



**---DRAFT---**

# **Secondary Aluminum Sweat Furnace Workbook**

Prepared for:  
U.S. Environmental Protection Agency  
Office of Air Quality Planning and Standards  
Information Transfer and Program Implementation Division  
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## Legend of Icons



The following icons are designed to highlight specific types of information as defined below.



Good Management Practices\*



Health Hazards



Pollution Prevention Practices\*



Important Information

\* Often, Good Management Practices and Pollution Prevention Practices are the same thing.



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# Introduction



## 1.0 Introduction

### 1.1 What is the purpose of this document?

In this workbook, you will find a summary and explanation of the regulation (or rule) that the United States Environmental Protection Agency (EPA) published to reduce hazardous air pollutants (HAPs) released into the air by sweat furnaces (and other processes used to make secondary aluminum). This workbook describes the components of the regulation and advises you on what to do to satisfy the regulation.

A **sweat furnace** is a furnace that is used only to reclaim aluminum from scrap metal that contains aluminum and iron. Sweat furnaces reclaim aluminum by applying heat to the scrap to melt the aluminum but not so much heat that the iron melts.

### 1.2 Who should use this document?

We, the EPA, designed this document to help you, sweat furnace owners and operators, understand the rule for Secondary Aluminum Production as it applies to sweat furnace operations. This document was also designed to help your State, local, or tribal permitting agency implement the rule. This workbook does not replace the final rule and we will not likely update its content to include any requirements added to the rule after the date of this workbook.

### 1.3 How should I use this document?

You should begin by reading sections 1 and 2 of this document. You should then read through the checklist in section 3 to get an overview of the requirements of the rule. The checklist in section 3 refers you to parts of section 4 for more information on specific requirements. You can either read all of section 4 straight through, or read those parts that are of most interest or that apply to you. Finally, you should return to the checklist in section 3 and use it to check off the requirements as you complete them.

### 1.4 What is the purpose of the regulation?

Sweat furnaces release hazardous substances into the air when reclaiming aluminum. The most hazardous are dioxins and furans. Exposure to dioxins and furans increases the likelihood of developing cancer. The regulation protects people working or living near sweat furnaces by establishing an emission standard for dioxins and furans, thus reducing exposure by reducing emissions.

Sweat furnaces release into the air dioxins and furans, which increase the likelihood of developing **cancer**.



# Introduction



## 1.5 How can I comply with the regulation?

You can reduce emissions from your sweat furnace by adding an air pollution control device to your sweat furnace, if you do not already have one. An afterburner is the most commonly used control device for sweat furnaces (see pages 16 and 17 for images of afterburners). An afterburner is a device that uses controlled flame combustion to convert air pollutants to less harmful substances. Other names for an afterburner are thermal oxidizer and incinerator.

Once you have an air pollution control device, you can comply with the rule by demonstrating that it meets the requirements of the rule, monitoring the control device to ensure that it continues to meet the requirements, and doing the necessary reporting and recordkeeping. Section 4.0 will explain each of these steps in more detail.

## 1.6 Does this guidance replace the regulation?

When using this document, remember that it **does not** replace or change the final rule and covers only requirements published on or before **6/14/02**. You should read the rule itself carefully, and keep up with new requirements printed after this date by periodically checking the *Federal Register* and subpart RRR of part 63 of title 40, chapter I of the Code of Federal Regulations ("40 CFR Part 63"). You can get copies of Federal Register notices by going to the Government Printing Office (GPO) website at [www.access.gpo.gov/su\\_docs/aces/aces140.html](http://www.access.gpo.gov/su_docs/aces/aces140.html) or to your local library.

You may find the published regulation ("National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production; Final Rule") in the March 23, 2000 issue of the *Federal Register*, pages 15710–15737. Changes to the rule were published on June 14, 2002. The March 23, 2000 version of the regulation is available online at <http://www.epa.gov/ttn/atw/alum2nd/fr23mr00.pdf>. The most up-to-date version of the rule is available in subpart RRR of 40 CFR Part 63. We've included a copy of the rule in Appendix D, so you can reference the rule while you're using this document.

