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(1) Electrolysis in prebake and Søderberg cells.
(2) Anode baking for prebake cells.
(b) This source category does not include experimental cells or research and development process units.

§ 98.61 Reporting threshold.
You must report GHG emissions under this subpart if your facility contains an aluminum production process and the facility meets the requirements of either § 98.2(a)(1) or (a)(2).

§ 98.62 GHGs to report.
You must report:
(a) Perfluoromethane (CF₄) and perfluoroethane (C₂F₆) emissions from anode effects in all prebake and Søderberg electrolysis cells.
(b) CO₂ emissions from anode consumption during electrolysis in all prebake and Søderberg electrolysis cells.
(c) CO₂ emissions from on-site anode baking.
(d) You must report under subpart C of this part (General Stationary Fuel Combustion Sources) the emissions of CO₂, N₂O, and CH₄ emissions from each stationary fuel combustion unit by following the requirements of subpart C.


§ 98.63 Calculating GHG emissions.
(a) The annual value of each PFC compound (CF₄, C₂F₆) shall be estimated from the sum of monthly values using Equation F-1 of this section:

\[ E_{PFC} = \sum_{m=1}^{12} E_m \]  
(Eq. F-1)

Where:
\( E_{PFC} \) = Annual emissions of each PFC compound from aluminum production (metric tons PFC).
\( E_m \) = Emissions of the individual PFC compound from aluminum production for the month “m” (metric tons PFC).

(b) Use Equation F-2 of this section to estimate CF₄ emissions from anode effect duration or Equation F-3 of this section to estimate CF₄ emissions from overvoltage, and use Equation F-4 of this section to estimate C₂F₆ emissions from anode effects from each prebake and Søderberg electrolysis cell.

\[ E_{CF4} = S_{CF4} \times AEM \times MP \times 0.001 \]  
(Eq. F-2)

Where:
\( E_{CF4} \) = Monthly CF₄ emissions from aluminum production (metric tons CF₄).
\( S_{CF4} \) = The slope coefficient ((kg CF₄/metric ton Al)/(AE-Mins/cell-day)).
\( AEM \) = The anode effect minutes per cell-day (AE-Mins/cell-day).
\( MP \) = Metal production (metric tons Al), where AEM and MP are calculated monthly.

\[ E_{CF4} = EF_{CF4} \times MP \times 0.001 \]  
(Eq. F-3)

Where:
\( E_{CF4} \) = Monthly CF₄ emissions from aluminum production (metric tons CF₄).
\( EF_{CF4} \) = The overvoltage emission factor (kg CF₄/metric ton Al).
\( MP \) = Metal production (metric tons Al), where MP is calculated monthly.

\[ E_{C2F6} = \frac{E_{CF4} \times F_{C2F6}/CF4}{0.001} \]  
(Eq. F-4)

Where:
\( E_{C2F6} \) = Monthly C₂F₆ emissions from aluminum production (metric tons C₂F₆).

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E_{CF_4} = CF_4 emissions from aluminum production (kg CF_4).

F_{C2F6/CF4} = The weight fraction of C_2F_6/CF_4 (kg C_2F_6/kg CF_4).

0.001 = Conversion factor from kg to metric tons, where E_{CF_4} is calculated monthly.

(c) You must calculate and report the annual process CO_2 emissions from anode consumption during electrolysis and anode baking of prebake cells using either the procedures in paragraph (d) of this section, the procedures in paragraphs (e) and (f) of this section, or the procedures in paragraph (g) of this section.

(d) Calculate and report under this subpart the process CO_2 emissions by operating and maintaining CEMS according to the Tier 4 Calculation Methodology in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(e) Use the following procedures to calculate CO_2 emissions from anode consumption during electrolysis:

(1) For Prebake cells: you must calculate CO_2 emissions from anode consumption using Equation F-5 of this section:

\[ E_{CO_2} = NAC \times MP \times \left[ (100 - S_a - Ash_a) / 100 \right] \times \left( \frac{44}{12} \right) \]  
(Eq. F-5)

Where:

- E_{CO_2} = Annual CO_2 emissions from prebaked anode consumption (metric tons CO_2).
- NAC = Net annual prebaked anode consumption per metric ton Al (metric tons C/metric tons Al).
- MP = Annual metal production (metric tons Al).
- S_a = Sulfur content in baked anode (percent weight).
- Ash_a = Ash content in baked anode (percent weight).
- 44/12 = Ratio of molecular weights, CO_2 to carbon.

