



Technical guidance note: Fluorinated Gas (F Gas) use at Swansea University



1 Introduction

This document seeks to clarify what environmental compliance and management system obligations exist on Fluorinated Gases (F gas) at Swansea University.



The guidance contained within this document is in line with British and Welsh legislation and Swansea University requirements. It covers operations within the University at the Singleton and Bay campuses, and other associated sites.

This document includes the following sections:

- Section 2 Fluorinated gas brief
- Section 3 Definitions
- Section 4 Authorised uses
- Section 5 Obligations if using or wanting to use F gas
- Section 6 Alternatives and non-essential use
- Section 7 What to do in the event of an unplanned F gas release
- Section 8 Supplier considerations
- Section 9 Responsibilities
- Section 10 Key contacts



2 Fluorinated gas brief



Fluorinated gases (F gases) are man-made greenhouse gases that contribute to global warming and include:

- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur Hexafluoride (SF₆)



The full list of regulated F gases can be found on the [F gases¹](https://www.gov.uk/guidance/fluorinated-gases-f-gases) gov.uk webpage.

F gases are regulated under several pieces of legislation, further details of which are available from the Sustainability team and included on the University's environmental legal register.



3 Definitions

Equipment owner: The person/group that purchased and maintains the equipment. Where this is two different entities discussions must occur to designate responsibility.



¹ <https://www.gov.uk/guidance/fluorinated-gases-f-gases>



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Global Warming Potential (GWP): refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1.



4 Authorised uses

Certain uses of F gases are banned or will be banned in the future. For the most up to date list, please refer to the [Bans on F gas in new products and equipment: current and future²](#) webpage.



Common uses at Swansea University include:

- HFC use in refrigeration and air-conditioning (RAC) equipment
- Research use of SF₆ and other high global warming potential fluorinated gases
- Use of SF₆ in electrical switchgear

5 Obligations if using or wanting to use F gas



5.1 Regulatory requirements

If you already use or are considering using F gas, alternatives to F gas should be considered first. If an alternative is not possible, the lowest global warming potential (GWP) F gas should be utilised.

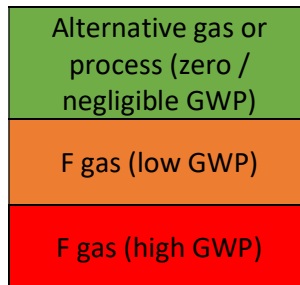


Figure 1: Gas selection



This analysis is to be undertaken during the risk assessment process (and associated reviews) for both new and existing projects/research.

Even if a use is currently allowed, the availability and feasibility of alternatives should be regularly reviewed as part of the risk assessment review.

The equipment owner must ensure that regulatory requirements are met, as a minimum this includes:



- Checking the competence of the contracted company and engineer; refer to [Company certification to work with F gas³](#) and [Qualifications to work with F gas⁴](#) on gov.uk



² <https://www.gov.uk/guidance/bans-on-f-gas-in-new-products-and-equipment-current-and-future>

³ <https://www.gov.uk/guidance/certification-for-companies-working-on-equipment-containing-f-gas>

⁴ <https://www.gov.uk/guidance/qualifications-required-to-work-on-equipment-containing-f-gas>

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- Ensuring leak checks are carried out the appropriate frequency; refer to [Checking F gas equipment for leaks⁵](#) on gov.uk
- Keeping the relevant records; refer to [Record F gas in equipment you own or service⁶](#)
- Appropriate recovery and reclamation/recycling; refer to [Recovering, reclaiming and recycling F gas⁷](#) on gov.uk



The Sustainability team will periodically audit your use, through internal audits or as part of the external (ISO14001:2015) audit.



