

Iron and Steel Production

Subpart Q, Greenhouse Gas Reporting Program



What Must Be Monitored?

Under the carbon (C) mass balance method, measure these parameters on an annual basis (unless otherwise noted):

For each taconite indurating furnace:

- Mass of solid fuel combusted each month (metric tons).
- Average carbon (C) content of solid fuel (% by weight).
- Volume of gaseous fuel combusted each month (standard cubic feet (scf)).
- Average C content of gaseous fuel (kilogram (kg) C/kg of fuel).
- Average molecular weight of gaseous fuel (kg/kg-mole).
- Volume of liquid fuel combusted each month (gallons (gal)).
- Average C content of liquid fuel (kg C/gal of fuel).
- Mass of greenball (taconite) pellets fed to furnace each month (metric tons).
- Average C content of greenball (taconite) pellets (% by weight).
- Mass of fired pellets produced by furnace each month (metric tons).
- Average C content of the fired pellets (% by weight).
- Mass of air pollution control residue collected each month (metric tons).
- Average C content of air pollution control residue (% by weight).
- Annual production quantity of taconite pellets (metric tons).
- Annual operating hours.

For each basic oxygen process furnace:

- Mass of molten iron (Fe) charged to furnace each month (metric tons).
- Average C content of molten Fe (% by weight).
- Mass of ferrous scrap charged to furnace each month (metric tons).
- Average C content of ferrous scrap (% by weight).
- Mass of flux materials (e.g., limestone, dolomite) charged to furnace each month (metric tons).
- Average C content of the flux materials (% by weight).
- Mass of carbonaceous materials (e.g., coal, coke) charged to furnace each month (metric tons).
- Average C content of the carbonaceous materials (% by weight).
- Mass of molten steel produced by furnace each month (metric tons).
- Average C content of steel (% by weight).

- Mass of slag produced by furnace each month (metric tons).
- Average C content of slag (% by weight).
- Mass of air pollution control residue collected each month (metric tons).
- Average C content of air pollution control residue (% by weight).
- Annual production quantity of steel (metric tons).
- Annual operating hours.

For each non-recovery coke oven battery:

- Mass of coal charged to battery each month (metric tons).
- Average C content of coal (% by weight).
- Mass of coke produced by battery each month (metric tons).
- Average C content of coke (% by weight).
- Mass of air pollution control residue collected each month (metric tons).
- Average C content of air pollution control residue (% by weight).
- Annual production quantity of coke (metric tons).
- Annual operating hours.

For each sinter process:

- Volume of gaseous fuel combusted each month (scf).
- Average C content of gaseous fuel (kg C/kg fuel).
- Average molecular weight of gaseous fuel (kg/kg-mole).
- Mass of sinter feed material each month (metric tons).
- Average C content of sinter feed material (% by weight).
- Mass of sinter produced each month (metric tons).
- Average C content of sinter pellets (% by weight).
- Mass of air pollution control residue collected each month (metric tons).
- Average C content of air pollution control residue (% by weight).
- Annual production quantity of sinter (metric tons).
- Annual operating hours.

For each electric arc furnace (EAF):

- Mass of direct reduced Fe charged to furnace each month (metric tons).
- Average C content of Fe (% by weight).
- Mass of ferrous scrap charged to furnace each month (metric tons).
- Average C content of ferrous scrap (% by weight).
- Mass of flux materials (e.g., limestone, dolomite) charged to furnace each month (metric tons).
- Average C content of flux materials (% by weight).

- Mass of C electrode consumed each month (metric tons).
- Average C content of C electrode (% by weight).
- Mass of carbonaceous materials (e.g., coal, coke) charged to furnace each month (metric tons).
- Average C content of carbonaceous materials (% by weight).
- Mass of molten steel produced by furnace each month (metric tons).
- Average C content of steel (% by weight).
- Mass of slag produced by furnace each month (metric tons).
- Average C content of slag (% by weight).
- Mass of air pollution control residue collected each month (metric tons).
- Average C content of air pollution control residue (% by weight).
- Annual production quantity of steel (metric tons).
- Annual operating hours.

For each argon-oxygen decarburization vessel:

- Mass of molten steel charged to vessel each month (metric tons).
- Average C content of molten steel before decarburization (% by weight).
- Average C content of molten steel after decarburization (% by weight).
- Mass of air pollution control residue collected each month (metric tons).
- Average C content of air pollution control residue (% by weight).

For each direct reduction furnace:

- Volume of gaseous fuel combusted each month (scf).
- Average C content of gaseous fuel (% by weight).
- Average molecular weight of gaseous fuel (kg/kg-mole).
- Mass of Fe ore or Fe ore pellets fed to furnace each month (metric tons).
- Average C content of Fe ore (% by weight).
- Mass of carbonaceous materials (e.g., coal, coke) charged to furnace each month (metric tons).
- Average C content of carbonaceous materials (% by weight).
- Mass of other materials charged to furnace each month (metric tons).
- Average C content of other materials (% by weight).
- Mass of Fe produced each month (metric tons).
- Average C content of Fe (% by weight).
- Mass of non-metallic materials produced each month (metric tons).
- Average C content of non-metallic materials (% by weight).
- Mass of air pollution control residue collected each month (metric tons).
- Average C content of air pollution control residue (% by weight).
- Annual production quantity of Fe (metric tons).

- Annual operating hours.

To determine emissions from coke oven pushing, measure these parameters:

- Annual mass of coke produced (metric tons).
- Annual operating hours.
- Mass of coal charged to the coke ovens each month (metric tons).

To use the site-specific emission factor (EF) method, reporters are required to:

- Conduct a performance test and measure carbon dioxide (CO₂) emissions from all exhaust stacks for the process and calculate the average hourly CO₂ emission rate (metric tons CO₂/hour).
- Measure the process production rate or feed rate, as applicable, during the test and calculate the average rate for the test period in metric tons/hour.
- Calculate the site-specific EF for the process in metric tons of CO₂/metric ton of feed or production, as applicable, by dividing the average hourly CO₂ emission rate during the test by the average hourly feed or production rate during the test.
- Calculate CO₂ emissions for the process by multiplying the EF by the total amount of feed or production, as applicable, for the reporting period.

Other Requirements for Using the Site-Specific EF Method:

The annual performance test must occur under representative performance (i.e., performance based on normal operating conditions) of the affected process. If your process operates under different conditions as part of normal operations in such a manner that CO₂ emissions change by more than 20% (e.g., routine changes in the C content of the sinter feed or change in grade of product), you must perform emission testing and develop separate EFs for these different operating conditions and determine emissions based on the number of hours the process operates and the production or feed rate (as applicable) at each specific different condition. Specific performance test requirements for each process are listed in Subpart Q of the rule.

If using a continuous emission monitoring system (CEMS):

Report the relevant information required under 40 CFR Subpart C (General Stationary Fuel Combustion Sources) for the Tier 4 Calculation Methodology.



For More Information

For additional information and resources on Subpart Q, please visit the [Subpart Q webpage](#).

This monitoring checklist is provided solely for informational purposes. It does not replace the need to read and comply with the regulatory text contained in the rule. Rather, it is intended to help reporting facilities and suppliers understand key provisions of the GHGRP. It does not provide legal advice; have a legally binding effect; or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits with regard to any person or entity.