## 1.7 Whom may I contact if I have questions about the regulation?

There are a lot of places you can go for help, including your:

1. State, local or Tribal air pollution control agency
2. Local, regional, or national trade associations
3. State's Small Business Assistance Program
4. EPA Regional Offices



# Introduction



*State and Local Contacts* can change frequently. To obtain the most current contact information go to the STAPPA/ALAPCO website (<http://www.cleanairworld.org/scripts/stappa.asp>) and then to the membership directory. The directory will provide you with the current contact persons for your agency.

Some of the *Trade Associations* representing the secondary aluminum production industry include the Automotive Recyclers Association (<http://www.autorecyc.org/> or 703-385-1001) and the Institute of Scrap Recycling Industries (<http://www.isri.org/> or 202-737-1770).

Many States have *Small Business Assistance Programs* (SBAP). If you are a small business and do not know who your SBAP representative is, you can call EPA's Control Technology Center Hotline at (919)541-0800 or visit EPA's SBAP at <http://www.epa.gov/ttn/sbap/> for help. Table 1 contains a list of State small business contacts.

The definition of "small business" depends on the industry code that applies to your company. Contact the Small Business Administration ([www.sba.gov](http://www.sba.gov)) to determine whether you are a small business.

You may speak with a representative of the *EPA Regional Office* that is appropriate for you. You may determine which Regional Office to contact by viewing the following Web page: <http://www.epa.gov/epahome/locate2.htm>.

## 1.8 How do I get copies of this document?

You can get a copy of this document at EPA's Air Toxics Website (<http://www.epa.gov/ttn/atw/>). Look under Rules and Implementation for Secondary Aluminum Production: <http://www.epa.gov/ttn/atw/alum2nd/alum2pg.html>.



# Introduction



**Table 1: List of State Small Business Contacts**

| State         | Contact | Telephone | State          | Contact | Telephone |
|---------------|---------|-----------|----------------|---------|-----------|
| Alabama       |         |           | Montana        |         |           |
| Alaska        |         |           | Nebraska       |         |           |
| Arizona       |         |           | Nevada         |         |           |
| Arkansas      |         |           | New Hampshire  |         |           |
| California    |         |           | New Jersey     |         |           |
| Colorado      |         |           | New Mexico     |         |           |
| Connecticut   |         |           | New York       |         |           |
| Delaware      |         |           | North Carolina |         |           |
| Florida       |         |           | North Dakota   |         |           |
| Georgia       |         |           | Ohio           |         |           |
| Hawaii        |         |           | Oklahoma       |         |           |
| Idaho         |         |           | Oregon         |         |           |
| Illinois      |         |           | Pennsylvania   |         |           |
| Indiana       |         |           | Rhode Island   |         |           |
| Iowa          |         |           | South Carolina |         |           |
| Kansas        |         |           | South Dakota   |         |           |
| Kentucky      |         |           | Tennessee      |         |           |
| Louisiana     |         |           | Texas          |         |           |
| Maine         |         |           | Utah           |         |           |
| Maryland      |         |           | Vermont        |         |           |
| Massachusetts |         |           | Virginia       |         |           |
| Michigan      |         |           | Washington     |         |           |
| Minnesota     |         |           | West Virginia  |         |           |
| Mississippi   |         |           | Wisconsin      |         |           |
| Missouri      |         |           | Wyoming        |         |           |



## Does This Regulation Apply to Me?



### **2.0 Applicability**

#### **2.1 Who does this regulation apply to?**

The regulation applies to you if you own or operate a sweat furnace (regardless of the size or location of the furnace) and you are involved in the recovery of aluminum from scrap material. In other words, this regulation applies to ALL secondary aluminum sweat furnaces.

A sweat furnace is a unit designed and used exclusively to reclaim aluminum from scrap that contains substantial quantities of iron by using heat to separate the low melting point aluminum from the scrap while the higher melting point iron remains in solid form. These units are also known as dry hearth furnaces. Figures 1 through 4 show examples of sweat furnaces.

