F-Gas Procedure

Introduction

Requirements for the use of Fluorinated greenhouse gases (F-Gases) like hydrofluorocarbons (HFCs), widely used in refrigeration applications, perfluorocarbons (PFCs) and sulphur hexafluoride (SF6), are described by the Fluorinated Greenhouse Gases regulations.

The Regulations (known as the F-gas Regulations) deal with the containment and recovery of these gases and also with training and certification of personnel who carry out leak testing, gas recovery, maintenance etc. of equipment that contains this type of gas.

The University uses F-Gases in stationary refrigeration equipment, air conditioning systems and uses SF6 as an insulating medium in HV switchgear.

The University uses FM200 an F-Gas in fire suppression equipment for the main Data Centre, and the Telephone Exchange

Most major buildings across the University of Kent contain Refrigeration and Air-conditioning (RAC) systems. In most cases these are managed and serviced through arrangements with the Estates Department. Where Departments are responsible for their own systems they are required to comply with the same legislation and to maintain independent records in line with these guidelines.

Procedure – Refrigeration and AC systems

F-Gas Register

Compile a list of all F Gas equipment under the control of the Department. Each piece of equipment should ideally have a unique identification. The register should include the location, type and quantity of refrigerant, the Global Warming Potential (GWP) and CO2 equivalent of the gas, and whether the system is hermetically sealed.

Ensure systems are labelled

All F-gas systems must be labelled with the following information:

- that the equipment contains an F gas
- the industry name for the F gas, or the chemical name if there isn't an accepted industry name
- If the system is hermetically sealed

From 2017 labels on new equipment must also state the:

- mass of F gas in the equipment (in kg)
- carbon dioxide (CO_2) equivalent mass of F gas in the equipment (in tonnes)
- the global warming potential of the F gas

Set up a record keeping system

For all F Gas systems above 3kg it is a requirement to keep records. It is recommended that the register of equipment is a good place to include records. Records must be regularly updated by certified/qualified personnel working on the equipment. There is no obligation to keep records for Ozone Depleting Substances (ODS) systems below 3kg although for completeness it is advisable to do so.

In addition to the information contained in the register, the operator of equipment, and the company that services it, must keep the following records about any equipment that has to be checked for leaks:

- quantity and type of gas in the equipment
- quantity and type of gas added during any maintenance
- details (name, address and certificate number if relevant) of any companies that install, service or decommission the equipment
- dates and results of all mandatory leak checks
- measures taken to recover and dispose of gases when you dispose of the equipment (eg. disposing of it through a registered waste carrier)

You must also record if the gas used in the equipment has been recycled or reclaimed and if so:

- details of the recycling or reclamation facility (name, address and certificate number if it has one)
- quantity of any gases recovered

You must keep records for 5 years

Ensure personnel are qualified

The regulations specify levels of qualifications required for installation, testing for leaks, general maintenance and disposal or decommissioning. Departments are responsible for ensuring that all contractors are sufficiently qualified to undertake any work required.

Ensure leak test obligations are being met

For all plant containing 3kg or more of F Gas, a leak test at least annually is required. Leak tests must be carried out by qualified personnel and results of tests must be recorded.

The thresholds at which leak check intervals are specified are expressed in terms of CO_2 equivalent. They take into account both the quantity of F gas in the equipment and the 'global warming potential' of the F gas (how much the F gas contributes to global warming). Most systems on the Canterbury campus and all on the Medway campus are within the threshold for annual checks. A few large systems on the Canterbury campus require checks 6-monthly.

- 5 and 50 tonnes CO_2e it requires one inspection per year.
- 50 to 500 tonnes CO_2e require inspection every six months.
- Greater than 500 tonnes CO_2e require quarterly inspections.

GWP figures for F-gases can be found at:

https://www.gov.uk/guidance/calculate-the-carbon-dioxide-equivalent-quantity-of-an-f-gas

Carbon equivalent can be calculated by multiplying the GWP by the total weight in Kg of the refrigerant.

Procedure - SF6

Sulphur Hexafluoride (SF6) is used at the University to insulate high voltage transmission switchgear. An external contractor is solely responsible for the maintenance, leak testing and repair of the system.

The University must ensure that the contractors:

- are qualified with an F Gas handling certificate
- check for leaks in accordance with the regulations
- install leak detection equipment where applicable
- keep records in accordance with the regulations
- recover SF6 when servicing or decommissioning systems

A copy of all records should be kept by the University for a minimum of 5 years.

Procedure – FM200 (HFC-272ea)

FM200 is used by the University in fire suppression equipment for some areas containing electric/electronic equipment.

The University must ensure that the contractors:

- are qualified with an F Gas handling certificate
- log all discharges and refills of the equipment
- keep records in accordance with the regulations
- recover SF6 when servicing or decommissioning systems

A copy of all records should be kept by the University for a minimum of 5 years.

Phasing Down of F-Gases

In 2020, a service ban will come into force which will mean that equipment with a charge in CO2 equivalent greater than 40 tonnes will no longer be able to be refilled or serviced with virgin HFCs with a GWP > 2,500. Recycled or reclaimed gases with a GWP > 2,500 can still be used for servicing and maintenance until 2030. Although possible, the use of HFCs with a high GWP will become increasingly expensive.

The University will review the current Inventory of F-Gas containing equipment with a view to phasing out the use of refrigerants with a GWP > 2,500, and a timeline for these works will be produced as part of this review.

Note: This ban doesn't apply to equipment designed for low temperature refrigeration, at temperatures below -50°C, e.g. -80 freezers used in the labs.