Small Business: Know the FACTS

Secondary Aluminum MACT
Appendix D: Sweat Furnaces

Sweat Furnaces

A sweat furnace is a unit specifically designed to reclaim aluminum from scrap containing large quantities of iron. Aluminum has a lower boiling point than iron and will melt off in the furnace at the right temperature, while the iron remains solid. The portion of the rule that applies to **sweat furnaces** affects small businesses like scrap yards and automotive salvage operations. The rule affects all sweat furnaces, no matter the size of the unit or the business operating it.

Scrap yards might use a sweat furnace to reclaim aluminum from items like sheet and cast aluminum, while automotive salvage operations can reclaim aluminum from unusable auto parts like transmissions.

Emissions Limits

Any owner or operator of a sweat furnace may not allow emissions of dioxin/furan toxic equivalents (D/F TEQ) greater than 3.5×10^{-10} grain per dry standard cubic foot (gr/dscf) [0.80 nanogram per dry standard cubic meter (ng/dscm)] at 11% oxygen. To meet this limit, a sweat furnace probably requires installation of an afterburner on the furnace exhaust.

An **alternate limit** requires operating an afterburner with a residence time of 0.8 second or greater and an operating temperature of 1600°F or greater. So, if the afterburners you install have a residence time shorter than 0.8 second, you would have no option but to meet the emissions limit of 3.5×10^{-10} gr/dscf.

Compliance Demonstration

Owner/operators who opt for the alternate limit are not required to perform an initial compliance test. Instead, the afterburner criteria in the alternate limit must be met at all times the sweat furnace is operating. The owner/operator must operate the afterburner according to the approved OM&M plan. Refer back to the main *Secondary Aluminum MACT and Area Source Requirements* fact sheet, and the third page of this fact sheet, for details on the OM&M plan.

Performance Test

If your afterburner cannot meet the alternate limit criteria, an initial performance test is required within 180 days of when you first start operating the unit, to demonstrate that each afterburner can meet the emissions limit. A repeat performance test is required every five years following the initial test.

If you must conduct an initial performance test to demonstrate compliance, you must submit a test plan 60 days prior to the scheduled test date. The plan should outline the test methods and procedures to be followed.

Each performance test for demonstrating compliance with D/F emissions limits shall include USEPA Methods 1-4 and 23. The following methods shall also be used during each performance test:

- √ Each test must be performed at the outlet of the afterburner.
- √ Each test must be performed at the highest capacity of the process with charge materials representative of the range of materials processed.
- √ For a continuous process, the test must consist of 3 runs, each of the length specified in the test method or, if not specified, a minimum of 3 hours.
- √ For a batch process, the test must consist of 3 runs, each conducted over the entire process operating cycle.

- √ For multiple units exhausted through a common stack, each run must be conducted over a period of time during which each of the units completes at least one entire operating cycle, or for 24 hours, whichever is shorter.
- √ For each afterburner, the temperature must be continuously monitored at the exit of the combustion chamber and recorded every 15 minutes during the test.

The operating parameter value or range for the afterburner operating temperature shall be established by determining each 15-minute block average temperature during the three test runs. Then determine the 3-hour block average temperatures during the three test runs. How are these block averages measured? The continuous temperature monitoring device records temperature in 15-minute block averages and 3-hour block averages. For example, if 15-minute blocks last from 3:00 to 3:15, 3:15 to 3:30, etc., then a 3-hour block could last from 3:00 to 6:00.

A test will be considered complete and sufficient to demonstrate compliance when the average emissions rate measured during all three runs is less than or equal to the applicable emission limit or standard.

The same tests required for the performance test must be used to establish any operating parameters: maximum, minimum, or range of values. Any test performed to establish the operating parameters must be submitted along with the notification of compliance status report. Refer back to the main *Secondary Aluminum MACT and Area Source Requirements* fact sheet for details on the reporting requirements. Work practices standards and design criteria may not change for the emissions units once an operating parameter has been established.

