1. Subpart K - Ferroalloy Production 2
1.1 Using e-GGRT to Prepare Your Subpart K Report 2
1.1.1 Subpart K Summary Information for this Facility 4
1.1.2 Subpart K Furnace Information for Furnaces NOT Monitored by CEMS 5
1.1.3 Subpart K Furnace Information for Furnaces Monitored by CEMS 8
1.1.4 Subpart K Emissions Information for Furnaces NOT Monitored by CEMS 10
1.1.5 Subpart K Emissions Information for Furnaces Monitored by CEMS 12
1.2 Using Subpart K Calculation Spreadsheets 16

Subpart K - Ferroalloy Production

A printer-friendly version (pdf) (18 pp, 8,213K) of GHG reporting instructions for this subpart

Please select a help topic from the list below:

- Using e-GGRT to Prepare Your Subpart K Report
  - Subpart K Summary Information for this Facility
  - Subpart K Furnace Information for Furnaces NOT Monitored by CEMS
  - Subpart K Furnace Information for Furnaces Monitored by CEMS
  - Subpart K Emissions Information for Furnaces NOT Monitored by CEMS
  - Subpart K Emissions Information for Furnaces Monitored by CEMS
- Using Subpart K Calculation Spreadsheets

- Carry forward of data from previous submissions into RY2012 forms
- Subpart K Rule Guidance
- Subpart K Rule Language (eCFR)

Additional Resources:

- Part 98 Terms and Definitions
- Frequently Asked Questions (FAQs)
- Webinar Slides

Using e-GGRT to Prepare Your Subpart K Report

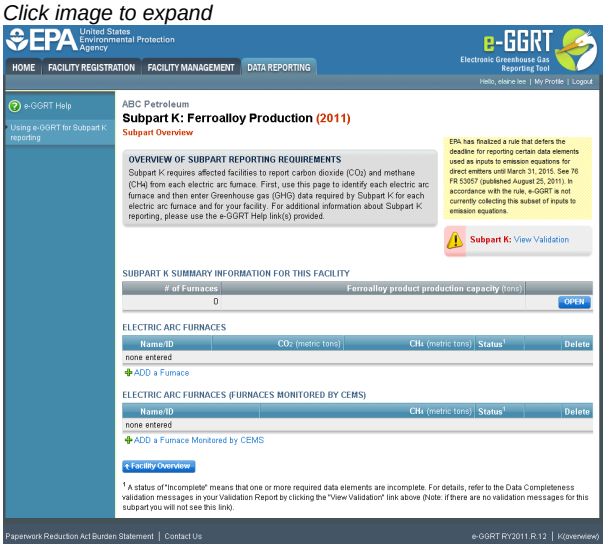
Subpart K consists of facilities that use pyrometallurgical techniques to produce any of the following metals: ferrochromium, ferromanganese, ferromolybdenum, ferronickel, ferrosilicon, ferrotitanium, ferrotungsten, ferrovanadium, silicomanganese, or silicon metal.

> If you previously reported for Reporting Year (RY) 2011, the Agency has carried some of your RY2011 data forward and entered it in your RY2012 forms to reduce the reporting burden. It is still your responsibility to review and ensure that all of the information in your submission is correct, but the Agency believes that most of the data which is carried forward is unlikely to change significantly from year to year. For more information about carry forward data, please see the Carry forward of data from previous submissions into RY2012 forms help content.

This page provides an overview of subtopics that are central to Subpart K reporting. This information is entered from the e-GGRT Subpart K Overview web form shown below. Each topic represents a key web form(s) you where you need to enter information:

- Subpart K Summary Information for this Facility
- Subpart K Furnace Information
- Subpart K Emissions Information
- Subpart K Validation Report

Click image to expand



The end of the page provides links you can use for more detailed information and instructions on entering required information related to each of these topics.

Subpart K Summary Information for this Facility

Subpart K requires you to report the following data about your facility:

- The annual facility ferroalloy product production capacity (this value must be entered into e-GGRT, in short tons)
- Number of electric arc furnaces reported (this value is calculated by e-GGRT)

Subpart K Furnace Information

The required electric arc furnace (EAF) information and the forms associated with required EAF information is entered into e-GGRT are different for EAFs that are monitored by a Continuous Emissions Monitoring System (CEMS) and EAFs that are NOT monitored by a CEMS.

As a result, separate help content has been created in this subpart for entering EAF information for EAFs monitored by CEMS and EAFs NOT monitored by CEMS.

For each EAF **NOT monitored by CEMS** at your facility, Subpart K requires you to report the following information:

- A unique name or identifier, plus optional description for this EAF (see also About Unique Unit Names)
- The following data for each input and output associated with the EAF:
    - A unique name or identifier
    - The general type of input or output

For each EAF **monitored by CEMS** at your facility, Subpart K requires you to report a unique name or identifier, plus optional description for the EAF (see also About Unique Unit Names).

Subpart K Emissions Information

The required emissions information and the manner by which required emissions information is entered into e-GGRT is different for EAFs that are monitored by a Continuous Emissions Monitoring System (CEMS) and EAFs that are NOT monitored by a CEMS.

As a result, separate help content has been created in this subpart for entering emissions information for EAFs monitored by CEMS and EAFs NOT monitored by CEMS.

