

The Environmental Protection Agency

**COMPLYING WITH REGULATIONS CONTROLLING FLUORINATED  
GREENHOUSE GASES AND OZONE DEPLETING SUBSTANCES**

A GUIDANCE NOTE FOR OPERATORS IN THE

**Offices and Public Buildings Sector**

# Environmental Protection Agency

The Environmental Protection Agency (EPA) is a statutory body responsible for protecting the environment in Ireland. We regulate and police activities that might otherwise cause pollution. We ensure there is solid information on environmental trends so that necessary actions are taken. Our priorities are protecting the Irish environment and ensuring that development is sustainable.

The EPA is an independent public body established in July 1993 under the Environmental Protection Agency Act, 1992. Its sponsor in Government is the Department of the Environment, Heritage and Local Government.

## OUR RESPONSIBILITIES

### Licensing

We license the following to ensure that their emissions do not endanger human health or harm the environment:

- waste facilities (e.g., landfills, incinerators, waste transfer stations);
- large scale industrial activities (e.g., pharmaceutical manufacturing, cement manufacturing, power plants);
- intensive agriculture;
- the contained use and controlled release of Genetically Modified Organisms (GMOs);
- large petrol storage facilities;
- waste water discharges.

### National Environmental Enforcement

- Conducting over 2,000 audits and inspections of EPA licensed facilities every year.
- Overseeing local authorities' environmental protection responsibilities in the areas of – air, noise, waste, waste-water and water quality.
- Working with local authorities and the Gardai to stamp out illegal waste activity by co-ordinating a national enforcement network, targeting offenders, conducting investigations and overseeing remediation.
- Prosecuting those who flout environmental law and damage the environment as a result of their actions.

### Monitoring, Analysing and Reporting on the Environment

- Monitoring air quality and the quality of rivers, lakes, tidal waters and ground waters; measuring water levels and river flows.
- Independent reporting to inform decision making by national and local government.

### Regulating Ireland's Greenhouse Gas Emissions

- Quantifying Ireland's emissions of greenhouse gases in the context of our Kyoto commitments.
- Implementing the Emissions Trading Directive, involving over 100 companies who are major generators of carbon dioxide in Ireland.

### Environmental Research and Development

- Co-ordinating research on environmental issues (including air and water quality, climate change, biodiversity, environmental technologies).

### Strategic Environmental Assessment

- Assessing the impact of plans and programmes on the Irish environment (such as waste management and development plans).

### Environmental Planning, Education and Guidance

- Providing guidance to the public and to industry on various environmental topics (including licence applications, waste prevention and environmental regulations).
- Generating greater environmental awareness (through environmental television programmes and primary and secondary schools' resource packs).

### Proactive Waste Management

- Promoting waste prevention and minimisation projects through the co-ordination of the National Waste Prevention Programme, including input into the implementation of Producer Responsibility Initiatives.
- Enforcing Regulations such as Waste Electrical and Electronic Equipment (WEEE) and Restriction of Hazardous Substances (RoHS) and substances that deplete the ozone layer.
- Developing a National Hazardous Waste Management Plan to prevent and manage hazardous waste.

### Management and Structure of the EPA

The organisation is managed by a full time Board, consisting of a Director General and four Directors.

The work of the EPA is carried out across four offices:

- Office of Climate, Licensing and Resource Use
- Office of Environmental Enforcement
- Office of Environmental Assessment
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet several times a year to discuss issues of concern and offer advice to the Board.

The Environmental Protection Agency

**COMPLYING WITH REGULATIONS CONTROLLING FLUORINATED  
GREENHOUSE GASES AND OZONE DEPLETING SUBSTANCES**

A GUIDANCE NOTE FOR OPERATORS IN THE  
**Offices and Public Buildings Sector**



**ENVIRONMENTAL PROTECTION AGENCY**

An Ghníomhaireacht um Chaomhnú Comhshaoil  
PO Box 3000, Johnstown Castle Estate, Co. Wexford, Ireland  
Telephone: +353 53 916 0600 Fax: +353 53 916 0699  
Email: [info@epa.ie](mailto:info@epa.ie) Website: [www.epa.ie](http://www.epa.ie)  
LoCall 1890 33 55 99

© Environmental Protection Agency 2010

**COMPLYING WITH REGULATIONS CONTROLLING FLUORINATED  
GREENHOUSE GASES AND OZONE DEPLETING SUBSTANCES  
A Guidance Note for Operators in the Offices and Public Buildings Sector**

Published by the Environmental Protection Agency, Ireland

This document does not purport to be and should not be considered a legal interpretation of the legislation referred to herein. Although every effort has been made to ensure the accuracy of the material contained in this publication, complete accuracy cannot be guaranteed. Neither the Environmental Protection Agency nor the authors accept any responsibility whatsoever for loss or damage occasioned, or claimed to have been occasioned, in part or in full as a consequence of any person acting or refraining from acting, as a result of a matter contained in this publication. All or part of this publication may be reproduced without further permission, provided the source is acknowledged.

ISBN: 978-1-84095-358-9

Free of Charge

# Contents

<b>Introduction</b>	<b>5</b>
<b>1. What are the EC F-gas and ODS Regulations?</b>	<b>6</b>
1.1 F-gas Regulation	6
1.2 ODS Regulation	6
<b>2. Where to Begin</b>	<b>7</b>
2.1 Identify all the RAC equipment you operate	7
2.2 Check to confirm you are the operator for all RAC equipment	7
2.3 Check whether this equipment contains refrigerants affected by these Regulations	7
2.4 Establish the quantity of refrigerant in each piece of equipment	8
<b>3. Key Obligations for Operators</b>	<b>9</b>
3.1 Summary of Key Obligations for Operators in the Offices and Public Buildings	9
3.2 I'm the end user does this affect me?	9
3.3 What equipment uses F-gases and ODS?	9
3.4 Where would I find F-gases and ODS?	10
3.5 Some common F-gases and ODS in use	11
<b>4. Key Obligations Explained</b>	<b>12</b>
4.1 Containment	12
4.2 Recovery and Waste Management	13
4.3 Training and Certification	15
4.4 Labelling	17
4.5 Placing on the Market	17
4.6 HCFC (including R22) Phase Out	17
<b>5. The Environmental Impact Considered</b>	<b>18</b>
5.1 Reducing Leakage	18
5.2 Considering Alternatives	18
5.3 Energy Efficiency	19
<b>Appendices</b>	
Appendix 1: Abbreviations and Definitions	20
Appendix 2: Sources of Further Information	23
Appendix 3: Example Inventory	24
Appendix 4: Refrigerants Affected by these Regulations	25
Appendix 5: Sample Log Sheet for Record Keeping	27
Appendix 6: Questions and Answers regarding the Management of Waste Refrigerant	28



# Introduction

*This Guidance Note is published by the Environmental Protection Agency and is aimed at assisting organisations in the Republic of Ireland to comply with the EC F-gas and ODS Regulations in offices and public buildings.*

The EC F-gas and ODS Regulations are European Regulations that are directly in force in all EU Member States. The purpose of these regulations is to reduce the emissions of F-gases, which contribute to climate change, and ozone depleting substances (ODS), which harm the earth's ozone layer.

F-gases and ODS have properties that make them very effective refrigerants and because of this have been widely used in refrigeration, air-conditioning and heat pump (RAC) equipment. This guidance is addressed to organisations working in offices and public buildings and operating refrigeration, air-conditioning and heat pump (RAC) equipment that contains F-gases or ODS. In this sector some examples of where RAC equipment can be found include air conditioning in offices and for critical uses such as computer server rooms and archive/document storage. Complying with the EC F-gas and ODS Regulations will help reduce emissions of both greenhouse gases and ODS.

The guidance begins with a summary of the legislation, followed by details on the key obligations and an overview of best practice. The guidance concludes by providing some thoughts on how good containment can both benefit the environment as well as the bottom line for the end user. Further useful resources are presented in the Appendices.

# 1. What are the EC F-gas and ODS Regulations?

The main principle of the EC F-gas Regulation is better containment, while the main principle of the EC ODS Regulation is ultimate phase out of ODS and better containment in the interim. It is the operator – often the owner – who has responsibility to ensure that they comply with these regulations. Key obligations cover the need for regular leak checking and record keeping on systems containing 3 kg or more of refrigerant as well as the use of appropriately qualified personnel and companies to work on RAC equipment. Additional issues concern the phase out of ODS “use” by 2015, a ban on the use of non-refillable containers and the labelling of all new equipment.

