

# F-GAS

S U P P O R T

Promoting Compliance with F Gas and Ozone Regulations

## Guidance for Stationary Refrigeration & Air-Conditioning

This Information Sheet provides a description of the key obligations under the EC F gas and Ozone Regulations for operators of stationary refrigeration, air-conditioning and heat pump equipment (RAC systems) in the UK. See Information Sheet GEN 1 for a glossary of common terms related to these Regulations.

### 1. Which Regulations are covered by this Information Sheet?

The two EC Regulations discussed in this Information Sheet are:

**The F Gas Regulation<sup>1</sup>**. This is EC Regulation 842/2006 on certain fluorinated greenhouse gases (F gases). This Regulation aims to reduce emissions of HFCs, PFCs and SF<sub>6</sub>. Many organisations use HFCs for refrigeration and air-conditioning systems. The key obligations in this Regulation applied from July 2007.

In Great Britain the Fluorinated Greenhouse Gases Regulations 2009 (Statutory Instrument No 261) applied from 9<sup>th</sup> March 2009. This Statutory Instrument prescribes offences and penalties applicable to infringements of the EC F gas Regulation and lays out the qualifications and certification requirements.

**The Ozone Regulation<sup>1</sup>** This is EC Regulation 1005/2009 on substances that deplete the ozone layer. This regulation came into force on 1<sup>st</sup> January 2010 and replaced the old Ozone Regulation EC 2037/2000 which has now been revoked. This Regulation is aimed at phasing-out the use of ozone depleting chemicals. The only Ozone Depleting Substances (ODS) still in use in most organisations are HCFC refrigerants, especially R22, which will be phased-out under this Regulation by 2015. The use of virgin HCFCs for maintenance of RAC systems was banned on 1<sup>st</sup> January 2010. See Section 5 of this Information Sheet for further details.

In Great Britain there are 3 Statutory Instruments that prescribe offences and penalties applicable to infringements of the EC Ozone Regulation and define the qualifications requirements. These are: Statutory Instruments 2002 No. 528, 2008 No. 91 and 2009 No. 216.

### 2. What types of equipment are covered by this Information Sheet?

This Information Sheet refers to “RAC systems”. This covers three different types of stationary system:

- ♦ **Refrigeration systems.** Equipment to cool products or storage spaces below ambient temperature, e.g. retail refrigerated displays, cold stores etc.
- ♦ **Air-conditioning systems.** Equipment to cool buildings to a comfortable ambient temperature, ranging from small units to cool a single room to large chillers that cool a whole building.
- ♦ **Heat pumps.** Heating devices that use a refrigeration machine to extract energy from a waste heat source and deliver useful heat.

### 3. Who is responsible for compliance?

In Great Britain, the person having control of the equipment containing the F gas refrigerant (the “operator”), typically a company, is likely to have responsibility. Also, any company employing

---

<sup>1</sup> See Information Sheet GEN 4 for a list of relevant regulations and links to download the full text.

personnel involved in working on equipment that contains or is designed to contain F gases must ensure that they have the appropriate qualifications and company certification.

The EC F gas Regulation defines the operator as follows:

*“Operator means the natural or legal person exercising actual power over the technical functioning of the equipment and systems covered by this Regulation”*

According to guidance and interpretation from the EC issued in 2008, the “*actual power over the technical functioning*” of a piece of equipment or system must include 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);
- ♦ The powers (including financial power) to decide on technical modifications (e.g. replacement of a component, installation of a permanent leak detector), modification of the quantities of F gases in the system, and to have checks or repairs carried out.

It can be assumed that at the earliest stage of the system’s lifetime, all these powers lie with a single natural or legal person, normally the owner. If all these powers are devolved by the operator to a third party through contractual arrangements, the authority of operator and the responsibilities attached to it under EC F gas Regulation should be deemed transferred to that third party. If these powers are only partially transferred, the authority of operator should not be deemed transferred.

Therefore the EC F gas Regulation usually places responsibility with the owner, even if there is a comprehensive maintenance contract in place.

The greatest area of potential complication is in landlord-tenant relationships e.g. in a leased air-conditioned office building. In these circumstances you may need to refer to the responsibilities set down in the lease – this would normally specify which party is responsible for the operation and upkeep of any air-conditioning system.

