

GAS SAFETY Bulletin



Message from the Editor

This issue of Gas Safety Bulletin features articles on liquefied petroleum gas (LPG) supply to commercial kitchens and food preparation establishments. Safety knowledge on how to prevent excessive release of carbon monoxide by gas installations in commercial kitchens, legal knowledge on gas safety, highlights of the Gas Safety Seminar, as well as statistics on gas incidents and prosecutions by type in 2009 are provided in this issue for reference of the trade.

LPG Supply to Commercial Kitchens and Food Preparation Establishments

LPG Supply to Catering Establishments

Any person interested in operating a catering establishment, including a restaurant, a bakery, a factory canteen, a food factory, a fresh provision shop, a frozen confection factory, a milk factory, a Siu Mei and Lo Mei shop, etc., in Hong Kong must apply for a licence from the Food and Environmental Hygiene Department (FEHD) before commencement of business. If gas is used as a cooking fuel in the premises, the applicant is required to submit the Certificate of Compliance and Work Completion Certificate to the FEHD. These certificates must be issued by registered gas contractors who have employed gas installers of the appropriate classes. This is in order to confirm that the gas installation work has been completed and that the gas installations are ready for operation under the Gas Safety Ordinance and the Code of Practice GU06: LPG Installations for Catering Purposes in Commercial Premises.

Requirements for Gas Installations

Here is a list of Dos and Don'ts for ensuring gas safety with regard to LPG supply to general commercial kitchens and food preparation establishments:

DOs

- > LPG cylinders should only be installed to supply LPG to fixed gas appliances where a piped gas supply is not available within the premises;
- > LPG cylinders must be placed in a purpose-designed chamber;
- > A notice indicating the location of the emergency control valve or the fire safety valve must be displayed prominently at the entrance of the kitchen;
- > An on/off sign must be provided for the emergency control valve or the fire safety valve;
- > Gas pipework must bear identification labels, be adequately supported and protected by painting or by being enclosed in a sleeve (if such pipework is to pass through a wall). A minimum separation distance of 25 mm from the electric conduit must be kept;
- > Gas supply and internal installation pipework must be of steel construction and comply with specified international standards. Such pipework must be installed in a safe, reliable and workmanlike manner; and
- > Gas pipework must be protected against corrosion and mechanical damage, and ventilation provided for the service ducts.

DON'Ts

- > Supply LPG to basement kitchens or seating areas below ground level;
- > Store LPG/LPG cylinders with a total nominal water capacity of over 130 litres;
- > Install gas meters at the only means of escape from the premises;
- > Install gas pipework in confined spaces; and
- > Install gas pipework in rooms accommodating air conditioning or ventilation equipment for the premises.



Commercial Kitchens

LPG Cylinder Storage Chambers

For gas safety, LPG cylinders must be stored in a purpose-designed chamber. The construction and use of an LPG cylinder storage chamber should comply with the following requirements:

- > It should be located in a well-ventilated area and not impede the means of escape from the premises;
- > It should be constructed of concrete or a material with a minimum of 2-hour fire resistance;
- > Its door should preferably be made of metal. The warning notices "LPG Cylinder Storage Chamber" and "No Smoking" should be displayed on the outside of the chamber door, and adequate ventilation openings provided both in the upper and lower parts of the door. A gas isolation valve should be installed outside the chamber;
- > Where a manifold is connected to two or more LPG cylinders at a pressure exceeding low pressure, non-return valves should be fitted to each LPG cylinder outlet connection and the flexible tubing should not exceed 1 m in length;
- > The gas supply system in a chamber should be fitted with a pressure gauge indicating the gas supply pressure. Gas pipework should be corrosion-resistant, suitably protected, clearly identified and be securely fixed to walls;
- > An on/off sign should be affixed to the valve; and
- > "Instructions for the Safe Exchange of LPG Cylinders" and "Safe Use of LPG" notices should be displayed prominently inside the chamber.

Points to Note after Completion of LPG Works

After completion of works, a registered gas contractor is required to give the Certificate of Compliance, Work Completion Certificate, gas installation manual and user guide to the restaurant operator concerned or his/her representative, and keep the records of works for two years for inspection. Restaurant operators should arrange for a registered gas contractor to carry out safety checks on the gas supply system at least once every 12 months, and keep the safety check records to safeguard their own interests.