Due to their small size and portability, sweat furnaces are common in many industries. They are used to process scrap that cannot be processed in other furnaces. For example, scrap yards use sweat furnaces to reclaim aluminum from many forms of scrap (sheet and cast aluminum), and automotive salvage yards use them to reclaim aluminum from unusable auto parts (such as transmissions).

#### **2.2 Does this regulation apply to new and existing sweat furnaces?**

Yes, the regulation applies to all existing sweat furnaces and all new or reconstructed sweat furnaces. A sweat furnace that was built after February 11, 1999 is a “new” sweat furnace. See section 4.1.1 of this document for information on differences in regulations for new and existing sweat furnaces.

#### **2.3 What does “reconstructed” mean?**

Reconstructed or reconstruction has a specific meaning in the rule. For sweat furnaces, reconstruction means replacement of the components of a sweat furnace such that the fixed capital cost of the new components is greater than 50 percent of the fixed capital cost that would be required to construct a comparable new sweat furnace, and it is technologically and economically feasible for the reconstructed sweat furnace to meet the emission standard for dioxins and furans. Replacement of the refractory in a sweat furnace is not considered to be reconstruction. A sweat furnace that was reconstructed after February 11, 1999 is a “reconstructed” sweat furnace.



## Photos of Sweat Furnaces



Figure 1: Large Sweat Furnace

Figure 2: Small Sweat Furnace<sup>1</sup>

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<sup>1</sup> This furnace is likely to not meet the requirements of the rule.



## Photos of Sweat Furnaces



Figure 3: Small Sweat Furnace<sup>2</sup>  
Figure 4: More Sweat Furnaces

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<sup>2</sup> This furnace is likely to not meet the requirements of the rule.



# Compliance Checklist



## 3.0 Requirements You Need to Comply With

### Air Quality Requirements

#### Initial Compliance

A-1   We operate an afterburner with a design residence time of 0.8 seconds or greater and an operating temperature of 1600°F or greater.

**OR**

We conducted a test to show that the emissions of dioxins and furans are at or below  $3.5 \times 10^{-10}$  grains of dioxins and furans per dry standard cubic foot at 11 percent oxygen (or 0.80 nanogram of dioxins and furans toxicity equivalents [TEQ] per dry standard cubic meter at 11 percent oxygen).

☆ You have two options for demonstrating that you comply with this standard, see section 4.1.6 of this document for details.



- We don't put items into our sweat furnace if the items can hold water.



- Dioxins and furans increase the likelihood of developing cancer.



- We wash materials before placing them into our sweat furnace in order to remove some chemicals that could be released into the atmosphere.



# Compliance Checklist



## Continuous Compliance

- A-2 We demonstrate continuous compliance with the emission standard in **ONE** of the following ways:
- G If you conducted a performance test to demonstrate initial compliance: we monitor the 3-hour block average operating temperature of the afterburner to ensure that it is at or above the temperature we established during the performance test.
  - G If you have an afterburner with a design residence time of 0.8 seconds<sup>3</sup> or greater and an operating temperature of 1600°F or greater: we monitor the 3-hour block average operating temperature to ensure that it is at or above 1600°F.
  - G If you use a control device other than an afterburner: we demonstrate continuous compliance according to the procedures we included in our operation, maintenance, and monitoring (OM&M) plan.
- ☆ See section 4.1.8 and Checklist 2 for more information on continuous compliance.

## Inspection

- A-3   We inspect every afterburner at least once a year, and make repairs according to our OM&M plan (see requirement A-4).
- ☆ See section 4.2 for an inspection checklist.

## Plans

- A-4   We have prepared, submitted, and are following our *OM&M plan*.
- ☆ You must submit your OM&M plan to the State or local regulatory agency that issues operating permits to sources of air pollution.
  - ☆ For more information on what to include in an OM&M plan, see section 4.3.2 of this document.



• *Suggestions??*

P<sup>2</sup>

• Good operation and maintenance of our equipment helps prevent pollution.

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<sup>3</sup> The final rule promulgated on 3/23/00 specified a design residence time of 2 seconds. However, this value was erroneous and had been corrected in the proposed amendments published on 6/14/02 (67 FR 41125).



