



## **LPG Code of Practice**



**TOTALGAZ**

# LPG Code of Practice

The performance of LPG cylinder installations is a critical element in ensuring that gas is supplied to appliances reliably and safely. This Code of Practice has been compiled with advice and input from across the industry in Nigeria and from international authorities.

The Code of Practice captures the latest knowledge and design features gained from operating experience and investigative work conducted by the LPG Association. The purpose of this Code of Practice is to:

- Assist with the reduction of phthalates from LPG systems.
- Assist with the removal of condensate at the regulator.
- Assist with the selection of suitable equipment and fittings.
- Assist with recommendations on equipment maintenance.
- It should be read in conjunction with Standards covering LPG cylinder storage.

It is intended that 3Gas suppliers and fitters will use this Code as a best practice guide for the installation and maintenance of domestic and commercial installations.

## **1. SCOPE, INTERPRETATION, DEFINITION AND GENERAL**

### **1.1 Scope**

This Code of Practice sets out the requirements for installation and servicing of domestic and commercial cylinder LPG installations.

### **1.2 Definitions**

For the purposes of this code the following definitions shall apply:

**Accessible:** Access can be gained without hazard or undue difficulty for repairs, testing, maintenance, renewal or operational purposes.

**Breather vent:** An orifice or opening designed to permit atmospheric pressure to act on the diaphragm of a regulator.

**Condensate:** The liquid that separates from the gas downstream of any regulator due to the reduction in temperature

resulting from pressure reduction.

**Condensate trap** (also known as a drip leg or tailpipe) – A device installed in a gas line to trap the condensate liquid

**Enclosure:** A compartment, an enclosed area or a partitioned - off space primarily used for the installing of a gas cylinder meter, or gas pressure regulator.

**EMA:** Meaning the “Environmental Management Authority.

**Gas fitting:** Has the same meaning as in the Plumbers, Gasfitters and Drain layers.

**Gas load:** The total gas consumption of all downstream appliances.

**Gas Pressure Regulator:** A device that automatically regulates the outlet pressure of the gas passing through it to a predetermined value.

**Automatic Change - Over Regulator:**

Combination valve / first stage gas pressure regulator, fitted to a LPG multiple - cylinder installation which will automatically change over from a cylinder in use to a reserve cylinder at a predetermined pressure. May be included in a one piece automatic changeover valve assembly comprised of automatic changeover valve, first and second stage regulators and may incorporate pressure relief or over pressure shut off capability.

**HSNO:** Hazardous Substances and New Organisms.

**LAB number:** Number allocated by OSH when a cylinder is approved.

**Lock - up pressure:** The maximum pressure in an installation when the regulator has closed and all appliances are shut down.

**Phthalates:** Plasticisers mainly DOP (DiOctyl Phtalates) predominantly found in hose inner liners.

**POL fitting (Prest – O - Lite):** The common name given for a standard union with left hand thread, used for connection to a 45 Kg cylinder.

**Pigtail:** A short length of flexible tube or copper pipe completed with end couplings. Use for connecting the cylinder to the manifold or the changeover valve.

**Pressure:** Pressure as measured above atmospheric pressure, also called gauge pressure.

**Twin cylinder installation:** A cylinder installation where the cylinders are connected separately to the system. Each cylinder is connected to a change over valve that can be operated manually or

automatically, to change over the cylinder which is supplying LPG to the installation. Connection may be made using flexible rubber or copper pigtails, or pipe fittings.

## SECTION 2: SELECTION CRITERIA FOR LPG CYLINDERS AND REGULATORS

### 2.1 Cylinders

- (a) All cylinders must comply with the requirements of the Authority\*.
- (b) Cylinders filled for use in LPG installations must be stamped with an LAB number and a current test date.
- (c) Consideration should be given to ensure that the demand of the appliances to be connected to the system can be supplied by a 45kg cylinder. As a guide a 45kg cylinder is capable of supplying a duty cycle of 1kg/50MJ over the period of 1 hour. The instantaneous demand can exceed this rate for short periods.

\*Note: currently cylinders have to comply with the requirements of the Dangerous Goods

Regulations and the Guide to Gas Cylinders.

Regulators should be designed to cope with the presence of condensate found in small quantities in the LPG. This design can include such things as the specification of the material used for the components in the regulator and the serviceability of the regulator.

## SECTION 3: LOCATION OF CYLINDERS

### 3.1 Location of Cylinders

Cylinders and associated equipment should be installed external to buildings, except where local laws permits.

### 3.2 Prohibited Locations:

Cylinders should not be installed in the following locations:

- (a) In an inaccessible location;
- (b) Under a stairway;
- (c) In a location where there would be no air movement across the cylinder;
- (d) Under a building
- (e) In a position that would obstruct egress from a building;
- (f) Buried in the ground; or
- (g) Where damage is likely to occur, unless adequate protection is provided

### 3.3 Requirements for cylinder deliveries.

Cylinder installations should be located such that the delivery of gas can be made safely by one person without excessive manual handling or risk to customer's property. In situations where the following conditions cannot be satisfied, other options such as locating the cylinders remotely and piping to the installation should be considered.

