

# Greenhouse Gas Reporting Program



## Subpart T: Magnesium Production



*This training is provided solely for informational purposes. It does not provide legal advice, have legally binding effect, or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits in regard to any person.*

# Disclaimer



This training is provided solely for informational purposes. It does not provide legal advice, have legally binding effect, or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits in regard to any person.

# Subpart T Reporting Requirements



- Definition of the source category (§98.200)
- GHG to report (§98.202)
- Calculating GHG emissions (§98.203)
- Monitoring and QA/QC requirements (§98.204)
- Procedures for estimating missing data (§98.205)
- Data reporting requirements (§98.206)
- Records that must be retained (§98.207)

# Definition of the Source Category



- Any process in which magnesium metal is produced through:
  - Smelting (including electrolytic smelting);
  - Refining; or
  - Remelting operations.
- Any process in which molten magnesium is used in alloying, casting, drawing, extruding, forming, or rolling operations.
- Threshold is 25,000 metric tons CO<sub>2</sub>e
  - This equates to 1,046 kg of SF<sub>6</sub> consumed, for example

# GHGs to Report



- Total annual emissions for each of the following cover or carrier gases used in magnesium production or processing:
  - Sulfur hexafluoride (SF<sub>6</sub>)
  - HFC-134a
  - The fluorinated ketone FK 5-1-12
  - Carbon dioxide (CO<sub>2</sub>)
  - Any other GHG\* as defined in 40 CFR part 98, subpart A (General Provisions) of the rule
- GHG emissions for other source categories for which calculation methods are provided in the rule, as applicable
  - For example: report CO<sub>2</sub>, N<sub>2</sub>O, and 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).

\*As defined in 40 CFR Part 98, **greenhouse gas or GHG** means carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and other fluorinated greenhouse gases as defined in this section.

# Calculating GHG Emissions



Using one of the following three methods:

- **Method 1.** Mass-balance approach that accounts for:
  - Decrease in Inventory: The decrease in inventory of cover or carrier gases stored in containers from the beginning to the end of the year.
  - Acquisitions: The amount of cover or carrier gas acquired through purchases or other transactions.
  - Disbursements: The amount of cover or carrier gases disbursed to sources and locations outside the facility through sales or other transactions.
- **Method 2.** Monitor the changes in the masses of individual containers as the gases are used.
- **Method 3.** Monitor the flow of pure cover gas and carrier gas into the cover gas distribution system using mass flow controllers (MFC).

# Monitoring and QA/QC



- When estimating emissions by monitoring the mass flow:
  - Must use gas flow meters or mass flow controllers with an accuracy of 1 % of full scale or better; all instruments must be calibrated according to manufacturer's procedures
- When estimating emissions using gas mass measurement:
  - Quantities must have been measured using scales or load cells with an accuracy of 1% of full scale or better; all instruments must be calibrated according to manufacturer's procedures
  - May accept gas masses or weights provided by the gas supplier, as long as the supplier verifies that accuracy standards were met

# Monitoring and QA/QC



- Cylinder Identity and Mass
  - Must track identities and masses of container leaving and entering and measure mass before returned to storage.
  - Quantities must have been measured using scales or load cells with an accuracy of 1% of full scale or better; all instruments must be calibrated according to manufacturer's procedures
  - May accept gas masses or weights provided by the gas supplier, as long as the supplier verifies that accuracy standards were met.
  - Flowmeters, scales, and load cells must be calibrated based on manufacturer specifications prior to start of the first reporting year and thereafter based on manufacturer specifications.



# Estimating Missing Data



- Process for missing emissions data:
  - Determine cover or carrier gas usage rate (metric tons of gas per metric ton of metal processed) for a period with similar operating conditions as the missing period.
  - Multiply the cover or carrier gas usage rate for the similar period by the amount of metal processed in metric tons.
- Process for missing cylinder weights:
  - If before and after weights of a container are not available, it should be assumed that the full weight of the container was utilized, less heel.

# Data Reporting Requirements



Facility level information for:

- Emissions of each cover or carrier gas in metric tons.
- Types of production processes at the facility (e.g., primary, secondary, die casting).
- Amount of magnesium produced or processed in metric tons for each process type.
  - Includes the output of primary and secondary magnesium production processes and the input to magnesium casting processes.

# Data Reporting Requirements



- Cover and carrier gas flow rate (e.g., standard cubic feet per minute) for each production unit and composition in percent by volume.
- For any missing data,
  - report the length of time the data were missing for each cover gas or carrier gas,
  - method used to estimate emissions in their absence, and
  - the quantity of emissions thereby estimated.
- Annual cover gas usage rate for the facility for each cover gas, excluding the carrier gas (kg gas/metric ton Mg).

