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To: Air-Conditioning and Refrigeration Trade Members, Property Management Companies, Owners and Users of the Refrigeration Equipment and Other Stakeholders

Circular: Safety of Flammable Refrigerants

Hydrofluorocarbon (HFC) refrigerants are now commonly used in Hong Kong. They are neither flammable¹ nor ozone depleting and are compliant with the relevant existing safety and environmental statutory requirements. However, HFC has high global warming potential (GWP) and its emission into the atmosphere would have a negative impact on global warming. In view of this, an agreement on the timeframe for reducing carbon emissions and phasing out high GWP gases (including the existing HFC refrigerants) was reached in October 2016 by nearly 200 representatives from different countries. Given the above development, low GWP but more flammable refrigerants have been used in some refrigeration equipment (including air-conditioning and refrigeration systems) in some parts of the world in recent years.

In Hong Kong, equipment using HFC as refrigerants is still available on the market and the trend of using flammable refrigerants in air-conditioning and refrigeration equipment in industrial and commercial buildings is not obvious at present. Nevertheless, the Electrical and Mechanical Services Department (EMSD) and the Fire Services Department (FSD) remind the local air-conditioning and refrigeration trade members, property management companies, owners and users of the refrigeration equipment and other stakeholders to duly consider the regulation and safety regarding flammable refrigerants, and to take public safety as the primary consideration when choosing refrigeration equipment and its refrigerants. In view of Hong Kong's crowded and densely populated environment with congested high-rise buildings, it is not suitable to adopt refrigeration equipment using flammable refrigerants (please see [Annex](#) for examples) in industrial and commercial

¹ HFC is classified as Class 1 according to the flammability classification of the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE), i.e. it does not show flame propagation at 60 °C.

buildings from the perspectives of safety and risk management. As for existing equipment, you are advised to adopt the prescribed refrigerants according to the manuals provided by manufacturers instead of switching to flammable refrigerants for the avoidance of accidents. Besides, the Labour Department (LD) reminds the employers concerned to develop and maintain a safe system of work, providing adequate safety precautions if their employees are required to handle refrigerants, irrespective of whether they are flammable.

The storage, handling and use of refrigerants are subject to statutory regulation, including the Dangerous Goods Ordinance and the Gas Safety Ordinance enforced by FSD and EMSD respectively, as well as the Factories and Industrial Undertakings Ordinance and the Occupational Safety and Health Ordinance which are enforced by LD in relation to occupational health and safety of employees.

Air-conditioning and refrigeration trade members and property management companies are also advised to convey the above message to owners and users of refrigeration equipment. In case illegal storage, handling and use of flammable refrigerants are found, or where there is any violation of occupational health and safety requirements in the work process concerned, law enforcement actions will be taken by the relevant departments.

In addition, EMSD will, together with the relevant departments, keep a close watch on the research and development of refrigerants and the development of refrigeration equipment, and continue the effort in offering advice to trade members and stakeholders.

For enquiries on this circular, please contact EMSD at 2808 3683.



(POON Kwok-ying, Raymond)
for Director of Electrical and
Mechanical Services



(CHAN Kam-cheung)
for Director of Fire Services



(CHAN Cheung-hing, Thomas)
for Commissioner for Labour

Name of Refrigerant	Composition	Flammability Classification of ASHRAE *
R600a	Isobutane (異丁烷)	Class 3 (Highly Flammable)
R290	Propane (丙烷)	Class 3 (Highly Flammable)
R32	Difluoromethane (二氟甲烷)	Class 2L (Mildly Flammable)
R1234ze(E)	1,3,3,3-Tetrafluoropropene (1,3,3,3-四氟丙烯)	Class 2L (Mildly Flammable)
R1234yf	2,3,3,3-Tetrafluoropropene (2,3,3,3-四氟丙烯)	Class 2L (Mildly Flammable)

* American Society of Heating, Refrigerating and Air-conditioning Engineers