



THE GOVERNMENT OF THE
HONG KONG SPECIAL ADMINISTRATIVE REGION

GUIDANCE NOTE ON HOUSEHOLD ELECTRIC REFRIGERATORS CONTAINING LPG AS REFRIGERANT



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1. Foreword and Scope

- 1.1 This guidance note covers the safety guidelines related to the standards, storage, transportation, maintenance and scrapping of household electric refrigerators containing Liquefied Petroleum Gas (LPG) as refrigerant.
- 1.2 In accordance with the Electrical Products (Safety) Regulation (Cap.406G), all household electrical products supplied in Hong Kong, including household electric refrigerators, shall comply with applicable safety requirements, such as IEC standards, and be issued with valid Certificates of Safety Compliance. Besides, as LPG is one of the gases defined in the Gas Safety Ordinance (Cap. 51), certain provisions in this Ordinance may be applicable in association with the use of LPG as refrigerant in household electric refrigerators.
- 1.3 This guidance note applies to household electric refrigerators containing LPG as refrigerant only. It shall be read in conjunction with all relevant statutory provisions under the Laws of the Hong Kong Special Administrative Region, including but not limited to the following:
- Electrical Products (Safety) Regulation (Cap.406G);
 - Gas Safety Ordinance (Cap. 51)
 - Electricity (Wiring) Regulations (Cap. 406E);
 - Code of Practice on Energy Labelling of Products.
 - Fire Services Ordinance (Cap. 95);
 - Dangerous Goods Ordinance (Cap. 295);
 - Fire Protection Notice No. 4 – Dangerous Goods;
 - Occupational Safety and Health Ordinance (Cap. 509);
 - Factory and Industrial Undertakings Ordinance (Cap. 59); and
- 1.4 This guidance note shall also be read in conjunction with the manufacturer's instructions and shall not supersede such instructions unless the latter conflict with statutory provisions.
- 1.5 This document is for guidance only and is not intended to relieve persons from their statutory responsibilities. The authoritative interpretation of the relevant statutory requirements is a matter of the court.

2. Definitions

Standard – means

- (a) the British Standard published by the British Standards Institution;
- (b) the European Standard published by the European Committee for Electrotechnical Standardisation;
- (c) the International Standard published by the International Electrotechnical Commission or the International Organization for Standardization; or
- (d) any other relevant standards,
as may be accepted by the Director.

Liquefied petroleum gas (LPG) – means any gas which is a mixture of:-

- (a) hydrocarbons primarily consisting of butanes, butylenes, propane or propylene; or
- (b) all or any of the hydrocarbons referred to in paragraph (a).

Cylinder wagon – a motor vehicle designed and constructed, or adapted, primarily for the conveyance of cylinders on roads.

Maintenance worker – worker who has completed the relevant training course on household electric refrigerators containing LPG as refrigerant.

Maintenance workshop – a premises designated for any activity related to the repair and maintenance of household electric refrigerators containing LPG as refrigerant.

3. Product Safety, Warning Label and Safety Instructions

3.1 Electrical product safety

All household electrical products, including household electric refrigerators, shall comply with the applicable safety requirements stipulated in the Regulation - Electrical Products (Safety) Regulation (Cap.406G). The Guidance Notes for the Electrical Products (Safety) Regulation is a guide for suppliers of electrical products to understand the requirements of the Regulation. The Guidance Notes also set out lists of standards that are deemed to satisfy the applicable safety requirements of the Regulation. For household electric refrigerators, the applicable safety standards are IEC 60335-2-24 in conjunction with IEC 60355-1.

3.1.1 A certificate of safety compliance shall include the following information in English or Chinese:-

- (a) a reference number;
- (b) the name and model or type reference of the electrical product;
- (c) the name and address of the manufacturer;
- (d) the name and address of the person who requested testing of the electrical product;
- (e) a standard to which the electrical product was tested and found in conformity;
- (f) the name, address, authorized signature and, if applicable, company seal of the recognized certification body or recognized manufacturer, as the case may be; and
- (g) the date of certification.