The F-gas and ODS Regulations came about as a result of two global environmental agreements: the Kyoto Protocol and the Montreal Protocol. The purpose of these two protocols is to reduce the impact of greenhouse gases, including fluorinated greenhouse gases (F-gases) on climate change and ozone depleting substances (ODS) on the ozone layer, by reducing emissions of F-gases and ODS respectively.

## 1.1 F-gas Regulation

**Fluorinated greenhouse gases (F-gases)** are very powerful greenhouse gases that contribute to climate change if emitted to the atmosphere. F-gases include hydrofluorocarbons (HFCs) which are commonly used as refrigerants.

**The EC F-gas Regulation (No. 842/2006) on certain fluorinated greenhouse gases** – aims to reduce emissions of HFCs, PFCs and SF<sub>6</sub><sup>1</sup>.

The key requirements in this Regulation applied from July 2007 and are directly binding in all Member States. Irish Regulations<sup>2</sup> will be published to give further effect in Ireland to specific elements of the F-gas Regulation.

For help with abbreviations and definitions of terms see Appendix 1 and for other sources of information see Appendix 2.

## 1.2 ODS Regulation

**Ozone-Depleting Substances (ODS)** are chemicals that can damage the Earth’s ozone layer if they escape into the upper atmosphere. ODS include hydrochlorofluorocarbons (HCFCs), which are still in use as refrigerants in many building air-conditioning systems and refrigeration systems.

**The EC ODS Regulation (No. 1005/2009) on substances that deplete the ozone layer** replaces an earlier regulation (Regulation EC No. 2037/2000). The key requirement of the Regulation is the phasing-out of the use of ODS. The only ODS still widely in use are HCFC refrigerants, especially R22 and blends such as R408A. The use of virgin HCFCs in maintenance and servicing of refrigeration and air-conditioning equipment is banned since the end of 2009. Recycled and reclaimed HCFCs can continue to be used until the end of 2014.

Regulation (EC) No 2037/2000 was given further effect in Ireland by the Control of Substances that Deplete the Ozone Layer Regulations 2006 (S.I. No. 281 of 2006). These regulations are being revised in light of the new ODS Regulation referred to above<sup>3</sup>.

<sup>1</sup> Hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

<sup>2</sup> It is the obligation of the reader to ensure to refer to the most current legislation. The Irish Regulations, when published, will be available on the website of the Department of Environment, Heritage and Local Government [www.environ.ie](http://www.environ.ie).

<sup>3</sup> *Ibid.*



## 2. Where to Begin



*Even if you employ a contractor to service and maintain RAC equipment on your behalf, you need to comply with these regulations.*

The following steps are recommended:

### 2.1 Identify all the RAC equipment you operate

It is recommended that you create an inventory of the F-gas and ODS equipment in your business (see Appendix 3 for an example). Give each piece of equipment a unique identification and record the location, gas type, quantity of gas and other relevant details (e.g. cross reference with your asset register).

### 2.2 Check to confirm you are the operator for all RAC equipment

The status of the operator may be in doubt, for example in a franchise/landlord or rental/hire situation. To help answer this question, the EU Commission issued guidance in 2008 which states that the “*actual power over the technical functioning*” of a piece of equipment or system must include each of the following elements:

- Free access to the system, which entails the possibility to supervise its components and their functioning, and the possibility to grant access to third parties;
- The control over the day-to-day functioning/running (e.g. take the decision to switch it on or off); and,
- The powers (including financial power) to decide on technical modifications (e.g. replacement of a component), modification of the quantities of F-gases in the system, and to have checks or repairs carried out.

If all of these elements are transferred to a third party through contractual arrangements then the responsibility for compliance with operator requirements will likely rest with the third party, depending on how the contract is set up.

### 2.3 Check whether this equipment contains refrigerants affected by these Regulations

The first thing to do is to check the label on the equipment. RAC equipment containing F-gases, placed on the EU market since 1 April 2008, must have a label with the text “**Contains fluorinated greenhouse gases covered by the Kyoto Protocol**” and must also indicate the type and amount of the F-gas.

If the label does not help, then check the manual or the technical specifications of the equipment as these could provide information on the type of the refrigerant contained in the equipment. Alternatively, the supplier, manufacturer or company engineer carrying out maintenance or servicing of this equipment may be able to provide this information.

Apart from pure substances, various blends (F-gas preparations) containing F-gases are in use, some of which may be covered by the Regulation. Under the F-gas Regulation, blends are defined as mixtures of two or more substances, of which at least one is an F-gas, except where the total global warming potential is less than 150. See Appendix 4 for a list of the more common blends. If the refrigerant is not on the list then check material safety data sheets or ask your refrigerant supplier.

In terms of HCFCs, R22 is the main refrigerant although some blends are still in use. Check Appendix 4 and follow the steps above to identify whether your equipment contains HCFCs.

## 2.4 Establish the quantity of refrigerant in each piece of equipment

If you have established that you are using an F-gas or ODS refrigerant in your RAC equipment, the next step is to find out **how much** refrigerant is in the system. This is important as it affects the way that the Regulations will be applied.

**Note:** if the system is labelled as hermetically sealed this may affect the leak checking and record keeping requirements.

The initial options for establishing the refrigeration charge of a system are as follows:

- The refrigerant charge might be shown on a label attached to the system;
- The charge might be recorded in the instruction manual or in commissioning records; and,
- You might be able to get details from the plant manufacturer or the installation contractor.

If these options are not available, you will need an appropriately qualified person to look at the equipment in more detail to calculate the amount of refrigerant in the system.

## 3. Key Obligations for Operators

### 3.1 Summary of Key Obligations for Operators in the Offices and Public Buildings

The EC F-gas and ODS Regulations require operators to take steps to prevent F-gas and ODS leakage and to repair detected leakage as soon as possible. The key obligations are:

#### 1. Containment

Check equipment for leaks in accordance with the required frequency, depending on the size of the refrigerant fluid charge.

Fit automatic leak detection on systems containing 300 kg or more of HFCs; and,

Keep records for all systems containing 3 kg or more of F-gases and ODS.

#### 2. Recovery and waste management

Recover HFCs/HCFCs during servicing and maintenance;

Comply with waste management legislation in relation to transport of waste gases; and,

Comply with legislation in relation to waste electrical and electronic equipment (WEEE).

#### 3. Training and certification

Ensure that technicians/engineers have the required qualifications;

Ensure that businesses who employ technicians/engineers hold company certification.

#### 4. Labelling

Label new equipment adjacent to service point/information and in instruction manuals.

#### 5. Placing on the market

Only use HFCs/HCFCs in refillable containers.

#### 6. HCFC phase out

Comply with phase outs of HCFC refrigerants.

The ban on the use of virgin HCFC began on 31 December 2009 and the ban on the use of reclaimed or recycled HCFC will begin on 31 December 2014.

### 3.2 I'm the end user does this affect me?

Under the EC F-gas Regulation the term **"operator"** is used. The operator is defined as *"... the natural or legal person exercising actual power over the technical functioning of the equipment and systems ..."*. For many organisations this is straightforward – the end user is the owner and also the operator. If in doubt the three conditions detailed under point 2 of Where to Begin should be investigated.

### 3.3 What equipment uses F-gases and ODS?

Typically this covers three different types of **stationary** equipment:

#### Refrigeration systems

Equipment to cool products or storage spaces below ambient temperature

#### Air-conditioning systems

Equipment to cool buildings to a comfortable ambient temperature

#### Heat pumps

Heating devices that use a refrigerant circuit to extract energy from a waste heat source and deliver useful heat – cooling is also available in reversible systems.

### 3.4 Where would I find F-gases and ODS?

Offices and public buildings may use a lot of refrigeration and air conditioning depending on the purpose of the building or service offered. Sometimes it is very obvious where it is being used and other times systems operate in the background. Some examples of where RAC system containing F-gases and ODS may be used are as follows:

#### Office Buildings

- All organisations need to consider their use of refrigerants in RAC systems in the office buildings they occupy. Much office air-conditioning systems use ODS refrigerants (such as HCFC 22) or F-gas refrigerants (such as R410A and R407C). These may be in the form of small split systems or larger chilled water systems.