#### **4. Obligations for Operators under the EC F Gas Regulation**

All operators of RAC systems that use refrigerants containing F gases, for example refrigerants R404A and R408A<sup>2</sup>, must comply with obligations in the EC F gas Regulation. See Information Sheets RAC 2 and GEN 2 for more information about which refrigerants are affected.

The actual obligations depend on the amount of refrigerant in each separate system. Two plants are considered to be separate if there is no interconnection between their refrigerant circuits (i.e. refrigerant cannot flow from one system to the other).

Table 1 summarises the obligations for each separate RAC system containing F gas refrigerant. The text following the table provides more detail about each obligation. References to Article numbers in the text below relate to Articles that are set out in the EC F gas Regulation.

---

<sup>2</sup> Note, R408A is a blend with HFC and HCFC components. Hence it has obligations under both the EC F gas and Ozone Regulations.

**Table 1 Summary of EC F Gas Regulation Obligations for RAC Systems**

Section	Obligation	Applicability to RAC Systems (for systems using F gas Refrigerants)
4.1	Take steps to prevent F gas leakage and repair detected leakage as soon as possible.	All stationary systems
4.2	Regularly check for leakage, see Table 2 for details.	Stationary systems 3 kg or more (or if hermetic and labelled 6 kg or more <sup>3</sup> )
4.3	Fit automatic leak detection system.	Stationary systems above 300 kg
4.4	Keep certain records about refrigeration plant that uses F gases.	Stationary systems 3 kg or more
4.5	Recover F gases during plant servicing and maintenance, and at end of plant life.	All stationary systems
4.6	Use appropriately qualified personnel to carry out installation, servicing and maintenance, and leakage checking. Have company certification if employing personnel to undertake installation, maintenance or servicing of RAC systems. Further obligations for companies employing these personnel or wishing to take delivery of containers of F gas.	All stationary systems
4.7	Label new equipment adjacent to service point/information & in instruction manuals.	All stationary systems
4.8	Placing on the market of non-refillable containers used to service equipment is banned from July 2007, except for those shown to be manufactured before that time.	All systems

#### 4.1. General obligation to prevent leakage

*Article 3.1. Applicable from 4<sup>th</sup> July 2007 to all sizes of RAC system.*

Using all measures which are technically feasible and do not entail disproportionate cost operators must: (a) prevent leakage of F gas refrigerants and (b) as soon as possible repair any detected leakage.

#### 4.2. Regular leakage checking

*Article 3.2. Applicable from 4<sup>th</sup> July 2007 to RAC systems containing 3 kg or more.*

Equipment containing 3 kg or more of F gas refrigerant must be checked for leakage by certified personnel on a regular basis. This threshold rises to 6 kg for hermetically sealed systems that are labelled.

“Checked for leakage” means that the equipment or system is examined for leakage using direct or indirect measuring methods, focusing on those parts of the equipment or system most likely to leak. The frequency of testing depends on the refrigerant charge and system type. Table 2 summarises the leakage checking frequencies. Individual plants must be rechecked within one month after a leak has been repaired to ensure that the repair has been effective. See Information Sheet RAC 6 for more guidance about leak testing.

<sup>3</sup> The threshold is 3 kg for most systems, but is increased to 6 kg for a “hermetically sealed system”. This is defined as: “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”.

**Table 2 Leak Testing Frequencies**

Frequency	Normal systems	Hermetically sealed systems
None	Less than 3 kg	Less than 6 kg
Annual	3 kg to 30 kg	6 kg to 30 kg
6-monthly*	30 kg to 300 kg	30 kg to 300 kg
Quarterly*	Greater than 300 kg	Greater than 300 kg

\* Half this frequency if fitted with automatic leak detection

### 4.3. Automatic leak detection systems

Article 3.3. Applicable from 4<sup>th</sup> July 2007 to RAC systems above 300 kg.

Equipment with 300 kg or more of F gases must be fitted with a leakage detection system, which is defined (in Article 2.10) as:

*“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 proper functioning.

