

# Fluorinated Gas Production

## Subpart L, Greenhouse Gas Reporting Program

### OVERVIEW

Subpart L of the Greenhouse Gas Reporting Program (GHGRP) (40 CFR 98.120 – 98.128) applies to any facility that produces fluorinated gas and that meets the Subpart L source category definition. Some subparts have thresholds that determine applicability for reporting, and some do not. To decide whether your facility must report under this Subpart, please refer to 40 CFR 98.121 and the GHGRP [Applicability Tool](#).

This Information Sheet is intended to help facilities reporting under Subpart L understand how the source category is defined, what greenhouse gases (GHGs) must be reported, how GHG emissions must be calculated and shared with EPA, and where to find more information.



## How is This Source Category Defined?

The fluorinated gas production source category consists of facilities that produce fluorinated gases from any raw material or feedstock chemical. Fluorinated gases include fluorinated greenhouse gases (GHGs), chlorofluorocarbons (CFCs), and hydrochlorofluorocarbons (HCFCs). The reuse or recycling of fluorinated gases and the generation of hydrofluorocarbon-23 (HFC-23) from the production of HCFC-22 are not included in this source category. Emissions of HFC-23 from HCFC-22 production are covered in Subpart O (HCFC-22 Production and HFC-23 Destruction).



## What GHGs Must Be Reported?

### Fluorinated Gas Production

Each facility must report emissions of fluorinated GHGs from fluorinated gas production, transformation, and destruction processes and from venting of container heels. Fluorinated GHGs include HFCs, perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), nitrogen trifluoride (NF<sub>3</sub>), hydrofluoroethers (HFEs), and others as defined in 40 CFR Part 98.6.

### Other Source Categories

Each facility must also report GHG emissions for other source categories for which calculation methods are provided in other subparts of the rule. For example, facilities must report carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and methane (CH<sub>4</sub>) emissions from each stationary combustion unit on-site by following the requirements of 40 CFR Part 98, Subpart C (General Stationary Fuel Combustion Sources). If applicable, facilities must also report the emissions of HFC-23 from HCFC-22 production processes and HFC-23 destruction processes as required by 40 CFR Part 98, Subpart O (HCFC-22 Production and HFC-23 Destruction). Please refer to the relevant information sheet for a summary of the requirements for calculating and reporting emissions from any other source categories at the facility.



## How Must GHG Emissions Be Calculated?

Fluorinated GHG emissions from fluorinated gas production and transformation processes must be estimated

using either measured or calculated emission factors (EFs) for process vents and using one of several methods for equipment leaks, as described further below. Emissions must also be calculated for destruction processes and for venting of residual gas from containers (e.g., cylinder heels).

### Calculating Fluorinated GHG Emissions from Process Vents

Depending on the situation, emissions from process vents are required to be calculated using either EFs based on emissions testing (process-vent-specific EFs) or EFs based on engineering calculations or assessments (process-vent-specific emission calculation factors). Either type of EF may be used to estimate emissions from process vents for batch processes. For continuous processes, the type of EF required depends on the quantity of emissions from the vent. For vents from continuous processes with annual controlled emissions of less than 10,000 metric tons of CO<sub>2</sub>e equivalent (CO<sub>2</sub>e), facilities may use engineering calculations or engineering assessments to establish the EF. For other vents from continuous processes, facilities must use emissions testing to establish the EF.

#### ***Process-Vent-Specific EF Method***

- Process-vent-specific EF based on
  - Hourly fluorinated GHG emission rate during the test (for continuous processes), and
  - Hourly process activity rate during the test.
- Total process activity during the year.
- The EF can be developed to estimate emissions either before or after the destruction device.
  - If the EF is developed to estimate emissions **before** the destruction device, the facility must apply the destruction efficiency (DE) of the destruction device to estimate emissions during periods when emissions are vented to the properly functioning destruction device.
  - If the EF is developed to estimate emissions **after** the destruction device, the facility must develop and apply an emission calculation factor to estimate emissions during periods when emissions are not vented to the properly functioning destruction device.
  - Facilities must conduct emissions testing to determine the DE of the destruction device every 10 years or when they make a change to the destruction device that would be expected to affect the DE.

