



# SCDF

The Life Saving Force

... for a safer Singapore

SINGAPORE CIVIL DEFENCE FORCE

Date : 13 January 2025

Our Ref: CD/05/03/01

Attn: Manufacturers / Suppliers / Distributors

Dear Sir/Madam,

## CIRCULAR ON THE USE OF R32 AND R290 REFRIGERANTS IN PORTABLE AIR CONDITIONERS IN SINGAPORE

From 1 April 2025, suppliers of portable air conditioners (PACs) are required to comply with the National Environment Agency's (NEA's) Energy Conservation Act (ECA) requirements. To date, only the R32 and R290 refrigerants can meet the ECA's requirements and the latest minimum energy efficiency standards. However, SCDF currently disallow the use of these refrigerants in PACs due to their flammability properties.

2. In consultation with NEA and the PAC industry, SCDF had completed the review on the use of R32 and R290 in PACs and will support the use of R32 and R290 in PACs subject to complying with SCDF's safety requirements (refer to **Annex A**). Any person who wishes to supply PACs using R32 or R290 are to seek SCDF's in-principle no objection before registering the products under the ECA.

3. This circular shall take immediate effect. Please convey the contents of this circular to the parties concerned. For any inquiries or clarifications, please contact CPT Jarren Tuang (e-mail: [Jarren\\_TUANG@scdf.gov.sg](mailto:Jarren_TUANG@scdf.gov.sg) or [SCDF\\_Haz\\_feedback@scdf.gov.sg](mailto:SCDF_Haz_feedback@scdf.gov.sg)).

Yours sincerely,

(transmitted via email)  
CPT Jarren Tuang  
HazMat Department  
Singapore Civil Defence Force



**SCDF – A member of the Home Team**

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## **1 SCOPE**

- 1.1 This document outlines the safety requirements for the safe use of R32 and R290 refrigerants in portable air conditioners (PAC) in Singapore. R32 is classified as A2L while R290 is classified as A3 in accordance with International Organisation for Standardisation (ISO) 817.

## **2 DEFINITION**

- 2.1 'Recognised Certification Body' (CB)  
Refers to local or foreign third-party independent body or centre, recognised by SCDF, that conducts conformity assessment for the equipment.
- 2.2 'Portable air conditioner'  
Refers to a self-contained, factory sealed, single package units that are designed for easy movement within occupancy spaces, and includes components such as compressors, condensers, evaporators, and fans within a single housing.
- 2.3 'Manufacturer'  
Refers to any party that owns or operates the plant manufacturing the PAC.
- 2.4 'Supplier'  
Refers to any party authorised by the manufacturer and relevant authorities to commercially distribute the PAC to users in Singapore.
- 2.5 'Service personnel'  
Refer to technical personnel who are employed by the manufacturer or approved suppliers to provide after-sale services, including but not limited to, delivery, installation, maintenance, decommissioning, and disposal of the PAC.
- 2.6 'User'  
Refers to any entity responsible for owning and/or managing the daily operation of the PAC, ensuring its proper maintenance and adherence to general duty of care standards.
- 2.7 'Equipment placement room'  
Refers to a specific compartmentalised area or room where the user places the PAC for its intended use.
- 2.8 'LFL'  
The LFL or Lower Flammability Limit refers to the minimum concentration of a flammable gas or vapour in air that can be ignited at a specific temperature and pressure.

### **3 SAFETY REQUIREMENTS**

#### **3.1 General Safety Requirements**

3.1.1 The manufacturer shall ensure that the PAC (hereinafter referred to as “equipment”) complies with the latest applicable International Electrotechnical Commission (IEC) standards (e.g., IEC 60335-2-40) and ISO standards (e.g., ISO 5149-1) or equivalent established standards (e.g., UL 60335-2-40) for air conditioning systems. The equipment shall also be regulated by Enterprise Singapore under the Consumer Protection (Consumer Goods Safety Requirements) Regulations (CGSR).

3.1.2 The manufacturer, either directly or through his approved suppliers, shall ensure that the equipment shall not carry more than the amounts of flammable refrigerants as listed in the table below.

<b>Refrigerant</b>	<b>Maximum Charge Limit (kg)</b>
R290 (Propane)	0.30
R32 (Difluoromethane)	2.45

3.1.3 The manufacturer, either directly or through his approved suppliers, shall ensure that R32 or R290 refrigerants are only used in the new equipment designed specifically for each refrigerant.

3.1.4 Any party who imports, transports, stores and/or works with R32 or R290 shall comply with all relevant regulatory requirements from the relevant authorities. This includes obtaining the relevant Petroleum and Flammable Materials license(s) from the SCDF HazMat Department and complying with the relevant fire safety requirements for buildings.