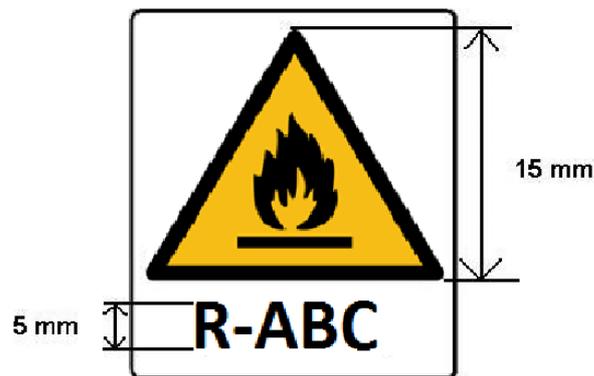
3.2 Warning label

3.2.1 Warning label shall be in compliance with Clause 7: Marking and instruction of IEC 60335-2-24 in conjunction with IEC 60335-1.

3.2.2 As LPG used as refrigerant in household electric refrigerator is flammable, a warning sign of "Caution: risk of fire" and the type of flammable refrigerant shall be clearly seen when gaining access to the compressor. Thus, printing or affixing the mentioned warning sign on the compressor of the refrigerator is one of the effective means to alert the users and maintenance workers.

3.2.3 The warning label shall be designed in accordance with ISO 7010 W021, i.e. a yellow triangular label of “Warning: Risk of fire / flammable materials”, or other relevant standards. The warning sign shall not be less than 15 mm in height. The type of the refrigerant is also suggested to be included in the warning label and the letters should not be less than 5 mm in height.

3.2.4 A sample of the warning label is shown below:



3.3 Nameplate

3.3.1 Nameplate shall be in compliance with Clause 7: Marking and instruction of IEC 60335-2-24 in conjunction with IEC 60335-1.

3.3.2 Apart from the requirements in the relevant standards, the nameplate is also recommended to contain the following information:-

- (a) warning label/sign as stated in the above clause 3.2 as well as the name and chemical symbol of the refrigerant in both Traditional Chinese and English;
- (b) message “維修工作必須由受過訓練的技師在工場進行。” and “Maintenance work shall only be carried out at workshop by well-trained maintenance worker.” or equivalent in both Traditional Chinese and English language.

3.3.3 The nameplate shall be durable and clearly legible for anyone who will transport, maintain or dispose the refrigerator.

3.4 Safety instructions to be shown in the user manual

3.4.1 Safety instructions shall be in compliance with Clause 7: Marking and instruction of IEC 60335-2-24 in conjunction with IEC 60335-1.

3.4.2 The user manual shall include the warning label in Clause 3.2 and safety notice in Clause 3.3.2(b) to alert users and maintenance workers. Moreover, the user manual shall include the following basic safety requirements:

- (a) The instructions shall include information pertaining to the installation, handling, servicing and disposal of the appliance.
- (b) WARNING: Keep ventilation openings, in the appliance enclosure or in the built-in structure, clear of obstruction.
- (c) WARNING: Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer
- (d) WARNING: Do not use electrical appliances inside the food storage compartments of the appliance, unless they are of the type recommended by the manufacturer.
- (e) Do not allow any sharp objects to come into contact with the refrigeration system behind and inside the refrigerator.
- (f) Children should be supervised to ensure that the refrigerator is used properly.
- (g) Do not block the area in the vicinity of the refrigerator.
- (h) In case the refrigerant circuit is damaged, do not use any electric appliances or fire equipment nearby, and open all windows to provide good ventilation. Please also contact your local maintenance agent to follow up.
- (i) The warning labels mentioned above shall be kept throughout the life cycle of the refrigerator. The user manual should be handed over to any

person who would use or handle the refrigerator whenever the refrigerator would be transferred to another location and delivered to a recycling plant.

3.4.3 Manufacturers of the refrigerators may include other safety requirements and/or revise the above requirements to suit their products.

4. Storage and Transportation

4.1 Storage

4.1.1 Under the Gas Safety (Gas Supply) Regulations, the aggregate water capacity of LPG from all refrigerators shall not be over 130 litres inside the storage room. Otherwise, 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 LPG refrigerators may vary according to water capacity of LPG contained in each refrigerator.)

4.1.2 In case of the aggregate water capacity of LPG from all refrigerators exceeding 130 litres, the safety requirement stated in the Code of Practice for Hong Kong LPG Industry - Module 1 - LPG Compounds and Cylinder Stores shall be followed.

4.2 Transportation

4.2.1 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 a valid permit issued in respect of the wagon. Therefore, it is required to transport household refrigerators containing LPG as refrigerant in bulk with a total aggregated water capacity of more than 130 litres by a valid motor vehicle and to comply with all relevant gas safety regulations. (The permitted number of transported refrigerators may vary according to the water capacity of LPG contained in each refrigerator.)

