



**Safety, Health & Environment  
Publication**

## **Cylinder Cage Instructions for Use**

Calor Gas Ltd. is always concerned for the health and safety of all its customers.

As part of our ongoing programme of customer safety and service, we produce a series of publications to provide information on safety issues, particularly where new requirements must be met.

This booklet contains information designed to give guidance to Calor Dealers, Retailers and Calor Customers.

The information in this document is believed to represent good practice at the time of publication. However, no responsibility or liability is accepted by Calor Gas Limited for any loss or damage arising out of the information given. It is important that consumers adhere to all legal requirements, Regulations, Industry Codes of Practice and Standards, particularly, those relating to safety.

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## 1.0 Introduction

In accordance with the requirements of section 6 of the Health and Safety at Work etc Act 1974, this booklet explains the nature of the products supplied to you and the general rules for keeping the cylinder cage in a safe working condition. The booklet also contains a bibliography detailing various Codes and literature which give full details of the potential hazards and precautions which should be taken at all times in the storage, handling and use of LPG

The Calor cylinder cages enable cylinders to be both stored securely and safely outdoors at a wide variety of retail outlets including shops, superstores, warehouses, garden centres and garage forecourts. The information given in this booklet is applicable to the total nett storage of between 15kg and 400kg of LPG in cylinders stored in a cage with a maximum cylinder size of 20kg.

If you require specific advice please contact the Technical Help Desk at Tachbrook Park (01926 318497).

## 2.0 Health and Safety Guidance

The cylinder cage and instructions for its use are designed to enable storage to conform with the guidance contained in LP Gas Association Code of Practice No 7 "Storage of Full and Empty LPG Cylinders and Cartridges".

This Code of Practice updates and merges three earlier documents all of which are now superseded:-

- HSE publication CS4 "The Keeping of LPG in Cylinders and Similar Containers"
- HSE publication CS8 "Small Scale Storage and Display of LPG at Retail Premises"
- 1986 edition of the Code of Practice 7.

Users are strongly recommended to obtain a copy of this Code of Practice from the LP Gas Association.

## 3.0 Features

Calor have two types of cylinder cage in use, Kudos and Ritchie cages, both are lockable.

Rigid and castor feet models are also available to suit the customers requirements.

The cage is intended for use with 3.9kg, 6kg, 13kg, 18kg and 19kg propane cylinders, in addition to 4.5kg, 7kg and 15kg butane cylinders.

The bottom shelf primarily holding the larger sized cylinders 13kg, 15kg and 19kg whilst the top shelf holds the smaller cylinders. Cylinders must be stored upright at all times.

**NOTE:** The weights detailed above refer to the nett weight shown on the cylinder. Please note a full cylinder weighs approximately twice the nett weight shown.

**The maximum amount of LPG in cylinder (gas weight) must not exceed 400kg per cage.**

The total weight of the cage is approximately:-

- Kudos 175kg when empty and a maximum of 1090kg when full of cylinders
- Ritchie 122kg (add 10kg per additional shelf) when empty and a maximum of 1058kg when full of cylinders.

#### **4.0 Construction, finish and marking**

The Kudos cage has an Epoxy Polyester Coated finish and the shelves are galvanised to the requirements of BS 729. The Ritchie cage and shelves are constructed from galvanised steel.

The cages can be fitted with feet or nylon castors with bearings, two of which are braked.

In addition to the Calor Gas Logo Plate, suitable notice or notices should be displayed prominently to indicate:

- LPG stored in the area
- That the contents are highly flammable
- That smoking or other sources of ignition are prohibited
- What to do in case of fire

Safety signs should conform to the Health and Safety (Safety Signs and Signals) regulations 1996. Guidance on these is given in leaflet IND(G) 184L "Signpost to Health and Safety (Safety Signs and Signals) regulations 1996; and L64 "Safety Signs and Signals; The Health and Safety (safety Signs and Signals) Regulations 1996: Guidance on Regulations".

