

**SRI LANKA STANDARD 1196 : PART 6 : 2000**  
**UDC 665.72**

**CODE OF PRACTICE FOR**  
**TRANSPORT, STORAGE AND**  
**HANDLING OF LPG**  
**PART 6 : USE OF LPG IN CYLINDERS AT RESIDENTIAL**  
**PREMISES**

**SRI LANKA STANDARDS INSTITUTION**



**CODE OF PRACTICE FOR TRANSPORT, STORAGE AND  
HANDLING OF LPG  
PART 6 : USE OF LPG IN CYLINDERS AT RESIDENTIAL PREMISES**

**SLS 1196 : Part 6 : 2000**

**Gr. 4**

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SRI LANKA**

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CODE OF PRACTICE FOR TRANSPORT, STORAGE AND  
HANDLING OF LPG  
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**FOREWORD**

This standard was approved by the Sectoral Committee on Liquefied Petroleum Gas Industry and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2000-09-21.

The objective of this part of the Code of Practice is to provide guidance primarily to dealers, stockists, installers, users and authorities for the safe use of LPG in cylinders at residential premises.

The other parts of this Code of practice are as follows:

- Part 1 : General provisions
- Part 2 : Design installation and maintenance of bulk LPG storage at fixed installation
- Part 3 : LP Gas piping system - Design and installation
- Part 4 : Safe filling of LP gas at depots
- Part 5 : Storage of full and empty LPG cylinders and cartridges
- Part 7 : Transport of LP gas in cylinders by road, rail or on water
- Part 8 : Safe handling and transport of LPG in bulk by road

The Sri Lanka Standards Institution gratefully acknowledges the use of the following publications, in the preparation of this code:

- a. **Code of practice number 24** - Part 2: 1998 - Use of butane in cylinders at residential premises; published by the Liquefied Petroleum Gas Industry Technical Association (UK).

**1 SCOPE**

**1.1** This part of the Code of Practice covers the installation and safe use of LPG in cylinders at residential premises.

**1.2** Cylinders covered by this code are refillable and designed, manufactured and maintained in accordance with **SLS 1178**.

**1.3** This part of the code does not cover the following:

- a) non - refillable cartridges and associated equipment;
- b) installation and use in boats and caravans; and
- c) liquid off take uses.

## **NOTE**

*This code does not preclude the use of alternative designs, materials and methods where these could provide equivalent or better standard of safety as judged by a competent person.*

## **2 REFERENCES**

BSEN 449	Liquefied petroleum gas appliances - Domestic flueless space heaters
BS 5440	Codes of Practice for flues and air supply for gas appliances
BS 5482	Code of Practice for domestic butane and propane gas burning installations Part 1. Installation in permanent dwellings
SLS 712	Liquefied petroleum gas
SLS 1171	Flexible rubber tubing, rubber hose and rubber hose assemblies for use in LPG vapour phase and LPG/air installations
SLS 1178	Transportable welded steel gas containers of 0.5L up to 150 l water capacity for liquefied petroleum gas
SLS 1180	Pressure regulators and automatic changeover devices for liquefied petroleum gases
SLS 1184	Valve fittings for use with liquefied petroleum gas cylinders

## **3 DEFINITIONS**

For the purpose of this standard the following definitions shall apply:

**3.1 atmosphere sensing device:** A device that is designed to shut off the main gas supply when the carbon dioxide content of the surrounding atmosphere exceeds a given level. Such a device normally comprises a carbon dioxide content in atmosphere sensitive pilot in conjunction with a suitable flame supervision device.

**3.2 cartridge:** Non-refillable, disposable container for LPG of less than 1.4 l water capacity.

**3.3 cylinder:** A portable, refillable container for LPG of up to 150 l water capacity.

**3.4 cylinder valve:** A device designed to release LPG for use from a cylinder when open and to ensure a leak free seal when closed.

