

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 Regulation¹. This is EC Regulation 842/2006 on certain fluorinated greenhouse gases. This Regulation aims to reduce emissions of HFCs, PFCs and SF₆. 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 2008 Statutory Instrument No 41 applied from 15th February 2008. This Statutory Instrument prescribes offences and penalties applicable to infringements of the EC F Gas Regulation and lays out the current qualifications and certification requirements.

The Ozone Regulation². This is EC Regulation 2037/2000 on substances that deplete the ozone layer. 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.

In Great Britain there are 4 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, 2006 No. 1510 and 2008 Nos. 91 and 97.

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.

¹ The full text of the F gas Regulation can be downloaded from: www.defra.gov.uk/fgas

² The full text of the Ozone Regulation can be downloaded from: www.defra.gov.uk/fgas

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 personnel involved in refrigerant handling must ensure that they have the appropriate qualifications.

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 EU 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 R408A³, 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.

³ Note, R408A is a blend with HFC and HCFC components. Hence it has obligations under both the EU F gas and Ozone Regulations.

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

Obligation		Applicability to RAC Systems (for systems using F gas Refrigerants)
(a)	Take steps to prevent F gas leakage and repair detected leakage as soon as possible.	All stationary systems
(b)	Regularly check for leakage.	Stationary systems 3 kg or more (or if hermetic and labelled 6 kg or more ⁴)
(c)	Fit automatic leak detection system.	Stationary systems above 300 kg
(d)	Keep certain records about refrigeration plant that uses F gases.	Stationary systems 3 kg or more
(e)	Recover F gases during plant servicing and maintenance, and at end of plant life.	All stationary systems
(f)	Use appropriately qualified staff to carry out installation, servicing and maintenance, and leakage checking.	All stationary systems
(g)	Label new equipment adjacent to service point/information in instruction manuals.	All stationary systems
(h)	Placing on the market of non-refillable containers used to service equipment is banned from July 2007, except for those shown to be manufactured at that time.	All systems

4.1. General obligation to prevent leakage

Article 3.1. Applicable from 4th 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 4th 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.

⁴ 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	<3 kg	<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*	>300 kg	>300 kg

* Half this frequency if fitted with automatic leak detection

4.3. Automatic leak detection systems

Article 3.3. Applicable from 4th 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 4th 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 4th 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. Also Waste producers have obligations associated with waste transfer.

4.6. Use of appropriately trained staff; Personnel and Company Certification

Article 5.1. Applicable from 4th July 2007 to all sizes of RAC system.

Personnel carrying out leak checking, gas recovery or other refrigerant handling activities such as plant installation and maintenance must have an appropriate refrigerant handling qualification and hold a suitable certificate. Companies carrying out installation and maintenance work also need certification. See Information Sheet RAC 5 for further information about qualifications and certification.

4.7. Labelling

Article 7.2. Applicable from 1st 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. See Information Sheet RAC 6 for more details about labelling.

4.8. Non-refillable containers

Article 9.1. Applicable from 4th 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 is banned from July 2007, except for those shown to be manufactured (i.e. filled with refrigerant) before July 4th 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).

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

Table 3 Summary of EC Ozone Regulation Obligations for RAC Systems

Obligation		Applicability to RAC Systems (for systems using F gas Refrigerants)
(a)	Check for leakage annually.	Systems with more than 3 kg
(b)	Recover ODS during plant servicing and maintenance and at end of plant life.	All systems
(c)	Use appropriately trained staff to carry out installation, servicing and maintenance and leakage checking.	All systems
(d)	Stop using virgin HCFC refrigerant for plant maintenance from 31 st December 2009.	All systems
(e)	Stop using recycled HCFC refrigerant for plant maintenance from 31 st December 2014.	All systems
(f)	Non-refillable containers shall not be used to transport HCFC refrigerant.	All systems

5.1. Check for leakage annually

Article 17.1. Applicable from 2000 for systems with more than 3 kg refrigerant.

All precautionary measures practicable shall be taken to prevent and minimise leakages of ODS. In particular, fixed equipment with a refrigerating fluid charge of more than 3 kg shall be checked for leakages annually.

5.2. Gas recovery

Article 16.1. Applicable from 2000 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 or destruction.

5.3. Use of appropriately trained staff

Article 17.1. Applicable from 2000 for systems with at least 3 kg refrigerant.

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

5.4. Phase Out of Virgin HCFCs

Article 5.5. Applicable from 31st December 2009 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 before the deadline.

5.5. Phase Out of Recycled HCFCs

Article 5.5. Applicable from 31st December 2014 to all sizes of RAC system.

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

5.6. Non-refillable containers

Article 9.1. Applicable from 2000 to all sizes of RAC system.

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 SF₆.** Some high voltage circuit breakers use SF₆. This is quite unlikely in many companies, but might apply in large or industrial sites. See Information Sheet HV 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

Email: 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 Enviros.