#### ***Process-Vent-Specific Emission Calculation Factor Method***

- Process-vent-specific emission calculation factor.
- Total process activity.
- DE, if the process vent is vented to a destruction device, during periods when emissions are vented to the properly functioning destruction device. Facilities must conduct emissions testing to determine the DE of the destruction device every 10 years or when they make a change to the destruction device that would be expected to affect the DE.

### Calculating Fluorinated GHG Emissions from Equipment Leaks

For each fluorinated gas production or transformation process, emissions from equipment leaks must also be calculated. To support this calculation, information must be collected on the number and type of pieces of equipment; service of each piece of equipment; concentration of each fluorinated GHG in the stream; and the time period each piece of equipment was in service. Emissions from equipment leaks must be calculated using one of the following methods:

- Average EF Approach in EPA Protocol for Equipment Leak Estimates.
- Other Approaches in EPA Protocol for Equipment Leak Estimates in conjunction with EPA Method 21.
- Other Approaches in EPA Protocol for Equipment Leak Estimates in conjunction with site-specific leak detection methods.

- Site-specific leak detection methods.

### Effective DE for Each Process

If the facility used the EF or emission calculation factor method to calculate emissions from the process, then it must use Equation L-35 to calculate the effective DE for the process. For emissions calculated using the EF or emission calculation factor method, the facility must estimate the effective DE for the process as a whole (see Equation L-35). The effective DE for the process provides an overall DE that accounts for the control level of each process vent included in the process.

$$DE_{Effective} = 1 - \frac{\Sigma \text{ Controlled GWP weighted FGHG Emissions}}{\Sigma \text{ Uncontrolled GWP weighted FGHG Emissions}}$$

Facilities must report the range that encompasses the effective DE of the process using Table L-1.

### Destruction of Fluorinated GHGs that were Previously Produced

Emissions from the destruction of fluorinated GHGs that were previously produced (e.g., shipped to the facility by another facility for destruction or returned to the facility for reclamation but found to be irretrievably contaminated and therefore destroyed) must be calculated using the following:

- Mass of fluorinated GHGs previously “produced” that are fed into the destruction device.
- DE of the destruction device.

### Venting of Residual Fluorinated GHGs in Containers

Emissions from the venting of residual fluorinated GHGs from containers must be calculated using one of the following methods:

- Measure the contents of each contained before and after venting.
- Develop a health factor (based on representative samples) and apply this factor to the number of containers vented.



## What Information Must Be Reported?

In addition to the information required by the General Provisions in Subpart A, found at 40 CFR 98.3(c), the following must be reported:

### Process information Reported All Facilities:

- A generic identifier, such as a number, letter, or other identifier for each process, that is consistent from year to year.
- Whether the process is a production process, transformation process where no fluorinated GHG reactant is produced at another facility, or transformation process where one or more fluorinated GHG reactants are produced at another facility.
- The type of fluorinated gas production process (reaction, distillation, and/or packaging).
- For each process and fluorinated GHG group, the method(s) used to determine the mass emissions of each fluorinated GHG group from process vents.
- For each process and fluorinated GHG group, the method(s) used to determine the mass emissions of each fluorinated GHG group from equipment leaks.
- For each production or transformation process and each fluorinated GHG group, the total global warming potential (GWP)-weighted emissions of all fluorinated GHGs in that group from process vents (metric tons of CO<sub>2</sub>e).
- For each production or transformation process and each fluorinated GHG group, the total GWP-

weighted emissions of all fluorinated GHGs in that group from equipment leaks (metric tons of CO<sub>2</sub>e).

- For each process, the range from Table L-1 of Subpart L that encompasses the effective DE calculated for that process.

### **Additional Information Reported by Facilities Producing Multiple Fluorinated Gas Products:**

#### ***Emissions Across all Production and Transformation Processes at the Facility:***

- The emissions (metric tons) from production and transformation processes totaled across the facility as a whole, of each fluorinated GHG that is emitted from production and transformation processes in quantities of 1,000 metric tons of CO<sub>2</sub>e or more, totaled across the facility as a whole.
- The total GWP-weighted emissions by fluorinated GHG group (in metric tons CO<sub>2</sub>e) of all other fluorinated GHGs emitted from production and transformation processes, summed across the facility as a whole.

