

**Environmental Protection Agency**

**§ 98.144**

part (General Stationary Fuel Combustion Sources).

(b) For each continuous glass melting furnace that is not subject to the requirements in paragraph (a) of this section, calculate and report the process and combustion CO<sub>2</sub> emissions from the glass melting furnace by using either the procedure in paragraph (b)(1) of this section or the procedure in paragraphs (b)(2) through (b)(7) of this section, except as specified in paragraph (c) of this section.

(1) Calculate and report under this subpart the combined process and combustion CO<sub>2</sub> emissions by operating and maintaining a CEMS to measure CO<sub>2</sub> emissions according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this

part (General Stationary Fuel Combustion Sources).

(2) Calculate and report the process and combustion CO<sub>2</sub> emissions separately using the procedures specified in paragraphs (b)(2)(i) through (b)(2)(vi) of this section.

(i) For each carbonate-based raw material charged to the furnace, obtain from the supplier of the raw material the carbonate-based mineral mass fraction.

(ii) Determine the quantity of each carbonate-based raw material charged to the furnace.

(iii) Apply the appropriate emission factor for each carbonate-based raw material charged to the furnace, as shown in Table N-1 to this subpart.

(iv) Use Equation N-1 of this section to calculate process mass emissions of CO<sub>2</sub> for each furnace:

$$E_{CO_2} = \sum_{i=1}^n MF_i \cdot \left( M_i \cdot \frac{2000}{2205} \right) \cdot EF_i \cdot F_i \quad (\text{Eq. N-1})$$

Where:

$E_{CO_2}$  = Process emissions of CO<sub>2</sub> from the furnace (metric tons).

$n$  = Number of carbonate-based raw materials charged to furnace.

$MF_i$  = Annual average mass fraction of carbonate-based mineral  $i$  in carbonate-based raw material  $i$  (percentage, expressed as a decimal).

$M_i$  = Annual amount of carbonate-based raw material  $i$  charged to furnace (tons).

$2000/2205$  = Conversion factor to convert tons to metric tons.

$EF_i$  = Emission factor for carbonate-based raw material  $i$  (metric ton CO<sub>2</sub> per metric ton carbonate-based raw material as shown in Table N-1 to this subpart).

$F_i$  = Fraction of calcination achieved for carbonate-based raw material  $i$ , assumed to be equal to 1.0 (percentage, expressed as a decimal).

(v) You must calculate the total process CO<sub>2</sub> emissions from continuous glass melting furnaces at the facility using Equation N-2 of this section:

$$CO_2 = \sum_{i=1}^k E_{CO_2i} \quad (\text{Eq. N-2})$$

Where:

$CO_2$  = Annual process CO<sub>2</sub> emissions from glass manufacturing facility (metric tons).

$E_{CO_2i}$  = Annual CO<sub>2</sub> emissions from glass melting furnace  $i$  (metric tons).

$k$  = Number of continuous glass melting furnaces.

(vi) Calculate and report under subpart C of this part (General Stationary Fuel Combustion Sources) the combustion CO<sub>2</sub> emissions in the glass furnace according to the applicable requirements in subpart C.

(c) As an alternative to data provided by the raw material supplier, a value of 1.0 can be used for the mass fraction ( $MF_i$ ) of carbonate-based mineral  $i$  in Equation N-1 of this section.

**§ 98.144 Monitoring and QA/QC requirements.**

(a) You must measure annual amounts of carbonate-based raw materials charged to each continuous glass melting furnace from monthly measurements using plant instruments used for accounting purposes, such as calibrated scales or weigh hoppers. Total annual mass charged to glass melting

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furnaces at the facility shall be compared to records of raw material purchases for the year.

(b) You must measure carbonate-based mineral mass fractions at least annually to verify the mass fraction data provided by the supplier of the raw material; such measurements shall be based on sampling and chemical analysis conducted by a certified laboratory using ASTM D3682-01 (Reapproved 2006) Standard Test Method for Major and Minor Elements in Combustion Residues from Coal Utilization Processes (incorporated by reference, see § 98.7).

(c) You must determine the annual average mass fraction for the carbonate-based mineral in each carbonate-based raw material by calculating an arithmetic average of the monthly data obtained from raw material suppliers or sampling and chemical analysis.

(d) You must determine on an annual basis the calcination fraction for each carbonate consumed based on sampling and chemical analysis using an industry consensus standard. This chemical analysis must be conducted using an x-ray fluorescence test or other enhanced testing method published by an industry consensus standards organization (e.g., ASTM, ASME, API, etc.).

### § 98.145 Procedures for estimating missing data.

A complete record of all measured parameters used in the GHG emissions calculations is required (e.g., carbonate raw materials consumed, etc.). If the monitoring and quality assurance procedures in § 98.144 cannot be followed and data is missing, you must use the most appropriate of the missing data procedures in paragraphs (a) and (b) of this section. You must document and keep records of the procedures used for all such missing value estimates.

(a) For missing data on the monthly amounts of carbonate-based raw materials charged to any continuous glass melting furnace use the best available estimate(s) of the parameter(s), based on all available process data or data used for accounting purposes, such as purchase records.

(b) For missing data on the mass fractions of carbonate-based minerals

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in the carbonate-based raw materials assume that the mass fraction of each carbonate based mineral is 1.0.

### § 98.146 Data reporting requirements.

In addition to the information required by § 98.3(c), each annual report must contain the information specified in paragraphs (a) and (b) of this section, as applicable.

(a) If a CEMS is used to measure CO<sub>2</sub> emissions, then you must report under this subpart the relevant information required under § 98.37 for the Tier 4 Calculation Methodology and the following information specified in paragraphs (a)(1) and (a)(2) of this section:

(1) Annual quantity of each carbonate-based raw material charged to each continuous glass melting furnace and for all furnaces combined (tons).

(2) Annual quantity of glass produced (tons).

(b) If a CEMS is not used to determine CO<sub>2</sub> emissions from continuous glass melting furnaces, and process CO<sub>2</sub> emissions are calculated according to the procedures specified in § 98.143(b), then you must report the following information as specified in paragraphs (b)(1) through (b)(9) of this section:

(1) Annual process emissions of CO<sub>2</sub> (metric tons) for each continuous glass melting furnace and for all furnaces combined.

(2) Annual quantity of each carbonate-based raw material charged (tons) to each continuous glass melting furnace and for all furnaces combined.

(3) Annual quantity of glass produced (tons) from each continuous glass melting furnace and from all furnaces combined.

(4) Carbonate-based mineral mass fraction (percentage, expressed as a decimal) for each carbonate-based raw material charged to a continuous glass melting furnace.

(5) Results of all tests used to verify the carbonate-based mineral mass fraction for each carbonate-based raw material charged to a continuous glass melting furnace, as specified in paragraphs (b)(5)(i) through (b)(5)(iii) of this section.

(i) Date of test.

(ii) Method(s) and any variations used in the analyses.