Monitoring and Record Keeping

Following the performance test, the owner/operator must maintain the 3-hour average temperature in the afterburner at or above the average temperature established during the test. If no performance test was required, the owner/operator must maintain the temperature at or above 1600°F. To demonstrate compliance with this condition, the afterburner must be monitored continuously and readings of its temperature recorded in 15 minute average blocks, and then the average temperature over each 3-hour period must be calculated and recorded.

The owner/operator must install, calibrate, maintain, and operate a device to monitor and record the operating temperature of the afterburner. The device must be installed at the exit of the combustion zone and have a response range from 0 to 1.5 times the average temperature established during the performance test. Calibration of the device shall be performed according to NIST methods.

An annual inspection is also required. A record of the results and any actions taken must be maintained on file. The inspection must include the following:

- ☐ inspect all burners, pilot assemblies, and pilot sensing devices and clean pilot senser
- ☐ ensure proper adjustment of combustion air
- ☐ inspect internal structures (e.g., baffles) to ensure structural integrity
- ☐ inspect dampers, fans, and blowers for proper operation
- ☐ check for proper sealing
- ☐ check motors for proper operation
- ☐ inspect combustion chamber refractory lining, and clean and replace lining as needed
- ☐ check afterburner shell for corrosion and/or hot spots
- ☐ obtain documentation during the burn cycle that follows the inspection to show the afterburner is operating properly and all necessary adjustments were made
- ☐ verify that the equipment is maintained in good operating condition

Following the inspection, all necessary repairs must be completed according to the OM&M plan.

Plan Requirements for Sweat Furnaces

What is an OM&M plan?

An operation, maintenance, and monitoring plan (OM&M Plan) describes the actions you will take to ensure proper operation of a sweat furnace and the device that controls emissions of dioxins and furans. You must prepare a written OM&M Plan and follow it. You must give the plan to the Department of Natural Resources (DNR). The mailing address is on the Notice of Compliance Status form. The DNR will review your plan and may require changes before approving your plan. If needed, you may change the original plan; you will have to give the revised plan to the DNR for their review.

The checklist below lists the seven basic components of an OM&M plan; section 63.1510(b) in the regulation has more specific information on these components. The OM&M plan is one component of the application that you make for a part 70 or part 71 permit. DNR has not yet established when the permit applications must be submitted for area sources affected by the Secondary Aluminum MACT.

Checklist: the seven basic components of an OM&M plan

A list of the parameters of the sweat furnace and emission control device that you must set and monitor to ensure that the sweat furnace does not emit too much.

- ☐ The schedule for monitoring the parameters in the list.
- ☐ A description of the actions you will take to properly operate and maintain each sweat furnace and the afterburner or other emission control device.
- ☐ A description of the actions you will take to properly operate and maintain the device that monitors the parameters in the list.
- ☐ The actions you will take to monitor the parameters on your list.
- ☐ The actions you will take to repair a sweat furnace or emission control device ("corrective actions") when the value of a parameter differs from its target value or range.
- ☐ The schedule you will follow to maintain a sweat furnace or emission control device.

What is a startup, shutdown, and malfunction plan, and how do I implement it?

You must prepare and implement a written plan that describes how you will start a sweat furnace and shut it down to minimize air pollution emissions, and what you will do to minimize air pollution emissions when the sweat furnace or air pollution control equipment malfunctions. This is called a startup, shutdown, and malfunction (SSM) plan. The description of procedures must be specific. You must include the plan in the notification of compliance status report. A more specific description of the contents of the plan appears in 40 CFR §63.6(e)(3). Your plan must include the following procedures:

- √ What you will do to determine the cause of malfunctions.
- √ How you will record the cause of malfunctions.
- √ How you will record the time the malfunction began and ended.
- √ What you will do to repair malfunctioning equipment.
- √ How you will record the actions you will have taken to repair malfunctioning equipment and minimize emissions during malfunctions.

You must follow the requirements in 40 CFR §63.10(b) for keeping records of startups, shutdowns, and malfunctions and the actions you take during these events. You must record and report actions that are inconsistent with the procedures in your plan for startups, shutdowns, and malfunctions.

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