**3.5 fixed heater:** A heater designed to be permanently fixed to a wall or floor.

**3.6 LPG:** Commercial butane and commercial propane to **SLS 712** and any mixtures thereof.

**3.7 mobile heater (cabinet heater):** A self contained heater incorporating its own LPG cylinder within the body of the appliance and designed to be moved without lifting.

**3.8 permanent dwelling:** Structure of a permanent nature, to which appropriate building regulations apply and which is used primarily for domestic purposes.

**3.9 regulator:** A device for automatically maintaining a constant gas outlet pressure at the level it is set.

**3.10 residential premises:** Includes permanent dwellings as above and which has sleeping accommodations.

**3.11 room sealed appliance:** An appliance which when in operation has the combustion air inlet and the combustion products outlet isolated from the atmosphere of the room in which the appliance is installed.

## **4 INSTALLATIONS**

### **4.1 General**

**4.1.1** All appliances and equipment installed and used shall comply with the requirements of the appropriate Sri Lanka Standards or equivalent as applicable. LPG appliances popularly used at residential premises are listed in Appendix A.

**4.1.2** Where a number of appliances are to be connected to an LPG supply it is recommended that they be supplied from cylinders or bulk storage vessel located outside the premises via fixed permanent metal pipework.(See Note)

### **NOTE**

*This standard does not cover the requirement of installation of bulk storage.*

**4.1.3** Appliances may be supplied from LPG cylinders located inside the premises subject to a maximum of 25 kg in not more than two cylinders, per dwelling.

**4.1.4** The likely maximum gas supply rate and the duration for the appliances needs to be assessed to ensure that adequate vaporisation from LPG cylinders could be achieved.

**4.1.5** Appliances supplied from LPG cylinders located outside the premises may not be capable of supplying sufficient gas in cold weather.

**4.1.6** Recommendations and guidance on vaporisation rates and appliance gas demand is given in **BS 5482 : Part 1**.

**4.1.7** An LPG cylinder housed in a suitable compartment as in 4.2 and located adjacent to a single appliance may be connected by a flexible hose complying with **SLS 1171** or equivalent, provided this does not exceed 1 m in length.

Supplies to more than one appliance should be via suitable properly installed metal pipework except that the feed into this pipework from the cylinder regulator may be by a flexible hose which should not exceed 0.5 m in length.

**4.1.8** Notwithstanding **4.1.7** hoses used for connections shall be as short as practicable, consistent with providing the flexibility in service as required.

**4.1.9** The installation of fixed permanent pipework and fittings shall comply with the appropriate requirements in **SLS 1196 : Part 3**.

**4.1.10** The gas pressure should be regulated from the cylinder(s) to the standard low pressure appropriate for the equipment i.e 2.8 kPa.

## **4.2 Cylinder protection and housing**

**4.2.1** The LPG supply cylinder(s) shall be located in a safe place, secure against interference, in a room or compartment or housing in which:

- a) the opening of the compartment is of a size which will permit the easy introduction and removal of the cylinders;
- b) effective ventilation is provided by openings at its base and upper section, the total area of the opening at the upper section being at least 1/100 of the floor area of the compartment and that at the base being 5/100 of the floor area of the compartment;
- c) the base has sufficient mechanical strength to resist deformation under the weight of full cylinder;
- d) cylinder valves are readily accessible and remain easy to manipulate when the cylinders are in place; and
- e) no combustible materials are used in the construction.



**4.2.2** The location of the room, compartment or housing shall be either at the ground level or above, and NEVER IN CELLARS OR BASEMENTS, where natural floor level ventilation is not available.

#### **4.3 Flues and ventilation**

It is essential that all flueing and ventilation is adequate.

#### **4.4 Appliance installation**

Appliances shall be installed according to manufacturer's instructions with account taken of the relevant Sri Lanka Standards or Codes of Practice when available or other National or International Standards or Codes of Practice if relevant Sri Lanka Standards or Codes of Practice are not available.