5.2 University reporting requirements for F gas

You should contact the Sustainability team to inform them of the use and follow the process in Figure 2. A summary is also provided below:

- [Contact the Sustainability Team⁸ \(sustainability@swansea.ac.uk\)](mailto:sustainability@swansea.ac.uk) or your local Environment Officer directly (see Section 10 for contact details) to inform them of the intended use or existing use (if the information has not previously been provided)
- Complete the form in Appendix 1 – F Gas Feedback Form and submit to the Sustainability team with the following:
 - Confirmation the use is not banned and no alternative exists
 - Confirmation the F gas regulatory requirements have been reviewed and will be met
 - Safety data sheet for the F gas(es)
 - Risk assessment – including detailed evaluation of whether or not the use is essential
 - Consider whether there is an alternative more environmentally friendly substance or way in which the process can be carried out to avoid the use of F gas. You will also need to consider any safety requirements and hazards of alternatives. This can be done in association with the Health and Safety Lead for your area (see Section 10 for further information).
 - Details of maintenance for any equipment that contains the F gas
 - A completed copy of the F gas use table (see Appendix 2)
- Obtain approval for use from the Sustainability team
- Conduct an annual (as a minimum) review of alternatives and re-submission of forms to the Sustainability team to confirm continued/change of use e.g. quantity change or to inform the use has ceased. Forms should be submitted by November, ahead of the Sustainability team reporting to HESA in January.



⁵ <https://www.gov.uk/guidance/checking-f-gas-equipment-for-leaks>

⁶ <https://www.gov.uk/guidance/record-f-gas-in-equipment-you-own-or-service>

⁷ <https://www.gov.uk/guidance/recovering-reclaiming-and-recycling-f-gas>

⁸ <https://www.swansea.ac.uk/sustainability/contact-us/>

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Key:
College led
Sustainability led