For the requirements for gas installations in commercial kitchens and food preparation establishments, please refer to the Code of Practice GU06: LPG Installations for Catering Purposes in Commercial Premises prepared by the Gas Standards Office of the Electrical and Mechanical Services Department (EMSD). The code of practice is available on EMSD website at http://www.emsd.gov.hk/emsd/e_download/pps/gas/gu06e.pdf.

How to ~~Prevent~~ Excessive Release of Carbon Monoxide by Gas Installations in Commercial Kitchens

One day in 2008, a chef fainted suddenly while he was working in a commercial kitchen. He was sent to hospital and subsequently confirmed to have the symptoms of carbon monoxide poisoning. Subsequent investigations revealed that the causes of the above incident were that the exhaust system in the kitchen was inoperative and, in addition, one of the cooking appliances was seriously maladjusted. Separately, one day in 2009, a number of staff and customers in a basement restaurant were suspected to have inhaled unknown gases. They felt unwell and were sent to hospital for treatment. After investigation, it was found that the exhaust system in the kitchen was inoperative at the time the incident happened. Furthermore, the safety protection device for cutting off the gas supply of the cooking appliances when the exhaust system malfunctioned had been removed. The two incidents have one cause in common. That is even though the exhaust system of the kitchen malfunctioned, the users continued operating the gas cooking appliances. This implies that the users underestimated the importance of the ventilation system to the safe operation of the gas cooking appliances.

Generally speaking, the heat input of commercial gas cooking appliances is remarkably large. Gas consumption by commercial gas cooking appliances is several times of domestic gas cooking appliances. So, when the cooking appliances are maladjusted, they may readily produce a lot of carbon monoxide. As such, most of the commercial kitchen cooking appliances rely on the exhaust system installed above them (e.g. fume collection hoods) to collect and discharge the exhaust gas to the outside environment (see Figure 1). If, due to poor maintenance, the effectiveness of the exhaust system weakens or the exhaust system becomes inoperative, the exhaust gas produced during combustion will build up inside the kitchen (see Figure 2). As a result, the amount of oxygen in the air will be reduced. In a combustion process that proceeds under a low oxygen level environment, more carbon monoxide will be produced. Carbon monoxide is colourless and odourless, and its ability to bind with the red blood cells in the human body is much higher than that of oxygen. It follows that upon