#### **4.5 Commissioning**

Tests and checks shall be carried out in accordance with the requirements of **BS 5440 : Part 1 and Part 2** and the Appendices of **BS 5482 : Part 1**.

### **5 HANDLING AND STORAGE OF CYLINDERS**

#### **5.1 General requirements for storage of full and empty cylinders not in use**

**5.1.1** LPG cylinders should be stored in a well ventilated position, preferably in the open air.

**5.1.2** Cylinders must be stored in an upright position with the valve uppermost and the protective caps or plugs in position where appropriate.

**5.1.3** Cylinders must not be stored near to any sources of heat, sources of ignition, or quantities of combustible or ignitable material. The storage shall always be at or above ground level.

**5.1.4** The storage area shall be essentially flat and level, without any low unventilated cavities and well away from any drains or gullies.

**5.1.5** The storage area shall not obstruct any means of access, passageways or emergency exits.

**5.1.6** Cylinders must not be stored near to any corrosive, toxic or oxidant materials.

**5.1.7** Detailed requirements for the storage of larger quantities of cylinders are given in Part 5 of this Code of Practice.

## **5.2 Keeping of spare cylinders inside premises**

**5.2.1** Where it is necessary to keep spare LPG cylinders indoors at a permanent dwelling the amount should be limited to a maximum of 15 kg of LPG in not more than two cylinders and the requirements of **5.1.2** to **5.1.6** shall be met.

## **5.3 Handling and changing of cylinders**

**5.3.1** All cylinders must be handled with care. They shall not be dropped or allowed to come into violent contact with any object.

**5.3.2** Cylinders shall be handled in an upright position and must not be used for any purpose other than that for which they are intended.

**5.3.3** Changing cylinders indoors should be done in a well ventilated area. Opening a door or a window will increase ventilation. No sources of ignition, e.g. naked flames, pilot lights, lighted cigarettes shall be nearby when changing cylinders.

**5.3.4** The pressure regulator must be of the correct size and type for the cylinder valve and the required duty.

**5.3.5** Before a regulator is disconnected from a quick coupling type valve the regulator switch must be turned to the 'off' position, and this action must extinguish the flame of the appliance if it is in operation. **IF THE FLAME DOES NOT GO OUT WHEN THE REGULATOR IS TURNED OFF, THE APPLIANCE SHOULD BE LEFT ALIGHT AND THE DEALER CONTACTED.**

**5.3.6** Before changing a cylinder fitted with a hand wheel valve, the hand wheel valve must be closed and the appliance switched off before the cylinder is disconnected. Also the hand wheel valve on the new full cylinder must be closed before the protection plug or cap is removed.

**5.3.7** After connecting a cylinder a check should always be made that there are no gas leaks from the cylinder connection. Leaks may be detected by sound, smell or by frosting in the area of the leak.

**5.3.8** The cylinder valve mating connections and sealing washers must be clean and undamaged before making the joint.

**5.3.9** Disconnected nominally empty cylinders should be treated as full. Hand wheel valves when available shall be kept closed to prevent air diffusion into the cylinder which

could form a flammable mixture with the vapour. Valve outlet caps or plugs shall be replaced. Nominally empty cylinders should be returned to a safe place as **5.1** and **5.2**.

## **6 CONDITIONS FOR USE OF LPG CYLINDERS IN CERTAIN SPECIFIED PREMISES**

### **6.1 High rise buildings and flats etc.**

**6.1.1** Appliances using LPG may be used in dwellings in high-rise buildings of standard construction, except in those of 5 or more stories including any basement.

**6.1.2** Not more than 15 kg of LPG should be kept per unit dwelling.

**6.1.3** Appliances shall be located so as not to impede any means of escape.

### **6.2 Schools, hospitals, old people's homes etc.**

**6.2.1** LPG appliances and cylinders should not be used or allowed in situations where they cannot be adequately and safely controlled.