#### Hospitals

- This sector includes hospitals, health centres and nursing homes. Typical cooling applications in a hospital may include general air conditioning (for staff offices and wards), specialist air conditioning (for operating theatres or IT/communications rooms), equipment cooling (e.g. for X-ray machines), general refrigeration (for mortuary rooms and canteen catering) and specialist refrigeration (for vaccine and tissue stores and cryogenic applications). Smaller sites, like health centres and nursing homes, may also have air conditioning and refrigeration.

#### Schools, Universities and Conference Centres

- Other examples of the buildings sector are schools, colleges and conference centres. There is relatively little use of F-gases in most schools. However, there may be some air conditioning installed in larger modern schools and it is more likely to be found in universities and conference centres, especially in large buildings. Many schools and universities will have refrigeration systems for catering facilities and within universities there will be some specialist uses of refrigeration and air conditioning, particularly in laboratories, such as chilled rooms. Most systems use either HFCs or HCFCs.

### 3.5 Some common F-gases and ODS in use

As described above some building and public sector organisations are major users of refrigerants that are affected by both these Regulations. The following table lists some of the most common refrigerants and shows which Regulations are relevant to each. See Appendix 4 for a more extensive listing.

**Table 1: Some common F-gases and ODS**

Refrigerant	Type	EC F-gas Regulation	EC Ozone Regulation
R22	HCFC	✗	✓
R408A	HCFC + HFC Blend	✓	✓
R134a	HFC	✓	✗
R404A	HFC Blend	✓	✗
R407C	HFC Blend	✓	✗
R410A	HFC Blend	✓	✗
Ammonia	Natural	✗	✗
CO <sub>2</sub>	Natural	✗	✗

## 4. Key Obligations Explained

The following section provides a brief introduction to the key obligations under the EC F-gas and ODS Regulations. For more detail please see the **Guidance Note for RAC Contractors** which provides more complete technical details on complying with the key obligations. As an end user it is important to be aware of the obligations and to ensure that you hold sufficient information to comply.

The operator is responsible for ensuring that they comply with the obligations under the EC F-gas and ODS Regulations. So even if you employ a contractor to service and maintain equipment on your behalf, you need to comply with these regulations, unless you have contractually transferred all such obligations to your contractor. In addition you need to comply with or ensure your contractor complies with legislation covering the handling of waste refrigerant that may arise during servicing, maintenance and dismantling of RAC equipment.

### 4.1 Containment

#### a. Undertake regular leak tests on all equipment containing 3 kg or more of an HFC/HCFC refrigerant and ensure that any leaks are repaired

Equipment containing 3 kg or more of HFC or HCFC refrigerant (6 kg or more for hermetically sealed systems labelled as such) must be checked for leakage by suitably qualified personnel at least annually.

#### b. Fit automatic leak detection – for larger systems with 300 kg or more of an HFC (F-gas) refrigerant

All systems with a refrigerant fluid charge of 300kg or more must be fitted with an automatic leak detection system. An automatic leak detection system is “a calibrated mechanical, electrical or electronic device for detecting leakage, which, on detection, alerts the operator”. The detection system must be checked at least once a year to ensure their proper functioning.

There is no mandatory requirement to fit automatic leak detection on HCFC (ODS) systems.

#### c. Keep records about each system containing F-gases and ODS

Records must be kept about each RAC system containing 3 kg or more of HFC refrigerant and since January 2010 this also applies to systems containing 3 kg or more of HCFC refrigerant. See Appendix 5 for an example.

Records may be kept centrally or with the equipment, the main requirement is that they are accessible so they **can be made available** on request to the competent authority (the EPA) and to the Commission. In addition, the operator should be prepared for inspections by the competent authority and ideally should nominate a person who is responsible for producing records during inspection.

## 4.2 Recovery and Waste Management

### a. Ensure proper recovery of any refrigerant removed from your systems during maintenance or on decommissioning

If HFC/HCFC refrigerant needs to be removed from RAC equipment it must be properly recovered by suitably qualified personnel and all due care must be taken to minimise any emissions.

### b. Ensure that waste refrigerant is handled appropriately

Once a decision has been taken to discard refrigerant it is classified as hazardous waste. Virgin HCFCs, which can no longer be used in the maintenance and servicing of RAC equipment, are considered a hazardous waste. Waste producers have a “duty of care” for the waste they handle and must ensure they use the right documentation and move waste appropriately.

The EPA has developed a position paper on the handling of waste F-gas and ODS refrigerants and it is important to be aware of its requirements. The position paper is available to download from [www.ozone.ie](http://www.ozone.ie).

Waste is defined in Section 4(1) of the Waste Management Act 1996 as amended, as “*any substance or object... which the holder discards or intends to discard or is required to discard, and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste until the contrary is proved*”. Under Section 32 of the Waste Management Act 1996, as amended, a holder of waste, “*shall not hold, transport, recover or dispose of waste in a manner that causes or is likely to cause environmental pollution*”. The Waste Management Act 1996, as amended, provides the basis for the management of hazardous waste in Ireland.

### Transport of waste refrigerant gases

Questions and Answers in relation to some scenarios on the use and handling of waste refrigerants have been prepared by the EPA and are given in Appendix 6.

The collection and transport of waste refrigerant gases can only be carried out by a person that either holds an appropriate waste collection permit or has submitted a Prior Annual Notification to the EPA. Waste refrigerant gases must be brought to an appropriately authorised waste facility when taken from an end-user site. The following options apply for the movement and management of waste refrigerant gases:

1. The holder of an appropriate waste collection permit can collect and transport waste refrigerant gases from an RAC contractor or end user and transfer the waste refrigerant gases to an appropriately authorised facility. C1 forms for the movement of hazardous waste within Ireland, under a waste collection permit, will be required and any transfer of hazardous waste outside the State must be in accordance with the requirements of transfrontier shipment of waste (TFS requirements).
2. A contractor who has made a **Prior Annual Notification** to the EPA can transport the waste refrigerant gas from the end-user site to an authorised waste management facility, as outlined in their Prior Annual Notification and in accordance with Article 30 of the Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007). In this instance, the contractor becomes the holder of the waste and must fulfil the general duty on the holder of waste set out in Section 32 of the Waste Management Act, as amended. A list of Prior Annual Notifications received and accepted by the EPA is available on [www.ozone.ie](http://www.ozone.ie). C1 forms are not required for the movement of waste

refrigerant gases within Ireland, under a Prior Annual Notification. However, any transfer of hazardous waste outside the State must be in accordance with the requirements of transfrontier shipment of waste (TFS requirements).

3. The end user/operator can make its own arrangements for the proper management of the waste refrigerant. In this instance, the end-user remains the holder of the waste and must fulfil the general duty on the holder of waste set out in Section 32 of the Waste Management Act, as amended.

#### Storage of waste refrigerant gases

The storage of waste refrigerant gases is not permitted on any site (other than temporary storage at the site of generation), unless that site is specifically authorised to do so.

Appropriate authorisation will be one of the following:

1. Waste Licence issued by the EPA;
2. Waste Facility Permit issued by the relevant local authority; or,
3. Certificate of Registration issued by the relevant local authority.

Under no circumstances can a contractor store the waste refrigerant gas on their own site without having an appropriate authorisation for the storage of such waste.

#### c. Waste Electrical and Electronic Equipment (WEEE) Waste Management Issues

When RAC equipment reaches the end of its life it must be disposed of in an environmentally sound manner through a facility authorised to accept and/or treat Waste Electrical and Electronic Equipment (WEEE). The route by which the RAC equipment (WEEE) can be managed will vary, depending on when the unit was placed on the market, and whether or not it is being replaced. The following points should be noted:

- For equipment placed on the market prior to 13 August 2005 that is now waste, the producer<sup>4</sup> is obliged to take back WEEE of a similar type and function (irrespective of brand) when a business end user is purchasing new equipment from him/her. **The producer is then responsible for the environmentally sound management of the WEEE.**
- If the business end user is simply discarding the WEEE (where the unit was placed on the market originally prior to 13 August 2005) and not replacing it, the responsibility for ensuring the environmentally sound management of the WEEE remains with the business end user.

An appropriately authorised waste management operator must be used to transport and manage the waste in both scenarios.

- For equipment placed on the market after August 2005 that will become waste, the producer must take back and manage WEEE from the business end user or make alternative financing arrangements with the business user

<sup>4</sup> The producer is normally the person who placed the equipment on the market in Ireland for the first time.



i.e. there must be a formal agreement between both parties on how and who will finance the management of the WEEE. The WEEE must be transported and managed by appropriately authorised waste management operators.

