

Government of HKSAR
Electrical and Mechanical Services Department
Gas Authority

GUIDANCE NOTE 19

SAFETY OF DISPOSABLE LPG CYLINDERS



Issue 1, September 2010

Safety of Disposable LPG Cylinders GU19

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Section 1: Foreword and Scope

- 1.1 This document is prepared as a general guideline for disposable cylinders containing liquefied petroleum gas (LPG). LPG is pressurized and stored in liquid form in disposable cylinders for a variety of purposes. These include cartridges for gas appliances especially cassette cookers, camping/decoration appliances and canisters for LPG lighter refill.
- 1.2 This guidance note does not include the safety requirements which are related to disposable cylinders containing fuel other than LPG which is outside the jurisdiction of the Gas Safety Ordinance, Cap.51.
- 1.3 LPG is one of the gases falling within the definition of gas under the Gas Safety Ordinance Cap. 51 and the LPG containers including disposable cylinders are under the control of the Ordinance. Importers, local manufacturers, suppliers and retailers have to comply with all relevant current statutory provisions under the Laws of the Hong Kong Special Administrative Region, with particular reference to the Gas Safety Ordinance, Cap. 51 and the subsidiary legislations, and related statutory provisions under other government department(s), such as Fire Services Department, Buildings Department, etc.
- 1.4 This guidance note must be read in conjunction with the relevant manufacturer's instructions and shall not supersede such instructions unless the latter conflict with statutory provisions.
- 1.5 This guidance note should not be regarded as exhaustive. It is not intended to relieve person from undertaking the work of their statutory responsibilities in accordance with the safety legislations.
- 1.6 This guidance note does not purport to address all of the safety concerns, if any, associated with the safety requirements

therein. It should determine the applicability of relevant regulatory requirements and establish the appropriate safety and health practices prior to the use of this guidance note.

Section 2: Terminology

Container – a bulk tank, mini-tank or cylinder.

Disposable LPG Cylinder – a container which is not constructed or intended to be refilled with liquefied petroleum gas after once containing such gas.

Liquefied Petroleum Gas (LPG) – any gas which is a mixture of the hydrocarbons primarily consisting butanes, butylenes, propane or propylene.

Gas Authority – the Gas Standards Office(GasSO), Electrical and Mechanical Services Department, Government of the Hong Kong Special Administrative Region, on behalf of the Gas Authority appointed under Section 5 of the Gas Safety Ordinance Cap.51.

Importer – a person who engages in the business of importation of disposable LPG cylinders for supply, sale or use in Hong Kong.

Manufacturer – a maker of disposable LPG cylinders for use in Hong Kong.

Supplier – an organization in connection with local sale or supply business of disposable LPG cylinders for use in Hong Kong excluding the importer and local manufacturer.

Retailer - a person, shop or business that sells disposable LPG cylinders to the public.

Recognized Safety Standard – an international, or national safety design and manufacture standard recognized by the Gas Authority.

Type-test Certificate – a certificate issued by a Recognized Testing Authority to certify that a disposable LPG cylinder complies with relevant international or national safety standard(s).

Notifiable Gas Installation – a gas installation which is defined under the interpretation of “notifiable gas installation” in Part I of Gas Safety Ordinance, Cap. 51.

Section 3: Legislative Requirements

3.1 Gas Safety Ordinance, Cap.51

Gas Safety Ordinance

An Ordinance to control, in the interests of safety, the importation, manufacture, storage, transport, supply and use of gas, and to provide for matters incidental thereto or connected therewith.

3.2 Regulation 3 of the Gas Safety (Registration of Gas Supply Companies) Regulations, Cap.51E reads:

Only registered gas supply company may carry on business of gas supply company

- (1) Subject to subregulation (2), no person other than a registered gas supply company shall carry on the business of a gas supply company.
- (2) A person may supply liquefied petroleum gas if he has the approval in writing so to do of the registered gas supply company which imports or manufactures such gas.