For each EAF that is **NOT monitored by CEMS** at your facility, Subpart K requires the following emissions information:

- The annual CO_2 process emissions (the output of Equation K-1, in metric tons)
- For each EAF used for the production of a ferroalloy listed in Table K-1, the annual CH4 process emissions (the output of Equation K-3, in metric tons)*
- For each Input and Output assigned to an electric arc furnace, Subpart K collects the following data:
    - The method used to determine carbon content (Provided by supplier, ASTM E1941-04, ASTM D5373-08, or ASTM C25-06)
    - An indication if a missing data procedure was used or analysis was repeated to determine carbon content
    - The procedure used to develop substitute data for monthly mass, if applicable (Purchase records or Other)
    - The number of months that missing data procedures were followed to determine monthly mass

**Note, reporting of CH4 process emissions is only required for ferroalloy types listed in Table K-1. If you do not produce a ferroalloy type listed in this table, enter "0" for your emissions.*

For each **CEMS Monitoring Location**, provide the following information:

- A unique unit name or identifier for the CML (see also About Unique Unit Names)
- An optional description or label for the CML
- The configuration of processes or process units that are monitored by the CML:
    - Single process or process unit that exhausts to a dedicated stack
    - Multiple processes or process units that share a common stack
    - Process or process unit that shares a common stack with one or more stationary fuel combustion units
- The name of each fuel combusted in the unit(s) monitored by the CEMS
- The Tier 4/CEMS methodology start and end dates
- The cumulative total of hourly CO_2 mass emissions for each quarter of the reporting year (metric tons) (*Do not cumulate emissions data between quarters*)
- The total annual CO_2 mass emissions measured by the CEMS (metric tons)
- An indication whether emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS
- The total annual biogenic CO_2 emissions from the combustion of all biomass fuels combined (metric tons) (*if not applicable, enter '0'*)
- The total annual non-biogenic CO_2 emissions which includes fossil fuel, sorbent, and process CO_2 emissions (metric tons)
- The total annual CH_4 and N_2O emissions associated with the combustion of all Table C-2 fuels combusted in all processes/process units

monitored by the CEMS derived from application of Equation C-10 (metric tons) (*if there are no combustion emissions in this CML, please enter '0'*)
- The total number of source operating hours in the reporting year
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO_2 concentration parameter
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter
- An indication of the process units monitored by the CML

Subpart K Validation Report

The Validation Report assists with the completeness and quality of your reporting data.

We strongly encourage you to use the Validation Report to check your work. The Validation Report performs two types of checks:

- Data Completeness: Data required for reporting that are missing or incomplete.
- Data Quality: Data that are outside of the expected range of values.

You may view the Validation Report at any time.

> Note that the Validation Report is intended to assist users in entering data, but it is not an indication that the reporter has entered all necessary information, nor is it an indication that the reporter is in compliance with part 98. Furthermore a negative finding on the validation report is not a guarantee that a data element was entered incorrectly.

Back to Top

See Also

Screen Errors
Subpart K Summary Information for this Facility
Subpart K Furnace Information for Furnaces NOT Monitored by CEMS
Subpart K Furnace Information for Furnaces Monitored by CEMS
Subpart K Emissions Information for Furnaces NOT Monitored by CEMS
Subpart K Emissions Information for Furnaces Monitored by CEMS
Subpart Validation Report

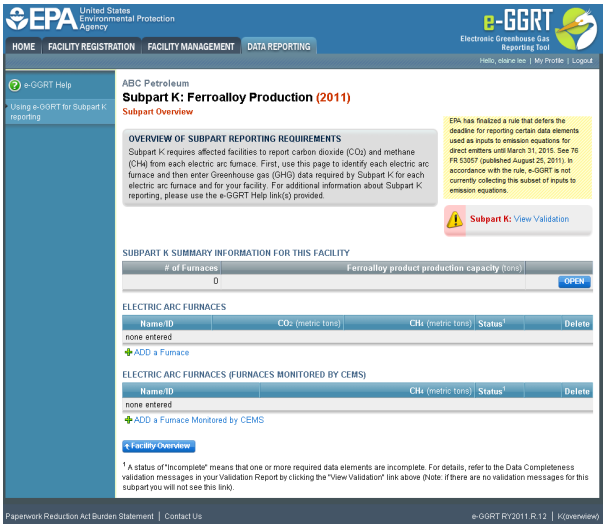
Subpart K Summary Information for this Facility

This page provides a description of how to enter Subpart K Ferroalloy Production summary information about this facility.

Adding or Updating Summary Information for this Facility

To add or update summary information for this facility, locate the SUBPART K SUMMARY INFORMATION FOR THIS FACILITY table on the Subpart Overview page and click OPEN.

Click image to expand

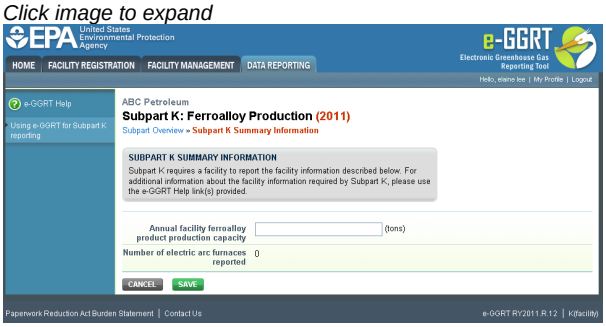


Subpart K requires you to report the following data about your facility:

- The annual facility ferroalloy product production capacity (this value must be entered into e-GGRT, in short tons)
- Number of electric arc furnaces reported (this value is calculated by e-GGRT)

When you have entered the required information, click SAVE. You should then return to the Subpart K Overview page.

Click image to expand



Back to Top

See Also

Screen Errors
Using e-GGRT to Prepare Your Subpart K Report
Subpart K Furnace Information for Furnaces NOT Monitored by CEMS
Subpart K Furnace Information for Furnaces Monitored by CEMS
Subpart K Emissions Information for Furnaces NOT Monitored by CEMS
Subpart K Emissions Information for Furnaces Monitored by CEMS
Subpart Validation Report

Subpart K Furnace Information for Furnaces NOT Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart K Ferroalloy Production furnace information.

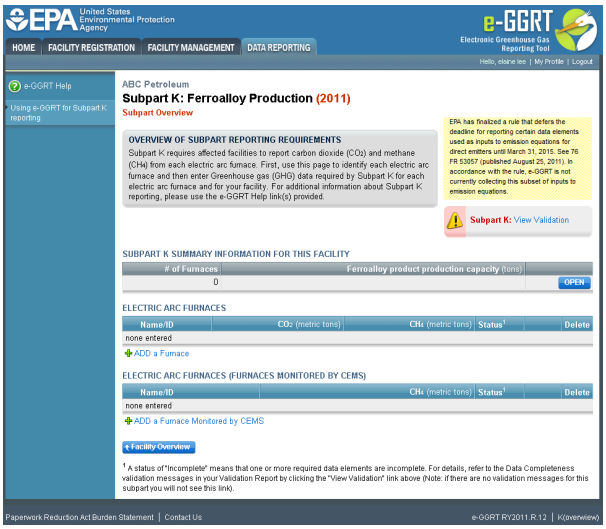
Step 1: Add an electric arc furnace (EAF)

To add an EAF that is NOT monitored by a CEMS, find the ELECTRIC ARC FURNACES table on the Subpart Overview page and click the link titled "ADD a Furnace."