# Compliance Checklist



- A-5         Yes No  
 We have prepared and are following our *Startup, Shutdown, & Malfunction (SSM) plan*.  
 ☆ You must submit your SSM plan as part of your notification of compliance status report (see requirement A-9).  
 ☆ See section 4.3.2 for more information on what to include in your SSM plan.

- A-6          Yes No N/A  
 We submitted a *site-specific test plan* at least 60 days before we were scheduled to conduct a performance test.<sup>4</sup>  
 ☆ See section 4.3.3 for more information on what to include in your site-specific test plan.

## Notifications & Reports

- A-7         Yes No  
 We submitted an *initial notification* within 120 days after the effective date of the regulation (March 23, 2000) or 120 days after starting up our facility.  
 ☆ Section 4.4 contains more information on all of the notifications you must submit.

- A-8          Yes No N/A  
 We submitted a *notification of intent to conduct a performance test* at least 60 days before we were scheduled to conduct a performance test.<sup>4</sup>

|   |                        |
|---|------------------------|
|  | • <i>Suggestions??</i> |
| <b>P<sup>2</sup></b>  | • <i>Suggestions??</i> |

<sup>4</sup> This requirements does not apply to you if your sweat furnace is equipped with an afterburner that has a design residence time of 0.8 seconds or greater and an operating temperature of 1600°F or greater. You should check the “N/A” box.



# Compliance Checklist



- A-9  Yes  No
- We submitted a complete *notification of compliance status report* within 60 days after our compliance date.
- ☆ An official from your company must sign the report and certify its accuracy.
  - ☆ The following items must be included with your notification of compliance status report. See section 4.4.2 and Checklist 6 for a full description of items to include in your report.
    - A complete performance test report, if required
    - Your approved site-specific test plan, if required
    - Your approved OM&M plan
    - Your current SSM plan
  - ☆ You may submit your report in parts (e.g., the items do not all have to be submitted at the same time).

- A-10  Yes  No
- We submit an *excess emissions/summary report* every 6 months, within 60 days of the end of each 6-month period (e.g., submit by 8/30 for 1/1 - 6/30 period).
- ☆ Section 4.4.3 provides an explanation of this report.

- A-11  Yes  No
- We submit *semi-annual SSM reports* to report startup, shutdown, and malfunction events for which we took actions that were consistent with our SSM plan.
- ☆ These reports are due 30 days after the end of each calendar half.
  - ☆ More information about SSM-related reports can be found in section 4.4.

|   |                        |
|---|------------------------|
|  | • <i>Suggestions??</i> |
| $P^2$   | • <i>Suggestions??</i> |



# Compliance Checklist



- A-12   Yes No
- We submit *immediate SSM reports* to report startup, shutdown, and malfunction events for which we took actions that were inconsistent with our SSM plan.
- ☆ An initial report must be made within two working days of the event, and a letter report must be submitted within 7 working days of the event.
  - ☆ More information about SSM-related reports can be found in section 4.4.

- A-13   Yes No
- We submit *reports on malfunctions not listed in our SSM plan* that affect our continuous monitoring systems (e.g., temperature monitoring device).
- ☆ An initial report must be made within 24 hours of the event, and a letter report must be submitted within 14 working days of the event.
  - ☆ More information about SSM-related reports can be found in section 4.4.

## Recordkeeping

- A-14   Yes No
- We maintain copies of all of the records we are required to keep.
- ☆ These records must be kept for at least 5 years, and the most recent 2 years of records must be kept on-site. Records must be accessible within 24 hours of a request to see them.
  - ☆ Records may be kept in hard copy, or you may use microfilm, computer disks, magnetic tape, etc. to store them.
  - ☆ See section 4.5 and Checklist 7 for a checklist of all of the records you must keep.



- We update our SSM report as needed to ensure that we are prepared to handle all malfunctions.

P<sup>2</sup>

- *Suggestions??*



# Compliance Requirements



## 4.0 Explanation of Rule Requirements

This section includes explanations of the rule requirements listed in the checklist in section 3.0.