**Note:** The cage shall display a message stating that not more than 400kg of LPG may be stored in the cage, (in accordance with LPGA CoP 7).

#### **Cage Dimensions**

##### **Kudos Cage**

- Overall height with castors 2100mm / with feet 2000mm
- Width 2460mm (cage door 1220mm)
- Depth 840mm

##### **Ritchie Cage**

- Height 1620mm
- Width 2080mm
- Depth 730mm

## 5.0 Properties of liquefied petroleum gas

Liquefied petroleum gas (LPG) which includes commercial butane, commercial propane and mixtures thereof can be easily liquefied by the application of moderate pressure. The liquid has approximately 1/250th of the gas volume and can thus be more conveniently stored in cylinders. The liquefied gas is vaporised for use as a fuel for heating, cooking etc.

LPG forms flammable mixtures with air in concentrations of between about 2% and 10%. It can, therefore, be a fire or explosion hazard if stored or used incorrectly. If LPG escapes into a confined space and is ignited, an explosion could result. If an LPG cylinder is involved in a fire, it will overheat and may, in severe heat, rupture violently, although a safety relief valve is fitted to significantly reduce the risk of this possibility.

LPG is normally odourised before distribution so that it has a characteristic smell, which can easily be recognised even in low concentrations.

Leaks of liquid gas or vapour from a cylinder valve may also be detected by sound or by frosting in the area of the leak. Small leaks may be detected by brushing the cylinder with a solution of detergent in water. Bubbles will form at the leak.

### **IN NO CIRCUMSTANCES SHOULD A NAKED FLAME BE USED TO DETECT A LEAK.**

LPG is colourless and its weight as a liquid is approximately half that of the same volume of water. If LPG is spilt on water it will therefore float on the surface before vaporising. The gas or vapour from LPG, however, is at least 1½ times heavier than air and does not disperse easily. It will tend to sink to the lowest possible level and may accumulate in cellars, pits, drains or other depressions. It is therefore important that LPG is always stored or used in a well-ventilated position so that any small leaks will disperse and be diluted to well below the flammable concentration.

When LPG is vaporised, heat is drawn in from the surroundings. LPG liquid can produce severe frost burns if it comes in contact with the skin.

## 6.0 Siting

The cylinder cage should be positioned in the open air (figure 1) on level concrete or compact ground and must be at least 1 m from a site boundary, buildings or source of ignition etc., unless fire resisting separation is provided.

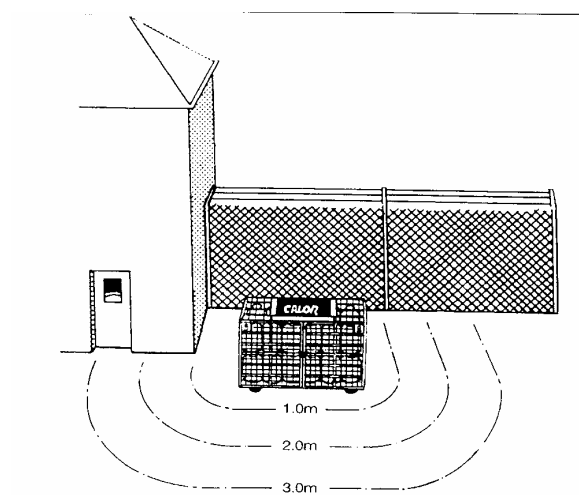


Figure 1. STORAGE IN THE OPEN AIR

Smoking, or other sources of ignition, including motor vehicles, should not be permitted within 1 m of the cylinder cage.

Only vehicles delivering or collecting LPG should be allowed to park within 3 m of the cylinder cage. When necessary, the cylinder cage should be protected from vehicle impact by positioning or the erection of suitable barriers.

No electrical apparatus should be installed either in or on the cage or within 1 m from it in any direction.

No opening into buildings, cellars or pits should be within 2m of the cylinder cage. Where a gully or drain is unavoidable within this distance, the opening should be securely covered or fitted with a suitable water seal.