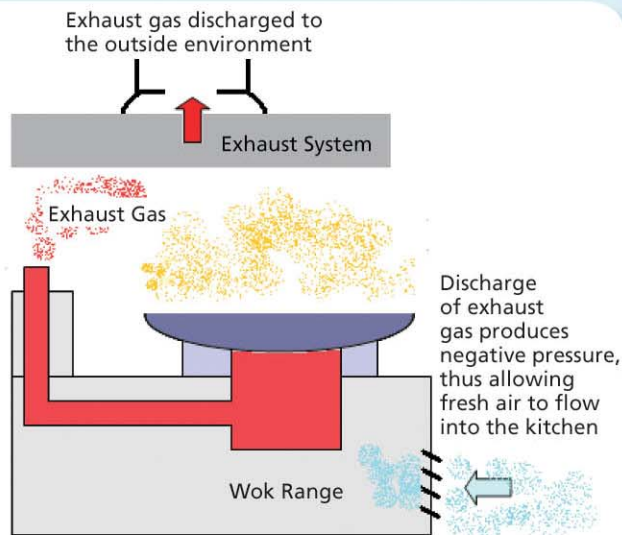


Figure 1 – Exhaust System Operating Normally

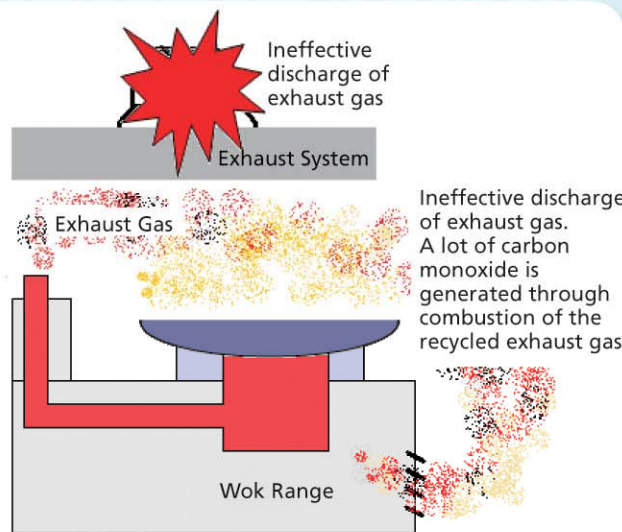


Figure 2 – Exhaust System Inoperative

Table 1: Checklist for Gas Installation and Exhaust System	
1.1 安裝前，須先檢查燃氣供應系統是否安全，並符合下列各項：	✓
1.2 燃氣供應系統必須由合格人士安裝。	✓
1.3 燃氣供應系統必須符合相關規例。	✓
1.4 燃氣供應系統必須符合相關規例。	✓
1.5 燃氣供應系統必須符合相關規例。	✓
1.6 燃氣供應系統必須符合相關規例。	✓
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1.99 燃氣供應系統必須符合相關規例。	✓
1.100 燃氣供應系統必須符合相關規例。	✓

Figure 3 – The “Green List”

inhaling excessive carbon monoxide, people working in the kitchen will develop symptoms of carbon monoxide poisoning including headache, dizziness, nausea, vomiting, increased breathing rate and pulse rate, reduced conscious level and flushed face etc. If the person suffering from carbon monoxide poisoning does not receive treatment in time, more severe harm, and even death, may result. Therefore, maintaining good ventilation in the kitchen and arranging regular maintenance and inspection of the gas cooking appliances are of utmost importance.

To enable the trade to have a better understanding of the relationship between the gas installations, the ventilation system and the concentration of carbon monoxide in commercial kitchens, as well as the way to avoid the release of excessive carbon monoxide by the gas installations, EMSD has prepared presentation materials on

the "Safe Use of Commercial Gas Appliances" for cooking appliance users and the maintenance trade, and compiled a "Comprehensive Checklist for the Inspection and Testing of Industrial and Commercial Gas Cooking Appliances" for their reference and trial use. Both the presentation materials and the list are available online (at http://www.emsd.gov.hk/emsd/chi/ppps/gsb_2010.htm) for browsing.

The main purpose of compiling the "Comprehensive Checklist for the Inspection and Testing of Industrial and Commercial Gas Appliances" is to provide a more systematic gas appliance inspection and testing checklist for reference by the trade, and to enable appliance owners who employ relevant parties for maintenance works to have a better understanding of the contents of the services. The comprehensive checklist is made up of two parts: the comprehensive inspection and testing procedures in green (The "Green List" (see Figure 3)) and the comprehensive inspection and testing checklist in yellow (The "Yellow List" (see Figure 4)). The "Green List" sets out in detail the recommended maintenance items for gas appliances and the guidelines for carrying out the inspection and testing work. Test methods for "combustion performance of the gas appliance" and "combustion products removal performance of kitchen exhaust systems" are also provided (see Figure 5). The "Green List" is also designed to facilitate internal training by the maintenance trade. The "Yellow List" is a suggested template, in table form, for the inspection and testing of gas appliances. The maintenance trade can create their own "Yellow List" according to their needs. After the completion of maintenance works, service providers shall record the inspection results and their recommendations in the list for reference by the appliance owners who employ them. Furthermore, in accordance with regulation 23 of the Gas Safety (Registration of Gas Installers and Gas Contractors) Regulations, a registered gas contractor shall maintain records of all gas installation works (such as the "Yellow List") undertaken by him for a period of not less than two years after the gas installation work concerned was carried out.