To edit or update identification information for an EAF, click the edit icon or the Name/ID link located in the first column of the table.

To delete an EAF, click the delete icon or red “x” located in the last column of the table.

Click image to expand



Step 2: Indicate CEMS utilization for a furnace

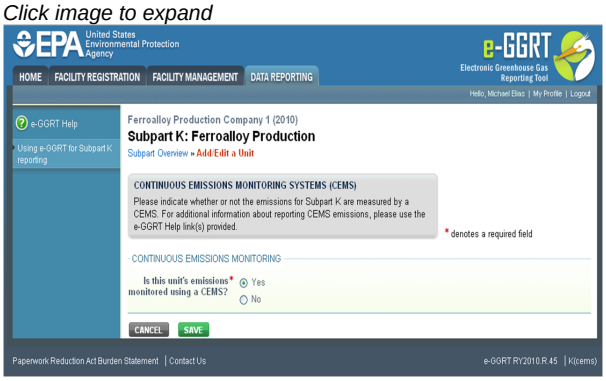
For each EAF, confirm whether or not the EAF utilizes CEMS.

Note that when adding a new EAF you are prompted to answer the CEMS question immediately (the answer to this question will default to "No" for EAF added using the "ADD a Furnace" link and will default to "Yes" for units added using the "ADD a Furnace Monitored by CEMS" link).

The CEMS response may be changed here and the EAF information will be relocated to the appropriate table on the Subpart Overview page.

When finished, click SAVE. You will then be directed to another Add/Edit a Unit form.

Click image to expand

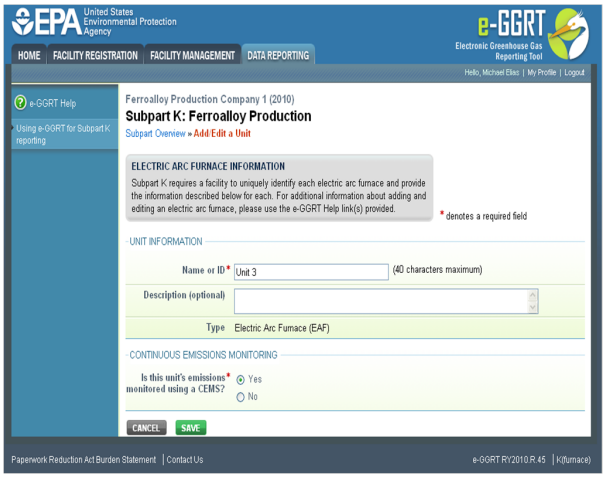


Step 3: Enter required furnace information

For each EAF NOT monitored by CEMS at your facility, Subpart K requires you to report the following information:

- A unique name or identifier, plus optional description for this EAF (see also About Unique Unit Names)
- The inputs and outputs associated with the EAF

Click image to expand



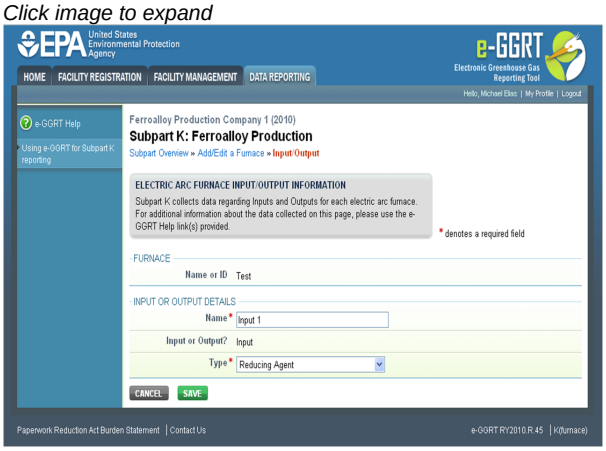
Step 4: Enter required input/output information

To add an input or an output, click "Add an Input" or "Add an Output" below each respective table and enter the following required information:

- For each input add a unique name or identifier.
- Select from the dropdown table, the general type of input or output (Reducing Agent, Electrode, Ore, Flux, Product, or Non-Product Outgoing)

When you are finished entering the required information for an input or output, click SAVE. You will be directed back to the Add/Edit a Unit form.

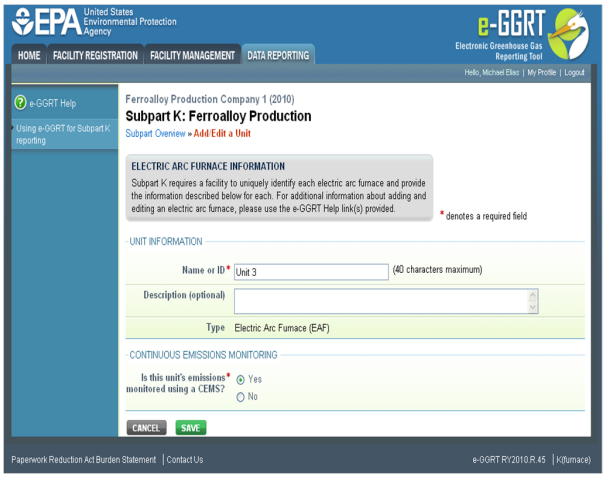
Click image to expand



Step 5: Save all entered information for an EAF

When you are finished entering all required information for a EAF, click SAVE. You will then be directed to the Subpart Overview page. You should see the furnace you just entered listed in the ELECTRIC ARC FURNACE table.

Click image to expand



Step 6: Repeat Steps 1-5

Repeat Steps 1-5 until all EAFs have been added for your facility. You should then see all EAFs at your facility listed in the ELECTRIC ARC FURNACE SUMMARY TABLE.

