



Engineering Guide #73 – Performing Visible Emissions Observations During Inspections

This engineering guide provides guidance to District Office and Local Air Agency (DO/LAA) inspectors including procedures and policy for performing visible emission observations and the use of visible emissions test methods during a Full Compliance Evaluation (FCE).

When should DO/LAA inspectors perform visible emissions observations?

DO/LAA inspectors are required to understand the visible emissions observations expectations for determining compliance with a visible emission limitation for a given source during an inspection. DO/LAA inspectors should perform visible emissions observations for all significant (Title V) and non-registration status (FEPTIO/NTV) emissions units subject to a visible emissions limitation each time an FCE is required. During inspections, inspectors should perform and document visible emissions observations in accordance with 40 CFR Part 60, Appendix A, Method 9 and/or Method 22, as applicable, rule requirements, as applicable, and with this engineering guide.

Each DO/LAA may use discretion when determining whether to perform visible emission observations for additional emissions units not covered by the previous paragraph. Possible reasons for performing visible emissions observations for additional emissions units include an expectation of the presence of visible emissions, visible emissions requirements established in a permit or applicable rule, or a history of visible emissions.

Which methods are used to determine compliance with visible emissions limitations?

Method 9 is used to determine compliance when a visible emissions limitation is expressed as a quantitative level of opacity (e.g., 10% or 20% opacity). This method can be used to determine compliance with stack or fugitive emissions depending on the applicable visible emissions limitation.

Note: Compliance with a 0% opacity limitation is determined using Method 9.

Method 22 is used to determine compliance for a source when “no visible emissions” is used to express the visible emissions limitation (e.g., no visible emissions, except for six minutes during any sixty-minute observation period).

How long must an inspector perform visible emissions observations during an inspection?

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Method 9

Except as provided below, inspectors should perform Method 9 visible emissions observations for the period of time sufficient to determine compliance with the emissions limitation considering the applicable averaging period. If an averaging period is not stated in the applicable emissions limitation and Method 9 is the appropriate compliance method, then the averaging period is six minutes by default because that is the minimum observation period required by the method.

When determining compliance using Method 9 for a given source during an inspection, if an inspector is reasonably assured that a violation will not occur after performing visible emissions observations for no less than twice as long as the averaging period, then the observations may be discontinued [e.g., an inspector evaluating compliance with OAC rule 3745-17-07(A)(1) may discontinue readings after 12 minutes (twice the six-minute averaging period) when reasonably assured that a violation will not occur].

Note: A visible emissions limitation may include an averaging period that is less than six minutes. Inspectors should refer to the procedures in OAC rule 3745-17-03(B)(3) or consult other guidance when applicable. For example, OAC rule 3745-17-07(B)(1) specifies a 20% opacity limitation as a three-minute average for fugitive dust emissions.

Method 22

When determining compliance using Method 22 for a given source during an inspection, an inspector should be prepared to perform observations for the full time sufficient to determine compliance with the emissions limitation considering the observation period specified in the emissions limitation, if any. However, if an inspector is reasonably assured that a violation will not occur, then the observations may be discontinued in accordance with the following:

If an observation period is specified in the emissions limitation [e.g., a one-hour compliance period established in OAC rule 3745-17-07(B)(4)], and an inspector is reasonably assured that a violation will not occur after performing visible emissions observations for 30 minutes (and at least one break required by Method 22 which does not count toward the observation period), then observations may be discontinued; or

If an observation period is not specified in the emissions limitation [e.g., a BAT emissions limitation which states only “no visible emissions”], and an inspector is reasonably assured that a violation will not occur after performing observations for 12 minutes (two times the minimum observation period required by Method 22*), then observations may be discontinued.

**Note that USEPA’s Method 22 Q&A document clarifies that readings should be performed for a minimum of 6 minutes.*

What else should an inspector consider when evaluating compliance using Method 22?