#### **3.2 Safety Awareness**

3.2.1 The manufacturer, either directly or through his approved suppliers, shall take all necessary measures as may be deemed reasonable to educate users on the inherent flammability risks of R32 and R290 refrigerants in the equipment and to ensure the safe handling and usage of the equipment. These measures shall include, but are not limited to, those outlined under Parts 4 and 5 of this document.

### **4 ADVISORY LABEL REQUIREMENTS**

#### **4.1 Advisory Label for Users**

4.1.1 The advisory label must be printed and attached as a label or sticker on the front of the equipment displayed at retail premises, ensuring it is clearly visible to potential buyers.

- 4.1.2 Units delivered to a buyer's premises, or any other location specified by the buyer shall have advisory labels affixed to the front of the equipment. Alternative locations on the equipment may be considered, provided that the labels remain clearly visible to the user after installation.
- 4.1.3 The advisory label shall comply with the design specifications outlined in **Appendix A1**. The advisory label shall be 90mm (length) by 90mm (breadth). The printed label shall be in an indelible manner and with a minimum resolution of 300 pixels per inch (ppi) as illustrated below.



4.2 **Advisory Label for Service Personnel**

- 4.2.1 The advisory label to indicate the flammability risks must be permanently affixed near the access area and ensure it remains clearly visible when the casing is removed for maintenance purposes.
- 4.2.2 The advisory label shall be accompanied with a triangular warning sign in accordance with the latest applicable ISO standards (e.g., ISO 7010) for flammable material warning labels. The perpendicular height of the triangular warning sign shall be at least 15mm. The name of the refrigerants (i.e., R32, Difluoromethane and R290, Propane) should also be included along with the triangular warning sign as shown in the sample below.



**Propane  
(R-290)**

- 4.2.3 The advisory label shall be accompanied by cautionary statements concerning the associated flammability risks, safe handling, servicing and disposal of the system. The cautionary statements shall be provided in both English and Chinese languages.
- 4.2.4 The advisory label shall comply with the design specifications outlined in **Appendix A2**. The printed label shall be in an indelible manner and with a minimum resolution of 300 pixels per inch (ppi).
- 4.2.5 For existing labels that may contain other advisory messages from the manufacturer, the advisory label outlined in Part 4.2 may be provided either as a standalone label or may be combined with the existing labels.
- 4.2.6 (**Exception**: The advisory label design specifications outlined in Appendix A2 may be exempted for systems with existing advisory labels containing similar warning sign and cautionary statements as outlined in Parts 4.2.2 and 4.2.3.)

## **5 SAFETY CONTROL MEASURES**

### **5.1 Manufacturer/Supplier**

- 5.1.1 The manufacturer or supplier shall take all necessary measures as may be deemed reasonable to ensure that service personnel, either employed by him or his approved suppliers, who handle the equipment, are equipped with all the relevant technical skills to work safely with the equipment. The manufacturer or shall fulfil this by ensuring that the service personnel have completed relevant competency training.
- 5.1.2 The manufacturer, either directly or through his approved suppliers, shall provide the equipment safety instruction manual to the user to ensure that the user is fully aware of the inherent flammability risks associated with R32 and R290 refrigerants, the essential safety precautions and procedures to adopt. The instruction manual should include a recommended maintenance regime for the equipment in accordance with relevant safety standards and the industry best practices.
- 5.1.3 The manufacturer, either directly or through his approved suppliers, shall offer assistance or services to the user in carrying out installation, maintenance and decommissioning of the system in accordance with the relevant safety standards and industry best practices.

### **5.2 Service Personnel**

- 5.2.1 The employer of the service personnel shall ensure that they are adequately trained before they work with R32 and R290 refrigerants and their related equipment.
- 5.2.2 The employer of the service personnel shall comply with the relevant requirements under the Workplace Safety and Health Act.

5.3 User

- 5.3.1 The user shall ensure mechanical, or natural ventilation system is available at the equipment placement room to prevent accumulation of flammable refrigerant during a leak.
- 5.3.2 The user shall be advised by the manufacturer, either directly or through his approved suppliers, to ensure strict ignition control regime (e.g., No smoking near equipment) and where practical, eliminate all potential ignition sources (e.g., spark/naked flame) from the equipment placement room.
- 5.3.3 The user shall engage trained service personnel to carry out any repair, servicing, or disposal of the equipment. The service personnel shall be trained to handle equipment using flammable refrigerants and follow safety procedures in accordance with relevant safety standards and industry best practices.