## 4.1 Compliance Requirements

### 4.1.1 When must I comply?

- ! If your operation is an existing source (a sweat furnace that began construction or reconstruction on or before February 11, 1999), you must be in compliance with the rule by March 24, 2003.
- ! If you operate a new or reconstructed source (constructed or reconstructed after February 11, 1999), you must be in compliance with the rule by March 23, 2000, or upon startup, whichever is later.

To be “in compliance” means that you (1) have either completed your test to show that you meet the emission limit or installed an afterburner with a design residence time of 0.8 seconds or greater and an operating temperature of 1600°F or greater, and (2) are monitoring the operating temperature of the afterburner. You will also need to get an operating permit from your State or local permitting authority (see section 4.1.2 below).

### 4.1.2 What is an operating permit?

An operating permit is a legally enforceable document issued by a permitting authority to a source of air pollution (e.g., a facility operating a sweat furnace) that contains all of the air-related requirements that apply to the facility. These permits are commonly called “Title V” permits, because they are required by Title V of the Clean Air Act. They are also sometimes called “part 70” or “part 71” permits, because the specific requirements for permitting programs are included in parts 70 and 71 of chapter 40 of the CFR.

As an owner or operator of a sweat furnace, you will need to get one of these permits from your State or local permitting authority. Contact your State or local permitting authority to find out how to apply for an operating permit. Under the secondary aluminum regulation, the EPA has specified that the State or local permitting authority has discretion to allow sweat furnaces at small facilities (“area sources”) to defer getting an operating permit until December 9, 2004. Your facility is an area source if your facility releases into the air less than 10 tons per year of any individual hazardous air pollutant or 25 tons per year of any combination of hazardous air pollutants. If your facility is an area source, check with your State or local permitting authority to



# Compliance Requirements



find out whether there is a deferral for your sweat furnace operation. If so, you do not need to have a permit until December 9, 2004.

### 4.1.3 How much will it cost me to comply?

Capital costs for afterburners start at \$8,000 to \$150,000 for capital costs only, and may range as high as \$250,000 to \$1 million depending on the size of the facility and the type of afterburner (e.g., thermal or regenerative). *[We are looking for help here on getting more refined cost estimates specific to the size/capacity of the afterburner.]* Installation costs vary depending on the location and size of the sweat furnace. Depending on the age and efficiency of an existing sweat furnace, it could be more cost-effective in the long run to purchase a new sweat furnace equipped with an afterburner. New sweat furnaces equipped with afterburners cost in the range of \$26,000 to \$1 million, depending on the size of the furnace. If you purchase a new afterburner (or a new sweat furnace equipped with an afterburner), you should make sure that it comes with monitoring equipment and a data recorder.

See Table 2 for a list of several vendors who sell sweat furnaces equipped with afterburners (Coreco, Stinchcombe Furnaces, and United Group), as well as vendors who sell afterburners separately (Anderson and Huntington Environmental Systems). This is not a complete list of all sweat furnace and afterburner vendors. See Table 3 and Figures 5 and 6 for information on example sweat furnaces equipped with afterburners. Figures 7 and 8 show examples of afterburners.

There are many types of sweat furnaces in use today, ranging from large, high-tech furnaces to small, portable, “home-made” furnaces. We recognize that it may be costly to bring some furnaces into compliance with the rule and that there is the possibility that some owners or operators will choose to discontinue the use of their sweat furnaces rather than install control equipment to comply with the rule.

Small, portable sweat furnaces are common in many industries. For example, scrap yards use sweat furnaces to reclaim aluminum from many forms of scrap (sheet and cast aluminum) and automotive salvage yards use them to reclaim aluminum from unusable auto parts (such as transmissions).



