

## **RESTRICTION ON USE OF FLAMMABLE REFRIGERANTS IN SINGAPORE**

### **SCOPE**

1. This appendix serves to inform all concerned parties that the policy to restrict and regulate the use of flammable refrigerants for the various applications which took effect from 1<sup>st</sup> January 2012.

### **DEFINITIONS**

2. **“Flammable Refrigerant”** refers to the group of refrigerants with flammability classification of group 2 or 3 in accordance to International Organization for Standardization (ISO) 5149. For refrigerant blends which have more than one flammability classification, the most unfavourable classification shall be taken for the purpose of this definition. Most of these flammable refrigerants are hydrocarbon (HC) based. Some examples of HC refrigerant include propane, butane and isobutene.

### **BACKGROUND**

3. Since September 2009, a multi-agency (SCDF, NEA, SPRING, MOM and LTA) working group undertook a holistic review on the use of flammable refrigerants across various applications<sup>1</sup>. While it is recognised that HC refrigerants have an edge over many refrigerants in terms of their environment 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.

### **GENERAL REQUIREMENTS**

4. The working group had carefully reviewed the use of flammable refrigerants and had also engaged the relevant industry stakeholders such as ASHRAE, MTA, SCIC) for their feedbacks during the review. The policies to restrict and regulate the use of flammable refrigerants for the various relevant applications are summarised in **Annex A**.

### **POLICY UPDATES**

5. Notwithstanding the restriction on certain applications, we would continue to monitor the market for emerging alternatives to flammable refrigerants that could better address the safety, environmental and economic concerns. For the latest updates on the policy, pls visit the following SCDF website address: “[http://www.scdf.gov.sg/content/scdf\\_internet/en/building-professionals/publications\\_and\\_circulars.html](http://www.scdf.gov.sg/content/scdf_internet/en/building-professionals/publications_and_circulars.html).”

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<sup>1</sup> Applications under review include domestic refrigerator, air-conditioning system, commercial refrigeration system and industrial process refrigeration system.

**Policy on the use of Flammable Refrigerants**

<p><b>1</b></p>	<p>Domestic refrigerators and air-conditioners (eg. stand-alone and wall mounted air-con units)</p>	<ul style="list-style-type: none"> <li>▪ To allow the use of flammable refrigerant in SPRING-regulated domestic refrigerators (under Consumer Protection Scheme), subject to a charge weight cap of 150g of flammable refrigerant and the refrigerant must be hermetically sealed within the refrigerator.</li> <li>▪ To allow the use of flammable refrigerant in SPRING-regulated air-conditioners (under Consumer Protection Scheme).</li> <li>▪ To educate users (eg. advisory labels) on the inherent risks of flammable refrigerant and issue of disposal.</li> </ul>
<p><b>2</b></p>	<p>Air-conditioning systems</p>	<ul style="list-style-type: none"> <li>▪ To disallow the use of flammable refrigerants in building air-conditioning systems<sup>2</sup>. Premises which have converted their air-conditioning systems into using flammable refrigerants as drop-in<sup>3</sup> shall be gradually phased out by end 2016.</li> <li>▪ To disallow the use of flammable refrigerants in vehicle air-conditioning system<sup>4</sup>.</li> </ul>
<p><b>3</b></p>	<p>Commercial refrigeration systems<sup>5</sup> (e.g. Coldrooms in supermarkets and food storage factories)</p>	<p>To disallow the use of flammable refrigerants in commercial refrigeration systems.</p>

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

<sup>3</sup> Generally refers to direct replacement of HCFC refrigerant with flammable refrigerant without modifying the operating specifications and design of the equipment

<sup>4</sup> LTA would publish the restriction in the guidelines for car import and car modifications.

<sup>5</sup> Commercial refrigeration systems include chiller room, standalone commercial/ retail refrigeration equipment and chiller truck.

4	Industrial process refrigeration systems (e.g. Heat exchangers)	<p>To disallow the use of flammable refrigerants in industrial process refrigeration systems unless:</p> <ol style="list-style-type: none"> <li>(1) the use of flammable refrigerants is inherent<sup>6</sup> to the industrial process, and</li> <li>(2) has satisfied MOM's workplace safety regime and SCDF's fire safety regulatory requirements</li> </ol> <p>For existing users where flammable 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 flammable refrigerant or are prepared to implement the necessary additional measures to address the fire risks.</p>
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<sup>6</sup> The use of flammable refrigerant is considered inherent to the industrial process if there are no alternatives which could achieve the necessary specific performance required for the process.