Back to Top

See Also

Screen Errors
Using e-GGRT to Prepare Your Subpart K Report
Subpart K Summary Information for this Facility
Subpart K Furnace Information for Furnaces Monitored by CEMS
Subpart K Emissions Information for Furnaces NOT Monitored by CEMS
Subpart K Emissions Information for Furnaces Monitored by CEMS
Subpart Validation Report

Subpart K Furnace Information for Furnaces Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart K Ferroalloy Production furnace information.

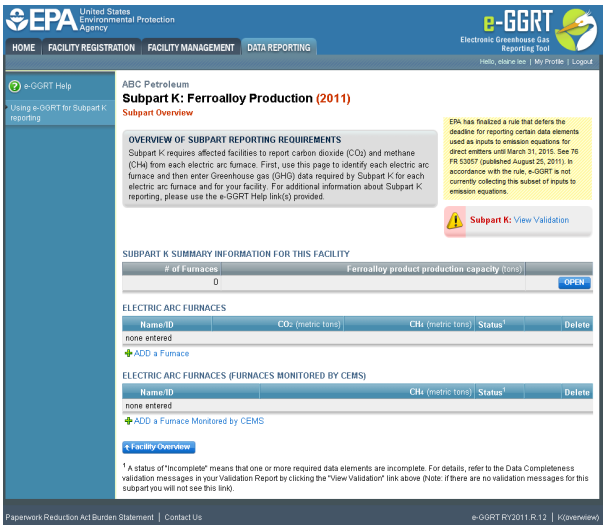
Step 1: Add an electric arc furnace (EAF)

To add an EAF that is monitored by a CEMS, find the ELECTRIC ARC FURNACES (Furnaces Monitored by CEMS) table on the Subpart Overview page and click the link titled "ADD a Furnace Monitored by CEMS."

To edit or update identification information for an EAF, click the edit icon or the blue hyperlinked Name/ID link located in the first column of the table.

To delete an EAF, click the delete icon or red “x” located in the last column of the table.

Click image to expand



Step 2: Indicate CEMS utilization for a furnace

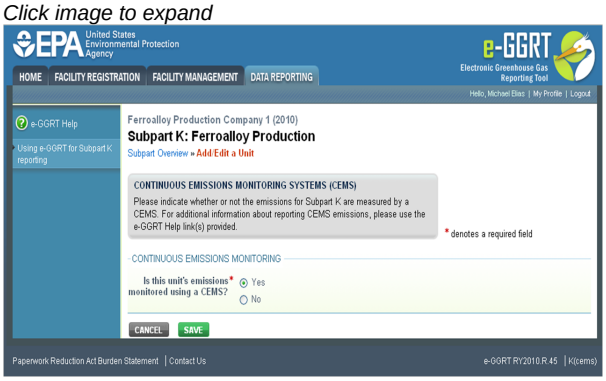
For each EAF, confirm whether or not the furnace utilizes CEMS.

Note that when adding a new EAF you are prompted to answer the CEMS question immediately (the answer to this question will default to "No" for EAF added using the "ADD a Furnace" link and will default to "Yes" for units added using the "ADD a Furnace Monitored by CEMS" link).

The CEMS response may be changed here and the EAF information will be relocated to the appropriate table on the Subpart Overview page.

When finished, click SAVE. You will then be directed to the next Add/Edit a Unit form.

Click image to expand

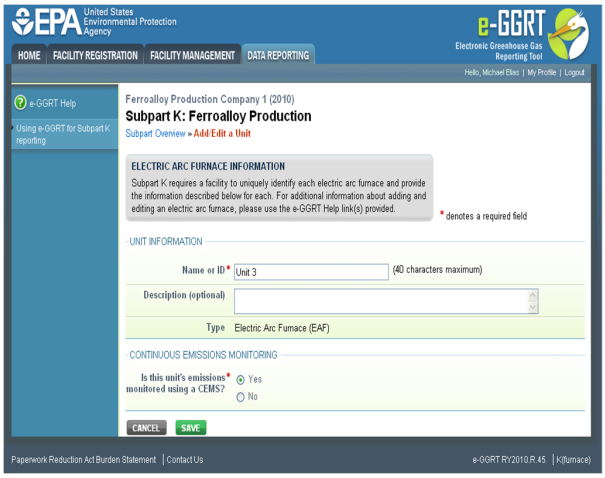


Step 3: Enter required information for an EAF

For each EAF monitored by CEMS at your facility, Subpart K requires you to report a unique name or identifier, plus optional description for the EAF (see also About Unique Unit Names).

When you are finished entering the required information for an EAF, click SAVE. You will then be direct back to the Subpart Overview form. You should now see the furnace you just identified listed in the ELECTRIC ARC FURNACES (Furnaces Monitored by CEMS) table.

Click image to expand



Step 4: Repeat Steps 1-3

Repeat Steps 1-3 until all EAFs have been added for your facility and you see all EAFs monitored by CEMS listed in the ELECTRIC ARC FURNACES (Furnaces Monitored by CEMS) table.

Back to Top

See Also

Screen Errors
Using e-GGRT to Prepare Your Subpart K Report
Subpart K Summary Information for this Facility
Subpart K Furnace Information for Furnaces NOT Monitored by CEMS
Subpart K Emissions Information for Furnaces NOT Monitored by CEMS
Subpart K Emissions Information for Furnaces Monitored by CEMS
Subpart Validation Report

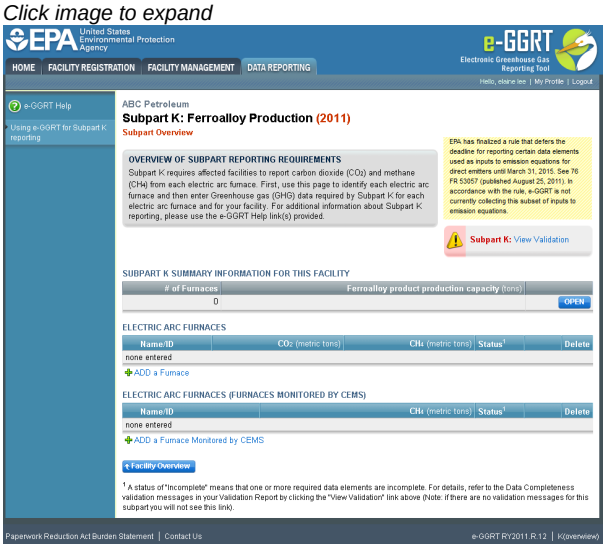
Subpart K Emissions Information for Furnaces NOT Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart K Ferroalloy emissions information for electric arc furnaces (EAFs) that are NOT monitored by a Continuous Emissions Monitoring System (CEMS).