3.3 Regulation 7(1)(a) of the Gas Safety (Gas Supply) Regulations, Cap. 51B reads:

Only approved containers may be used to contain liquefied petroleum gas

- (1) Subject to subregulation (2), the owner of a container shall not use the container to contain liquefied petroleum gas unless the container –
 - (a) has been approved in writing, or is of a type which has been approved in writing, by the Authority for such use; or
 - (b) is of a type which has been approved under regulation 64 of the Dangerous Goods (General) Regulations (Cap.295 sub. leg.) for such use and such approval was in force immediately before the commencement of the Ordinance.

- (2) Where the Authority is satisfied that a container to which subregulation (1)(a) or (b) applies –
 - (a) has shown to be prejudicial to the safety of the members of the public; or
 - (b) has, for any other reason (including its supersession by another type of container), ceased to be of a standard of safety acceptable to the Authority.

then the Authority may, by notice in the Gazette, specify a date on and after which the owner of the container shall cease to use the container to contain liquefied petroleum gas.

An importer or a local manufacturer wishing to import or manufacture respectively for sale or supply of a model of disposable LPG cylinder for use in Hong Kong shall apply to the Gas Authority for type approval before the import or manufacture of the product. Application form for type approval of disposable LPG cylinders is attached in Appendix 4.

Section 4: Type Approval of Disposable LPG Cylinders

4.1 Requirements:

- (a) An importer or a local manufacturer wishing to supply a new model of disposable LPG cylinder in Hong Kong shall apply to the Gas Authority for type approval in accordance with this Guidance Note.
- (b) Disposable LPG cylinders should comply with all the requirements specified in a relevant reputable international or national standard which is acceptable to Gas Authority, e.g. GB, BS, JIS, EN, etc.
- (c) Disposable LPG cylinders should have relevant type-test certificate and full test report issued by an independent recognized testing laboratory showing the full compliance with international or national standard concerned. This testing laboratory or some independent organisation should be responsible for monitoring the quality of the disposable LPG cylinders to ensure that they are maintained at an acceptable standard.
- (d) An importer or a local manufacturer shall be responsible for ensuring the validity of the type-test certificate and renew the certificate if necessary for the purpose of attaining or maintaining the status of type approval.
- (e) An instruction advising the user on how to operate and maintain the disposable LPG cylinders safely shall be provided. Essential safety information and user instructions shall be printed to the users in both Chinese and English languages.
- (f) Suitable warnings and instructions shall be durable, legible and clearly printed or affixed onto the cylinder in both Chinese and English languages.
- (g) The connection of the disposable LPG cylinder to the gas

equipment should be fully compatible with each other.

- (h) All disposable LPG cylinders should incorporate with self-sealing valves.
- (i) Proper and safe arrangement on transportation and storage of disposable LPG cylinders in Hong Kong shall be adopted (refer to Section 7).
- (j) It may be necessary to conduct factory inspection by the Gas Authority to assess the integrity of supplier, the application of quality control measures and the range of testing facilities available in the factories.

4.2 Documents/Material to be Submitted for Type Approval Application

- (a) Completed application form (Refer to Appendix 4)
- (b) Technical literature, specification and international/national standard of manufacture of the disposable LPG cylinder
- (c) Relevant type-test certificate and test report issued by an independent recognized testing authority and the formal arrangement for quality control of the production process
- (d) The composition of LPG in the cylinder and the developed vapour pressure and filling volume of the contents of the cylinder at a reference temperature as specified in international or national standard
- (e) Sectional diagrams showing the connection between the disposable LPG cylinder and the gas equipment
- (f) Sample of warnings and instructions (bilingual) affixed onto the cylinder
- (g) Sectional diagrams to show the disposable LPG cylinder and its valve design

- (h) The importer's confirmation and details showing that requirements in Section 4.1(h) will be satisfied
- (i) Written details on proper and safe transportation and storage of the disposable LPG cylinders in Hong Kong (refer to Section 4.1 (i))
- (j) A sample of disposable LPG cylinder

Section 5: Remedial Measures for Unsafe Disposable LPG Cylinders

5.1 General

- 5.1.1 Where the Gas Authority has reason to believe that a disposable LPG cylinder is shown to be prejudicial to the safety of the members of the public, the Authority may suspend or withdraw the approval of the disposable LPG cylinder. The importer, local manufacturer or supplier(s) shall cease to import, manufacture in Hong Kong, sell or expose for sale, supply or offer to supply the disposable LPG cylinders for use in Hong Kong.
- 5.1.2 Upon suspension or withdrawal of approval of the disposable LPG cylinder, the Gas Authority would serve on the importer or local manufacturer a written notice to take reasonable remedial measures in association with its retailer(s).
- 5.1.3 Apart from remedial measures as directed by the Gas Authority, the importer, local manufacturer or supplier(s) should, in consultation with the Gas Authority, initiate voluntary remedial measures to, as far as reasonably practicable, avoid a safety hazard arising from an unsafe disposable LPG cylinder at his/her own expense.