5. Maintenance Workshop

5.1 General

In accordance with the Occupational Safety and Health Ordinance (Chapter 509), employers shall contribute to safety and health in their workplaces by:

- providing and maintaining plant and work systems that do not endanger safety or health;
- making arrangement for ensuring safety and health in connection with the use, handling, storage or transport of plant or substances;
- providing all necessary information, instruction, training, and supervision for ensuring safety and health;
- providing and maintaining safe access to and egress from the workplaces; and
- providing and maintaining a safe and healthy work environment.

5.2 Location

5.2.1 For a large-scale workshop designed for repair and maintenance work of a large quantity of household electric refrigerators containing LPG as refrigerant at the same time, necessary safety precautions shall be provided. The following safety requirements shall be considered in workshop design.

- (a) If the maintenance workshop is located on upper floor, it shall have a well-ventilated access route and safe ventilation system.
- (b) The maintenance workshop shall not be built below ground level.
- (c) The equipment required for repair and maintenance of LPG refrigerant circuit in the maintenance workshop has to be maintained well to ensure their workability and reliability. The equipment should be tested and calibrated according to manufacturer's recommendations in order to make sure that the equipment is working properly.
- (d) Drains or unventilated pits shall be avoided in the workshop floor area or located at least 1 metre from the workshop to prevent accumulation of the heavier-than-air gas. If a gully or drain is unavoidable, the opening/drain shall either be securely covered or suitably sealed.

5.3 Ventilation

In view of a large quantity of household refrigerators containing LPG as refrigerants required for repair and maintenance and temporarily stored in the premises at the same time, the maintenance workshop shall be well ventilated.

5.3.1 Natural ventilation

The safety requirements for natural ventilation could make reference to Section 4.8.2 of the Code of Practice for Hong Kong LPG Industry, Module 1 - LPG Compounds and Cylinder Stores.

5.3.2 Mechanical ventilation

- (a) The maintenance workshop shall have adequate ventilation capacity for general ventilation. Apart from this, the maintenance workshop which could not meet the requirements in Clause 5.3.1 above shall provide with mechanical ventilation system.
- (b) The mechanical ventilation system shall be separated from other general ventilation systems. All exhaust ducts of the mechanical ventilation system shall be air-tight to prevent leakage.
- (c) The inlet apertures of the spot extraction system shall be located at no more than 150 mm above the floor level.
- (d) The spot extraction system shall be switched on before commencing work and be kept operating during the entire work period. An audio and alarm system is preferred to be provided for any failure of the spot extraction system.

5.3.3 Gas detection system and fire extinguisher

- (a) Gas detectors calibrated for the detection of LPG shall be installed in the workshop at no more than 150 mm above the floor level.
- (b) The layout plan showing the gas detection system shall be placed at a

conspicuous location in the workshop.

- (c) If there is a flammable mixture with the concentration reaching 20% of the lower limit, an audible and visible alarm shall be given by the gas detection system. The alarm shall be maintained workable in case of interruption of main electricity supply.
- (d) All the gas detection system parts including the fixed and portable ones shall be examined and revalidated regularly.
- (e) Appropriate number of dry powder fire extinguisher shall be equipped in the maintenance workshop.

5.4 Training for maintenance workers

5.4.1 All maintenance workers shall complete relevant safety training course.

5.4.2 Maintenance workers should attend relevant refresher course periodically.

5.4.3 Maintenance workers shall be familiar with the emergency procedures, use of the fire extinguishers and means of escape in the workshop in case of accidents.

6. Safety of Scrapping

6.1 When a household refrigerator containing LPG as refrigerant is to be scrapped, all LPG in the refrigerant circuit shall be removed before disposal of the refrigerator.

6.2 Prior to disposal of the refrigerator, it shall be purged with an inert gas or water to remove all LPG content inside the refrigerant circuit of the refrigerator to ensure safety. No work involving fire or high temperature shall be carried out before proper purging.

7. Reference

7.1 IEC 60335-2-24:2012 in conjunction with IEC 60335-1:2010
Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers

- 7.2 Code of Practice for Hong Kong LPG Industry, Module 1 - LPG Compounds and Cylinder Stores
- 7.3 Guidance Notes for the Electrical Products (Safety) Regulation