For any equipment fitted with a leakage detection system (including those below the mandatory 300 kg threshold), the frequency of leak checking can be halved, although an annual check remains the minimum frequency.

See Information Sheet RAC 6 for more guidance about automatic leak detection.

### 4.4. Maintaining records

Article 3.6. Applicable from 4<sup>th</sup> July 2007 to RAC systems containing 3 kg or more.

Records must be kept on each system with more than 3 kg of HFC refrigerant. The records must include:

- ◆ The **quantity** and **type** of F gas refrigerants installed in each system,
- ◆ Any **quantities** of refrigerant **added**,
- ◆ The **quantity** of refrigerant **recovered** during servicing, maintenance and final disposal.
- ◆ The **identity** of the **company** or **personnel** who performed the servicing or maintenance, as well as the **dates** and **results** of leakage checks and leakage detection system checks.

These **records shall be made available** on request to the competent authority and to the Commission. See Information Sheet RAC 6 for more details and an example log sheet.

### 4.5. Gas recovery

Article 4.1. Applicable from 4<sup>th</sup> July 2007 to all sizes of RAC system.

If refrigerant needs to be removed from a system (e.g. to gain access to part of a system for maintenance or during system decommissioning at the end of life) it must be properly recovered by appropriately certified personnel. After recovery the refrigerant can be reused or sent for reclamation or destruction. Recovered refrigerant is classified as Hazardous Waste and comes under the UK Hazardous Waste Regulations. Waste producers have a “duty of care” for the waste they handle and must ensure they use the appropriate documentation and consign and transfer waste appropriately. More information is available from the Environment Agency or SEPA.

### 4.6. Use of appropriately trained personnel; Personnel and Company Certification

Article 5. Applicable from 4<sup>th</sup> July 2007 to all sizes of RAC system.

Personnel carrying out leak checking, gas recovery, plant installation, maintenance or servicing on equipment that contains or is designed to contain F gas refrigerant must have an appropriate qualification.

Businesses that handle F gases for the purpose of installation, maintenance or servicing of RAC equipment need to hold a company certificate. Defra has designated three Company Certification bodies. Other certification bodies may be appointed at a later date. The certification bodies are – Bureau Veritas, Quidos and Refcom.

To take delivery of containers of F gas, for the activities described above, an organisation needs to employ appropriately certificated personnel.

See Information Sheet RAC 5 for further information about all of these requirements.

#### 4.7. Labelling

*Article 7.2. Applicable from 1<sup>st</sup> April 2008 to all sizes of RAC system.*

Any new system placed on the market must be fitted with a label adjacent to the service point clearly stating the type and quantity of HFC refrigerant used. Where personnel add F gases to equipment outside the manufacturing site, the label should indicate the total quantity of F gases contained. In addition instruction manuals that come with the products/equipment need to contain information on the type of F gas contained and its global warming potential. See RAC 6 for more details about labelling.

#### 4.8. Non-refillable containers

*Article 9.1. Applicable from 4<sup>th</sup> July 2007 to all sizes of RAC system.*

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 July 4<sup>th</sup> 2007.

### 5. Obligations for Operators under the EC Ozone Regulation

All RAC systems that use refrigerants containing ODS, for example refrigerants R22 and R408A, must comply with obligations in the EC Ozone Regulation. See Information Sheets RAC 2 and GEN 2 for more information about which refrigerants are affected.

The actual obligations depend on the amount of refrigerant in each separate system. Two plants are considered to be separate if there is no interconnection between their refrigerant circuits (i.e. refrigerant cannot flow from one system to the other).

The obligations for each separate RAC system containing ODS refrigerant are summarised in Table 3. The text following the table provides more detail about each obligation.