## Here is a Helpful List of Sweat Furnace and Afterburner Vendors



**Table 2: Vendors of Sweat Furnaces and Afterburners**

| Vendors of Sweat Furnace/Afterburner Packages  | Vendors of Afterburners  |
|--|--|
| <p>College Research Corp. (Coreco)<br/>           P.O. Box 577<br/>           Germantown, WI 53022<br/>           Phone: (262) 255-4700<br/>           Fax: (262) 255-5283<br/>           Email: <a href="mailto:coreco@netwurx.net">coreco@netwurx.net</a><br/> <a href="http://www.corecorp.com">Http://www.corecorp.com</a></p> <p>Stinchcombe Furnaces, Ltd (SF)<br/>           Unit 31A, Central Trading Estate, Cable Street, Wolverhampton, WV2 2RS<br/>           United Kingdom<br/>           Tele: +44 1902 870350<br/>           Fax: +44 1902 870880</p> <p>United Group, Inc.<br/>           408 NW 14<sup>th</sup> Street<br/>           Topeka, KS 66618<br/>           Phone: (800) 999-0457<br/>           Fax: (785) 232-4218<br/>           email: <a href="mailto:jancy@unitedgroupinc.com">jancy@unitedgroupinc.com</a><br/> <a href="http://www.unitedgroupinc.com">http://www.unitedgroupinc.com</a></p> | <p>Andersen 2000, Inc.<br/>           300 Dividend Drive<br/>           Peachtree City, GA 30269<br/>           Phone: (770) 486-2000, (800) 241-5424<br/>           Fax: (770) 487-5066<br/> <a href="http://www.crownandersen.com">http://www.crownandersen.com</a></p> <p>Huntington Environmental Systems (HES)<br/>           707C West Algonquin Road<br/>           Arlington Heights, IL 60005 U.S.A.<br/>           Phone: (847) 545-8800<br/>           Fax: (847) 545-1947<br/>           Email: <a href="mailto:info@huntington1.com">info@huntington1.com</a><br/>           Email: <a href="mailto:MACT111@aol.com">MACT111@aol.com</a><br/> <a href="http://www.huntington1.com">http://www.huntington1.com</a></p> |

**Table 3: Specifications of Two Coreco Sweat Furnaces Equipped with Afterburners**

|                            | Model 1231  | Model 1848  |
|----------------------------|---|---|
| <b>Capacity</b>            | 2,000 lbs/hr  | 5,000 lbs/hr  |
| <b>Fuel Options</b>        | Natural gas, manufactured gas, liquid petroleum (LP) gas, #2 fuel oil | Natural gas, manufactured gas, liquid petroleum (LP) gas, #2 fuel oil |
| <b>Average Fuel Demand</b> | 1.2 million BTU/hr  | 3.0 million BTU/hr  |



## Photos of Sweat Furnaces and Afterburners



Figure 5: Photograph of Coreco Sweat Furnace and Afterburner (Models 1231 and 1848)  
Figure 6: Schematic of Coreco Sweat Furnace and Afterburner (Models 1231 and 1848)



## Photos of Sweat Furnaces and Afterburners



Figure 7: Afterburner  
Figure 8: Regenerative Afterburner



# Compliance Requirements



## 4.1.4 What could happen if I don't comply?

If you fail to comply with the requirements of the rule, you could face legal action under the Clean Air Act. You may be assessed civil penalties of up to \$25,000 **per day** for non-compliance.

## 4.1.5 What is the emission limitation for my sweat furnace?

To convert measurements of dioxins and furans to TEQ units, you must use the procedures and equations in *Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs) and 1989 Update*, EPA-625/3-3-89-016. The document is available from the National Technical Information Service (<http://www.ntis.gov>). Order document number PB 90-145756.

A sweat furnace may not emit more than  $3.5 \times 10^{-10}$  grains of dioxins and furans per dry standard cubic foot at 11 percent oxygen. This emission standard can also be expressed in terms of toxicity equivalents (TEQ): 0.80 nanogram of dioxins and furans TEQ per dry standard cubic meter at 11 percent oxygen. Note that the unit of volume in the first form of the emission standard is a cubic foot, but the unit of volume in the second form is a cubic meter.