Step 1: Select a unit

To select a unit for which to enter emissions data, find the unit in the ELECTRIC ARC FURNACES table and click OPEN.

Click image to expand



Step 2: Equation K-1 and K-3 Summary and Result

For each EAF that is NOT monitored by CEMS at your facility, Subpart K requires the following emissions information:

- The annual CO_2 process emissions (the output of Equation K-1, in metric tons)
- For each EAF used for the production of a ferroalloy listed in Table K-1, the annual CH_4 process emissions (the output of Equation K-3, in metric tons). Note, reporting of CH_4 process emissions is only required for ferroalloy types listed in Table K-1. If you do not produce a ferroalloy type listed in this table, enter “0” for your emissions.

For assistance in calculating CO_2 and CH_4 process emissions for an EAF, access the calculation spreadsheets for this subpart by clicking one of the links titled "Use K-1, K-3 spreadsheet to calculate," located below the red emissions data entry boxes, then follow the provided instructions.

Step 3: Input and Output values

For each Input and Output assigned to an electric arc furnace, Subpart K collects the following data:

- The method used to determine carbon content (Provided by supplier, ASTM E1941-04, ASTM D5373-08, or ASTM C25-06)
- An indication if a missing data procedure was used or analysis was repeated to determine carbon content
- The procedure used to develop substitute data for monthly mass, if applicable (Purchase records or Other)
- The number of months that missing data procedures were followed to determine monthly mass

Click image to expand

Step 4: Save Your Data

When you have finished entering Equations K-1 and K-3 results and Input/Output data, click SAVE. You will then be directed back to the Subpart Overview page. The status of data entry for this furnace in the ELECTRIC ARC FURNACES table should now be “Complete” in the Status column.

After you save the data on this page, the next time you open the page, the calculator on the top of the page will display the CO_2 and CH_4 process emissions, rounded to the nearest 0.1 and 0.01 of a metric ton, respectively. The value displayed is for informational purposes only.

Step 5: Repeat steps 1-4

Repeat Steps 1-4 until emissions and input/output data has been entered for all EAFs NOT monitored by a CEMS. Once you have entered the emissions information, that status of data entry for all furnaces in the ELECTRIC ARC FURNACES table should now be “Complete” in the Status column. If you have missed something, the validation report messages will help you identify any incomplete entries.

Back to Top

See Also

Screen Errors
Using e-GGRT to Prepare Your Subpart K Report
Subpart K Summary Information for this Facility
Subpart K Furnace Information for Furnaces NOT Monitored by CEMS
Subpart K Furnace Information for Furnaces Monitored by CEMS
Subpart K Emissions Information for Furnaces Monitored by CEMS
Subpart Validation Report

Subpart K Emissions Information for Furnaces Monitored by CEMS

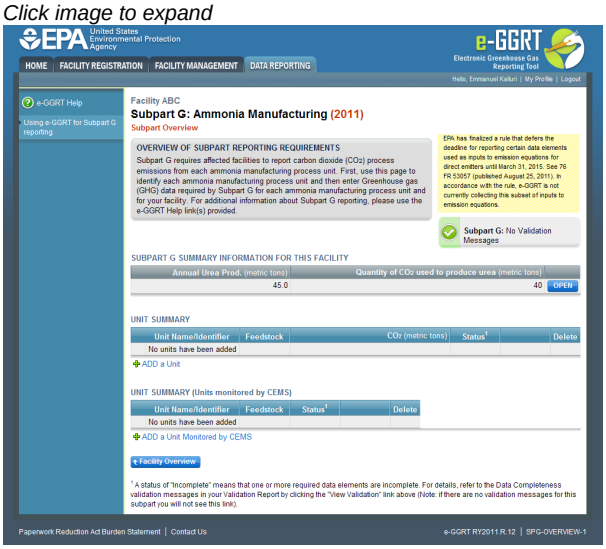
This page provides step-by-step instructions on how to enter and edit Subpart K Ferroalloy Production emissions information for process units (electric arc furnaces) that are monitored by a Continuous Emissions Monitoring System (CEMS). The CEMS MONITORING LOCATION (CML) Summary table will only appear on the Subpart Overview page when you have added an EAF that is monitored by CEMS in the ELECTRIC ARC FURNACES (Furnaces monitored by CEMS) table.

Step 1: Add a CEMS Monitoring Location (CML)

To add a CML, click the “Add a CEMS Monitoring Location” link below the CEMS MONITORING LOCATION (CML) SUMMARY table on the Subpart Overview page

> ⚠ The screenshot below is from Subpart G and is displayed as an example. The screen for other subparts may differ slightly.

Click image to expand



Step 2: Define a CML and report emissions information

For each CEMS Monitoring Location, provide the following information:

- A unique unit name or identifier for the CML (see also About Unique Unit Names)
- An optional description or label for the CML
- The configuration of processes or process units that are monitored by the CML:
  - Single process or process unit that exhausts to a dedicated stack
  - Multiple processes or process units that share a common stack
  - Process or process unit that shares a common stack with one or more stationary fuel combustion units
- The types of fuel combusted in the unit(s) monitored by the CEMS
- The Tier 4/CEMS methodology start and end dates
- The quarter total of hourly CO_2 mass emissions for each quarter of the reporting year (metric tons) (*Do not cumulate emissions data*

between quarters)
- The total annual CO_2 mass emissions measured by the CEMS (metric tons)
- An indication whether emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS
- The total annual biogenic CO_2 emissions from the combustion of all biomass fuels combined (metric tons) (*if not applicable, enter '0'*)
- The total annual non-biogenic CO_2 emissions which includes fossil fuel, sorbent, and process CO_2 emissions (metric tons)
- The total annual CH_4 and N_2O emissions associated with the combustion of all Table C-2 fuels combusted in all processes/process units monitored by the CEMS derived from application of Equation C-10 (metric tons) (*if there are no combustion emissions in this CML, please enter '0'*)
- The total number of source operating hours in the reporting year
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO_2 concentration parameter
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter
- The total annual CO2 emissions from the CEMS Monitoring Location (CML) Summary attributable to combustion (metric tons)

Do not leave any of these fields blank. If, for example, your facility has no biogenic CO_2 emissions, enter '0'.