**This requirement applies whether or not the equipment is being replaced.**

If your company has purchased RAC units from outside the State or sourced them from an unregistered producer, your company will be required to register<sup>5</sup> as a producer of Electrical and Electronic Equipment (EEE). To find out more about the requirements of the Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005 including any producer obligations that may apply visit [www.weee-enforcement.ie](http://www.weee-enforcement.ie).

In addition, if the equipment contains batteries you will need to consider your obligations under the Waste Management (Batteries and Accumulators) Regulations 2008. More information is available at [www.batteries-enforcement.ie](http://www.batteries-enforcement.ie).

## 4.3 Training and Certification

### a. Only use engineers/technicians with suitable qualifications

#### F-gases

In addition to the EC F-gas Regulation, the implementing Commission Regulation (EC) No. 303/2008 sets out minimum requirements for the qualifications for personnel working on stationary RAC equipment that contain or are designed to contain HFCs. This Regulation refers to four different levels of certification, which allow personnel to carry out different activities – Category I allows personnel to work on any systems containing 3kg or more of an F-gas whereas Category IV only allows personnel to undertake leak checking.

The Further Education and Training Awards Council (FETAC) has developed a national specification for F-gas and ODS certification for stationary RAC qualifications that meets these minimum requirements – FETAC Level 5 (Special Purpose Certificate in Handling F-gas Refrigerants 5S0108). This qualification is to the same standard as the City and Guilds (Level 2 Award in F-gas Regulation, No.2079). These qualifications will be accepted in Ireland and by other European Member States under mutual recognition obligations. Individuals must obtain the relevant certification by 4 July 2011. In the meantime interim arrangements will apply. See Table 1 below and Appendix 2 for additional details. Further details on the FETAC courses are available at [www.fetac.ie](http://www.fetac.ie) and [www.refrigerationskillnet.ie](http://www.refrigerationskillnet.ie).

---

<sup>5</sup> All details on the registration process and a list of registered producers are presented on the website of the WEEE Register Society Ltd. [www.weee-register.ie](http://www.weee-register.ie).

**Table 2: City and Guilds and FETAC F-gas Qualifications**

Level	City and Guilds 2079	FETAC 550108
<b>Category I</b>	2079-11 City and Guilds NDAQ Ref No 500/5730/3 NFQ Level 4 Award in F-gas and ODS Regulations: Category I	F-gas Handling in Large RAC Systems plus Category II, III and IV awards* Award Code 5N0104
<b>Category II</b>	2079-12 City and Guilds NDAQ Ref No, 500/5731/3 NFQ Level 4 Award in F-gas and ODS Regulations: Category II	F-gas Handling in Small RAC Systems plus Category III and IV awards* Award Code 5N0103
<b>Category III</b>	2079-13 City and Guilds NDAF Ref No. 500/5732/7 NFQ Level 4 Award in F-gas and ODS Regulations: Category III	F-gas Recovery in Small RAC Systems plus Category IV award* Award Code 5N0105
<b>Category IV</b>	2079-14 City and Guilds NDAF Ref No. 500/5729/7 NFQ Level 4 Award in F-gas and ODS Regulations: Category IV	F-gas Refrigerant Leak Detection Award Code 5N0102

\* Completion of all four minor awards leads to a Special Purpose Award in Handling F-gases Refrigerants.

**Note:** there are three exemptions – for trainees, those only undertaking brazing, soldering or welding and those undertaking recovery of F-gases from “waste equipment” under the WEEE Directive.

## ODS

The requirement for those contractors to working with HCFCs is to hold either a *City and Guilds 2078* or the appropriate category of F-gas qualification for the work to be undertaken.

## b. Ensure that companies contracted to provide qualified engineers hold company certification

There is a requirement for companies working with F-gases and employing qualified engineers and technicians to hold a company certificate. F-Gas Registration Ltd. is the certification company established in Ireland to issue company certificates. Certification can be completed online at [www.fgasregistration.ie](http://www.fgasregistration.ie) or by contacting F-Gas Registration Ltd. at

Unit 7, Northwest Business Park,  
Blanchardstown,  
Dublin 15 or

Tel: +353 (0)86 2089900 or email  
[info@fgasregistration.ie](mailto:info@fgasregistration.ie).

## 4.4 Labelling

### Make sure equipment installed since April 2008 is labelled

All new equipment containing F-gas refrigerant and F-gas blown foam must be labelled, irrespective of size, as required by the EC F-gas Regulation, consisting of a label with the text ***“Contains fluorinated greenhouse gases covered by the Kyoto Protocol”*** and must also indicate the type and amount of the F-gas. The labelling rule applies to RAC equipment and equipment containing foam placed on the market after 1 April 2008. Existing equipment does not need to be labelled, although it is good practice to label all equipment. Commission Regulation (EC) No. 1494/2007 sets out the labelling requirements for products and equipment containing F-gases.

## 4.5 Placing on the Market

### Refillable containers

The use of non-refillable containers for transporting or storing F-gas refrigerants is banned. Placing on the market of non-refillable containers used to service equipment was banned from July 2007, except for those shown to be manufactured (i.e. filled with refrigerant) before 4 July 2007.

## 4.6 HCFC (including R22) Phase Out

### Ensure you are prepared for the phase out of HCFCs

The use of HCFC in maintenance and servicing of RAC equipment is being phased out under Regulation (EC) No. 1005/2009, which came into force on 1 January 2010<sup>6</sup>. It is now illegal

to use virgin HCFCs to service and maintain existing RAC equipment. The two key phase-out dates are:

- **From 1 January 2010** it is illegal to use virgin HCFCs to service RAC equipment. This ban applies even if HCFC was purchased before the ban date. It is illegal to use any supplies of virgin HCFCs that were stockpiled before the end of 2009. Such stockpiles are considered hazardous waste.
- **From 1 January 2015** it will be illegal to use recycled or reclaimed HCFCs to service RAC equipment.

The new ODS Regulation provides definitions of recovered, reclaimed and recycled HCFCs and provides clarity on how they can be used until the complete ban on the use of HCFCs enters into force.

### Ban on virgin HCFCs

The ban on the use of virgin HCFC gases represents a very real business threat if you have critical refrigeration or air-conditioning equipment that uses HCFCs like R22 or R408A. R22 remains one of the most commonly used refrigerants and may be found in computer server rooms, shop floor refrigeration systems or in cold stores and many types of building air-conditioning. Many of these applications are absolutely critical to the continued operation of the business.

It should be noted that the bans described above refer to the “use” of HCFCs. This specifically means use for servicing and maintenance. It will remain legal to continue using RAC equipment containing HCFCs beyond the phase-out dates providing they do not require maintenance that involves putting any HCFCs back into a system.

---

<sup>6</sup> The phase-out dates for HCFC in servicing and maintenance of RAC equipment were originally set out in the earlier Regulation (EC) No. 2037/2000 on substances that deplete the ozone layer.

## 5. The Environmental Impact Considered

### 5.1 Reducing Leakage

Emissions of F-gases and ODS are harmful to both the environment and the bottom line. Complying with the EC F-gas and ODS Regulations will help reduce emissions of both greenhouse gases and ODS. To achieve the lowest possible loss of refrigerant an organisation should consider taking the following steps:

- Only purchase equipment that is “leak tight”. This also involves making sure contractors are building leak-free systems from design through to installation. When installing both off the shelf and bespoke equipment care is needed to build leak-free systems. Leaking systems cost money for the operator.
- Do regular leak checks and take action to repair leaks. By doing leak check at least as often as required by the legislation you can build up a picture of which equipment leaks the most and be in a position to address the issues.
- Ask your contractor about the leak rate and ensure that they aim to improve this continually.
- Focus attention on the leakiest equipment. It is typical to find that 80% of annual leakage comes from only 20% of the refrigeration systems. By expending more effort on identifying and maintaining these systems you can minimise your leaks.
- Ensure you maintain complete records. Records are the source of the data that can help you manage and reduce refrigerant leakage.

By following these rules you can reduce the likelihood of refrigerant loss. In addition you will be well placed to identify the equipment that is most likely to cause you problems.

### 5.2 Considering Alternatives

One way of reducing F-gas or ODS emissions is to use an alternative refrigerant. These include, for example, natural refrigerants (such as CO<sub>2</sub>, ammonia or hydrocarbons) or low global warming potential refrigerants. However, before you invest you must take care that your alternative design is cost effective and has the lowest “overall carbon footprint<sup>7</sup>”. Refrigeration equipment gives rise to two main types of greenhouse gas emissions:

Direct emissions of refrigerants, such as F-gases through leakage; and,

“Indirect” emissions of CO<sub>2</sub> from the power station supplying the plant with electricity.