5.2 Objectives

Remedial measures for unsafe disposable LPG cylinders involve prompt and effective actions to be carried out by the importer or local manufacturer aiming at:

- (a) Minimizing the risk of injury to the public and / or damage to property;
- (b) Complying with statutory provisions; and
- (c) Where appropriate, restoring public confidence in the safety of the disposable LPG cylinders in question.

5.3 Planning

5.3.1 The importer or local manufacturer shall appoint a coordinator who represents the company to liaise with the Gas Authority, media and the public, where necessary.

5.3.2 The importer or local manufacturer shall develop and maintain communication channels with all parties in the supply chain and where possible, customers / end users so as to ensure that prompt and effective actions can be taken where necessary.

5.3.3 The importer or local manufacturer shall maintain necessary information which should include product identification, product supply quantities and locations, customer / end user information where applicable, etc. so as to facilitate the implementation of remedial measures.

5.4 Implementation

5.4.1 When the importer, local manufacturer or supplier(s) has reason to believe a disposable LPG cylinder is potentially unsafe, he/she shall immediately investigate the situation and devise appropriate remedial strategies for implementation at his/her expense. The remedial actions shall be implemented in agreement with the Gas Authority.

5.4.2 Implementation of remedial measures by the importer, local manufacturer or supplier(s) shall normally consist of:

- (a) Public notification;
- (b) Progress monitoring

5.4.3 Means of notifying the public will depend on the extent of the problem and the size of population affected, etc. The following means of notification may be considered:

- (a) Direct notification to relevant parties of supply chain and where appropriate, customers. Notification should contain instructions that the disposable LPG cylinders must be immediately withdrawn from supply or sale.
- (b) Public announcements through mass media through Chinese and English television and / or radio broadcast and / or newspapers and any other appropriate means, e.g. internet, etc. to disseminate remedy message.
- (c) Display of point-of-sale posters / notices at retail outlets, supermarkets, chain stores, department stores and any other places visited by the public as appropriate, where the disposable LPG cylinders has been supplied. Posters / notices should be displayed at strategic conspicuous locations in the premises to arouse wide attention where necessary.

5.4.4 Notification to the public which is made for a sufficient period in a clear and precise manner, shall include all relevant information, for example:

- (a) Description of the disposable LPG cylinders including brand name, model or serial number, if applicable, product identification code and / or

production date, supplemented with photograph or drawing.

- (b) Reason for remedial action, i.e. problem of the disposable LPG cylinders and specific hazard.
- (c) Advice to customers on immediate action to be taken.
- (d) A telephone hotline for enquiries and / or assistance.

5.4.5 Notwithstanding the above and in order to rectify the safety defect of the disposable LPG cylinders, the importer or local manufacturer in conjunction with the supplier(s), shall formulate urgent product recovery strategies. The following options may apply:

- (a) Retrieval of disposable LPG cylinders from sale outlets
- (b) Withdrawal of disposable LPG cylinders from the production lines, if manufactured and supplied in Hong Kong.

5.4.6 The importer/local manufacturer and supplier(s) shall record all decisions made, actions taken and achievements attained for the purposes of monitoring the progress of remedial action. It is crucial that the product recovery period should be kept to a minimum. This may necessitate stepped up actions to expedite remedial measures, for example reiterating or intensifying notification to the public, highlighting remedial measures, etc.

5.4.7 The importer/local manufacturer and supplier(s) shall analyze and monitor the ongoing progress taking consideration of the set targets and potential risks associated with the outstanding products yet to be

remedied. Consultation or assistance may need to be sought from the Recognized Certification Authority or an appropriate independent party to carry out investigation, testing, evaluation, etc. Interim reports and other required information shall be submitted periodically to the Gas Authority for examination.