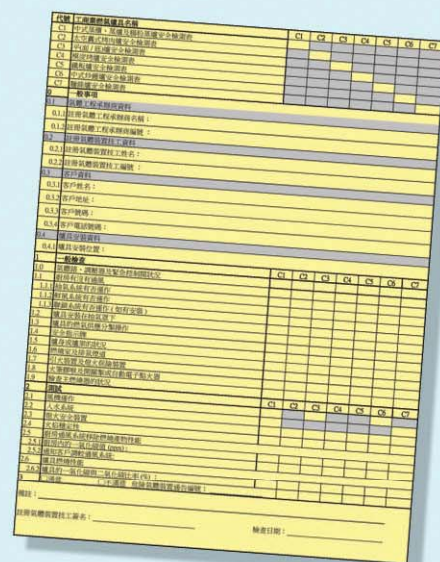


Figure 4 – The "Yellow List"

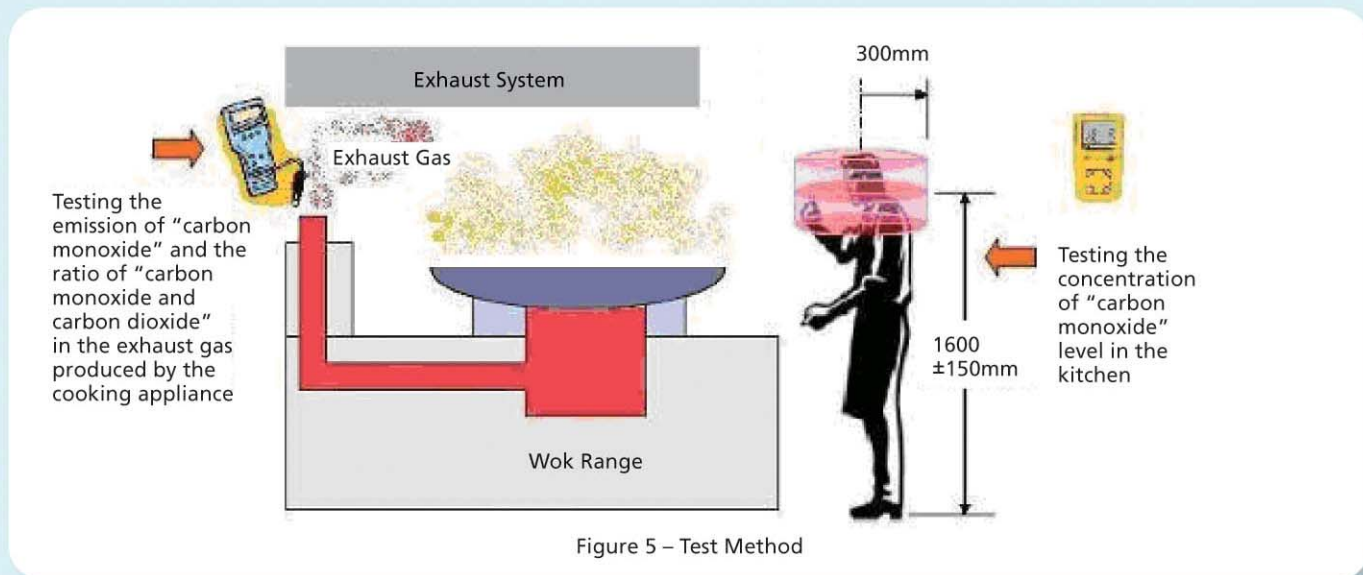


Figure 5 – Test Method

Illegal Storage, Transportation or Supply of LPG by Cylinder LPG Distributors

Court news: A cylinder LPG distributor was allegedly storing LPG cylinders that were not provided by the registered gas supply company for which he was a gas distributor. He was convicted and fined at the Eastern Magistry.

The court heard that the defendant had stored a number of LPG cylinders in a LPG cylinder wagon that were not provided by his registered gas supply company. According to the defendant, no approval to store or transport LPG cylinders in the said LPG cylinder wagon had been obtained from the registered gas supply company concerned at the time of the incident. The LPG cylinders were

temporarily stored in the said LPG cylinder wagon because the other LPG cylinder wagon carrying the LPG cylinders required maintenance repair.

The defendant was convicted after the trial. The magistrate stated in the verdict that the purpose of the ordinance was to safeguard public safety, but public safety was compromised in this case. The maintenance repair of the LPG cylinder wagon should not be used as an excuse by the gas distributor for committing the offence. He should have contacted his registered gas supply company for assistance.