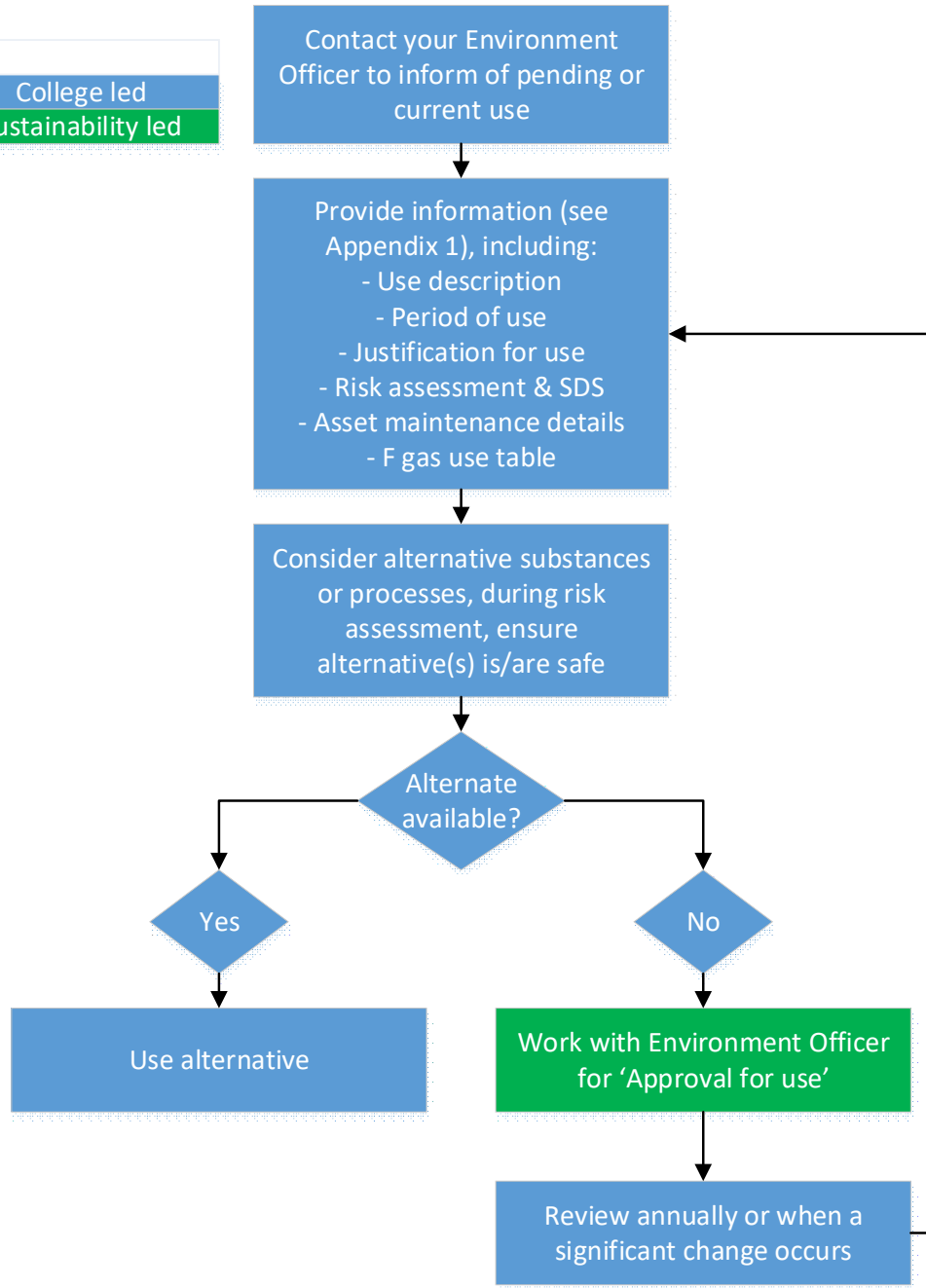


Figure 2: Process for F gas approval and reporting at Swansea University

5.3 Uses by contractors and suppliers

If using F gas, Swansea University and suppliers/contractors must comply with the F gas legislation and government guidance:

- [Fluorinated gas \(F gas\): guidance for users, producers and traders⁹](#)

⁹ <https://www.gov.uk/government/collections/fluorinated-gas-f-gas-guidance-for-users-producers-and-traders>





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- [Using and trading fluorinated gas and ozone-depleting substances: rules and processes from January 2021¹⁰](#)



6 Alternatives and non-essential use

If an alternative exists and / or use of the F-gas is not essential then it should stop immediately. Disposal should be undertaken in-line with current UK requirements by a specialist and competent contractor. You must return the gas to the provider, the process for this will be detailed within the contract with your specific gas supplier. If the gas supplier is unable to accept the F gas, contact estates-waste@swansea.ac.uk for more information.



7 What to do in the event of an unplanned F gas release

F gas shall not be intentionally released into the atmosphere, where the release is not technically necessary for the intended use. All technically and economically feasible measures must be taken to prevent and minimise unintentional releases.



If the release is technically necessary as part of the work then this should be recorded using the F gas use table in Appendix 2 and submitted (as a minimum) as part of the annual review detailed in Section 5.2. If any significant changes were to happen during the year then a mid-year report would be expected.



If there is an accidental leak of F gas from equipment (e.g. due to a system failure or operator error), it must be repaired urgently and appropriately to prevent any further releases. Regulatory requirements including the use of a competent contractor must be followed, as detailed in Section 5.1. The release must be reported to the Sustainability team as soon as possible through an adverse event form on the [Report IT! system¹¹](#), with the information in Table 1 included.

