

EU F-Gas Regulation Guidance

Information Sheet 13: Semiconductor Manufacture

Target audience for this Information Sheet

This information sheet is aimed at companies that carry out manufacture of semiconductors.

1. Background

This guidance is for organisations affected by the 2014 EU F-Gas Regulation (517/2014). The F-Gas Regulation creates controls on the use and emissions of fluorinated greenhouse gases (F-Gases) including HFCs, PFCs and SF₆.

In the semiconductor manufacturing sector, the F-Gas Regulation affects the use of F-Gases used in specialist processes including plasma etching and chemical vapour deposition. The 2014 EU F-Gas Regulation replaces the 2006 Regulation, strengthening all of the 2006 requirements and introducing a number of important new measures.

The F-Gas Regulation is an important piece of legislation that will result in significant reductions in the emissions of F-Gases. These are very powerful greenhouse gases, with global warming impacts that can be several thousand times higher than CO₂ (per kg of gas emitted). All EU Member States agree that it is important to reduce emissions of these gases.

This Information Sheet describes the requirements that apply to semiconductor manufacturing. Further guidance is available for other F-Gas users – see Information Sheet 30 for a full list.

Semiconductor Manufacturing: Compliance Checklist for EU F-Gas Regulation

Operation of semiconductor manufacturing plants

- ✓ **NEW:** special labelling requirement for F-Gases used in semiconductor plants
- ✓ **NEW:** special reporting requirements for producers and importers of F-Gases used in semiconductor plants
- ✓ **NEW:** general requirement to avoid release of F-Gases (including SF₆ and HFCs)

2. Sector description

The semiconductor manufacturing industry makes use of a range of F-Gases for specialised processes including plasma etching and cleaning of chemical vapour deposition chambers.

The products used include SF₆, PFCs and HFCs. The industry also uses NF₃ for similar processes. These gases all have very high GWPs¹.

¹ GWP, Global Warming Potential: see Information Sheet 25 for details about GWP

3. Operation of semiconductor manufacturing plants

Exclusion from HFC Phase Down Process

The 2014 F-Gas Regulation includes a process of HFC phase down. This will reduce the quantity of HFCs that can be sold in the EU – by 2030 there will be an 80% cut in HFC supply². This phase down process only applies to HFCs – other F-Gases including SF₆ and PFCs are not being controlled in this way.

The semiconductor sector is being exempted from the phase down process. In order to purchase HFCs from outside the new EU quota system, semiconductor manufacturers need to ensure that:

- a) **NEW:** They purchase HFCs that are labelled with an indication that the contents of the container may only be used for the specialist semiconductor processes for the etching of semiconductor material or the cleaning of chemical vapour deposition chambers.
- b) **NEW:** That their suppliers ensure that the quantities of HFCs produced and imported for use in semiconductor manufacturing is properly reported to the European Commission annually.

NEW: General requirement to avoid release of F-Gases

The 2014 F-Gas Regulation states that:

“The intentional release of fluorinated greenhouse gases into the atmosphere shall be prohibited where the release is not technically necessary for the intended use.

Operators of equipment that contains fluorinated greenhouse gases shall take precautions to prevent the unintentional release (‘leakage’) of those gases. They shall take all measures which are technically and economically feasible to minimise leakage of fluorinated greenhouse gases”.

Semiconductor plant operators using F-Gases should ensure that they are in compliance with this requirement. F-Gases should be used with care and every effort made to avoid unintentional release.

Gluckman Consulting
specialists in refrigeration and climate change

This Information Sheet has been prepared by Gluckman Consulting

in collaboration with the Defra (UK Department for Environment, Food and Rural Affairs) and Jacobs

This document can be used and distributed for no charge. It contains the best information available to date and will be updated as more or different information is made available. It does not seek to provide a definitive view on the legal requirements; only the courts can provide such a view. If there are uncertainties you should always refer to the text of the Regulation and seek qualified legal advice.

admin@gluckmanconsulting.com

www.gluckmanconsulting.com

² HFC phase down: see Information Sheet 28 for further details