoods, have fixed ventilation appropriate to size of appliance (not doors, windows, hatches or skylight) which shall be never less than a total of 4000 square mm (2 foot by 4 foot). Be located such as not to impede escape. Each unit shall have a carbon monoxide detector and a sign both written and in pictographic form indicating action to be taken on activation of carbon monoxide detector.

No gas BBQ units unless flame failure device.



Photograph 5: Turn down valve i.e. screw on H valve.



Photograph 6: Ball valves with yellow strip after regulator and before appliance (2 per run serving an appliance)

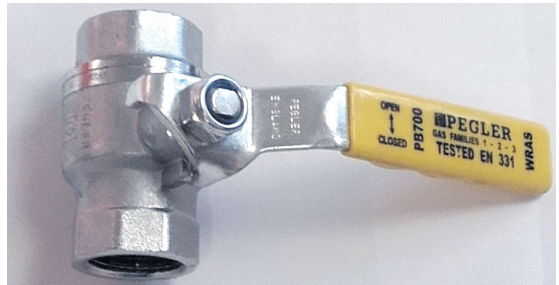


Photograph 7: Non return valves only

Cylinders shall be fitted with pressure relief valves and an emergency shut off.



Photograph 8(a): Pressure relief valve



Photograph 8(b): Emergency shut off

The low pressure regulator, this safely reduces the high pressure of the cylinder to a lower pressure.



Photograph 9: Low pressure regulator

The next pigtails connecting the regulator to the gas. The automatic change over with ball valve (plug and play).

Non appropriate tools shall never be used to turn on or off cylinders.

Cylinders shall be stored upright at all times and secured in a level manner so that they can't fall over.

Care shall be taken when changing cylinders that there are no naked flames or heat sources that may ignite gas i.e. cylinders shall be stored away from any ignition source. No cylinders to be changed when public are present unless by a suitably qualified and experienced gas engineer* [*they shall generally be the only person to change cylinders].

Cylinders shall not be located near entrances/exits and circulation areas, they shall not impede flow of persons in their vicinity due to placing. Appropriate escape route shall be available and identified for staff on concessions, (i.e. not acceptable for staff to vault the counter of concession)

Cylinder shall be turned off when not in use and left so until required.

Combustible material shall be kept away from cylinders.

In the event of a fire the fire brigade and event safety officer are to be immediately notified, even if the fire and issue(s) appears resolved.

The event safety officer shall make the fire brigade aware of location of units using gas, location of gas depot and have this information readily available in the event of an incident.

A suitable notice shall be fixed to the outside of the cylinders cage to warn of the presence of gas. The sign shall indicate "highly Flammable," "no smoking", "Use Caution" and to "keep the area clear".



Photograph 10: Safety Sign

No vehicles that require the engine running or generators shall be near gas rigs. Ideally 6 metres but can be less based on a comprehensive risk assessment.

Where used all fryers shall be fitted with an automatic high temperature-limiting device and non-adjustable thermostatic gas cut-off valve (this operates at a fat temperature of 230 degrees Celsius). A wet chemical extinguisher can also be fitted within the unit but there shall be the appropriate wet chemical extinguisher to hand as a minimum. Manual resetting of the gas supply valve shall be required and the device shall operate independently of the automatic temperature control gas valve. An intermediate temperature control shall be fitted to prevent the maximum temperature of oil or fat exceeding 205 degrees Celsius.

There shall be a 3 metres gap at rear of tent/marquee to caged gas.

There shall never be more than 200kgs or 4 cylinders (whose weight shall not exceed 200kgs) at any gas rig. This is a maximum figure and the amount of gas shall be kept to a minimum per recommendations of the suitably qualified and experienced gas engineer*.

GAS USED IN MARKET STALLS (ONLY).

When gas is used at a market i.e. an open and readily accessible area whereby no ticket is required or restriction on access is in place; they may use 5 metres of armoured hosing.

The caged gas set up shall be a minimum of 3 metre from marquee or tent. The requirement for 6 metres between gas rig is always required along with all the other minimum requirements.

There shall never be more than 100kgs or 2 cylinders (whose weight shall not exceed 100kgs) at any gas rig. This is a maximum figure and the amount of gas shall be kept to a minimum per recommendations of the suitably qualified and experienced gas engineer*.

ADDITIONAL REQUIREMENTS.

Where possible we would strongly recommend the following additional measures or to mitigate or reduce the level of risk on foot of a risk assessment.

- Gas slam shut valve. Gas detection.
- Localised suppression. Temporary fire resistant wall/partition/construct separation to provide 30 minutes fire resistance between cylinders and cooking for non-units.
- Fan in canopy (above appliance) linked to gas via pressure differential switch (or contact micro switch) i.e. if no flow of air/ventilation gas can't be turned on; to prevent Carbon monoxide poisoning. ('Gas Safety (Installation and Use) Regulations (Northern Ireland) 2004' Part V, Regulation 32)
- Low Pressure regulator with consumer safety reset and over-pressure shut-off.

For large number of vendors (8-10 vendors or more) using gas such as outdoor events or events over a number of days; then the suitably qualified and experienced gas engineer* shall be present on site. The suitably qualified and experienced gas engineer* shall regularly review gas rigs (at least twice a day) and shall control gas depot and the changing of gas cylinders.

A gas depot is an area far away from main concert area where the minimum required additional amount of gas is stored. Empty gas cylinders may be stored here.

The empty cylinders shall be removed regularly. The suitably qualified and experienced gas engineer* in consultation with the event safety officer on completion of a risk assessment shall decide on location and extent of gas depot; this shall be clearly identified and identifiable on a map in the event of an incident to the fire brigade officer in charge of an incident. The area shall be well ventilated, on a raised area well away from event and secure and monitored.

GAS IN THE CITY (BUILT UP URBAN AREAS)

In general this is not permitted due to residences near where gas rigs may be located and the issue of drains and difficulty of fire brigade access due to crowds and site restrictive nature of city.

However a comprehensive risk assessment and case will always be considered by the fire officer assessing same.

Items such as deadman's switch, Lower pressure gas e.g. butane, hand held wet chemical suppression, improved management (designated staff or professional), no overnight storage i.e. removal from site and reset each morning.

No gas shall be used in proximity to drains, gulleys or other such areas where gas can lie. Their use near residential areas shall be restricted and may only be considered upon acceptance of risk assessment and confirmation of minimum rig requirements.

GAS FIRE OR LEAK

Dublin Fire Brigade operations require an area of 150 metres radius around gas rig which is on fire. This safe zone shall be established immediately a fire in a gas rig has been identified and shall remain in place until the fire brigade officer in charge has given an all clear.

References

1. ORIGINAL ISSUE DATE: October 1997 ISSUE No: 3 RFN ISSUE DATE: August 2002
2. Guidelines for the Safe Use of LPG in Mobile Catering Installations. Calor Gas.

* The suitably competent and qualified gas engineer shall be experience in setting up LPG at events and markets.

Appendix 1

To detect leaks. If the solution bubbles there is a leak.



To ensure the connection is not allowing gas to escape.