5.5 Follow-up on Post-remedial Action

- 5.5.1 Before the remedial action is concluded, the importer or local manufacturer shall outline, evaluate and review the whole incident, and draw on lessons learnt with respect to identifying the problems, promulgating remedy messages, taking corrective actions, etc. with a view to making recommendations for possible room for improvement in terms of product design, manufacture or transportation, and remedial action procedure per se, etc. as deemed necessary.
- 5.5.2 If the situation warrants, the importer or local manufacturer shall collect and dispose of unsafe or unserviceable disposable LPG cylinders in a secure and proper manner and maintain a record of the disposal.
- 5.5.3 The importer or local manufacturer shall submit a final report to the Gas Authority. The report should contain analysis of incident, summary of remedial process, results of remedial action taken, evaluation, conclusion and improvement plans. Upon scrutiny of the report, the Gas Authority may require further follow-up on post-remedial action to be taken as deemed necessary in the interests of public safety.
- 5.5.4 The Gas Authority may serve a notice in writing upon the importer or local manufacturer to suspend the approval of the disposable LPG cylinder at the implementation stage. When the importer or local manufacturer has confirmed in writing the completion of all measures and

post-remedial action and follow-up, if any; and the Gas Authority is fully satisfied that members of the public are not exposed to undue risk, such a suspension will be lifted and the importer or local manufacturer may then re-market the disposable LPG cylinder. In the event of functional modification of the disposable LPG cylinder, a fresh application for type approval shall be submitted to the Gas Authority.

Section 6: Design and Manufacture of Disposable LPG Cylinders

- 6.1 The design and manufacture of disposable LPG cylinders should comply with relevant international or national safety standards (Appendix 1).
- 6.2 In general, disposable LPG cylinders should conform to the following basic requirements.

Design and Manufacture

- (a) The cylinder shall be made of metal and compatible with LPG. It shall be corrosion resistant and heat resistant.
- (b) The dimensions of the cylinder shall comply with the gas appliances designated and relevant international or national safety standard.
- (c) Surface of the contacting part of connections should be smooth for use.
- (d) Airtightness should be maintained after applying the same vibration which can be given during transportation.
- (e) Gas should be extracted in gaseous state from the structure at the usual common condition.
- (f) Measures should have been taken to ensure gas not be discharged after separating the cylinder part of the valve.
- (g) Measures should have been taken to protect the projecting part of the valve.

Filled Gas

(a) Gas quantity

The gas quantity in each cylinder should be in compliance with specified in relevant international or national standards.

(b) Distinctive Smell

Odorous additive should be added in the gas to ensure that a distinctive smell can be maintained in their gas all the times.

Indication

The disposable LPG cylinder shall be marked with the following basic information by an indelible method.

- Name of manufacturer
- Name of supplier
- Type of gas contained
- Year and month of manufacture
- Manufacturing number / lot number
- Type of gas equipment to be used
- Method of use of the disposable LPG cylinder
- Mounting method/preserving method

Warnings and Instructions

Suitable warnings and instructions shall be affixed onto the cylinder in bilingual language. Wordings may vary accordingly to products. Sample of warning instructions are shown as follows.

Directions 使用指南:

- Follow the **Instructions for Use** supplied with the appliance.
遵照器具指示使用。
- The disposable LPG cylinder is designed for use exclusively with XXX Brand XXX Model appliance. Never use it with other appliances.
只適用於 XXX 牌子 XXX 型號器具使用。不得作其他用途。
- Use and change the disposable LPG cylinder only in well-ventilated area and away from ignition sources.
只可在通風良好及遠離火源的地方下使用或更換氣罐。

Caution 警告：

- Flammable gas under pressure.
壓縮易燃氣體。
- Keep in a cool place (below 50°C), out of the sun.
擺放於陰涼處(50°C 以下)並遠離陽光。
- Keep out of reach of children.
擺放在兒童不能觸及的地方。
- Do not inhale contents.
切勿吸入罐內氣體。
- No smoking while in use.
使用時不可吸煙。
- WARNING : DO NOT REFILL.
警告:不可重新注氣。
- Do not puncture, pierce or burn even when empty.
用完後之氣罐，均不得將其刺穿或燃燒。