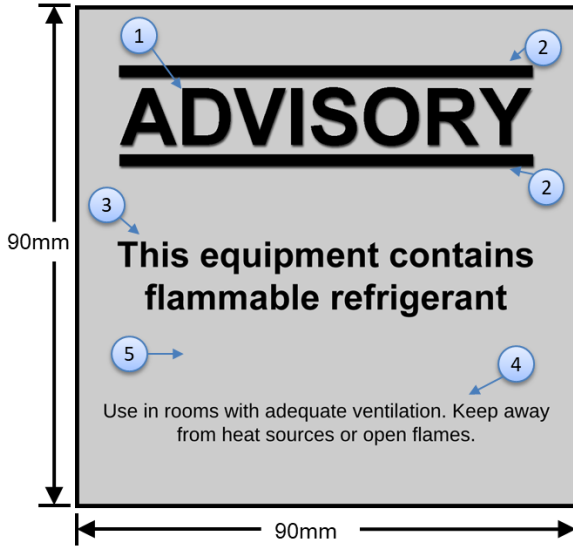
**6 IMPLEMENTATION**

- 6.1 Manufacturers, suppliers or distributors shall inform SCDF (HazMat Department) of any modifications made to the equipment which may potentially affect the safe usage of the equipment or changes made to the relevant safety standards. Where necessary, SCDF may require a new certification and lab testing from the recognised CB to be submitted. The supplier shall be responsible for the full compliance of the safety requirements stipulated in Parts 3, 4 and 5 of this document.

**7 REFERENCES**

- 7.1 International Electrotechnical Commission. *Household and similar electrical appliances – Safety – Part 2-40: Particular requirements for electrical heat pumps, air-conditioners, and dehumidifiers* (IEC 60335-2-40).
- 7.2 International Organisation for Standardisation. *Refrigerants – Designation and safety classification* (ISO 817).
- 7.3 International Organisation for Standardisation. *Refrigerating systems and heat pumps – Safety and environmental requirements. Part 1: Definitions, classification and selection criteria.* (ISO 5149-1).
- 7.4 Enterprise SG - Consumer Protection (Consumer Goods Safety Requirements) Regulations.

*Full Design Specifications for Advisory Labels on Front of Equipment*

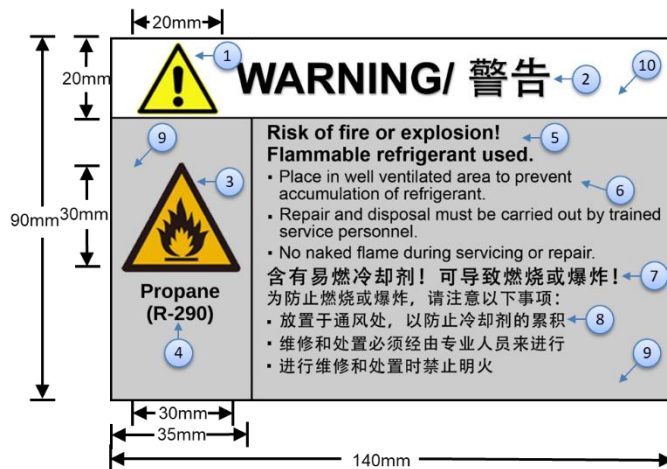


Tag	Description
1	Main cautionary sign. (Arial Black, Bold, Black; Size 40)
2	Two black bars (6 pt thickness) border the cautionary sign.
3	General information statement indicates presence of flammable refrigerant in the equipment. (Arial Black, Bold, Black; Size 18)
4	Any other information is specified here. (Arial Black, Black; Size 10)
5	Background in light grey, (Light Grey; Hex Colour Code #CCCCCC)

Sample



*Full Design Specifications for Advisory Labels for Service Personnel and Users*



Tag	Description
1	Hazard warning symbol in accordance with ISO 7010.
2	Main cautionary sign in English and Chinese. (Arial Black, Bold, Black; Size 28)
3	Flammable material warning symbol in accordance with ISO 7010.
4	Name and refrigerant designation. (Arial Black, Bold, Black; Size 14)
5	Cautionary statement on the risks in English (Arial Black, Bold, Black; Size 14)
6	Safety precautions and advice in English. (Arial Black, Black; Size 12)
7	Cautionary statement on the risks in Chinese. (Adobe Heiti Std, Bold, Black; Size 14)
8	Safety precautions and advice on the risk in Chinese. (Adobe Heiti Std, Bold, Black; Size 12)
9	Background in light grey. (Light Grey; Hex Colour Code #CCCCCC)
10	Background in white. (Light Grey; Hex Colour Code #FFFFFF)

Sample