# Data Reporting Requirements



- In case of any change greater than 30 percent in the facility's cover gas usage rate
  - Provide explanation, *e.g.*, installation of new melt protection technology or leak discovered in the cover gas delivery system that resulted in increased emissions.
  - Provide a description of any new melt protection technologies adopted to account for reduced or increased GHG emissions in any given year.

# Recordkeeping Requirements



Facility level information for:

- Check-out, weigh-in sheets and procedures for gas containers.
- Accuracy certifications and calibration records for scales including the method or manufacturer's specification used for calibration.
- Residual gas amounts (heel) in cylinders sent back to suppliers.
- Records, including invoices, for gas purchases, sales, and disbursements for all GHGs.

# When Can I Stop Annual Reporting?



- Notify EPA by March 31 of the year after you meet one of the following conditions:
  - If annual reports demonstrate CO<sub>2</sub>e <25,000 metric tons/yr for 5 consecutive years.
  - If annual reports demonstrate CO<sub>2</sub>e <15,000 metric tons/yr for 3 consecutive years.
  - If you shut down all processes/units/supply operations covered by the rule. (Does not apply to landfills)
- You must resume reporting in future year if conditions are no longer met

# Schedule for Monitoring and Reporting – Reporting Year 2011



<b>1/1/11</b>	<b>Start collecting data using required methods in each subpart or best available monitoring methods</b>
<b>12/31/11</b>	<b>Complete 2011 data collection</b>
<b>7/30/12</b>	<b>Submit certificate of representation</b>
<b>9/28/12</b>	<b>Submit GHG report for 2011</b>
<b>Ongoing</b>	<b>Submit corrected report 45 days after each discovery (unless extension is requested)</b>
<b>Ongoing</b>	<b>Submit annual reports on 3/31 each year</b>

# Monitoring Plan



- Identifies responsibilities (i.e., job titles) for data collection
- Explains processes and methods used for data collection
- Describes QA/QC procedures
- May rely on references to existing corporate documents (e.g., existing QA plans, standard operating procedures)
- Monitoring Plans must be prepared by January 1, 2011 for subpart T reporters





# Additional Information

- <http://www.epa.gov/ghgreporting/reporters/index.html>
  - Preamble and rule
  - Technical background documents on source categories
  - Response to comment documents
  - Link to rulemaking docket
  - Technical assistance materials (e.g., Information Sheets, Monitoring Checklists, FAQs, optional forms)
  - Data reporting system information (e-GGRT)
  - On-line applicability tool
- Rule questions: [GHGMRR@epa.gov](mailto:GHGMRR@epa.gov)
- e-GGRT questions: [GHGReporting@epa.gov](mailto:GHGReporting@epa.gov)



# **APPENDIX**

# Calculating GHG Emissions



## Method 1. Mass-balance Inventory

$$E_x = (I_{B,x} - I_{E,x} + A_x - D_x) * 0.001$$

- $E_x$  = Emissions of each cover gas or carrier gas, X, in metric tons over the reporting year.
- $I_{B,x}$  = Inventory of each cover gas or carrier gas stored in cylinders or other containers at the beginning of the year, including heels, in kg.
- $I_{E,x}$  = Inventory of each cover gas or carrier gas stored in cylinders or other containers at the end of the year, including heels, in kg.
- $A_x$  = Acquisitions of each cover gas or carrier gas during the year through purchases or other transactions, including heels in  
cylinders or other containers returned to the magnesium production or processing facility, in kg.
- $D_x$  = Disbursements of each cover gas or carrier gas to sources and locations outside the facility through sales or other transactions during the year, including heels in cylinders or other containers returned by the magnesium production or processing facility to the gas supplier, in kg.
- 0.001 = Conversion factor from kg to metric tons
- X = Each cover gas or carrier gas that is a GHG.

# Calculating GHG Emissions



**Method 2 and 3.** Monitoring changes in the masses of individual containers as their contents are used

$$E_{GHG} = \sum_{p=1}^n Q_p * 0.001$$

- $E_{GHG}$  = Emissions of each cover gas or carrier gas, X, over the reporting year (metric tons).
- $Q_p$  = The mass of the cover or carrier gas consumed (kg) over the container-use period p.
- n = The number of container-use periods in the year.
- 0.001 = Conversion factor from kg to metric tons.
- X = Each cover gas or carrier gas that is a GHG.

# Calculating GHG Emissions



**Method 2 and 3.** Monitoring changes in the masses of individual containers as their contents are used, cont.

$$Q_P = M_B - M_E$$

- $Q_p$  = The mass of the cover or carrier gas consumed (kg) over the container-use period  $p$  (*e.g., one month*).
- $M_B$  = The mass of the container's contents (kg) at the beginning of period  $p$ .
- $M_E$  = The mass of the container's contents (kg) at the end of period  $p$ .

Alternatively:

- $Q_p$  = The mass of the cover or carrier gas consumed (kg) over the container-use period  $p$  (*e.g., one month*) based on mass flow controller data.