No flammable liquids, combustible, corrosive or oxidising materials should be stored within 3m of the cylinder cage area unless they are separated from the area by a structure of 30 minutes' fire resisting construction.

**Oxidising materials include compressed oxygen, organic peroxides and sodium chlorate.**

The area within 1 m of the cylinder cage should be kept clear of weeds, rubbish and other combustible materials.

**Sodium Chlorate weedkillers must not be used.**

Effective ventilation will ensure that any small leaks will disperse and be safely diluted to well below the flammable concentration within a short distance of the source.

Care should be taken with the handling and stocking of cylinders within the cage to avoid both injury and cylinder damage.

Cylinders within the cage should be inspected daily to ensure the stocks are stable and that there are no damaged or leaking cylinders.

**In no circumstances should cylinders be placed on the top shelf of the cage unless the bottom shelf is full.**

## 7.0 Cylinder Storage

- The cylinder cage must not hinder or endanger the means of escape from the premises or adjoining premises.
- The outlet valve of every cylinder should be kept closed while the cylinder is in store or on display. Plastic caps or plugs must be fitted to cylinders even when they are regarded as empty.
- Cylinders must be stored or displayed with their valves uppermost. This ensures that if there is a leak from the valve area, vapour and not liquid will escape.
- At least one 9kg dry powder fire extinguisher **must be provided** in the vicinity of the cylinder cage and regularly serviced.
- No other materials should be stored within the cylinder cage.
- The cylinder cage should be kept locked and under direct supervision.
- **The Cylinder Cage should be located in a well ventilated position, in the open air.**

## 8.0 Storage against a wall or between two or three walls

Where necessary, cylinder cages may be located next to a boundary wall (with the wall owners permission), provided that the following conditions are met:

The wall is not less than 2m high, of not less than 30 minutes' fire resisting construction and imperforate on either side of the cylinder cage within 1 m of a boundary, 2m of any building, gully or drain and 3m of other flammable combustible, corrosive or oxidising materials.

