Guidance Note for Recovery and Minimizing the Release of Hydrochlorofluorocarbons (HCFCs) Refrigerant



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Recovered



Purpose

- 1. Ozone depleting substances (ODS), which include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), etc, contribute to the destruction of the ozone layer and allow more UV radiation to reach the Earth's surface, where they could cause higher rates of skin cancer and cataracts. Also, excessive UV radiation could affect the human immune system and damage food crops and marine ecosystems.
- 2. The purpose of this Guidance Note is to provide guidelines for the persons who involve in the handling of refrigeration and air-conditioning system such as the owner/manager of the system, the person who conducts maintenance and services and the recycler of the system that containing HCFCs as refrigerant. It aims to minimize the release of HCFCs to the atmosphere through recovery and proper handling of HCFCs refrigerant and proper disposal of the used refrigerant.

Phasing out schedule of refrigerant

- 3. The import of CFCs has already been discontinued since 1996. For those CFCs chilling systems that are still being used, owner/manager of the system should make every effort to replace them with environmentally friendly systems as soon as possible.
- 4. To fulfill the obligations of the Montreal Protocol, the import of HCFCs will be banned in 2020. The quantity of HCFCs imported into Hong Kong for local consumption has been capped since 1996 using the consumption level of 1989 (i.e. 138 ozone depleting potential-tonnes (ODP-t)) as the baseline level. The consumption level has been limited to 65% of the baseline level in 2004. The maximum consumption level will then further reduced to 25% in 2010, 10% in2015 and 0% in 2020.



Minimizing the release of HCFCs refrigerant

- 5. The release of HCFCs from the refrigeration and air-conditioning systems should be prevented to help minimize the damage to the atmosphere. The HCFCs should be recovered or recycled as far as possible during maintenance, repair and disposal of the refrigeration and air-conditioning systems. Because of the substantial reduction of the import quota for the eventual phase-out of HCFCs and many existing equipment using HCFCs is not yet at the end of their service lives, there will still be demand for recycled HCFCs in the market. However, if any recovered or recycled HCFCs cannot be re-used, they should be properly destroyed and disposed of at the Chemical Waste Treatment Centre in Tsing Yi.
- 6. It is imperative that the refrigerant is recovered by qualified technical personnel using proper equipment and procedures to prevent the release of HCFCs from the refrigeration and air-conditioning systems. Further details on the actions and requirements need to be observed are listed in Appendix I.

Recovery of HCFCs

- 7. Whenever the refrigerant has to be replaced or the refrigeration equipment, including domestic units, has to be dismantled, the refrigerant should be recovered or recycled for other uses by qualified technical personnel. The person who recovers or recycles the refrigerant should:
 - use the recycling equipment approved by the Environmental Protection Department (EPD); and
 - operate the recycling equipment according to the instructions issued by the equipment's manufacturer.

The list of approved recycling equipment can be found in EPD's webpage below:

http://www.epd.gov.hk/epd/english/environmentinhk/air/ozone_layer_protection/wn 6_info_equipment.html



The list will be updated from time to time. For any recycling equipment that is not listed in the above webpage, you may seek the approval from EPD.

Refrigerant Management Plan

- 8. For medium and large refrigeration and air-conditioning systems, the owner/manager should develop a refrigerant management plan to determine how and when to maintain, convert or replace each piece of HCFCs equipment after analyzing the inventories, choices, cost, etc. A good refrigerant management plan is based on accurate equipment and refrigerant inventories and takes account of the unique business environment. The plan will help minimize the unnecessary use of refrigerant as well as relief any possible shortage in supply of HCFCs for servicing the existing equipment.
- 9. Effort should also be made to prevent refrigerant used or intended for use in the refrigeration equipment from escaping into the atmosphere during operation. Precautionary steps such as conserving HCFCs through routine leak checks, leak detection, equipment repairs and refrigerant recovery can minimize emissions of HCFCs to the atmosphere. A self-monitoring system to automatically detect the leakage of refrigerant from the refrigeration and air-conditioning system is recommended.