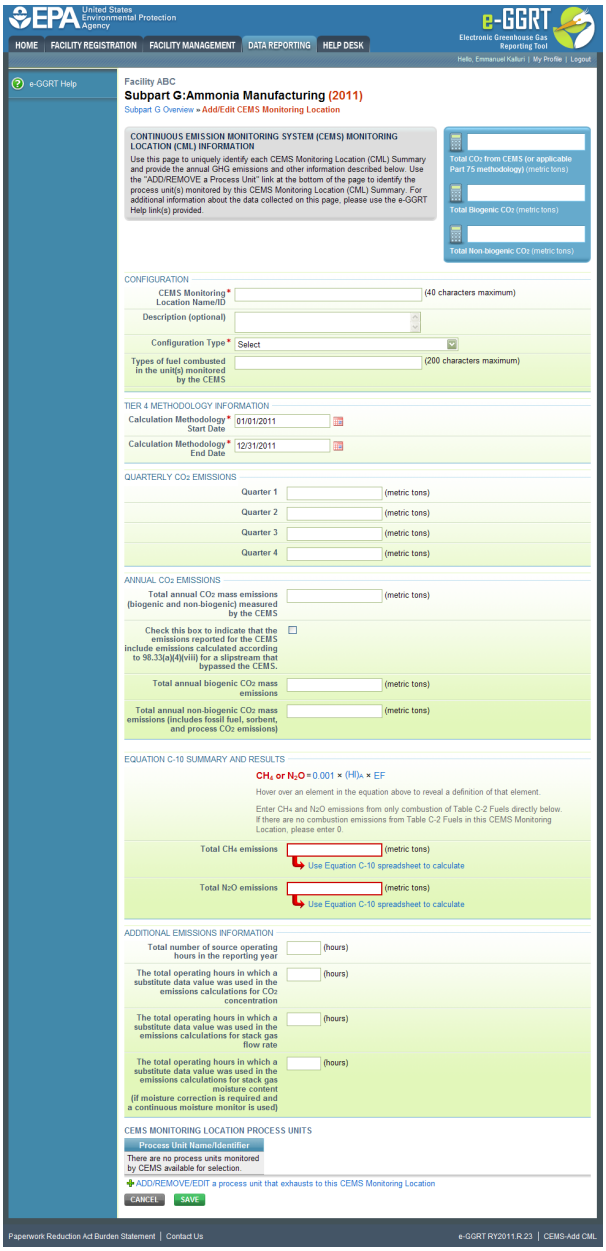
For assistance in calculating annual CH_4 and N_2O emissions using Equation C-10, access the optional calculation spreadsheet by clicking one of the links titled "Use Equation C-10 spreadsheet to calculate" located below each of the red emissions information data entry boxes and follow the provided instructions

Step 3: Identify process units monitored at a CML

To identify the process units monitored at a CML, first click the link titled "ADD/REMOVE a process unit that exhausts to this CEMS Monitoring Location" at the bottom of the page

> ⚠ The screenshot below is from Subpart G and is displayed as an example. The screen for other subparts may differ slightly.

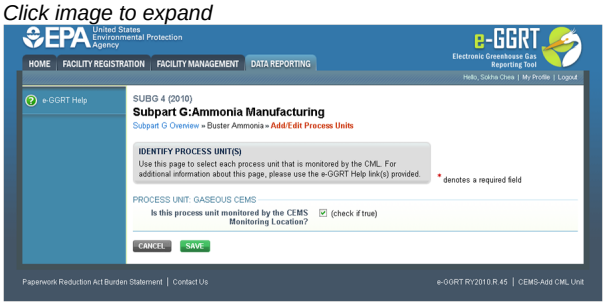
Click image to expand



On the CML Process Units Selection page, use the check boxes to select the process unit(s) monitored at this CML. This will indicate that the unit(s) selected vent emission through the stack monitored by this CML.

> ⚠ The screenshot below is from Subpart G and is displayed as an example. The screen for other will differ slightly depending on the number of units with emissions monitored by a single CML at your facility.

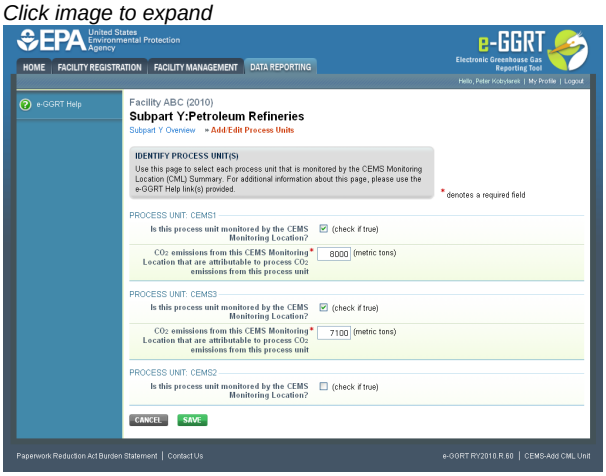
Click image to expand



Subpart Y also collects the CO_2 emissions from this CEMS Monitoring Location that are attributable to process CO_2 emissions from this process

unit (metric tons).

Click image to expand



When finished selecting process unit for the CML and entering additional required information (if applicable), click SAVE. You should then be directed back to the Add/Edit a CML Location form and see the units you selected listed in the CEMS MONITORING LOCATION (CML) PROCESS UNITS table.