- (a) Cylinder installation must be designed to be capable of accommodating the size of cylinder intended for use.
- (b) A minimum distance of 600mm should be provided between front of the cylinder installation and other structures to allow adequate access for the cylinder delivery to be made.
- (c) The cylinder compound should be accessible by cylinder trolley.
- (d) Paths should have a minimum width of 600mm.
- (e) Steps should have a minimum of 2:1 tread depth to tread rise. Maximum tread rise should be 125mm.
- (f) Steps should not exceed 1.5m total rise.
- (g) Paths should not exceed 20 degree gradients.
- (h) Total distance from cylinder delivery truck parking area and cylinder installation should not exceed 75m.
- (i) It must be possible to legally and safely park the truck while making the delivery.
- (j) Access route should be firm and compact even in wet conditions.
- (k) The access route should not be over delicate or decorative surfaces such as terracotta.

## SECTION 4 INSTALLATION OF CYLINDERS

### 4.1 General

- (a) Cylinders shall be installed upright with the valve uppermost to ensure the inlet to the safety valve remains in the vapour space clear of the liquid content of the cylinder.
- (b) Clearances around cylinders shall comply with 4.6
- (c) Where two or more exchange cylinders are installed, a manual or automatic changeover valve shall be fitted immediately upstream of the regulator. This valve may be an integral part of an automatic changeover regulator.

#### 4.2 Support

- (a) Cylinders shall not be supported by other cylinders.
- (b) Cylinders shall be installed on supporting bases that are firm, level, of non – combustible material, and with a finished surface that is drained and at least 50mm above the surrounding surface. Soil is not considered an acceptable supporting base.
- (c) All cylinders larger than 25L capacity shall be securely held in place by chains and brackets. The brackets shall be fastened to a wall or similar robust anchorage. The cylinder's fastenings must be capable of withstanding a steady applied load equal to four times the weight of the filled cylinder.

#### 4.3 Cylinder Connection

- (a) Cylinders should be connected directly to the changeover valve assembly by copper or flexible rubber pigtails.
- (b) An excess flow valve shall be fitted immediately upstream of the piping or hose assembly. This excess flow valve may be an integral part of the POL fitting.
- (c) Pigtails connecting cylinders to changeover valves or manifolds should not exceed 1M in length.
- (d) A non - return valve must be fitted in the supply between each cylinder and the changeover valve, or in a manifold system, between each cylinder and its manifold connection.

#### 4.4 Cylinders in an Enclosure or Recess

- (a) Where a cylinder is to be installed in an enclosure or recess, the enclosure or recess shall be designed to house cylinders and their associated equipment only and should;
  - (i). Allow free unimpeded discharge from each cylinder safety valve;
  - (ii). Ensure that water will not accumulate on the base;
  - (iii). Ensure the cylinder and its associated equipment is clear of the surrounding soil.
- (b) Enclosures of sheet metal or similar impervious construction shall have ventilation openings at the top and bottom, with each opening providing a free area of at least 20,000 mm<sup>2</sup> (200mm x 100mm) for every cylinder enclosed.

#### 4.5 Cylinders under Buildings Supported on Piers

Where a cylinder is to be located under a building that is supported on a pier:

- (a) No part of the cylinder shall be more than 400mm inside the building wall perimeter;
- (b) The area between the piers shall be:
  - (i) open on at least three sides; or
  - (ii) enclosed by a construction through which cross - ventilation can occur (e.g. slats or battens) on at least three sides; or
  - (iii) a combination of both items (i) and (ii) above

Where the area between piers is walled - in as a vapour - proof construction, the limitation of (a) still applies.

#### 4.6 Clearances around Cylinder

Cylinders should be installed with clearances and at least 1 metre from any readily ignitable material. Readily ignitable materials include paper, dry grass or oily substances. Discharge from pressure safety relief device is to be directed away from the building. A cylinder is permitted within the perimeter of a building having this type of construction, provided the requirements are met. Open piers, batten walls, or vapour – proof walls.

#### 4.7 Cylinder Safety Valve Discharge

The discharge point of the cylinder safety valve shall be directed away from any other cylinder, piping, building, drain and any opening into or under a building.

#### 4.8 Regulators

Regulators should be located outside buildings, except where an indoor location is permitted by authorities. Regulators should be:

- (a) Rigidly fixed to the cylinder with the vent pointing vertically downwards;
- (b) Protected from the entry and accumulation of water (e.g. sprinkler water, rainwater etc) and other foreign matter.

#### 4.9 Test Points

A pressure test point should be installed immediately downstream of each second stage regulator. Such test point may be an integral part of the regulator.

## **SECTION 5 MAINTENANCE OF MULTI – LPG CYLINDER INSTALLATIONS.**

### **5.1 Cylinders**

Cylinders should not be filled unless they have been tested and certified within the last ten years.

### **5.2 Pigtails**

(a) Pigtails should be inspected visually for cracks and deterioration every time the cylinder is exchanged or filled.

(b) Pigtail connections should be checked with a soapy solution every time the cylinder is changed or filled.

(c) Pigtails should be replaced every five years.

### **5.3 Change - over Valves**

Changeover valves should be checked for correct operation in accordance with manufacturers' recommendations or in the absence of any recommendation, at least every ten years.

### **5.4 Regulators**

(a) The regulator to be checked for correct operation in accordance with the

manufacturers' recommendations, or in the absence of any recommendation at least every ten years.

(b) The condensate trap to be drained by removing the drain plug provided) at intervals not exceeding two years, and at every visit of the Gas fitter

(c) The rubber diaphragm and rubber seat must be inspected for deterioration and replaced if necessary.