For most refrigeration plants it is the energy related CO<sub>2</sub> emission that is the dominant part of the overall carbon footprint. Hence, it is essential that a system with an alternative refrigerant is equal to or better than an HFC system in terms of energy efficiency.

<sup>7</sup> A measure of the impact our activities have on the environment, especially climate change, often reported as the units of tonnes (or kg) of carbon dioxide each of us produces over a given period of time.

## 5.3 Energy Efficiency

The operation of RAC equipment may account for a significant percentage of the total energy costs. A 10% decrease in operational efficiency may lead to a 10% increase in running costs. The steps necessary for compliance with the EC F-gas and ODS Regulations provide an opportunity to assess the energy efficiency of your RAC equipment. If HCFC systems have to be replaced or retrofitted, this is particularly important.

Typical issues to consider are:

- Load reduction (e.g. better time and temperature controls, for instance if refrigeration temperatures are set 1°C too low, it can increase running costs by 2-4%);
- Plant operating conditions (e.g. clean condenser and evaporator fins regularly, keep refrigeration doors and lids closed, ensure door seals are not faulty; reduce head pressures);
- Secondary loads (e.g. chilled water pumps);
- Part-load operation (e.g. compressor controls and variable speed drives); and,
- Assistance on cutting costs and improving the general environmental performance of Irish organisations is available through the following website [www.greenbusiness.ie](http://www.greenbusiness.ie). Organisations can receive free impartial advice on improving resource efficiency through reducing the wastage of materials, consumables, water and energy.

# Appendices

## Appendix 1: Abbreviations and Definitions

Term	Abbreviation	Definition
<b>Fluorinated greenhouse gases</b>	<b>F-gas</b>	Means hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF <sub>6</sub> ) or preparations containing these gases, unless controlled by the ODS Regulation. <i>From EC F-gas Regulation 842/2006</i>
<b>Ozone depleting substance</b>	<b>ODS</b>	Various chemicals, including CFCs and HCFCs that damage the ozone layer. Many are already completely phased out.
<b>Chlorofluorocarbon</b>	<b>CFC</b>	Family of chemicals that was historically used in various applications such as refrigeration, foam blowing and aerosols. Now completely banned under ODS Regulation.
<b>Hydrochloro-fluorocarbon</b>	<b>HCFC</b>	Family of chemicals used in various applications such as refrigeration, foam blowing and aerosols. Already phased out in many applications under ODS Regulation. All maintenance applications will be banned in EU by 2015.
<b>Hydrofluorocarbon</b>	<b>HFC</b>	Means an organic compound consisting of carbon, hydrogen and fluorine, and where no more than six carbon atoms are contained in the molecule. <i>From EC F-gas Regulation 842/2006</i>
<b>Perfluorocarbon</b>	<b>PFC</b>	Family of F-gas chemicals used in unusual applications such as electronic chip manufacture, as refrigerants and in older fire protection systems.
<b>Hydrocarbon</b>	<b>HC</b>	Family of chemicals including propane and butane. These have been adopted as alternatives to ODS and F-gases in some applications.
<b>Preparation</b>		Means for the purposes of the obligations in the EC F-gas Regulation, excluding destruction, a mixture composed of two or more substances at least one of which is a fluorinated greenhouse gas, except where the total GWP of the preparation is less than 150. The total GWP of the preparation shall be determined in accordance with EC F-gas Regulations Part 2 of Annex I. <i>From EC F-gas Regulation 842/2006</i>
<b>Global warming potential</b>	<b>GWP</b>	Means the climatic warming potential of a fluorinated greenhouse gas relative to that of carbon dioxide (CO <sub>2</sub> has a GWP = 1). The GWP is calculated in terms of the 100-year warming potential of one kilogram of a gas relative to one kilogram of CO <sub>2</sub> . <i>From EC F-gas Regulation 842/2006</i>
<b>Carbon footprint</b>		A measure of the impact our activities have on the environment, especially climate change, often reported as the units of tonnes (or kg) of carbon dioxide each of us produces over a given period of time.

Term	Abbreviation	Definition
<b>Heat pump</b>		Means a device or installation that extracts heat at low temperature from air, water or earth and supplies heat. <i>From EC F-gas Regulation 842/2006</i>
<b>Hermetically sealed system</b>		Means a system in which all refrigerant containing parts are made tight by welding, brazing or a similar permanent connection which may include capped valves and capped service ports that allow proper repair or disposal and which have a tested leakage rate of less than 3 grams per year under a pressure of at least a quarter of the maximum allowable pressure. <i>From EC F-gas Regulation 842/2006</i>
<b>Operator</b>		Means the natural or legal person exercising actual power over the technical functioning of the equipment and systems covered by this Regulation; a Member State may, in defined, specific situations, designate the owner as being responsible for the operator's obligations. <i>From EC F-gas Regulation 842/2006</i>
<b>Leak detection system</b>		Means a calibrated mechanical, electrical or electronic device for detecting leakage of fluorinated greenhouse gases which, on detection, alerts the operator. <i>From EC F-gas Regulation 842/2006</i>
<b>Recovery</b>		Means the collection and storage of fluorinated greenhouse gases/ozone depleting substances from, for example, machinery, equipment and containers during maintenance or servicing or before disposal. <i>From EC F-gas Regulation 842/2006 and EC Ozone Regulation 1005/2009</i>
<b>Recycling</b>		Means the reuse of a recovered fluorinated greenhouse gas/ozone depleting substances following a basic cleaning process. <i>From EC F-gas Regulation 842/2006 and EC Ozone Regulation 1005/2009</i>
<b>Reclamation</b>		Means the reprocessing of a recovered controlled substance in order to meet the equivalent performance of a virgin substance, taking into account its intended use. <i>From EC F-gas Regulation 842/2006 and EC Ozone Regulation 1005/2009</i>
<b>Destruction</b>		Means the process by which all or most of a fluorinated greenhouse gas is permanently transformed or decomposed into one or more stable substances which are not fluorinated greenhouse gases. <i>From EC F-gas Regulation 842/2006</i>

Term	Abbreviation	Definition
<b>Non-refillable container</b>		<p>Means a container that is designed not to be refilled and is used in the servicing, maintenance or filling of refrigeration, air-conditioning or heat pump equipment, fire protection systems or high-voltage switchgear, or to store or transport fluorinated greenhouse gas based solvents.</p> <p><i>From EC F-gas Regulation 842/2006</i></p>
<b>Installation</b>		<p>Means joining two or more pieces of equipment or circuits containing or designed to contain fluorinated greenhouse gas refrigerant, with a view to assembling a system in the location where it will be operated, including the action by which refrigerant conductors of a system are joined together to complete a refrigerant circuit irrespective of the need to charge the system after assembly.</p> <p><i>EC Minimum qualifications for stationary RAC equipment 303/2008</i></p>
<b>Maintenance or servicing</b>		<p>Means all activities, excluding recovery and checks for leakage, which entail breaking into the circuits containing or designed to contain fluorinated greenhouse gases, in particular supplying the system with fluorinated greenhouse gases, removing one or more pieces of circuit or equipment, re-assembling two or more pieces of circuit or equipment, as well as repairing leakages.</p> <p><i>EC Minimum qualifications for stationary RAC equipment 303/2008</i></p>
<b>Use</b>		<p>Means the utilisation of fluorinated greenhouse gases in the production, refilling, servicing or maintenance of products and equipment covered by this Regulation.</p> <p><i>From EC F-gas Regulation 842/2006</i></p>



## Appendix 2: Sources of Further Information

There are a number of sources of additional information on the EC F-gas and ODS Regulations that is most easily access from the internet.

### To download copies of the legislation

For copies of relevant Irish regulations see link below and for access to the European Regulations select EU Regulation at the same link.

Please see: [www.envron.ie/en/Legislation/Environment/Atmosphere/](http://www.envron.ie/en/Legislation/Environment/Atmosphere/)

### Environmental Protection Agency

Guidance and policy documents on both the EC F-gas and ODS Regulations as well as the management of hazardous waste are available to download from the EPA website: [www.epa.ie](http://www.epa.ie).