**Table 3 Summary of EC Ozone Regulation Obligations for RAC Systems**

Section	Obligation	Applicability to RAC Systems (for systems using F gas Refrigerants)
5.1	Stop using virgin HCFC refrigerant for plant maintenance from 31 <sup>st</sup> December 2009. Only use recycled or reclaimed HCFCs for plant maintenance from 1 <sup>st</sup> January 2010 until 31 <sup>st</sup> December 2014.	All systems
5.2	Stop using recycled and reclaimed HCFC refrigerant for plant maintenance from 1 <sup>st</sup> January 2015.	All systems
5.3	Take steps to prevent HCFC leakage and repair detected leakage as soon as possible and at any event within 14 days.	All stationary systems
5.4	Regularly check for leakage, see Table 2 for details. Please note there is no requirement to fit automatic leak detection on systems containing HCFC refrigerants and if fitted the leak checking frequencies are not reduced.	Stationary systems 3 kg or more (or if hermetic and labelled 6 kg or more <sup>4</sup> )

<sup>4</sup> The threshold is 3 kg for most systems, but is increased to 6 kg for a “hermetically sealed system”. This is defined as: “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”.

5.5	Record Keeping There are a number of record keeping requirements which depend on the size of the system and whether recycled or reclaimed HCFC refrigerants have been added.	All systems
5.6	Label equipment to which recycled or reclaimed HCFCs have been added	All systems
5.7	Recover ODS during plant servicing and maintenance and at end of plant life.	All systems
5.8	Use appropriately trained personnel to carry out servicing and maintenance, leakage checking and recovery.	All systems
5.6	Non-refillable containers shall not be used to transport HCFC refrigerant.	All systems

## 5.1. Phase-out of virgin HCFCs

*Article 5 and Article 11.4 and 11.5. Applicable from 1<sup>st</sup> January 2010 to all sizes of RAC system.*

After 2009 virgin HCFCs cannot be used for plant servicing and maintenance. This applies to all virgin HCFCs, even if purchased and stockpiled before the deadline.

- ♦ **Use** means the utilisation of HCFC refrigerant in the production, maintenance or servicing, including refilling of products or equipment.

After the ban on the use of virgin comes into place only recycled or reclaimed HCFCs may be used in servicing and maintenance of refrigeration and air-conditioning equipment. The following definitions apply:

- ♦ **Recycled HCFC** – is recovered HCFC gas that has been subject to a basic cleaning process (this might include mechanical filtering and moisture removal).
- ♦ **Reclaimed HCFC** – is recovered HCFC gas that has been chemically reprocessed to a specified standard.

Recycled HCFCs may only be used by either the undertaking which carried out the recovery (in most cases the refrigeration contractor) or the undertaking for which the recovery was carried out (the owner). Recycled HCFCs may not be placed on the market.

Reclaimed HCFCs may be placed on the wider market and used by undertakings other than the original contractor and owner. Reclaimed HCFCs must be held in containers labelled as such, with information on the batch number and name and address of the reclamation facility.

- ♦ **Placing on the market** means the supplying or making available to third persons within the Community for payment or free of charge.

## 5.2. Phase-out of recycled and reclaimed HCFCs

*Article 11.4 and 11.5. Applicable from 31<sup>st</sup> December 2014 to all sizes of RAC system.*

After 2014 recycled and reclaimed HCFCs cannot be used for plant servicing and maintenance. This applies to all recycled HCFCs, even if purchased before the deadline.

The ban on the “use” of HCFCs 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 the servicing and maintenance of the HCFCs in the system.

## Preventing/minimising HCFC leakage

*Article 23.1 Applicable from 2010 for all systems containing HCFC refrigerant.*

Undertakings should take all practical precautionary measures to prevent and minimise any emissions of HCFCs.

### 5.3. Check for leakage

*Article 23.2. Applicable from 2010 for systems with 3 kg or more*

The leak checking requirements for stationary RAC systems now mirror those for F gases, see Section 4.2 for details and Table 2 for leak checking frequencies. The exception is there is no requirement to fit automatic leak detection on systems of 300 kg and over. For equipment where this is fitted there is no reduction in the leak checking frequency.

### 5.4. Record keeping

The record keeping requirements will depend on whether mobile or stationary equipment is operated and on the refrigerant charge in that equipment.

*Article 11.7 (first paragraph) Applicable from 2010 for stationary and mobile systems with 3 kg or more*

When recycled or reclaimed HCFC refrigerants are added to either a mobile or a stationary system containing 3 kg or more a record needs to be kept to show what refrigerant has been added, in what quantity and who (name of person or company) did this servicing or maintenance.