Table 1 Gas lost from an accidental release of F gas¹²

Gas type / name		
Global Warming Potential (GWP)		
Gas quantity lost	Kg	
	T CO₂e	
Date of release		
Equipment / asset number		
Equipment description		
Proposed loss/leak root cause		



¹⁰ <https://www.gov.uk/government/publications/fluorinated-gases-and-ozone-depleting-substances-how-to-do-business-if-the-uk-leaves-the-eu-with-no-deal/using-and-trading-fluorinated-gas-and-ozone-depleting-substances-rules-and-processes-if-the-uk-leaves-the-eu-with-no-deal>

¹¹ <https://www.swansea.ac.uk/about-us/safety-and-security/health-and-safety/report-it/>

¹² If a loss occurs from more than one piece of equipment in one adverse event, please provide the details on gas type and quantity lost from each piece of equipment



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8 Supplier considerations

It is the equipment owner's responsibility to ensure checks are carried out on the supply chain to ensure they have the appropriate requirements in place to enable legal sale in the UK.



Producers and importers must have an F gas quota to produce or import HFCs in the EU, for more details refer to the [Applying for quota to produce or import F gas¹³](https://www.gov.uk/guidance/applying-for-quota-to-produce-or-import-f-gas) gov.uk webpage.



When purchasing from a wholesaler or reseller, you should be required to provide a letter of reassurance that you are:

- Permitted to buy or collect F gas (through either holding or employ someone who holds the relevant F gas certificates and qualifications)
- You will not release F gas into the atmosphere intentionally, unless technically necessary for the use of the F gas
- You will take all steps to prevent F gas leaks



The supplier will then keep records of this reassurance, certificate number(s) and quantities of F gases purchased.

Before purchasing RAC equipment, you should be asked to provide the seller with details of the qualified technicians who will be used to install, service, repair and decommission equipment.



Products and equipment purchased should also meet labelling requirements detailed on the [Labelling F gas equipment you produce, import or install¹⁴](https://www.gov.uk/guidance/labelling-f-gas-equipment-you-produce-import-or-install) gov.uk webpage.

If the supplier does not request the details above and/or labelling of equipment is not as expected, then the equipment owner should ask the supplier to provide evidence of regulatory compliance, in line with Section 5.3.



9 Responsibilities

The Sustainability team will support staff in ensuring an understanding of compliance obligations. However, it is the member of staff's responsibility to:

- Abide by compliance obligations i.e. any restrictions and requirements related to F gas use
- Complete any additional documentation associated with Swansea University procedures, including risk assessments
- Notify the Sustainability team of any proposed amendments to F gas use (change of F gas, additional/reduced volume etc.)
- Inform the Sustainability team of any releases to air



¹³ <https://www.gov.uk/guidance/applying-for-quota-to-produce-or-import-f-gas>

¹⁴ <https://www.gov.uk/guidance/labelling-f-gas-equipment-you-produce-import-or-install>



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- Ensure waste is disposed of in-line with Swansea University procedures

10 Key contacts

For additional support, you can contact one of the following:



	Environment Officer	H&S Lead
Engineering	Emily Ingram	William Finn-Lewis
Science	Hayley Beharrell	Lorraine Wild
Medicine	Hayley Beharrell	Alison Trace



11 Document Control

Document control	
Author:	Emily Ingram, Hayley Beharrell
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Appendix 1 – F Gas Feedback Form

Please submit the following information to the Sustainability Team (sustainability@swansea.ac.uk) and your local Environment Officer (see Section 10 for contact details). Additional documents to be submitted are detailed on the form.



Name:	Enter information here	Faculty/PSU:	Enter information here
Team / Research group:	Enter information here	Research lab (if applicable):	Enter information here
Date:	Click to add date	Current/new use:	Choose an item.
PI (if applicable):	Enter information here	Contact details:	Enter information here



Use start date:	Enter information here
Use end date (estimated):	Enter information here



Use description:
Enter information here



Justification for use:
Enter information here



Items to send back with this form:	
Confirmation use is not banned	<input type="checkbox"/>
Confirmation the F gas regulatory requirements have been reviewed and will be met	<input type="checkbox"/>
Safety Data Sheet for F gas(es)	<input type="checkbox"/>
Risk Assessment (incl. detailed evaluation of whether or not the use is essential)	<input type="checkbox"/>
Maintenance details for equipment containing F gas	<input type="checkbox"/>
F Gas Use Table (see Appendix 2)	<input type="checkbox"/>





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Appendix 2 – F Gas Use Table

Excel version is available on the [EMS Operational Procedures webpage¹⁵](#).