For more specific guidance please see: [www.epa.ie/downloads/advice/air/ods/](http://www.epa.ie/downloads/advice/air/ods/) or [www.ozone.ie](http://www.ozone.ie).

### European Commission Guidance

The European Commission has produced some guidance for all sectors on the EC F-gas Regulations. For the RAC sector there are two sets of guidance one for operators and one for technical personnel.

Please see: [http://ec.europa.eu/environment/climat/fluor/publications\\_en.htm](http://ec.europa.eu/environment/climat/fluor/publications_en.htm).

From here you can also get an introduction to the legislation and find links to the regulations by selecting the appropriate buttons on the left hand side menu.

There is also a section on the Ozone Regulation see: <http://ec.europa.eu/environment/ozone/>

### F-Gas Support

In Great Britain a team called F-Gas Support has been funded to provide advice and guidance on the EC F-gas Regulations and related GB Regulations. They have a website with guidance that is relevant to Great Britain but it also contains other useful resources that operators in the Republic of Ireland might find helpful such as a refrigerant charge calculator (Information Sheet GEN 5) and guidance on preparation for phase out of HCFCs (Information Sheet RAC 8).

Please see: [www.defra.gov.uk/fgas](http://www.defra.gov.uk/fgas) – you can download the guidance by selecting the information sheet button from the left hand side menu.

### FETAC

The Further Education and Training Awards Council in Ireland (FETAC) have developed national standards equivalent to the City and Guilds F-gas qualifications that have been developed in the UK. These courses have been assessed as Level 5 FETAC Award courses and the FETAC course developed for the refrigeration and air conditioning sector is the Special Purpose Certificate in Handling F-gas Refrigerants 550108.

For more information on FETAC courses see: [www.fetac.ie](http://www.fetac.ie)

### Refrigeration Skillnet

Refrigeration Skillnet is an industry-led training network for companies in the refrigeration and air-conditioning (RAC) sector in Ireland. They can provide details of F-gas training and other courses that are being delivered in Ireland. For more details see: [www.refrigerationskillnet.ie](http://www.refrigerationskillnet.ie).

## Appendix 3: Example Inventory

The table below shows a sample inventory with an example on the first row and suggestions for other information that could be captured in the inventory. Keeping an inventory is not a mandatory requirement of the EC F-gas or ODS Regulations. However, it can provide a summary of all the equipment on site, a means of tracking equipment and collating relevant information in relation to both these regulations.

Equipment/ system unique identifier	Equipment Location	Type of Refrigerant	Quantity of Refrigerant (kg)	Leak Checking Requirement	Contractors Responsible	Next Service
<b>RSZ60</b>	<b>Roof 1</b>	<b>R 410A</b>	<b>12kg</b>	<b>1 x year</b>	<b>Xx Freeze Ltd</b>	<b>Feb 2010</b>
Other points to include: <ul style="list-style-type: none"> <li>■ Links to asset register</li> <li>■ Serial number of equipment</li> </ul>	Other points to include: <ul style="list-style-type: none"> <li>■ Reference to site plan</li> <li>■ Unit description</li> </ul>	Other points to include: <ul style="list-style-type: none"> <li>■ Which Regulation is relevant</li> <li>■ Is HCFC phase –out relevant</li> </ul>	Other points to include: <ul style="list-style-type: none"> <li>■ How has this been determined? From actual data from installation contractors, design documents or calculation.</li> </ul>	Other points to include: <ul style="list-style-type: none"> <li>■ Is the system hermetically sealed?</li> </ul>	Other points to include: <ul style="list-style-type: none"> <li>■ Where are the records kept</li> <li>■ Date of last service</li> <li>■ Relevant company certification reference and date of expiry</li> <li>■ Details of qualified employees</li> </ul>	

## Appendix 4: Refrigerants Affected by these Regulations

The following tables list the F-gas and ODS refrigerants by type, which regulation will govern its use; the first table is for pure refrigerants and indicates the main markets where they tend to be used, the second table is for blends used for RAC purposes.

**Table 3: Pure Refrigerants**

Refrigerants	Formula	EC F-gas Regulation?	EC ODS Regulation?	Main Markets
HCFC 22 (R22)	CHClF <sub>2</sub>	✗	✓	RAC
HCFC 123 (R123)	CHCl <sub>2</sub> CF <sub>3</sub>	✗	✓	RAC
HCFC 124 (R124)	C <sub>2</sub> HClF <sub>4</sub>	✗	✓	Blend component
HCFC 142b (R142b)	C <sub>2</sub> H <sub>3</sub> ClF <sub>2</sub>	✗	✓	Solvent
HFC 23 (R23)	CHF <sub>3</sub>	✓	✗	Fire protection, electronics manufacture
HFC 32 (R32)	CH <sub>2</sub> F <sub>2</sub>	✓	✗	Blend component
HFC 41 (R41)	CH <sub>3</sub> F	✓	✗	
HFC 43-10mee (R43-10mee)	C <sub>5</sub> H <sub>2</sub> F <sub>10</sub>	✓	✗	Solvent
HFC 125 (R125)	C <sub>2</sub> HF <sub>5</sub>	✓	✗	Blend component. Fire protection
HFC 134 (R134)	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub>	✓	✗	
HFC 134a (R134a)	CH <sub>2</sub> FCF <sub>3</sub>	✓	✗	RAC, aerosols, foam
HFC 143 (R143)	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	✓	✗	
HFC 143a (R143a)	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub>	✓	✗	Blend component
HFC 152a (R152a)	C <sub>2</sub> H <sub>4</sub> F <sub>2</sub>	✓	✗	Blend component
HFC 227ea (R227ea)	C <sub>3</sub> HF <sub>7</sub>	✓	✗	Fire protection, aerosols
HFC 236cb (R236cb)	CH <sub>2</sub> FCF <sub>2</sub> CF <sub>3</sub>	✓	✗	
HFC 236ea (R236ea)	CHF <sub>2</sub> CHFCF <sub>3</sub>	✓	✗	
HFC 236fa (R236fa)	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub>	✓	✗	Some use in Portable Fire Extinguishers
HFC 245ca (R245ca)	C <sub>3</sub> H <sub>3</sub> F <sub>5</sub>	✓	✗	
HFC 245fa (R245fa)	CHF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	✓	✗	Foam blowing
HFC 365mfc (R365 mfc)	CF <sub>3</sub> CH <sub>2</sub> CF <sub>2</sub> CH <sub>3</sub>	✓	✗	Foam blowing, solvent
HC 290 – Propane	C <sub>3</sub> H <sub>8</sub>	✗	✗	RAC
HC 600a – Iso-butane	C <sub>4</sub> H <sub>10</sub>	✗	✗	RAC
R 717 – Ammonia	NH <sub>3</sub>	✗	✗	RAC

**Table 4: Blended Refrigerants Used in RAC Market**

Refrigerant	Composition Variants*	Composition Components	Type	EC F-gas Regulation?	EC Ozone Regulation?
R401	A, B, C	R22/152a/124	HCFC + HFC	✓	✓
R402	A, B	R22/125/290	HCFC + HFC + HC	✓	✓
R403	A, B	R22/218/290	HCFC + PFC + HC	✓	✓
R404	A	R143a/125/134a	HFC	✓	✗
R406	A	R22/600a/142b	HCFC + HC	✗	✓
R407	A, B, C	R32/125/134a	HFC	✓	✗
R408	A	R22/143a/125	HCFC + HFC	✓	✓
R409	A, B	R22/142b/124	HCFC	✗	✓
R410	A	R32/125	HFC	✓	✗
R411	B	R22/152a/1270	HCFC + HFC + HC	✓	✓
R413	A	R134a/218/600a	HFC + PFC + HC	✓	✗
R416	A		HFC	✓	✗
R417	A	R125/134a/600	HFC + HC	✓	✗
R422	A, D	R125/134a/600a	HFC + HC	✓	✗
R423	A	R134a/227	HFC	✓	✗
R424	A	R134a/125/600/600a/601a	HFC + HC	✓	✗
R427	A	R134a/125/32/143a	HFC	✓	✗
R428	A	R125/143a/600a/290	HFC + HC	✓	✗
R434	A	R125/143a/R134a/600a	HFC + HC	✓	✗
R507		R143a/125	HFC (azeotropic)	✓	✗
R508		R23/116	HFC + PFC (azeotropic)	✓	✗

\* Composition Variant: Each blend in the table above contains 2 or 3 components. For example R401 contains a mixture of R22, R152a and R124. R401 is available in three different composition variants as follows:

- R401A is 53% R22, 13% R152a and 34% R124
- R401B is 61% R22, 11% R152a and 28% R124
- R401C is 33% R22, 15% R152a and 52% R124

These different compositions are chosen by the refrigerant manufacturers to provide performance characteristics to suit different RAC applications.

