VISIBLE EMISSIONS MONITORING INSTRUCTIONS – WELDING OPERATIONS

This document was developed to assist those area sources subject to National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Nine Metal Fabrication and Finishing Source Categories, 40 CFR Part 63 Subpart XXXXXX (6X) and that have welding operations. Visible emissions (VE) testing is required for welding operations that use 2,000 pounds or more per year (on a rolling 12-month average basis) of welding rod or wire that contains metal fabrication hazardous air pollutants (MFHAPs). Testing is done to demonstrate continuous compliance with the emissions standards in this rule. Observations during testing are to be made at the vent, stack, exit, or opening from the building containing welding operations. This testing for welding operations has a three-tier compliance structure. This document focuses on Tier 1 and briefly describes Tiers 2 and 3 requirements.

TIER 1 – Visual determination of fugitive emissions using EPA Method 22.

What are fugitive emissions?

- Fugitive emissions are non-stack emissions that escape during material transfer from buildings that contain the process, or directly from process equipment.
- For welding operations, fugitive emissions are the fumes created from welding.

What is EPA Method 22?

- Method 22 is a simple procedure that uses the human eye to determine total time an industrial activity causes visible emissions (VE).
- Some emission standards require minimizing VE from processes. Method 22 is a procedure used to make sure the process and any emission control equipment are operating properly and are not generating excess emissions.
- Method 22 procedures are straightforward, but every observer must also know and understand the effects that background, weather conditions, ambient lighting, and the observation point can have on VE observations.
- EPA documentation on Method 22 is available at: https://www.epa.gov/emc/method-22-visual-determination-fugitive-emissions.

What equipment do I need?

- Two stopwatches are required and must be the accumulative type that measure to at least one-half of a second.

Where do I stand to look for visible emissions?

- Walk around the facility, building, or structure where welding is taking place, and find where potential emissions may occur.
    - This will be the primary vent, stack, exit, or opening from the building.
- Choose a location with a clear view of the building. Make sure it is safe – not in the path of moving equipment – and does not pose any safety hazard.
- The method recommends standing no closer than 15 feet and no farther away than one-quarter mile from the potential emission source.
- Pick a spot where the sunlight is not shining directly into your eyes.

How do I make the observations, and measure and record the time?

- Attached is a form for recording observations made during Tier 1 VE testing for welding operations. Some of the form could be completed prior to going outdoors.
    - Fill in the company name, its address where the welding occurs, and the name of the contact person.
    - Fill in the name of the observer, and the company with which he or she is affiliated.
    - Fill in the NAICS and SIC codes.
    - Describe the welding unit. If more than one exists, identify the one being observed.
    - Circle when in the graduated testing schedule this observation is being conducted.
- At the time of the test, record the estimated wind speed, wind direction, and sky condition (for example, cloudy, sunny, partly cloudy, etc.). Sketch the emission source being observed, and mark the observer's location on the sketch relative to the emission source and the sun. Show actual and potential emission points on the sketch.
- Record the clock time on the form when you begin.
- Use one stopwatch (SW1) to time the entire 15-minute observation period. After 15 minutes (the time this 6X rule requires for testing), stop SW1 and record the accumulated time and the clock time.
- During the observation period, continuously watch the source and if any emissions are seen, start the second stopwatch (SW2) and then stop it when the emissions stop.
    - Restart SW2 without resetting it if emissions occur again, and stop it if the emissions stop.
    - Continue doing this throughout the 15-minute observation period.
- Remember that **steam and other forms of condensed water vapor are not emissions** and are not a reason to start SW2.
- When the observation period is over, record the total time on SW2, which is the total time that emissions were visible in 15 minutes.

How long do I have to observe for fugitive emissions?

- For this rule, observe for a maximum of 15 minutes.
- You may quit after observing six minutes of emissions before the 15 minutes elapses; otherwise, continue observing for 15 minutes.
- The observation period must not be less than a total of six minutes.

What is the graduated testing schedule?

- The schedule progresses from daily to weekly to monthly to quarterly testing as follows:
    - Perform VE testing **daily** for two weeks (that the source is in operation).

    If VEs are not observed at any time during those two weeks,
    - perform VE testing **weekly** for four consecutive weeks (that the source is in operation). If VEs are not observed at any time during the weekly tests,
    - perform VE testing **monthly** for three consecutive months (that the source is in operation).

    If VEs are not observed during any of the monthly tests,
    - perform VE testing **quarterly** (once per consecutive three months of operation).
- If VEs are not observed, continue VE testing quarterly.
- If VEs are observed during any of these times, the affected sources must resume VE testing on the more frequent schedule just prior to the schedule where VEs were observed.

What if visible emissions are observed?

- If VEs are observed for more than a total of six minutes during the 15-minute testing period, immediate corrective action will be required, including the following:
    - Inspect fume sources and control methods in operation.
    - Document visual emissions test results.
- If VEs are observed for more than a total of six minutes during the 15-minute testing period, any of these times, the affected sources must resume VE testing on the more frequent schedule just prior to the schedule where VEs were observed.
- If VEs are detected for the second time in any consecutive 12-month period, go to Tier 2.

TIER 2 – Visual determinations of plume opacity using EPA Method 9

What is EPA Method 9?

- Method 9 involves visual determination of plume opacity by *qualified* observers. Visible emissions discharged into the atmosphere by stationary sources are usually in the shape of a plume.
- The method includes procedures for training and certification of observers, and procedures to be used in the field for determination of plume opacity. The certification is valid for a period of six months. Typically, personnel responsible for opacity readings attend a "smoke school" to receive training and certification.
- The Kansas Department of Health and Environment lists possible "smoke schools" that train and certify in conducting Method 9 testing. The schools are listed in the FAQs section under Air Compliance and Enforcement at https://www.kdhe.ks.gov/faq.aspx?qid=74.