The EMSD would like to reiterate here that pursuant to regulation 12 of the Gas Safety (Registration of Gas Supply Companies) Regulations (Cap 51 sub. leg. E), a gas distributor shall not store, transport or supply any LPG that is provided by a registered gas supply company for which he is not a gas distributor, nor shall he do the same for another gas distributor of such company. Offenders are liable to a fine of \$10,000 on conviction.

Case Sharing




Safety Precautions for Installing Gas Appliances

There are two main types of gas appliances: fixed gas appliances and portable gas appliances. Fixed gas appliances include cooking appliances, food warming appliances and water heaters. Portable gas appliances include dim sum trolleys and LPG cassette cookers.

Gas appliances must be installed in compliance with the requirements of the Gas Safety Ordinance, and at locations that will not constitute any fire hazard or impede means of escape. Efforts must be made to ensure sufficient air supply to the gas appliance and the safe removal of products of combustion. Pursuant to regulation 23 of the Gas Safety (Installation and Use) Regulations (Cap 51 sub. leg. C), any person who fails to comply with the safety precautions as specified thereon in installing a gas appliance will be liable to a fine of \$5,000 on conviction.

All domestic gas appliances currently sold in Hong Kong bear the GU mark, indicating that the appliance is manufactured according to recognised international safety standards, and is in compliance with the local quality assurance requirements. Gas appliances should be used according to manufacturer instructions to ensure safety and best efficiency.

In addition, the installation, testing, replacement and maintenance of gas appliances must be carried out by registered gas installers employed by registered gas contractors. It is an offence in law for members of the public to carry out any gas installation work on their own. 




Legal Knowledge

The 2010 Gas Safety Seminar

We organised a gas safety seminar for the trade on the afternoon of 4 March at the lecture theatre on the 7th floor of our headquarters building. Topics covered included:

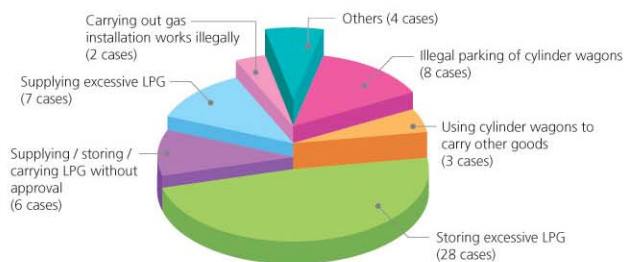
- Replacement of flexible gas tubing;
- Brief introduction of Guidance Note GU17 - Household Refrigerators Containing LPG As Refrigerant;
- LPG Installations for catering purposes in commercial premises;
- Flueless gas water heaters;
- The relationship between the gas installations and ventilation systems in commercial kitchens;
- How to minimise the chance of excessive release of "Carbon Monoxide" by gas installations in commercial kitchens.

The seminar was well attended and the response of the participants was enthusiastic. During the seminar, a number of EMSD staff was on hand to provide detailed presentations on gas safety matters to the participants. Issues were eagerly raised by the floor and discussed in a lively and positive interchange during the Q&A session at the end of the seminar. To revisit the seminar, please click on the following link. (http://www.emsd.gov.hk/emsd/chi/pps/gsb_2010.htm) 

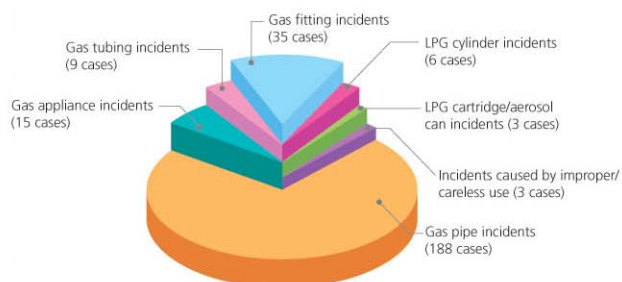


Gas Statistics

Prosecutions by Type for LPG-related Cases in 2009



Reportable Gas Incidents by Type in 2009



Gas Authority  EMSD

3 Kai Shing Street, Kowloon, Hong Kong
Tel: 1823 (Hotline) Fax: 2576 5945
Homepage: www.emsd.gov.hk
E-mail: info@emsd.gov.hk