#### Symbols used in the tables

✗	Not relevant	✓	Relevant and must comply
HCFC	Hydrochlorofluorocarbon	HFC	Hydrofluorocarbon
PFC	Perfluorocarbon	HC	Hydrocarbon

## Appendix 5: Sample Log Sheet for Record Keeping

The table below shows an example record sheet for compliance with the EC F-gas Regulation. Records of this type must be kept for each RAC system that contains 3 kg or more of HFC refrigerant and for each RAC system that contains 3 kg or more of HCFC (from Jan 2010).

Equipment Record				
<i>Name of Equipment Operator</i>				
<i>Postal Address</i>				
<i>Telephone Number</i>				
<i>Equipment Model</i>		<i>Unique Identifier</i>		
<i>Description</i>		<i>Hermetically Sealed</i> Yes / No		
<i>Location of plant</i>		<i>Date of Installation</i>		
<i>Refrigerant Type</i>		<i>Refrigerant Quantity/Charge (kg)</i>		
Refrigerant Additions				
<i>Date</i>	<i>Personnell/Company*</i>	<i>Type of Refrigerant</i>	<i>Amount Added, kg</i>	<i>Reason for addition</i>
Refrigerant Removals				
<i>Date</i>	<i>Personnell/Company*</i>	<i>Type of Refrigerant</i>	<i>Amount Removed, kg</i>	<i>Reason for removal</i>
Leak Tests (including follow-up tests)				
<i>Date</i>	<i>Personnell/Company*</i>	<i>Areas Checked</i>	<i>Test Result (location and cause of any leaks identified)</i>	<i>Follow up actions and checks required</i>
Maintenance or Servicing Activities				
<i>Date</i>	<i>Personnell/Company*</i>	<i>Areas concerned</i>	<i>Maintenance/ servicing work</i>	<i>Comments</i>
Testing of Automatic Leak Detection System (if fitted)				
<i>Date</i>	<i>Personnell/Company*</i>	<i>Test Result</i>	<i>Comments</i>	
Other relevant information				

\* include name of engineer and of company, postal address, telephone number.

## Appendix 6: Questions and Answers regarding the Management of Waste Refrigerant

The **Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007), Article 30**, require that all contractors recovering, transporting and storing refrigerant gases submit details to the EPA's Prior Annual Notification Register (PAN), and that all waste gas sent for disposal is documented accordingly with a disposal certificate. The end user should keep documentation on file showing PAN registration of their RAC contractors and all waste disposal certificates.

Both the end users and the RAC contractors may encounter a number of scenarios when equipment containing refrigerant gases is being serviced or decommissioned. These scenarios are addressed in the questions and answers presented below from an end user's perspective.

### Questions and answers for END USERS of Refrigerant Gases

#### 1. Question – What qualifications should I look out for when selecting a contractor?

**Answer** – Your contractor should currently hold City and Guilds Certificate in Handling Refrigerants Scheme 2078. In addition, your contractor should be making plans to become qualified to City and Guilds (Level 2 Award in F-gas Regulation, No. 2079) standard **or** FETAC Level 5 (Specific Purpose Certificate in Handling F-gas Refrigerants 550108) standard, by 4 July 2011.

#### 2. Question – I have a critical system running on R22 and I am worried that my contractor won't be able to get recycled or reclaimed R22 after 31 December 2009. Can I get my contractor to recover the R22 from the system and replace with virgin R22 before 31 December 2009 and keep the recovered gas for future maintenance or servicing needs?

**Answer** – No. The European Commission has confirmed that such a practice is not in keeping with Regulation 2037/2000 on ozone depleting substances, or the Recast (Regulation (EC) No. 1005/2009). The EPA does not consider the complete exchange of usable HCFC with virgin R22 a maintenance or servicing operation.

#### 3. Question – I have a system on my site containing R22, and there appears to be a leak. If my contractor recovers the gas from the system and repairs the leak, can he/she charge the recovered gas back into the same system?

**Answer** – Yes, the recovered gas should be passed through a recovery unit to ensure it is recycled and then it can be charged back into the same system by your contractor.

#### 4. Question – I have a system on my site containing R22. If my contractor recovers the R22 and replaces it with another type of gas, can the R22 he/she has recovered be used to service and maintain another R22 system on my site?

**Answer** – Yes, the recovered R22 must be passed through a recovery unit to ensure it is recycled and then it can be charged into another system on your site.

**5. Question – I have five separate large chillers on my site, each containing R22, which I plan to decommission over an 18-month timescale. As each chiller is decommissioned, can I keep some recovered R22 onsite for service or maintenance on the remaining R22 chillers until they are all decommissioned?**

**Answer** – Yes, but with the following provisos:

- a. The recovered R22 should be recycled onsite using a basic cleaning process;
- b. The retention of recycled R22 onsite should be reported immediately to the EPA via email ([ods@epa.ie](mailto:ods@epa.ie)) detailing how much recovered gas is being held on site, the capacity of remaining chillers and when your change-over programme is planned to be finalised;
- c. The quantity of R22 retained onsite should be in proportion to the demonstrated need for recycled R22, vis-à-vis the chillers remaining in use onsite i.e. there should be reasonable certainty regarding the future use of the recovered R22 to be retained. Refer to point 6 below regarding the approval to be sought from EPA for the appropriate quantity of recovered gas to be retained;
- d. Relevant records must be maintained regarding the quantities of R22 recovered, recycled and reused onsite and these should be made available for inspection by EPA inspectors during normal operating hours of the site;
- e. Recovered R22, for which you and your contractor have no further demonstrated need, must be managed as a hazardous waste. This should be collected in a purpose built designated recovery cylinder; and,
- f. No R22 must be used in maintenance or servicing after 31 December 2014.

**6. Question – How will I know how much recovered R22 is justified for the future need of plant on my site?**

**Answer** – This will depend on the quantity of gas recovered, the gas charge of the equipment remaining and the capacity for safe storage of recovered gas on your site. This must ultimately be agreed with the EPA, and will be dealt with on a case-by-case basis. If, in the opinion of the EPA, a reasonable certainty of use is not demonstrated for the quantity of recovered R22 being retained, the EPA reserves the right to direct an end user to discard such quantities of recovered refrigerant as hazardous waste. If you wish to discuss this with the EPA email details of your site and situation to [ods@epa.ie](mailto:ods@epa.ie) for consideration.

**7. Question – I am planning to have a large chiller on my site decommissioned, it contains about 600kg R22 gas. Can I keep the recovered gas for maintenance and servicing of two small split air-conditioning units?**

**Answer** – No. Small split air-conditioning units typically contain less than 10kg of refrigerant gas. Therefore, the retention of 600kg of R22 for future maintenance and servicing of such units would not be justified (refer to point 5c. above).

**8. Question – My contractor has recovered R22 from systems on my site and I have no further need for it. What should I do with the gas?**

**Answer** – The following options are available to you:

- a. You can reuse the recovered gas on another site within your organisation, as long as it has been recycled (i.e. subjected to a basic cleaning process);
- b. You can arrange to have the recovered gas collected and managed as a hazardous waste by engaging the services of a hazardous waste contractor. All such movement should be made in purpose built designated recovery cylinders. You should confirm with your contractor that the recovery cylinder is their property and that they agree to allow the waste company to remove it from your site before shipment.
- c. Where your contractor has a Prior Annual Notification (PAN), you can allow him/her to move the R22 to an appropriately permitted waste facility. You can check that a PAN has been made by your contractor by referring to [www.ozone.ie](http://www.ozone.ie). All such movement should be made in purpose built designated recovery cylinders. You should obtain documentary proof from your contractor that the gas was accepted by the waste management facility.
- d. You can allow your contractor to remove it from your site for reuse on other sites that he/she services subject to the following provisos:
  - 1) Your contractor must have submitted a Prior Annual Notification to the EPA to allow him/her to remove recovered gas from your site. You can check this on [www.ozone.ie](http://www.ozone.ie)
  - 2) You should ensure that your contractor plans to reuse the recycled gas on another site that he or she is maintaining or servicing. The receiving site is required to maintain records of recovered gases coming from your site, including its source.