Step 4: Save entered data for a CML

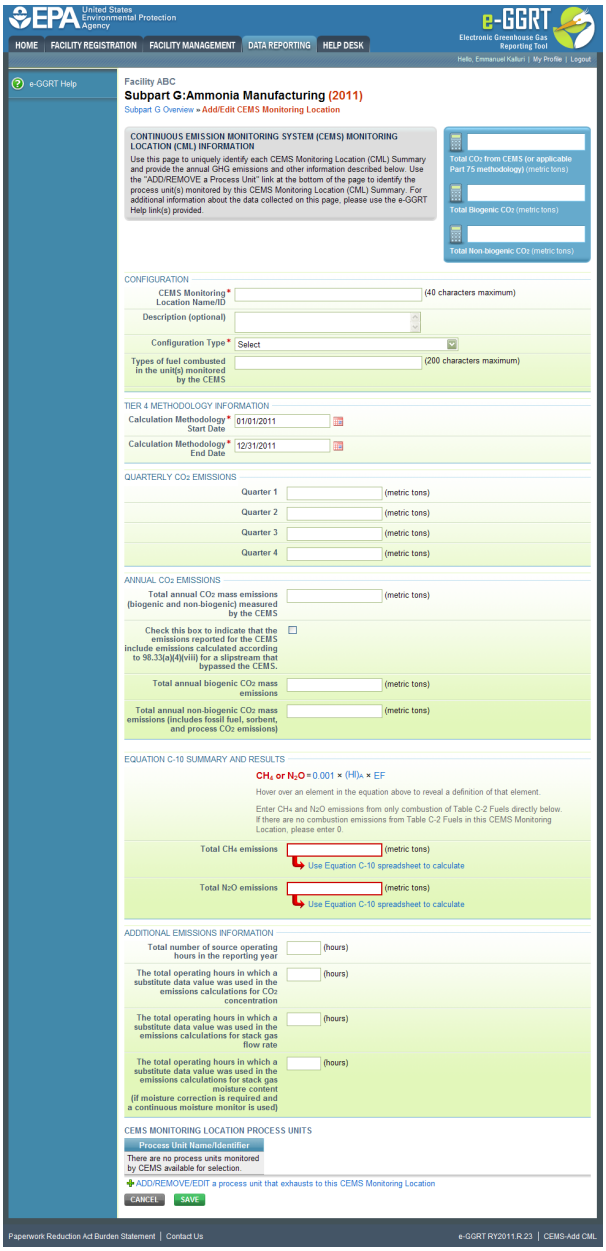
When you have finished entering data for a CML, click SAVE. You will then return to the Subpart Overview page. You will see the status of data entry for the CML updated to “Complete” in the Status column in the CEMS MONITORING LOCATION (CML) SUMMARY table.

If you don't have all the data, you can enter some now, save it, and finish later by clicking on the hyperlinked name of the CML in the CEMS MONITORING LOCATION (CML) SUMMARY table.

After you save the data on this page, the next time you open the page, the calculator on the top of the page will display the CO_2 process emissions for the CML, rounded to the nearest 0.1 of a metric ton. The value displayed is for informational purposes only.

> ⚠ Note: the screenshot below is from Subpart G and is displayed as an example. The screen for other subparts will differ slightly.

Click image to expand



Step 5: Repeat Steps 1-4

Repeat Steps 1-4 until emissions information has been entered for all CMLs. If you have missed something, the validation report messages will help you identify any incomplete entries.

Back to Top

See Also

Screen Errors
Using e-GGRT to Prepare Your Subpart K Report
Subpart K Summary Information for this Facility
Subpart K Furnace Information for Furnaces NOT Monitored by CEMS
Subpart K Furnace Information for Furnaces Monitored by CEMS
Subpart K Emissions Information for Furnaces NOT Monitored by CEMS
Subpart Validation Report

Using Subpart K Calculation Spreadsheets

These optional spreadsheets are provided to assist reporters in calculating emissions and in keeping records of these calculations.

Reporters are required to keep records of these calculations under 40 CFR 98.3(g) and additional subpart-specific provisions, but are not required to use these spreadsheets or to submit any spreadsheets to EPA.

Spreadsheets may include inputs to emission equations, reporting some of which EPA deferred until 2015. (See 76 FR 53057, published August 25, 2011, http://www.gpo.gov/fdsys/pkg/FR-2011-08-25/pdf/2011-21727.pdf).

Overview

This help page provides guidance for working with the supplemental Subpart K Calculation Spreadsheet. The guidance provides step-by-step instructions for the following tasks:

- Downloading the Calculation Spreadsheet
- General Information on Using a Calculation Spreadsheet
- Using the Equation K-1, K-3 Calculation Spreadsheet

Downloading the Calculation Spreadsheet

The calculation spreadsheet for Subpart K may be downloaded by clicking the link in the first column of the table below. Users may also jump to instructions for each calculation spreadsheet by clicking the link in the second column.

Calculation Spreadsheet (click to download)	Instructions (click to view)
Equation K-1, K-3 Calculation Spreadsheet.xls	K-1, K-3 Help

General Information on Using a Calculation Spreadsheet

The guidance provided in this section applies to calculation spreadsheets for all subparts. Additional guidance specific to Subpart K is provided in the following section.

Color coding

The calculation spreadsheets contain green input cells, gray informational cells, and red-bordered results cells filled with yellow or white. Users should use green input cells to enter all data specific to their facility, unit, or process. Gray informational cells contain parameter names, column and row headings, equation constants and subtotals. Calculation results are displayed in red-bordered results cells filled with yellow or white. For red-bordered, yellow-filled results cells, the values in these cells should be entered in the appropriate and separate calculation spreadsheet (as directed below cell) where additional calculations will be made. For red-bordered, white filled results cells, the values in these cells should be entered in e-GGRT for the appropriate process units. All cells that are not green input cells are locked and cannot be modified.

	Green input cell (data entry)
	Gray informational cells (locked)
	Red-bordered, yellow-filled results cells (enter in appropriate and separate calculation spreadsheet)
	Red-bordered, white filled results cells (enter in e-GGRT)

Stop and Warning Messages

The calculation spreadsheets will display a stop message if the user enters a value that is invalid or a warning message if the user enters a value outside the EPA estimated range for a particular data element. For invalid data entries, the stop messages will not allow a user to proceed and the user must reenter valid data before moving forward. For data entries that are outside the EPA estimated range for a particular data element, the warning messages will allow a user to proceed if the user deems the entered value to be accurate.