(2) For Soderberg cells you must calculate CO_2 emissions using Equation F-6 of this section:

\[ E_{CO_2} = (PC \times MP - [CSM \times MP] / 1000 - BC / 100 \times PC \times \]  
\[ MP \times \left[ S_p + Ash_p \times H_p \right] / 100 - [100 - BC] / 100 \times PC \times MP \times \]  
\[ \left[ S_c + Ash_c \right] / 100 \times MP \times CD \times \left( \frac{44}{12} \right) \]  
(Eq. F-6)

Where:

- E_{CO_2} = Annual CO_2 emissions from paste consumption (metric ton CO_2).
- PC = Annual paste consumption (metric ton/metric ton Al).
- MP = Annual metal production (metric ton Al).
- CSM = Annual emissions of cyclohexane soluble matter (kg/metric ton Al).
- BC = Binder content of paste (percent weight).
- S_p = Sulfur content of pitch (percent weight).
- Ash_p = Ash content of pitch (percent weight).
- H_p = Hydrogen content of pitch (percent weight).
- S_c = Sulfur content in calcined coke (percent weight).
- Ash_c = Ash content in calcined coke (percent weight).
- CD = Carbon in skimmed dust from Soderberg cells (metric ton C/metric ton Al).
- 44/12 = Ratio of molecular weights, CO_2 to carbon.

(f) Use the following procedures to calculate CO_2 emissions from anode baking of prebake cells:

(1) Use Equation F-7 of this section to calculate emissions from pitch volatiles combustion.
\[
E_{\text{CO}_2\text{PV}} = (GA - H_w - BA - WT) \times (44/12) \quad \text{(Eq. F-7)}
\]

Where:
- \(E_{\text{CO}_2\text{PV}}\) = Annual \(\text{CO}_2\) emissions from pitch volatiles combustion (metric tons \(\text{CO}_2\)).
- \(GA\) = Initial weight of green anodes (metric tons).
- \(H_w\) = Annual hydrogen content in green anodes (metric tons).
- \(BA\) = Annual baked anode production (metric tons).
- \(WT\) = Annual waste tar collected (metric tons).
- \(44/12\) = Ratio of molecular weights, \(\text{CO}_2\) to carbon.

(2) Use Equation F-8 of this section to calculate emissions from bake furnace packing material.

\[
E_{\text{CO}_2\text{PC}} = PCC \times BA \times \left(\left[100 - S_{pc} - \text{Ash}_{pc}\right]/100\right) \times (44/12) \quad \text{(Eq. F-8)}
\]

Where:
- \(E_{\text{CO}_2\text{PC}}\) = Annual \(\text{CO}_2\) emissions from bake furnace packing material (metric tons \(\text{CO}_2\)).
- \(PCC\) = Annual packing coke consumption (metric tons/metric ton baked anode).
- \(BA\) = Annual baked anode production (metric tons).
- \(S_{pc}\) = Sulfur content in packing coke (percent weight).
- \(\text{Ash}_{pc}\) = Ash content in packing coke (percent weight).
- \(44/12\) = Ratio of molecular weights, \(\text{CO}_2\) to carbon.

(g) If process \(\text{CO}_2\) emissions from anode consumption during electrolysis or anode baking of prebake cells are vented through the same stack as any combustion unit or process equipment that reports \(\text{CO}_2\) emissions using a CEMS that complies with the Tier 4 Calculation Methodology in subpart C of this part (General Stationary Fuel Combustion Sources), then the calculation methodology in paragraphs (d) and (e) of this section shall not be used to calculate those process emissions. The owner or operator shall report under this subpart the combined stack emissions according to the Tier 4 Calculation Methodology in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).