Others 其他：

- Net weight of LPG ___ g.
石油氣淨重 ___ 克。

Section 7: Transportation, Storage and Sale of Disposable LPG Cylinders

7.1 Transportation

7.1.1 Under the regulation 25(2) of the Gas Safety (Gas Supply) Regulations, no person shall use a motor vehicle to carry on a road (a) any cylinder which has a water capacity of not less than 130 litres; or (b) any combination of cylinders which have a combined water capacity of not less than 130 litres, unless (i) the vehicle is a cylinder wagon; and (ii) there is valid permit issued in respect of the wagon. Therefore, it is required to transport disposable LPG cylinders in bulk with total aggregated water capacity more than 130 litres by a valid motor vehicle and to comply with all relevant gas safety regulations.

7.1.2 There is no statutory requirement from the Gas Authority specified for transportation of small quantity of disposable LPG cylinders.

7.1.3 Transportation of disposable LPG cylinders should be in compliance with related statutory requirements under Fire Services Department.

7.2 Storage

7.2.1 Under the Gas Safety (Gas Supply) Regulations, the aggregate water capacity of LPG from all cylinders should not be over 130 litres inside the storage room. If aggregate water capacity of the LPG from all cylinders exceeds 130 litres, prior approval must be sought from the Gas Authority for construction and use of an NGI in accordance with Regulation 3 of the Gas Safety (Gas Supply) Regulations. (The permitted number of stored disposable LPG cylinders may vary according to LPG storage water capacity of each disposable LPG cylinder, i.e. approximate 50kg of LPG, or about 200 nos. of cylinders in one storage area if each cylinder has a capacity of 250 grams LPG)

7.2.2 In case of aggregate water capacity of the LPG from all

cylinders exceeding 130 litres (approximate 50kg of LPG, or about 200 nos. of cylinders in one storage area if each cylinder has a capacity of 250 grams LPG), the safety requirement stated in “Code of Practice for Hong Kong LPG Industry, Module 1 LPG Compounds and Cylinder Stores” shall be followed.

7.2.3 The stock area shall be a chamber designed specifically for storing disposable LPG cylinders with a maximum total quantity of 130 litres water capacity. It should be located outside of the building. If not possible, it can be situated inside the building but with effective seal to prevent the leaked gas being penetrated into the building. It shall also have sufficient permanent ventilation direct to open air. The chamber shall not be located below ground level. General arrangements and designs of chamber are indicated in the Gas Utilization Guidance Note GU08.

7.2.4 Storage of disposable LPG cylinders should be in compliance with related statutory requirements under Fire Services Department and Buildings Department.

7.3 Sale

7.3.1 A total of not more than 15kg of disposable LPG cylinders (about 60 nos. of cylinders in one storage area if each cylinder has a capacity of 250 grams LPG) may be displayed for sale purposes in an area where the general public have access.

7.3.2 Shelves used for the storage of disposable LPG cylinders shall be of non-combustible materials and designed to support the weight of the cylinders stored.

7.3.3 There should be provision for good means of access and escape to and from the display areas. Adequate access gangways should be provided and maintained to ensure unimpeded and rapid means of escape in the case of

incident involving disposable LPG cylinders.

- 7.3.4 Care should be exercised to ensure that disposable LPG cylinders in window displays or lighted cabinets are not subject to direct sunlight, concentrated artificial light or placed close to lighted bulbs, heaters, hot pipes, hot air vents, or other heat sources. Suppliers are able to supply dummy packs for display purposes and these should be used wherever there is a possibility of disposable LPG cylinders being overheated.
- 7.3.5 All staff employed in the retail premises should be trained in emergency procedures, use of fire extinguishers and means of escape. Particular attention should be paid to ensure that staff and members of the public are evacuated as quickly as possible in the event of an incident.
- 7.3.6 Careful and safe handling of disposable LPG cylinders in the distribution chain makes a significant contribution to safety. High standard of cleanliness and tidiness should be maintained in stock, display, demonstration and point of sale areas.
- 7.3.7 Display of disposable LPG cylinders shall not be located on staircase, in passageways, near exit doors, next to flammable materials, or in any other place where they are likely to hinder or endanger a means of escape. In addition, smoking and naked lights must be prohibited from around the display area. When disposable LPG cylinders are used for demonstration purposes, no more than two shall be used at any one time i.e. connected to gas appliances.
- 7.3.8 Damaged or leaking disposable LPG cylinders should be removed immediately to a well-ventilated, safe place preferably outdoors where there is no ignition source. The Emergency Services should be contacted as necessary