Inspectors should be aware of the following to ensure that Method 22 observations are satisfactory to determine compliance:

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- Take 5 to 10-minute breaks every 15 to 20 minutes of readings as outlined in the method. The time taken for breaks does not count toward the total observation period (usually 1 hour). These breaks are required to be documented on the Method 22 form.
- Do not observe more than one emissions source or egress at a time using Method 22.
- For roadways and parking areas, visible emissions observations should be taken at one single point which cannot be changed during the observation. This point must be at a height of approximately 4 feet above the ground as specified in OAC rule 3745-17-03(B)(4).

Note: These provisions should be followed for roadways and parking areas when “no visible emissions” is used to express the visible emissions limitation regardless of whether that limit is rule-based or established through Best Available Technology.

When is it acceptable to forgo or postpone visible emissions observations for an emissions unit during an inspection?

A DO/LAA inspector may forgo visual emissions observations under any of the following circumstances:

- The emissions unit is an insignificant or registration status emissions unit.
- An emissions unit is located in an area of the facility where buildings or other obstructions do not allow for proper positioning to perform visible emissions observations.
- The emissions unit is “inherently clean”, or the emissions unit is well-controlled, has a very low mass emission rate, no visible emissions have been observed during past inspections, and there is no history of complaints or other credible evidence (such as videos or photographs) which indicate non-compliance. In these cases, an inspector should simply check for the presence or absence of visible emissions during the inspection. However, if visible emissions are observed, then visible emissions observations should be performed in accordance with the applicable method.

The terms and conditions library defines an emissions unit as “inherently clean” if it is an uncontrolled emissions unit that burns only natural gas and/or number two fuel oil, the particulate emissions from the emissions unit are due solely to the combustion of the fuel(s), and under normal operating conditions the emissions will not exceed the particulate or visible emission limitations.

- The emissions unit is equipped with a certified, continuous opacity monitoring system.
- For units venting inside of a building, the inspector should observe the unit in operation and if no visible emissions are observed, the inspector may forgo Method 9 readings. However, if visible emissions are observed inside of the building, the inspector should perform Method 9 or Method 22, whichever is applicable, at the nearest building egress point.

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A DO/LAA inspector may postpone visual emissions observations under any of the following circumstances during an inspection; however, follow-up observations are necessary:

- Weather conditions or sun position prohibited observations at the time of the inspection.
- Not enough time
- Lack of daylight prohibited observations during time of inspection
- The emissions unit is not operating at the time of the inspection.
- The inspector is not certified to perform Method 9 or qualified to perform Method 22 at the time of inspection.
- Temporary safety issues prohibit visible emissions observations at the time of inspection.
- Uncombined water (steam/condensing water vapor) in the plume makes it difficult to ascertain compliance.

Method 9 provides for observations to be made even when attached or detached steam plumes are present. Prior to performing visible emissions observations in these conditions, an inspector should be familiar with the Method 9 procedures for performing observations when steam plumes are present. Observations should never be made through a steam plume as they are not representative of particulate emissions and cannot be used to ascertain compliance. Although less likely when observing fugitive emissions, Method 22 observations should also not be performed when the inspector is uncertain whether steam could be influencing the observations.

What are some other important things to remember when performing visible emissions observations during an inspection?

DO/LAA inspectors should use visible emissions observation forms that provide for all of the information necessary to document that the applicable method was performed accurately. Visible emissions observation forms are a part of the inspection record and should be treated accordingly. Forms should be completed to the fullest extent possible. Instead of leaving a section blank, an inspector should explain why the information was not recorded (e.g., unavailable, unknown, etc.).

Particular care should be taken to make sure that the observer's position with respect to the sun and compass orientation are clearly documented. It is also important to make sure that the observation conditions do not adversely affect the efficacy of the visible emissions observations. Do not attempt to make observations through glass or any other transparent medium (with the exception of tinted personal glasses used during Method 9 certification) and do not make observations when the atmospheric visibility is significantly reduced.

In rare cases, specific procedures for performing visible emissions observations are outlined in rules and regulations. This guide is not intended to contradict or replace specific procedures outlined in a rule or regulation. If other procedures are required to determine compliance with a specific type of source, the inspector must become familiar with those procedures through review of the applicable rules and regulations.

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Revision History

This guidance was originally issued April 27, 2006.