### **Additional Information Reported by Facilities Producing Only One Fluorinated Gas Product:**

#### ***Emissions Across all Production and Transformation Processes at the Facility:***

- The total GWP-weighted emissions from production and transformation processes by fluorinated GHG group for the facility as a whole, with the following exception:
  - Where emissions consist of a major fluorinated GHG constituent of a fluorinated gas product (and the product is sold or transferred), the total mass of each fluorinated GHG that is emitted from production and transformation processes and that is a major fluorinated GHG constituent of the product.

### **Information Reported by Facilities that Estimate Missing Data:**

- The generically identified process for which the data were missing.
- The reason the data were missing.
- The length of time the data were missing.
- The method used to estimate values for missing data.
- The estimate of those data for all missing data associated with data elements required to be reported.

### **Information Reported by Fluorinated Gas Producing Facilities that Destroy Fluorinated GHGs:**

- Excess emissions that result from malfunctions of the destruction device. Such excess emissions would occur if the DE was reduced due to the malfunction. These excess emissions must be reflected in the fluorinated GHG emissions reported for each process and for the facility.
- A destruction device testing report containing the information below. This report is one-time unless the facility makes a change to the destruction device that would be expected to affect its DE. (Note, however, that destruction devices are required to be tested at least every 10 years.)
  - Chemical identity of the fluorinated GHG(s) used in the performance test conducted to determine DE, including surrogates, and information on why the surrogate is sufficient to demonstrate DE for each fluorinated GHG, consistent with requirements in 40 CFR 98.124(g)(1), vented to the destruction unit.
  - Date of the most recent destruction device test.
  - Name of all applicable federal or state regulations that apply to the destruction process.
- For each previously produced fluorinated GHG destroyed:
  - The mass of the fluorinated GHG emitted from the destruction device.
- A one-time report that describes any measurements, research, or analysis that it has performed or obtained that relate to the formation of products of incomplete combustion (PICs) that are fluorinated

GHGs during the destruction of fluorinated gases. The report should include:

- The methods and results of any measurements or modeling studies, including the PICs for which the exhaust stream was analyzed.
- Copies of relevant scientific papers, if available, or citations of the papers, if they are not.

### Information Reported by Fluorinated Gas Producing Facilities that Vent Residual Fluorinated GHGs from Containers:

- The mass of the residual fluorinated GHGs vented from containers annually.



## What Records Must Be Maintained?

Reporters are required to retain records that pertain to their annual GHGRP report for at least three years after the date the report is submitted. Please see the [Subpart A Information Sheet](#) and 40 CFR 98.3(g) for general recordkeeping requirements. Specific recordkeeping requirements for Subpart L are listed at 40 CFR 98.127.



## When and How Must Reports be Submitted?

Reporters must submit their annual GHGRP reports for the previous calendar year to the EPA by March 31<sup>st</sup>, unless the 31<sup>st</sup> falls on a Saturday, Sunday, or federal holiday, in which case reports are due on the next business day. Annual reports must be submitted electronically using the [electronic Greenhouse Gas Reporting Tool \(e-GGRT\)](#), the GHGRP's online reporting system.

Additional information on setting up user accounts, registering a facility, and submitting annual reports is available on the [GHGRP Help webpage](#).



## When Can a Facility Stop Reporting?

A facility may discontinue reporting under several scenarios, which are summarized in Subpart A (found at 40 CFR 98.2(i)) and the [Subpart A Information Sheet](#).



## For More Information

For additional information on Subpart L, please visit the [Subpart L webpage](#). For additional information on the GHGRP, please visit the [GHGRP website](#), which includes additional information sheets, [data](#) previously reported to the GHGRP, [training materials](#), and links to Frequently Asked Questions ([FAQs](#)). For questions that cannot be answered through the GHGRP website, please contact us at: [GHGreporting@epa.gov](mailto:GHGreporting@epa.gov).

*This Information Sheet is provided solely for informational purposes. It does not replace the need to read and comply with the regulatory text contained in the rule. Rather, it is intended to help reporting facilities and suppliers understand key provisions of the GHGRP. It does not provide legal advice; have a legally binding effect; or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits with regard to any person or entity.*