

Fluorinated Gas Production

Final Rule: Subpart L, Mandatory Reporting of Greenhouse Gases

What Must Be Monitored by Each Producer of Fluorinated Gases?

Conduct the Following Monitoring Activities...

All Fluorinated Gas Production Facilities:

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| <ul style="list-style-type: none"> <input type="checkbox"/> For processes that have at least one process vent with annual uncontrolled fluorinated GHG emissions of one ton or more, conduct an initial scoping speciation to identify all fluorinated GHGs that may be generated <input type="checkbox"/> Measure GHG emissions that occur as a result of startups, shutdowns, and malfunctions, either recording fluorinated GHG emissions during these events, or documenting that these events do not result in significant fluorinated GHG emissions | <ul style="list-style-type: none"> <input type="checkbox"/> Describe the analytical methods used in the site GHG Monitoring Plan, including the description of the method, a description of the analytical measurement equipment and procedures, quantitative estimates of the method's accuracy and precision for the analytes of interest at the concentrations of interest, as well as a description of how these accuracies and precisions were estimated, including the validation protocol used |
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If using the Mass Balance Approach

Measure the following masses on a monthly or more frequent basis using flowmeters, weigh scales, or a combination of volumetric and density measurements with accuracies and precisions that allow the facility to meet the error criteria:

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| <ul style="list-style-type: none"> <input type="checkbox"/> Total mass of each fluorine-containing product produced <input type="checkbox"/> Total mass of each fluorine-containing reactant fed into the process | <ul style="list-style-type: none"> <input type="checkbox"/> The mass removed from the process in each stream fed into the destruction device <input type="checkbox"/> The mass removed from the process in each recaptured stream |
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Measure the following concentrations at least once each calendar month during which the process is operating to be representative of the full range of process conditions using equipment and methods with an accuracy and precision that allow the facility to meet the error criteria:

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| <ul style="list-style-type: none"> <input type="checkbox"/> The concentration (mass fraction) of each fluorine-containing reactant, product, and by-product in each stream that is fed into the destruction device, OR the concentration of total fluorine in each stream that is fed into the destruction device | <ul style="list-style-type: none"> <input type="checkbox"/> The concentration (mass fraction) of each fluorine-containing by-product in each stream that is recaptured OR the concentration of total fluorine in each stream that is recaptured <input type="checkbox"/> Characterize emissions from process vents at frequency specified in rule |
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If using the Process-Vent-Specific Emission Factor Approach

Conduct an emissions test to develop the process-vent-specific emission factor every 10 years, when a change to the operating scenario is calculated to result in a 15 percent or greater change in the emission factor, or when a continuous process vent with less than 10,000 mtCO₂e is later found to have emissions of 10,000 mtCO₂e or greater. Measure process activity during the year.

- Conduct the emissions test during representative performance of the process or operating scenario(s) of the process, as applicable. For continuous processes, sample the process vent for a minimum of 3 runs of 1 hour each. If the relative standard deviation among the emission factors based on each run is greater than 15%, sample for an additional 3 runs.
- Both during the test and throughout each year, measure the process activity (e.g., process feed or process production) using flow meters, weigh scales, or other measurement devices or instruments with an accuracy and precision of ± 1 percent of full scale or better.
- If process vents from separate processes are manifolded together, sample emissions from each process in the ducts before the emissions are combined or sample in the common duct when only one process is operating. Alternatively, sample the combined emissions and use engineering calculations or engineering assessments to allocate the emissions to each process vent, provided the sum of calculated emissions across the process vents is within 20% of the total measured emissions.
- Produce an emissions test report that contains all information and data used to derive the process-vent-specific emission factor, as well as key process conditions during the test.

If using the Process-Vent-Specific Emission Calculation Factor Approach

Conduct an emissions calculation for each operating scenario for each batch and continuous process vent every 10 years, or when a change to the operating scenario is expected to change the process-vent-specific emissions calculation factor. Measure process activity during the year.

- For continuous process vents, determine the emissions based on the process activity for representative performance of the operating scenario; for batch process vents, determine emissions based on the process activity for each typical batch operating scenario.
- Throughout each year, measure the process activity (e.g., process feed or process production) using flow meters, weigh scales, or other measurement devices or instruments with an accuracy and precision of ± 1 percent of full scale or better.
- The emission calculation must be documented by identifying the process, the operating scenario, and the process vents. The documentation must contain the information and data used to calculate the process-vent-specific emission calculation factor.

If the Facility conducts a site-specific leak detection method or monitoring approach for pieces of equipment:

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| <ul style="list-style-type: none"><input type="checkbox"/> If you determine that EPA Method 21 is appropriate for monitoring leaks from your process, conduct screening value concentration measurements using Method 21.<input type="checkbox"/> Conduct monitoring on at least 1/3 of equipment annually, ensuring this 1/3 is representative of equipment in the process. | OR | <ul style="list-style-type: none"><input type="checkbox"/> Develop a site-specific leak monitoring approach.<input type="checkbox"/> Validate the leak monitoring method and describe the method and the validation in the GHG Monitoring Plan.<input type="checkbox"/> Conduct monitoring on at least 1/3 of equipment annually if emissions are estimated based on monitoring of individual pieces of equipment. Ensure this 1/3 is representative of equipment in the process. |
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If the Facility Destroys Fluorinated GHGs:

Conduct an emissions test to determine the destruction efficiency. If CF₄, SF₆, or a saturated PFC other than CF₄ is vented to the destruction device in more than trace concentrations, develop a destruction efficiency specifically for that compound or for a more difficult-to-destroy surrogate that is specified in the rule to take credit for the emissions reduction.

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| <ul style="list-style-type: none"><input type="checkbox"/> Sample the inlet and outlet of the destruction device for a minimum of three runs of 1 hour each to determine the destruction efficiency. | <ul style="list-style-type: none"><input type="checkbox"/> Conduct the test when operating at high loads reasonably expected to occur and when destroying the most-difficult-to-destroy fluorinated GHG (or a more difficult to destroy surrogate) that is fed into the device or that belongs to the group of fluorinated GHGs for which you wish to establish a DE. |
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Track emissions from destruction device malfunctions and measure previously produced fluorinated GHGs fed into destruction device:

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| <ul style="list-style-type: none"><input type="checkbox"/> Account for any temporary reductions in the destruction efficiency that result from any malfunctions of the destruction device.<input type="checkbox"/> Measure the mass of each fluorinated GHG that is fed into the destruction device and that was previously produced using flow meters, weigh scales, or a combination of volumetric and density measurements with an accuracy and precision of ±1 percent of full scale or better. | <ul style="list-style-type: none"><input type="checkbox"/> Measure the concentration of the fluorinated GHG being destroyed (if the measured mass includes more than trace concentrations of materials other than the fluorinated GHG being destroyed). |
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If the Facility vents residual fluorinated GHGs from containers:

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| <input type="checkbox"/> Measure residual fluorinated GHGs in containers received by the facility using either scales or pressure and temperature measurements with an accuracy and precision of ± 1 percent | OR | <input type="checkbox"/> Develop a heel factor (based on representative samples) for each combination of fluorinated GHG, container size, and container type, and apply this factor to the number of containers vented. |
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See also the information sheet for Fluorinated Greenhouse Gas Production available at: http://epa.gov/climatechange/emissions/ghg_infosheets.html.