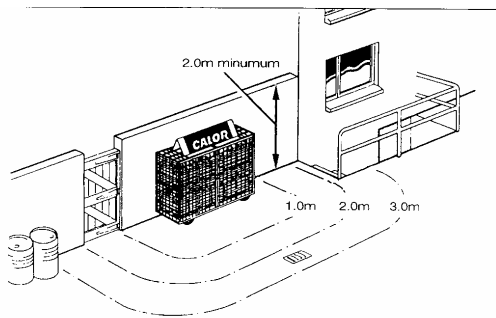


Fig 2 Storage against a wall

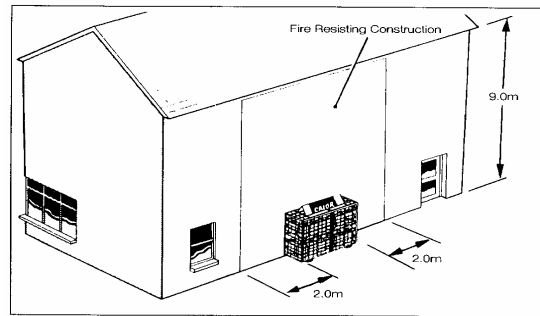


Figure 3. STORAGE AGAINST A BUILDING

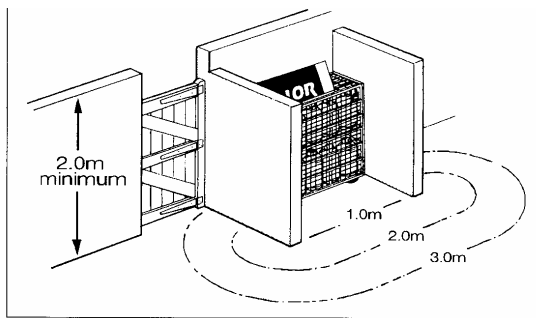


Figure 5. STORAGE BETWEEN TWO WING WALLS

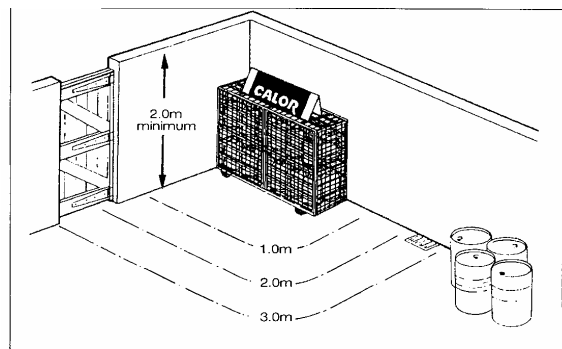


Figure 4. STORAGE IN A CORNER

The height of the cylinder cage does not exceed the height of the wall (Figure 2).

If the wall against which the cylinder cage is located is that of a building, any part of that facade including any overhanging roof up to a height of 9m and extending horizontally for a distance of 2m on either side of the cylinder cage, should be of 30 minutes' fire resisting construction and imperforate (Figure 3).

Where part of the building is used for residential accommodation, the facade against which the cylinder cage is located including any overhanging roof should be of 60 minutes' fire resisting construction and imperforate (Figure 3).

Passageways or yards enclosed by two or three walls and less than 3m wide by 5m long are generally unsuitable as areas in which to locate cylinder cages.

The cylinder cage may be stored in the angle between two walls, e.g. in the corner of a yard (Figure 4).

Where the cylinder cage is surrounded by three walls, at least one wall should be no higher than 3m.

It may sometimes be convenient to locate the cylinder cage in a bay between two wing walls (Figure 5). If such wing walls are less than 2m high, they should be discounted for separation purposes and the area should be treated as if the cylinder cage were located against a single wall as in Figure 2. If the wing walls are 2m or more high, separation distances may be calculated by measuring along and around the perimeter of the wing walls, (Figure 5) to enable doors to be located closer to the cylinder cage. The wing walls should not extend outwards more than 1 m beyond the cylinder cage to ensure that ventilation is not impeded.

Where more than one cage is used they shall not be located together but there shall be at least 2m separation distance between the cages as per section 2.4.2.3 of LP Gas Association Code of Practice 7.

## **9.0 Additional requirements for storage at petrol station premises.**

The Petroleum Officer or Local Authority must be consulted before a petrol station is considered suitable for the storage of LPG cylinders in cages as this will affect the petrol station's existing Petroleum Licence.

When cylinder cages are used on petrol station forecourts, a separation distance of 4.3m from petrol pumps and petrol storage tank manlids must be observed, as recommended in **HS/(G) 41**.

The Petroleum Officer has the right to prohibit the inclusion of LPG on any licensed site or can insist on any other safety precautions deemed necessary.

### **Notes**

It is the responsibility of the petroleum licensee to apply for LPG to be included in his licence.

The Petroleum Officer/Authority can be identified from the existing licence for the premises.

## **10.0 Inspection**

The cage shall be regularly inspected and any defects, including missing signage, broken or buckled shelves or shelf supports and padlocks as well as damage shall be reported to Calor Gas Limited, Customer Support Centre as soon as possible.

## **11.0 Fire and Emergency Procedures**

### **Procedure in case of fire**

Anyone who discovers a fire should call the Fire Brigade and tell them that LPG cylinders may be involved.

- (a) Nearby sources of ignition should be extinguished
- (b) an attempt should be made to stop the leak by closing the valve where possible and replacing the plug or cap.
- ( C ) If the leak cannot be stopped, the cylinder should be carefully removed to a well-ventilated open space clear of drains, buildings and sources of ignition. It should be marked faulty and left with the leak (usually at the valve) uppermost. General access should be prevented e.g. by temporary barriers. The supplier of the cylinder should be informed immediately.

**In no circumstances should retailers attempt to dismantle or repair defective cylinder valves.**

## **12.0 Training**

All employees should receive instruction and be trained in proper manual handling techniques and made aware of the gross weights of each of the cylinders to be stored. In addition employees should receive instruction and training to ensure that they understand the fire precautions and are aware of what they should do if there is leakage of LPG or a fire. All employees should be instructed and trained appropriate to their responsibilities in the event of an emergency. Notices stating the emergency procedure should be prominently displayed near the cylinder cage. Training advice and instruction is available from Calor Gas Limited, Customer Support Centre.