## **7 SERVICE AND MAINTENANCE**

### **7.1 General**

All LPG appliances must be correctly maintained and regularly serviced according to the manufacturer's instructions by a competent person to ensure satisfactory operation throughout their working life.

### **7.2 Cylinders and cylinder valves**

The inspection and maintenance of cylinders and valves is the responsibility of the company which owns them (not the hirer).

### **7.3 Fittings**

**7.3.1** All flexible hoses should be periodically inspected for deterioration, cracking, etc. and replaced when found necessary.

**7.3.2** Regulators and changeover valves should be checked at regular intervals for general condition and satisfactory performance.

## **8 TRAINING**

**8.1** All persons responsible for the retailing of LPG cylinders and /or appliances that operate on LPG should be trained to ensure that they understand the properties and hazards of LPG so that they could give appropriate advice to customers. They should be aware of what actions to take and advice to give in an emergency.

Those concerned with the installation and servicing of LPG appliances should be suitably trained and be competent to understand the following:

- a) use and siting of appliances
- b) combustion characteristics
- c) ventilation
- d) flues
- e) fault diagnosis

## **9 USER INSTRUCTIONS**

### **9.1 General**

**9.1.1** Users of LPG cylinders and appliances should be supplied with adequate safety and operation instructions. These should include safety information on LPG and details of how and where to change cylinders safely (See **5** and **6**). The need for regular servicing of appliances by a competent person to maintain proper combustion and the need for adequate ventilation should be stated clearly on operating instructions.

The attention of users should be drawn to the need to observe instructions supplied with appliances.

**9.1.2** Ownership of cylinders, valves, regulators etc., shall be clearly defined, and also the consequent responsibilities for maintenance and servicing.

### **9.2 Emergency procedures**

**9.2.1** LPG suppliers shall provide all users with instructions on actions to be taken in the event of an emergency, i.e. a gas leak or fire in the vicinity of cylinders.

**9.2.2** In the event of a GAS LEAKAGE or SUSPECTED LEAKAGE:

- a) extinguish all naked flames and ignition sources.
- b) turn off all gas appliances.
- c) do not switch on or off any electrical equipment.
- d) open doors and windows to increase ventilation.
- e) turn off gas supply at cylinder.

- f) NOTIFY the gas supplier.
- g) do not use any gas appliance until it has been made safe and tested.

**9.2.3** In the event of FIRE:

- a) call the Fire Brigade immediately and inform them that LPG cylinder(s) are on the premises.
- b) turn off the gas supply if practicable and safe to do so.

**APPENDIX A**

**LPG APPLIANCES USED AT RESIDENTIAL PREMISES**

**A.1 Fixed flueless and mobile flueless space heating appliances.**

All flueless domestic heating appliances should conform to either **BSEN 449** or the appropriate Sri Lanka Standard when available.

A particular feature on the mobile heater is the requirement for an atmosphere sensing device. This device usually comprises a precision pilot which will 'lift' when the air in the room is contaminated with carbon dioxide (CO<sub>2</sub>) over a pre-set level. The pilot is used in conjunction with the thermocouple of a flame failure device. When the CO<sub>2</sub> level in the room rises to a predetermined level, the pilot flame will lift away from the thermocouple which will cool and then close the flame supervision device and hence cut off the gas supply to the heater.

The combustion performance of the appliance is required to be maintained up to the point at which atmosphere sensing pilot cuts off the gas.

**A.2 Cookers, water heaters and other appliances**

Appliances such as Cookers, Water Heaters etc. for use LPG shall comply with the requirements of the appropriate Sri Lankan, or other reputed International Standards.

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## **SLS CERTIFICATION MARK**

*The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI which includes surveillance inspection of the factory, testing of both factory and market samples.*

*Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*



## **SRI LANKA STANDARDS INSTITUTION**

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.