*Article 11.7 (second paragraph) Applicable from 2010 for all stationary and mobile systems, irrespective of refrigerant charge*

When recycled or reclaimed HCFC refrigerants are added to a system a record needs to be kept which should show who supplied the reclaimed HCFCs and of the source of recycled HCFCs.

*Article 23.3 Applicable from 2010 for all stationary systems with 3 kg or more*

For all stationary systems containing 3 kg or more a record needs to be kept. This record should show the quantity and type of refrigerant added and the quantity recovered during maintenance, servicing and final disposal of the equipment. Records also need to show other relevant information including the identification of the company or technician performing the maintenance or servicing, as well as the dates and results of the leakage checks carried out. Please see RAC 8 for an example record sheet.

### 5.5. Labelling

*Article 11.6 Applicable from 2010 for all systems containing HCFC refrigerant*

When recycled or reclaimed HCFCs are added to RAC equipment it should then be labelled. A label should show:

- ◆ The type of refrigerant, and
- ◆ The total quantity contained in the system, and
- ◆ The label elements set out in Annex I to Regulation EC/1272/2008 for substances or mixtures classified as Hazardous to the Ozone Layer.

An example of a label is shown below:

<p style="text-align: center;"><b>This equipment contains RECYCLED/ RECLAIMED refrigerant</b></p> <p>Type of Refrigerant.....</p> <p>Total Refrigerant Charge (kg).....</p> <p style="text-align: center;"><b>DANGER</b></p> <p style="text-align: center;"><b>EUH059: HAZARDOUS TO THE OZONE LAYER</b></p> <p style="text-align: center;"><b>AVOID RELEASE TO THE ENVIRONMENT</b></p> <p style="text-align: center;"><b>DISPOSE OF THIS REFRIGERANT AS HAZARDOUS WASTE</b></p>
---

## 5.6. Gas recovery

*Article 22.1. Applicable from 2010 to all sizes of RAC system.*

If an ODS refrigerant needs to be removed from a system (e.g. to gain access to part of a system for maintenance or during system decommissioning at the end of life) it must be properly recovered by certified personnel. After recovery the refrigerant can be reused or sent for reclamation, recycling or destruction.

## 5.7. Use of appropriately trained personnel

*Article 22.5 and 23.4. Applicable from 2010 for all sizes of systems.*

Personnel carrying out leak checking, gas recovery or other refrigerant handling activities, such as plant maintenance, must have a suitable refrigerant handling qualification. See Information Sheet RAC 5 for further information about qualifications.

## 5.8. Non-refillable containers

*Article 5.2. Applicable from 2010*

The use of non-refillable containers for transporting or storing ODS refrigerants is banned.

## 6. Possible Obligations Related to non-RAC Applications

Most obligations will relate to RAC systems as described in this Information Sheet. Some organisations have other F gas technologies, e.g.:

**HFC Fire protection.** Some fire protection systems used for high value assets such as large computer systems use gaseous HFCs. See Information Sheet FP 1.

**High voltage switchgear with SF<sub>6</sub>.** Some high voltage circuit breakers use SF<sub>6</sub>. This is quite unlikely in many companies, but might apply in large or industrial sites. See Information Sheet SCS 1.

Information Sheet GEN 3 provides a comprehensive list of F gas applications and the types of organisations that use such equipment.



### How to Contact F-Gas Support:

**Telephone Help Line:** 0161 874 3663 **Website:** [www.defra.gov.uk/fgas](http://www.defra.gov.uk/fgas)

**Email:** [fgas-support@enviros.com](mailto:fgas-support@enviros.com)

**Post:** F-Gas Support, P O Box 481, Salford, M50 3UD

This document has been prepared by F-Gas Support; the information provided is intended as guidance and must not be taken as formal legal advice nor as a definitive statement of the law. Ultimately only the courts can decide on legal questions and matters of legal interpretation. If you have continuing concerns you should seek legal advice from your own lawyers.

F-Gas Support is a Government funded team set up to help organisations understand their obligations under the EU Fluorinated Greenhouse Gases and Ozone Regulations. F-Gas Support is also working with Regulators to promote compliance. It is being run on behalf of Defra and the devolved administrations by the Local Authorities Coordinators of Regulatory Services (LACORS) and SKM EnviroS.