**9. Question – What is a Prior Annual Notification?**

**Answer** – A Prior Annual Notification (PAN) is a notification that your contractor may have submitted to the EPA, to allow him/her to transport waste, returned or recovered refrigerant gases in appropriate containers, without the need for a waste collection permit or C1 forms. A C1 form is normally needed for transport of hazardous waste, but the Prior Annual Notification specifically provides an exemption for waste refrigerants. Before allowing your contractor to remove waste refrigerant gases from your site you should confirm that they do have a PAN. More information on this is available on the EPA webpage at [www.ozone.ie](http://www.ozone.ie).

**10. Question – How do I know if my contractor has used recycled or reclaimed HCFC in the maintenance or servicing of equipment on my site?**

**Answer** – Any equipment that is maintained or serviced using recycled or reclaimed HCFCs must be labelled with an indication of the type of substance and its quantity contained in the equipment. Where your contractor is using recycled R22 you should ensure that he/she advises you in writing of the source of the R22 and you should maintain this information on your records for future inspection by EPA inspectors.



**11. Question – Am I required to keep any particular records of recycled or reclaimed HCFCs used during maintenance or servicing?**

**Answer** – *Yes, any undertaking (end user or contractor) using recycled or reclaimed HCFCs during maintenance or servicing must keep a record of the supplier of reclaimed HCFCs and of the source of the recycled HCFCs. Such records should be available for inspection by the EPA.*

**12. Question – What is a purpose built designated recovery cylinder?**

**Answer** – *A purpose built designated recovery cylinder is one which can be obtained from a refrigerant gas wholesaler and should be approved for use with the type of refrigerant to be recovered. It should be checked to ensure its integrity and fitness to use prior to connection. It should have indelible marking to clearly differentiate it from stock refrigerant containers and should be labelled to indicate the refrigerant, the type of oil, any possible contamination, the weight of the cylinder and the quantity of refrigerant contained.*



# An Gníomhaireacht um Chaomhnú Comhshaoil

Is í an Gníomhaireacht um Chaomhnú Comhshaoil (EPA) comhlachta reachtúil a chosnaíonn an comhshaoil do mhuintir na tíre go léir. Rialaímid agus déanaimid maoirsiú ar ghníomhaíochtaí a d'fhéadfadh truailliú a chruthú murach sin. Cinntímid go bhfuil eolas cruinn ann ar threochtaí comhshaoil ionas go nglactar aon chéim is gá. Is iad na príomh-nithe a bhfuilimid gníomhach leo ná comhshaoil na hÉireann a chosaint agus cinntiú go bhfuil forbairt inbhuanaithe.

Is comhlacht poiblí neamhspleách í an Gníomhaireacht um Chaomhnú Comhshaoil (EPA) a bunaíodh i mí Iúil 1993 faoin Acht fán nGníomhaireacht um Chaomhnú Comhshaoil 1992. Ó thaobh an Rialtais, is í an Roinn Comhshaoil agus Rialtais Áitiúil a dhéanann urraíocht uirthi.

## ÁR bhFREAGRACHTAÍ

### Ceadúnú

Bíonn ceadúnais á n-eisiúint againn i gcomhair na nithe seo a leanas chun a chinntiú nach mbíonn astuithe uathu ag cur sláinte an phobail ná an comhshaoil i mbaol:

- áiseanna dramhaíola (m.sh., líonadh talún, loisceoirí, stáisiúin aistrithe dramhaíola);
- gníomhaíochtaí tionsclaíocha ar scála mór (m.sh., déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta);
- diantalmhaíocht;
- úsáid faoi shrian agus scaoileadh smachtaithe Orgánach Géinathraithe (GMO);
- mór-áiseanna stórais peitireail;
- scardadh dramhuisce.

### Feidhmiú Comhshaoil Náisiúnta

- Stiúradh os cionn 2,000 iniúchadh agus cigireacht de áiseanna a fuair ceadúnas ón nGníomhaireacht gach bliain.
- Maoirsiú freagrachtaí cosanta comhshaoil údarás áitiúla thar sé earnáil – aer, fuaim, dramhaíl, dramhuisce agus caighdeán uisce.
- Obair le húdaráis áitiúla agus leis na Gardaí chun stop a chur le gníomhaíocht mhídhleathach dramhaíola trí chomhordú a dhéanamh ar líonra forfheidhmithe náisiúnta, díriú isteach ar chiontóirí, stiúradh fiosrúcháin agus maoirsiú leigheas na bhfadhbanna.
- An dlí a chur orthu siúd a bhriseann dlí comhshaoil agus a dhéanann dochar don chomhshaoil mar thoradh ar a ngníomhaíochtaí.

### Monatóireacht, Anailís agus Tuairisciú ar an Gcomhshaoil

- Monatóireacht ar chaighdeán aeir agus caighdeáin aibhneacha, locha, uiscí taoide agus uiscí talaimh; leibhéil agus sruth aibhneacha a thomhas.
- Tuairisciú neamhspleách chun cabhrú le rialtais náisiúnta agus áitiúla cinntí a dhéanamh.

### Rialú Astuithe Gáis Ceaptha Teasa na hÉireann

- Cainníochtú astuithe gáis ceaptha teasa na hÉireann i gcomhthéacs ár dtiomantas Kyoto.
- Cur i bhfeidhm na Treorach um Thrádáil Astuithe, a bhfuil baint aige le hos cionn 100 cuideachta atá ina mór-ghineadóirí dé-ocsaíd charbóin in Éirinn.

### Taighde agus Forbairt Comhshaoil

- Taighde ar shaincheisteanna comhshaoil a chomhordú (cosúil le caighdeán aeir agus uisce, athrú aeráide, bithéagsúlacht, teicneolaíochtaí comhshaoil).

### Measúnú Straitéiseach Comhshaoil

- Ag déanamh measúnú ar thionchar phleananna agus chláracha ar chomhshaoil na hÉireann (cosúil le pleananna bainistíochta dramhaíola agus forbartha).

### Pleanáil, Oideachas agus Treoir Chomhshaoil

- Treoir a thabhairt don phobal agus do thionscal ar cheisteanna comhshaoil éagsúla (m.sh., iarratais ar cheadúnais, seachaint dramhaíola agus rialacháin chomhshaoil).
- Eolas níos fearr ar an gcomhshaoil a scaipeadh (trí cláracha teilifíse comhshaoil agus pacáistí acmhainne do bhunscoileanna agus do mheánscoileanna).

### Bainistíocht Dramhaíola Fhorghníomhach

- Cur chun cinn seachaint agus laghdú dramhaíola trí chomhordú An Chláir Náisiúnta um Chosc Dramhaíola, lena n-áirítear cur i bhfeidhm na dTionscnamh Freagrachta Táirgeoirí.
- Cur i bhfeidhm Rialachán ar nós na teoracha maidir le Trealamh Leictreach agus Leictreonach Caite agus le Srianadh Substaintí Guaiseacha agus substaintí a dhéanann ídiú ar an gcrios ózóin.
- Plean Náisiúnta Bainistíochta um Dramhaíl Ghuaiseach a fhorbairt chun dramhaíl ghuaiseach a sheachaint agus a bhainistiú.

### Struchtúr na Gníomhaireachta

Bunaíodh an Gníomhaireacht i 1993 chun comhshaoil na hÉireann a chosaint. Tá an eagraíocht á bhainistiú ag Bord lánaimseartha, ar a bhfuil Príomhstíúrthóir agus ceithre Stíúrthóir.

Tá obair na Gníomhaireachta ar siúl trí ceithre Oifig:

- An Oifig Aeráide, Ceadúnaithe agus Úsaide Acmhainní
- An Oifig um Fhorfheidhmiúchán Comhshaoil
- An Oifig um Measúnacht Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáide

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag ball air agus tagann siad le chéile cúpla uair in aghaidh na bliana le plé a dhéanamh ar cheisteanna ar ábhar imní iad agus le comhairle a thabhairt don Bhord.



## ENVIRONMENTAL PROTECTION AGENCY

An Ghníomhaireacht um Chaomhnú Comhsaoil  
PO Box 3000, Johnstown Castle Estate, Co. Wexford, Ireland  
Telephone: +353 53 916 0600 Fax: +353 53 916 0699  
Email: [info@epa.ie](mailto:info@epa.ie) Website: [www.epa.ie](http://www.epa.ie)  
LoCall 1890 33 55 99