## 4.1.6 What can I do to comply with the emission limitation for my sweat furnace?

You have two options to select from in showing that your sweat furnace complies with the emission limitation:

1. Conduct a performance test whose results show that the emissions from the process are less than the emission limitation listed in section 4.1.5. See section 4.1.7 for an explanation of how to conduct a performance test.
  - In most cases, you will choose to use a control device to reduce furnace emissions. An afterburner is the most commonly used control device for sweat furnaces.
  - In some cases, you may choose instead to burn clean fuels or make other process modifications to meet the emission limitation.

An afterburner is a device that uses controlled flame combustion to convert combustible materials to noncombustible gases. Other names for an afterburner are thermal oxidizer and incinerator.



# Compliance Requirements



2. Show that the afterburner maintains a design residence time of 0.8 seconds<sup>5</sup> or greater and an operating temperature of 1600°F or greater. By complying with these design requirements, you would not be required to conduct emissions testing to show compliance with the emission limit because the high temperature and residence time would ensure that you are meeting the regulation.

We expect that most of you will choose to comply with option #2. However, if you choose to conduct a performance test instead, you would likely need to hire a testing contractor to perform the test and prepare a report documenting the results of the test (your State or local air pollution control agency should have a list of contractors in your area). The cost for a performance test to measure dioxins and furans can range from \$XX,000 to \$XX,000. You may want to consider whether it would be more cost-effective in the long run to buy a new sweat furnace equipped with an afterburner that has a design residence time of 0.8 seconds or greater and an operating temperature of 1600°F or greater instead of conducting a performance test.

#### **4.1.7 How do I conduct a performance test to demonstrate initial compliance?**

Unless you are using an afterburner meeting the design requirements specified in the rule, you must conduct a performance test (or provide the results of a representative test as described below) in order to show that the average concentration of dioxins and furans (averaged over three cycles) is less than the emission limitation. You will also establish the operating limits that you will continue to monitor to ensure the ongoing performance of the control device. Performance tests must meet all the specifications in Checklist 1 on the following page of this workbook. Your State or local air pollution control agency should have a list of contractors in your area who you can hire to conduct performance tests.

You may not need to conduct a performance test if you have already conducted a performance test in which you measured the required parameters. You must obtain approval to substitute a previous performance test from the regulatory agency with jurisdiction over your sweat furnace (see section 1.6 for contact information). For this previous test, you must satisfy all the following conditions to obtain their approval:

Checklist 1 on the following page of this workbook refers to the “operating cycle.” In the context of sweat furnaces, operating cycle means the period including the charging and melting of scrap aluminum and the fluxing, refining, alloying, and tapping of molten aluminum (the period from tap-to-tap).

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<sup>5</sup> The final rule promulgated on 3/23/00 specified a design residence time of 2 seconds. However, this value was erroneous and had been corrected in the proposed amendments published on 6/14/02 (67 FR 41125).



## Compliance Requirements



- G Provide the complete emission test report from the previous performance test.
- G In the previous performance test, you used the test methods and procedures listed in Checklist 1.
- G Certify that you have not changed the design or operating procedures of either the sweat furnace or add-on pollution control equipment since the previous test.
- G In the previous performance test, you monitored the operating parameters according to the procedures in Checklist 2.
- G The emission test report documents how you monitored the operating parameters.



## Here is a Helpful Checklist for Performance Tests



### Checklist 1: How to Design and Conduct Performance Tests

- G At least 60 days before conducting a performance test, prepare and submit a “site-specific test plan” (see section 4.3.3) to the State or local regulatory agency that issues operating permits to sources of air pollution. That plan must meet the specifications in 40 CFR §63.7(c). You may not conduct a performance test until the regulatory agency has approved your site-specific test plan.
- G Conduct every performance test according to the General Provisions in subpart A of 40 CFR Part 63.
- G Conduct the first performance test. New and reconstructed sources must conduct the test by March 23, 2000 or upon startup, whichever is later. Existing sources must conduct the test by March 24, 2003.
- G You must operate the sweat furnace at the highest production level and with materials that represent the range of materials that you expect to process.
- G Conduct the test three times.
- G Sample dioxins and furans over the entire operating cycle.
- G Measure emissions at the outlet of the control device.
- G Measure emissions according to Test Method 23 in appendix A of 40 CFR Part 60. You may use an alternative test method with the approval of the Administrator of the U.S. Environmental Protection Agency.
- G You must conduct a performance test every 5 years if your sweat furnace is in a secondary aluminum production facility that is a major source (see Appendix A for a definition of “major source”).
- G Report the results of the first performance test and all the subsequent tests in a “notification of compliance status report” (see section 4.4.2).