EXAMPLE 1																
Time Period - 01-Aug-19 to 31-Jul-20																
Equipment / asset number	Equipment description	Gas Type / Name	Global Warming Potential (GWP) - CO2e	Gas held in equipment (at one time)		Gas consumed in process		Gas released - part of process		Gas released - accidental		Total gas released		Comments		
				Kg	T CO2e	Kg	T CO2e	Kg	T CO2e	Kg	T CO2e	Kg	T CO2e			
Asset 1 Name - Talbot Chiller 1	CHILL001	Daikin Chiller	R410a	2088	14	29.2	0	0.0	0	0.0	0	0.0	0	0.0	0	No loss this year, previous year loss
Asset 2 Name - Talbot Chiller 2	CHILL002	Daikin Chiller	R410a	2088	14	29.2	0	0.0	0	0.0	0	0.0	0	0.0	0	No loss this year, previous year loss
Asset 3 Name - Engineering East Chiller 1	CHILL003	Airedale Chiller	R410a	2088	50	104.4	0	0.0	0	0.0	0	0.0	0	0.0	0	2 circuits each with 25kg, no losses to date
Asset 4 Name - Engineering East Chiller 2	CHILL004	Airedale Chiller	R410a	2088	50	104.4	0	0.0	0	0.0	5	10.4	5	10.4	03-May-20 adverse event reported	
Asset 5 Name - ILS2 A/C Unit 1	CHILL005	Fujitsu Air Conditioning Unit	R134a	1430	30	42.9	0	0.0	0	0.0	30	42.9	30	42.9	16-Sep-19, adverse event reported	
EXAMPLE 2																
Time Period - 01-Aug-19 to 31-Jul-20																
Equipment / asset number	Equipment description	Gas Type / Name	Global Warming Potential (GWP) - CO2e	Gas held in equipment (at one time)		Gas consumed in process		Gas released - part of process		Gas released - accidental		Total gas released		Comments		
				Kg	T CO2e	Kg	T CO2e	Kg	T CO2e	Kg	T CO2e	Kg	T CO2e			
Asset 1 Name - Engineering TEM	ASSET123	JEOL TEM 3000 Transmission Electron Microscope	SF6	22800	10	228.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	No losses on equipment to date. Sealed and when a gas change is required, every 7 years the waste gas is taken away for recycling
EXAMPLE 3																
Time Period - 01-Aug-19 to 31-Jul-20																
Equipment / asset number	Equipment description	Gas Type / Name	Global Warming Potential (GWP) - CO2e	Gas held in equipment (at one time)		Gas consumed in process		Gas released - part of process		Gas released - accidental		Total gas released		Comments		
				Kg	T CO2e	Kg	T CO2e	Kg	T CO2e	Kg	T CO2e	Kg	T CO2e			
Asset 1 Name - SPTS Etch (Etch01)	ASSET-AB-123	STPS Etch Machine	SF6	22800	50	1140.0	1000	1140.0	450	513.0	0	0.0	450	0.0		
Asset 1 Name - SPTS Etch (Etch01)	ASSET-AB-123	STPS Etch Machine	C4F8	10300	75	772.5	550	424.9	500	212.4	0	0.0	500	0.0		
Asset 2 Name - Oxford Plasmlab (PLS01)	ASSET-AB-125	Oxford Plasmlab50	CHF3	14800	8	118.4	100	11.8	50	0.6	5	0.0	55	0.0	5 kg loss on 02-Mar-1, adverse event reported	

¹⁵ <https://staff.swansea.ac.uk/professional-services/estates-and-facilities-management/our-services/sustainability/culture-and-community/ems-operational-procedures/>