What is required in Tier 2?

- Perform visual determination of emissions opacity using EPA Method 9 (40 CFR part 60, appendix A-4) within 24 hours of the failed Method 22 test.
- Tier 2 requires testing on a graduated schedule. Regulations detail the schedule and when the facility can switch back to Method 22.
- The facility can reduce to quarterly testing if there are no exceedences in three consecutive monthly tests.
- If the required average opacity is determined to be greater than 20% in the Method 9 tests, go to Tier 3.

When can I return to Method 22 testing?

Method 22 testing may be resumed if, after two consecutive months of testing, the average of the six-minute opacities recorded during any of the monthly EPA Method 9 tests does not exceed 20 percent.

TIER 3 – Development and implementation of a site-specific welding emissions management plan (SWMP)

What is required in Tier 3?

- Perform visual determination of emissions opacity using EPA Method 9, according to the graduated schedule.
- Develop an SWMP that includes
  - more effective implementation of management and pollution prevention practices already in place, and
  - use of capture equipment and control devices.
- Develop the SWMP within 30 days of failing Tier 2 requirements, and submit to KDHE and EPA Region 7 (addresses provided later in this document).
- Revise/update the SWMP after any failures to meet 20% or less opacity as determined by Method 9.

What does the SWMP address?

- type(s) of welding operation(s) currently used at the facility
- measures used to minimize welding fumes at each type of welding operation or each welding station
- procedures used by the facility to ensure these measures are being implemented

Recordkeeping and reporting requirements

What if no visible emissions were observed in Tier 1?

Maintain VE testing records on site. Keep them in a readily accessible location for inspector review.

What if visible emissions were observed in Tier 1?
An annual certification and compliance report must be submitted no later than January 31 of each year that an exceedence has occurred and must contain the following information:

- the date of every visual determination of fugitive emissions which resulted in detection of visible emissions
- a description of corrective actions taken subsequent to the test
- the date and result of follow-up visual determination of fugitive emissions performed after the corrective actions

General information that must be included in the certification and compliance report includes the following:

- company name and address
- statement by a responsible official with that official's name, title, and signature certifying truth, accuracy, and completeness of the content of the report
- date of report, and beginning and ending dates of the reporting period

If required to submit reports, where do I send them?
In Kansas, reports to be submitted are to be sent to the KDHE Bureau of Air, with a copy sent to USEPA Region 7 at the following addresses:

KDHE Bureau of Air
1000 SW Jackson, Suite 310
Topeka, KS 66612-1366

USEPA Region 7
Air Permitting and Compliance
11201 Renner Blvd.
Lenexa, KS 66219

Emissions monitoring questions and answers

Following are Q&As from EPA pertaining to emissions monitoring for welding operations that use 2,000 pounds or more of welding wire or rod in any consecutive 12 months. Q&As that have been received by EPA on the entire 6X rule have been compiled and are available at:
https://www.epa.gov/stationary-sources-air-pollution/nine-metal-fabrication-and-finishing-area-source-categories-40-cfr

Q: If a welder emits to a room, where is the "visible determination of welding fugitive emissions" to be conducted to satisfy 40 CFR 63.11516(f)(3)? What if there is a filter system which is vented to the room? Does the rule expect the outlet of the filter to be assessed at the nearest doorway or HVAC vent to the outdoors? Is the rule intended to exclude sources which vent indoors?

A: *You should measure at the exit of the building closest to the room. Sources vented indoors are not excluded, but are not likely to result in visible emissions measured at the building exit. We assume that OSHA regulations would oversee the venting of exhaust inside buildings.*

Q: 40 CFR 63.11517(b)(2) states that if no visible fugitive emissions are detected in consecutive daily EPA Method 22 tests for 10 work days you may decrease the frequency of EPA Method 22 testing to once every five days of operation of the process (one calendar week). However, if a facility is on a seven day work week schedule it can become confusing to keep track of the testing schedule. Is it permissible to follow a normal weekly testing schedule in this case?

A: *Yes, if a facility is open 6 or 7 days a week then they should follow "weekly" as defined for their facility and not every five days. The schedules mentioned in this section (63.11517) for both Method 22 and Method 9, assumed a 5 day work week and the resultant subsections for weekly, monthly and quarterly testing maintained that assumption. Obviously, when a facility operates on a longer work week the provisions in these sections of the rule are slightly different. Therefore, you should follow the weekly, monthly and quarterly schedules that make sense for your facility's situation and use the standard definitions of week, calendar month, and quarter year (three months).*

VISIBLE EMISSIONS TESTING
WELDING OPERATIONS – TIER 1 – Method 22

Company name: Address: Company rep.:	Observer: Company name:
NAICS/SIC codes:	Date:
Welding unit(s) description (ID no., process):	Visible emission testing (circle one): Daily Weekly Monthly Quarterly
Sky conditions: Precipitation:	Wind direction: Wind speed:

Sketch welding unit: indicate observer position relative to source; indicate potential emission points and/or actual emission points (primary vent, stack, exit, or opening from building which houses the unit).

VISIBLE EMISSIONS TESTING	SW1	SW2
Begin observation	Clock time/elapsed time *(minutes:seconds)*	Accumulated emission time *(minutes:seconds)*
Record initial clock time/elapsed time:	_____ / 0:00	
Record total time of continuous emissions:		_____
Record total time of continuous emissions:		_____
Record total time of continuous emissions:		_____
Record total time of continuous emissions:		_____
Record final clock time/elapsed time (at least 15 min. later):	_____/_____	
Total time emissions observed: (If more than 6 min., then immediate corrective action required.)		_____
End observation		