in order to arrange a safe disposal method for leaking disposable LPG cylinders. Defective or dented disposable LPG cylinders should be returned to the supplier.

7.3.9 Particular care should be exercised when handling disposable LPG cylinders. They must not be dropped or allowed to come into violent contact with one another or any adjacent object.

7.3.10 Combustible wastes of straw paper and cardboard are a potential risk and should be removed immediately from stock areas. Never store disposable LPG cylinders near corrosive products which may adversely affect their safety. Good housekeeping cannot be over emphasized as a means of avoiding costly and damaging events.

7.3.11 The disposable LPG cylinders should be displayed in an upright position in a dry and well ventilated area which is clear of any other readily combustible materials for a minimum of 4.5m.

7.3.12 It is essential to ensure that an adequate system of stock rotation is in use when retailing disposable LPG cylinders and that they are stocked in dry cool conditions and always on ground level only. A constant change of stock should be undertaken to ensure that old or out-dated disposable LPG cylinders are not held in store for long periods of time. Such packs are potentially of greater hazard because of leakage due to corrosion. It is recommended that each consignment received should have a sign indicating the date of receipt, when stored.

7.3.13 For retail premises with residential property adjacent or above, all the disposable LPG cylinders display should be returned into the stock area after business hours.

7.3.14 Sale of disposable LPG cylinders should be in compliance with related statutory requirements under Fire Services

Department.

Section 8: Gas Safety Tips to Use Disposable LPG Cylinders

As LPG leaked from disposable LPG cylinder may form explosive mixture with air and cause serious injuries if not properly handled, some general important aspects of gas safety which the consumer should know when using disposable LPG cylinders.

DOs:

- √ Check the disposable LPG cylinder for damage and leak before using
- √ Use only in a well-ventilated area and away from flammable materials
- √ Keep the disposable LPG cylinder in a dry, cool and well-ventilated place
- √ Keep out of reach of children
- √ Follow user instructions printed on the disposable LPG cylinder
- √ Check that there is no smell/sound of gas leaking from the disposable LPG cylinder connection
- √ Where a disposable LPG cylinder is to be scrapped, all LPG in the container should be consumed before disposal.

DON'Ts

- × Refill the disposable LPG cylinder
- × Use disposable LPG cylinders without self-sealing valve
- × Smoke or use the disposable LPG cylinder in a confined area where electrical appliances are in operation
- × Spray on naked flame, fire or incandescent surface
- × Inhale the contents of disposable LPG cylinder

- × Keep the disposable LPG cylinder in an enclosed space, such as inside the car compartment exposed to high temperature of sunlight
- × Puncture or burn the used disposable LPG cylinder

Appendix 1: International or National Safety Standards

The following international or national standards of the current edition are acceptable to the Gas Authority:

1. **BS EN 417:2003**

Non-refillable metallic gas cartridges for liquefied petroleum gases, with or without a valve, for use with portable appliances – Construction, inspection, testing and marking.

2. **JIS S 2148**

Gas cylinders for portable gas cooker

3. **GB 16691-2008**

Portable Butane Cookers and Gas Cylinders

Appendix 2: List of Independent Testing Authority (Reference Only)

