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Dear Sir/Madam,

REVIEW ON USE OF HYDROCARBON REFRIGERANT IN SINGAPORE

Since September 2009, a multi-agencies (HSD, SCDF, NEA, SPRING, MOM, LTA) working group undertook a holistic review on the use of Hydrocarbon (HC) refrigerants across various applications¹. While we recognise that HC refrigerants have an edge over some other refrigerants in terms of their environmental impact, the main consideration is that HC refrigerant is extremely flammable and would pose a potential safety hazard to users and occupants. These are additional risks which can be avoided if safer alternative refrigerants or other refrigerant blends are used.

2. The working group had reviewed the use of HC refrigerants carefully and had also engaged the relevant agencies (eg. NEA, SPRING, MOM, LTA) and industry stakeholders (eg. ASHRAE, MTA, SCIC) for feedbacks during the review. A survey to seek information on the use of HC refrigerants in buildings was also conducted through Fire Safety Managers in Oct 2010. The policy to restrict and regulate the use of HC refrigerants for the various relevant applications are summarised in **Annex A**.

3. We have not come to this conclusion lightly as we understand the potential ramifications to the industry and users. To manage the risk exposure as well as the economic impact to the industry and users, we have been conducting our outreach efforts to the industry and through the relevant lead agencies since July 2011. The intention is to provide the relevant lead agencies sufficient time to communicate with their stakeholders as well as to allow the industry sufficient lead time to adjust to the policy. Notwithstanding the restriction on certain applications, we would continue to monitor the market for emerging alternatives to HC refrigerants that could better address the safety, environmental and economic concerns.

¹ Applications under review include domestic refrigerator, air-conditioning system, commercial refrigeration system and industrial process refrigeration system (Annex A).

4. This circular serves to inform all concern parties that the policy to restrict and regulate the use of HC refrigerants for the various applications shall take effect from 1st January 2012. Please assist to convey the contents of this circular to the parties concerned.

5. This circular also serves to advise Qualified Persons, Registered Inspectors and Fire Safety Managers on the regulatory requirements with regard to the use of hydrocarbon refrigerants in buildings. They are advised to ensure that the use of refrigerants in air-conditioning and refrigeration systems is in compliance to the requirements outlined in Annex A.

6. For any inquiry or clarification, please contact MAJ Han Fook Kuang at Tel. No.: 68481467 (e-mail : Han_Fook_Kuang@scdf.gov.sg), or CPT Jason Zhou at Tel. No.: 68483312 (e-mail : Jason_Zhou@scdf.gov.sg).

7. Please convey the contents of this circular to members of your Institution/Association/Board. This circular is also available in CORENET-e-Info: <http://www.corenet.gov.sg/einfo>

Yours faithfully,



CPT JASON ZHOU
HazMat Department
for Commissioner
Singapore Civil Defence Force

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Policy on the use of Hydrocarbon (HC) Refrigerants

S/N	Applications	Recommendations
1	Domestic refrigerators and air-conditioners (eg. stand-alone and wall mounted air-con units)	<ul style="list-style-type: none">▪ To allow the use of HC refrigerant in SPRING-regulated domestic refrigerators (under Consumer Protection Scheme), subject to a charge weight cap of 150g of HC refrigerant and the refrigerant must be hermetically sealed within the refrigerator.▪ To allow the use of HC refrigerant in SPRING-regulated air-conditioners (under Consumer Protection Scheme).▪ To educate users (eg. advisory labels) on the inherent risks of HC refrigerant and issue of disposal.
2	Air-conditioning systems	<ul style="list-style-type: none">▪ To disallow the use of HC refrigerants in building air-conditioning systems². Premises which have converted their air-conditioning systems into using HC refrigerants as drop-in³ shall be gradually phased out by end 2016⁴.▪ To disallow the use of HC refrigerants in vehicle air-conditioning system⁵.
3	Commercial refrigeration systems ⁶ (e.g. Coldrooms in supermarkets and food storage factories)	To disallow the use of HC refrigerants in commercial refrigeration systems.

² The building air-conditioning systems refer to single/multi split system which requires the installation of piping into occupied areas.

³ Direct replacement of HCFC refrigerant with HC refrigerant without modifying the operating specifications and design of the equipment

⁴ Users whom have not already been contacted by SCDF are requested to contact SCDF for more details.

⁵ LTA will publish the restriction in the guidelines for car import and car modifications.

⁶ Commercial refrigeration systems include chiller room, standalone commercial/retail refrigeration equipment and chiller truck.

S/N	Applications	Recommendations
4	Industrial process refrigeration systems (e.g. Heat exchangers)	<p>To disallow the use of HC refrigerants in industrial process refrigeration systems unless:</p> <p>(1) the use of HC refrigerants is inherent⁷ to the industrial process, and</p> <p>(2) has satisfied MOM's workplace safety regime and SCDF's fire safety regulatory requirements</p> <p>For existing users⁸ where HC refrigerant is not inherent to the industrial process, they could still appeal to SCDF through the waiver process. They would need to provide sufficient justifications that the existing fire safety provisions are adequate to address the fire risks posed by the HC refrigerant or are prepared to implement the necessary additional measures to address the fire risks.</p>

⁷ The use of HC refrigerant is considered inherent to the industrial process if there are no alternatives which could achieve the necessary specific performance required for the process.

⁸ Users whom have not already been contacted by SCDF are requested to contact SCDF for more details.