## 13.0 First Aid Measures

**Eyes:** Immediately flush eyes with plenty of cold tepid water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get immediate medical attention.

**Skin:** In case of cold burns, immediately place effected area in tepid water and keep immersed until circulation returns.

**Ingested:** No emergency care anticipated, the material is a gas at standard temperature and pressure.

**Inhalation:** Immediately remove patient to uncontaminated area. Keep warm and at rest. If breathing has stopped or shows signs of failing, commence artificial respiration. Summon immediate medical attention.

**Other Requirements:** Severe inhalation, over exposure to this product may sensitize the heart to catecholamine induced arrhythmias. Do not administer catecholamines to an over exposed person.

## 14.0 Basic Rules

- Site cylinder cage correctly and safely.
- Protect cylinder cage from fire.
- Deny unauthorised access to cylinders.
- Protect cylinder cage from vehicle impact.
- Display warning notices and provide dry powder fire extinguishers.
- Train employees.
- Keep cylinder cage locked and under direct supervision.
- Report any defects or damage to the cage to Calor gas

## 13.0 References

### ***Available from HM Stationery Office***

The Health and Safety at Work etc. Act 1974

The Management of Health and Safety at Work Regulations 1999

Manual Handling Operations Regulations 1992

The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972

The Gas Safety (Installation and Use) Regulations 1998

The Health and Safety (Safety Signs and Signals) Regulations 1996

**Available from HSE Publications**

HS (G) 41 Petrol filling stations: Construction and operation.

**Available from British Standards Institution,**

BS476: Fire tests on building materials and structures.

Part 20: Method for determination of the fire resistance of elements of construction (general principles.)

Part 21: Methods for determination of the fire resistance of load bearing elements of construction.

Part 22: Methods for determination of the fire resistance of non-load bearing elements of construction.

Part 23: Methods for determination of the contribution to the fire resistance of a structure.

NOTE tests conforming to BS476 Part 8 performed after 1988 are not valid. Part 8 has been withdrawn and replaced by BS476 Parts: 20 - 23 inclusive.

BS4250: Specification for commercial butane and propane.

BS5045: Transportable gas containers. Part 2: Steel containers up to 450 litres water capacity with welded seams.

BS5306: Code of Practice for fire extinguishing installations and equipment on premises.

Part 1: Hydrant systems, hose reels and foam inlets.

Part 3: Portable fire extinguishers, selection installation and maintenance.

BS EN 60079 – 14:1997, IEC 60079-14:1996 Electrical apparatus for explosive gas atmospheres. Electrical installations in hazardous areas (other than mines)

Part 1: Basic requirements for all parts of the code.

BS 5499: Fire Safety signs, notices and Graphic Symbols.

BS 5499: Part 1: Specification for fire safety signs.

BS EN 3: Portable Fire Extinguishers.

BS EN 3-1: Description, duration of operation, class A and B fire test.

BS EN 3-2: Tightness, dielectric test, tamping test, special provisions.

BS EN 3-3: Construction, resistance to pressure, mechanical tests.

BS EN 3-4: Charges, minimum required fire.

BS EN 3-5: Specification and supplementary tests.

BS EN 3-6: Provisions for the attestation of conformity of portable fire extinguishers in accordance with EN 3 Part 1 to Part 5.

BS 7863: Recommendations for colour coding to indicate the extinguishing media contained in portable fire extinguishers.

LPGA Code of Practice No. 7 “Storage of Full and Empty LPG Cylinders and Cartridges” available from:-

LP Gas Association

Pavilion 16, Headlands Business Park

Salisbury Road

Ringwood

Hampshire, BH 24 3PB

Tel: 01425 461612

Fax: 01425 471131

All general enquiries contact

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