The Australian Gas Association

Technical Office
P.O. Box 171
Highett, VIC 3190
Australia

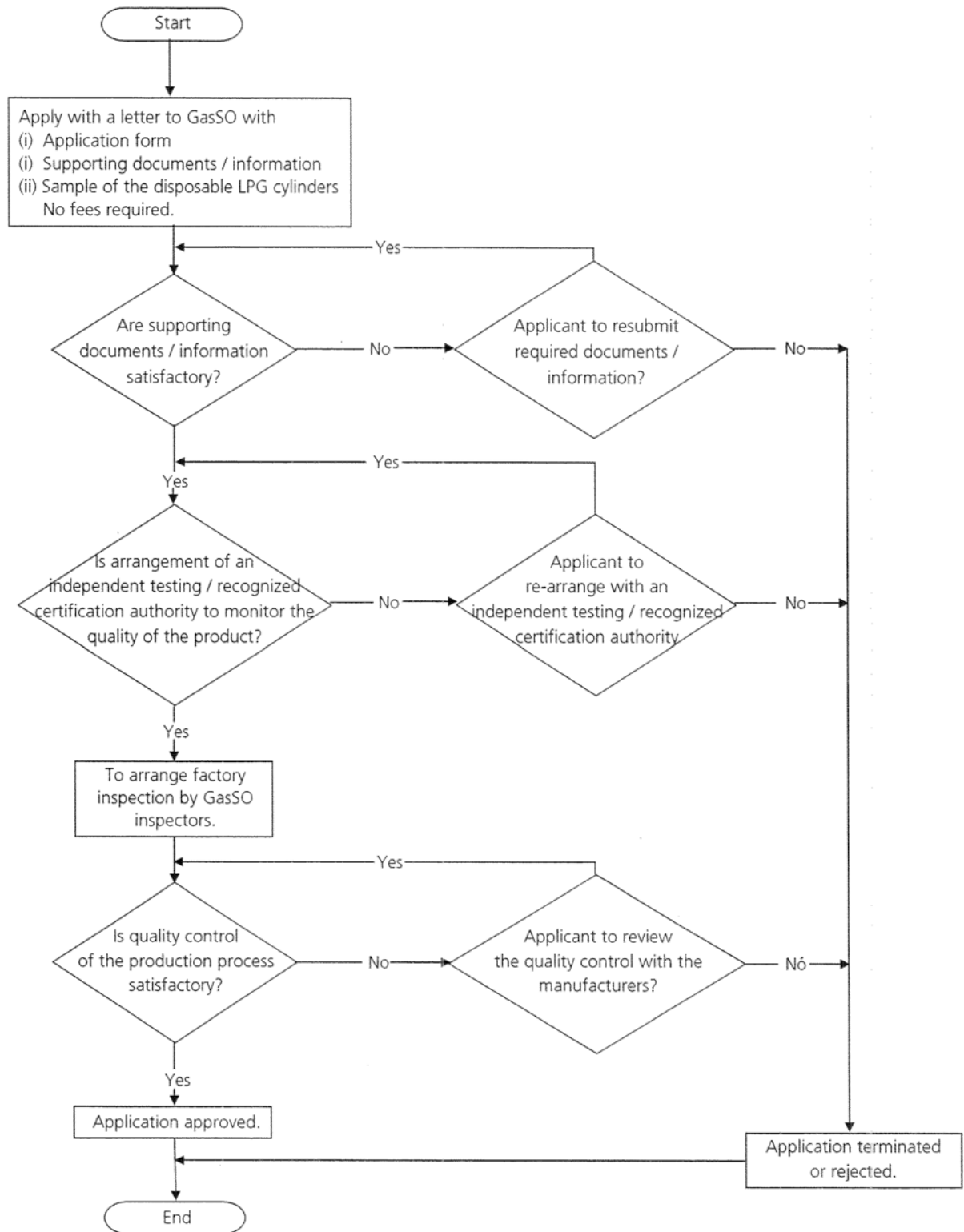
Japan Gas Appliances Inspection Association

3-4, 1-chome Atago Minato-Ku
Tokyo
(Atago Toyo Building), Post 105
Japan
Phone: 03(5401)3980
Fax: 03(5401)3997

Underwriters Laboratories Inc.

333 Pfingsten Road,
Northbrook, Illinois 60062-2096
United States Country Code(1)
Phone: (847)-272-8800
Fax : (847) 272-8129
<http://www.ul.com>

Appendix 3: Procedures for Type Approval of Disposable LPG Cylinders



Appendix 4
Application Form for Type Approval of Disposable LPG Cylinder

The application form could be downloaded from the following website:

http://www.emsd.gov.hk/emsd/eng/pps/gas_app.shtml