Using the Equation K-1, K-3 Calculation Spreadsheet

Use the Equation K-1, K-3 Calculation Spreadsheet to calculate the annual CO_2 and CH_4 process emissions from an electric arc furnace. A

separate spreadsheet is to be used for each furnace. Users should not use aggregated data from multiple furnaces in a single calculation spreadsheet. The Equation K-1, K-3 Calculation Spreadsheet performs the calculations using Equations K-1 and K-3, provided below (see calculation spreadsheet for definitions of variables).

(Equation K-1)

$$E_{CO2} = \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{i} \left(M_{reducing\ agent_i} \times C_{reducing\ agent_i} \right)$$
$$+ \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{m} \left(M_{electrode_m} \times C_{electrode_m} \right)$$
$$+ \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{h} \left(M_{ore_h} \times C_{ore_h} \right)$$
$$+ \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{j} \left(M_{\text{flux}_j} \times C_{\text{flux}_j} \right)$$
$$- \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{k} \left(M_{product\ outgoing_k} \times C_{product\ outgoing_k} \right)$$
$$- \frac{44}{12} \times \frac{2000}{2205} \times \sum_{1}^{l} \left(M_{non\text{-}product\ outgoing_l} \times C_{non\text{-}product\ outgoing_l} \right)$$

(Equation K-3)

$$E_{CH4} = \sum_{1}^{i} \left(M_{product_i} \times \frac{2000}{2205} \times EF_{product_i} \right)$$

Begin by entering the facility name, your name, the furnace name or identifier, the reporting period and any additional comments in the green input cells of the General Information table located immediately below the equations in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	EAF

Next, enter the requested information in the green input cells of the input data tables.

Input Data for Reducing Agents

Space for up to five materials is provided.

Use additional copies of this spreadsheet for additional materials (i.e, use multiple spreadsheets to calculate contributions to E_{CO2} and E_{CH4}, and add the contributions prior to entering in eGGRT).

	i=1	i=2	i=3	i=4	i=5
[$M_{reducing\ agent\ i}$] = Annual mass of reducing agent i fed, charged, or otherwise introduced into the EAF (tons)					
[$C_{reducing\ agent\ i}$] = Carbon content in reducing agent i (percent by weight, expressed as a decimal fraction)					

Input Data for Electrodes

Space for up to five materials is provided. Use additional copies of this spreadsheet for additional materials.

Use additional copies of this spreadsheet for additional materials (i.e, use multiple spreadsheets to calculate contributions to E_{CO2} and E_{CH4}, and add the contributions prior to entering in eGGRT).

	m=1	m=2	m=3	m=4	m=5
[$M_{electrode\ m}$] = Annual mass of carbon electrode m consumed in the EAF (tons)					
[$C_{electrode\ m}$] = Carbon content of the carbon electrode m (percent by weight, expressed as a decimal fraction)					

Input Data for Ore

Space for up to five materials is provided. Use additional copies of this spreadsheet for additional materials.

Use additional copies of this spreadsheet for additional materials (i.e, use multiple spreadsheets to calculate contributions to E_{CO2} and E_{CH4}, and add the contributions prior to entering in eGGRT).

	h=1	h=2	h=3	h=4	h=5
[$M_{ore\ h}$] = Annual mass of ore h charged to the EAF (tons)					
[$C_{ore\ h}$] = Carbon content in ore h (percent by weight, expressed as a decimal fraction)					

Input Data for Flux

Space for up to five materials is provided. Use additional copies of this spreadsheet for additional materials.

Use additional copies of this spreadsheet for additional materials (i.e, use multiple spreadsheets to calculate contributions to E_{CO2} and E_{CH4}, and add the contributions prior to entering in eGGRT).

	j=1	j=2	j=3	j=4	j=5
[$M_{flux\ j}$] = Annual mass of flux material j fed, charged, or otherwise introduced into the EAF to facilitate slag formation (tons)					
[$C_{flux\ j}$] = Carbon content in flux material j (percent by weight, expressed as a decimal fraction)					

Input Data for Product

Space for up to five materials is provided. Use additional copies of this spreadsheet for additional materials.

Use additional copies of this spreadsheet for additional materials (i.e, use multiple spreadsheets to calculate contributions to E_{CO2} and E_{CH4}, and add the contributions prior to entering in eGGRT).

	k=1 or i=1	k=2 or i=2	k=3 or i=3	k=4 or i=4	k=5 or i=5
[$M_{product\ k}$] = Annual mass of alloy product k tapped from EAF (tons)					
[$C_{product\ k}$] = Carbon content in alloy product k (percent by weight, expressed as a decimal fraction)					
[$EF_{product\ i}$] = CH_4 emission factor for alloy product i from Table K-1 in this subpart (kg of CH4 emissions per metric ton of alloy product i)					

Input Data for non-Product Outgoing Material

Space for up to five materials is provided. Use additional copies of this spreadsheet for additional materials.

Use additional copies of this spreadsheet for additional materials (i.e, use multiple spreadsheets to calculate contributions to E_{CO2} and E_{CH4}, and add the contributions prior to entering in eGGRT).

	l=1	l=2	l=3	l=4	l=5
[$M_{non\text{-}product\ outgoing\ l}$] = Annual mass of non-product outgoing material l removed from EAF (tons)					
[$C_{non\text{-}product\ outgoing\ l}$] = Carbon content in non-product outgoing material l (percent by weight, expressed as a decimal fraction)					

The calculation spreadsheet will then calculate the annual CO_2 and CH_4 process emissions from this electric arc furnace. The calculated values will be displayed in red-bordered cells in the K-1, K-3 Results tables at the bottom of the spreadsheet. This value should be entered in e-GGRT for this furnace.

Annual CO_2 Emissions (metric tons) from Equation K-1

[E_{CO2}] = Annual process CO_2 emissions from an individual EAF (metric tons)	0.00

Enter this value in e-GGRT

Annual CH_4 Emissions (metric tons) from Equation K-3

[E_{CH4}] = Annual process CH_4 emissions from an individual EAF (metric tons)	0.00

Enter this value in e-GGRT

Back to Top