Records to be kept

- 10. For non-domestic premises in which there is refrigeration and airconditioning system, the owner/manager should also keep in the premises up-to-date records of:
 - the dates on which HCFCs was removed from the system; and
 - the dates on which any replacement of HCFCs was added to that system; and
 - the amount of HCFCs involved,

to facilitate a better monitoring of the usage and minimize unnecessary use of HCFCs.



Disposal of HCFCs

- 11. The unwanted HCFCs are classified as chemical waste under Waste Disposal (Chemical Waste) (General) Regulation and its handling and disposal are subject to control under the Waste Disposal Ordinance and its subsidiary Regulation.
- 12. Any person or company requiring disposal service of unwanted HCFCs should first register with the EPD as a chemical waste producer. The registered chemical waste producer needs to properly pack, label and store chemical waste, and engage licensed chemical waste collectors to collect and deliver the waste to the Chemical Waste Treatment Centre, a licenced chemical waste disposal facility in Tsing Yi. The producer should also keep records known as trip-tickets for consignment of the chemical waste, the producer is required to make prior notification to EPD before any intended disposal operation. The disposal of such chemical waste needs to follow directions issued by EPD. For details please refer to the leaflet "Guidance Note for Ozone Depleting Substances Destruction at the Chemical Waste Treatment Centre" which can be accessed online at

http://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk /air/ozone_layer_protection/files/GN2014P013-2014ar-e.pdf

Enquiry

13. Enquiries concerning this Guidance Note and any other information on the Ozone Layer Protection ordinance may be made to the Air Science and Modelling Group of the Environmental Protection Department at the following address:

Address	Telephone	Facsimile
Air Science and Modelling Group Environmental Protection Department 33/F., Revenue Tower, 5 Gloucester Road, Wan Chai, Hong Kong	2594 6593 2594 6225	2827 8040

Appendix I

Routine servicing of system

- 1. All servicing of air-conditioning or refrigeration system should be carried out by qualified technical personnel.
- 2. Do not use refrigerant gas for cleaning purposes.
- 3. The manufacturer's recommended routine servicing procedures should be followed and in particular, the following must be checked, tightened, and replaced when necessary:
 - (i) all refrigerant piping joints,
 - (ii) all refrigerant valve stem glands,
 - (iii) all blanking plates over gauge points,
 - (iv) all compressor gaskets,
 - (v) all shaft seals, control bellows, or possible leakage points.
- 4. Before refrigerant is added to the system, make sure the causes of the leakage are identified and all leakages are repaired.
- 5. When a leak is located, isolate that part of the system to minimize the loss of refrigerant. If it is impossible to isolate that part of the system, pump the refrigerant charge to the plant receiver or to a properly designed container.
- 6. Lightly purge all connecting lines or hoses before charging the system.
- 7. Never vent refrigerant to the atmosphere. Always recover and re-use refrigerant during servicing to minimize the discharge to the atmosphere.



Cleaning and flushing a contaminated system after a hermetic or semi-hermetic compressor failure or motor burn out

- 1. Follow the manufacturers recommended procedures and isolate as many parts of the system as possible.
- 2. Remove the contaminated refrigerant into properly designed refillable containers using a recycling equipment. Great care should be taken not to over-fill a container. Different refrigerant gases should not be mixed in the same container.
- 3. When the system or the isolated part is empty, the component parts should be removed, capped off, and cleaned with a proper solvent as recommended by the manufacturer. Do not use any solvent containing ozone depleting substance to clean the parts.
- 4. After cleaning, the components should be re-assembled in the system with new replacement parts.
- 5. The system should then be pressurized by nitrogen and a thorough leak test carried out before recharging with refrigerant.

Recovery and recycling refrigerant

- 1. When filling up a HCFCs refrigerant container, never exceed the designed maximum working pressure carrying capacity however temporarily.
- 2. Contaminated refrigerant decanted into a refrigerant container may corrode the container. Competent engineer should regularly examine the container to determine if it is fit for continued service under design conditions.
- 3. To avoid the danger of mixing different refrigerants, transfer a refrigerant to receiving containers which were only used previously for storing the same refrigerant.