## Compliance Requirements



### **4.1.8 How must I monitor my sweat furnace to demonstrate continuous compliance (e.g., ensure that it does not emit too much)?**

If you conducted a performance test, you must continuously monitor the operating temperature of the afterburner to show that you maintain the 3-hour block average operating temperature of the afterburner at or above the average temperature established during your performance test. Checklist 2 on the following page explains how to monitor the operating temperature of an afterburner. Your monitoring equipment should have a data recorder so you can automatically keep records of your monitoring data. Your sweat furnace or afterburner may malfunction, causing the value of an operating parameter to deviate from the value or range established during the performance test. When the latter event happens, you must quickly repair the equipment and take steps to prevent another breakdown.

If you did not conduct a performance test, you must continuously monitor the operating temperature of the afterburner to show that you maintain the 3-hour block average operating temperature of the afterburner at or above 1600°F (see Checklist 2). This requirement only applies to afterburners with a design residence time of 0.8 seconds<sup>6</sup> and an operating temperature of 1600°F or higher. Residence time means the duration of time required for gases to pass through the combustion zone of the afterburner. Calculate residence time by dividing the volume (cubic feet) of the combustion zone of the afterburner by the volumetric flow rate of the gas stream in actual cubic feet per second (acfs). For example, an afterburner with a volume of 30,000 cubic feet and a flow rate of 20,000 acfs would have a residence time of 1.5 seconds (e.g.,  $30,000 \text{ ft}^3 \div 20,000 \text{ acfs} = 1.5 \text{ seconds}$ ). Your monitoring equipment should have a data recorder so you can automatically keep records of your monitoring data.

If you use a control device other than an afterburner or have made other process changes to reduce emissions, your operation, maintenance, and monitoring (OM&M) plan (see section 4.3.1) must reflect all of the necessary procedures and parameters you will use to ensure the continuous compliance of the sweat furnace with the emission limitation. See §63.1510(b) of the rule for more information (see Appendix D). Your monitoring equipment should have a data recorder so you can automatically keep records of your monitoring data.

You may apply to the Administrator of the U.S. Environmental Protection Agency for permission to use alternate monitoring requirements. Section 63.1510(w) in the regulation (see Appendix D) describes the process you would follow to submit an application.

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<sup>6</sup> The final rule promulgated on 3/23/00 specified a design residence time of 2 seconds. However, this value was erroneous and had been corrected in the proposed amendments published on 6/14/02 (67 FR 41125).



## Here is a Helpful Checklist for Monitoring Afterburner Temperature



### Checklist 2: Actions to Take to Monitor the Operating Temperature of an Afterburner\*

1. Ensure that the temperature monitoring device satisfies all of the following specifications:
  - G It is installed at the exit of the combustion zone of the afterburner.
  - G It records the 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).
  - G The response range of the data recorder must include the following values: (1) zero and (2) 1.5 times the “average temperature.”
2. Determine the “average temperature” that you will use to verify the operation of your data recorder using the following steps:
  - G Before the first test of the performance of your afterburner, evaluate the performance of the temperature monitor according to 40 CFR §63.8.
  - G When you conduct your performance test, you must conduct three test runs.
  - G Continuously measure and record the operating temperature for each run.
  - G Record the 15-minute block average temperature for each run.
  - G Record the 3-hour block average temperature for each run.
  - G Calculate the “average temperature” by adding the three 3-hour block average temperatures, and divide by three.
  - G Use a thermocouple-potentiometer system or an alternative approved method.

\*You must install, calibrate, maintain, and operate a device to continuously monitor and record the operating temperature of the afterburner. You must satisfy the requirements for continuous monitoring systems in subpart A of 40 CFR Part 63.



## Here is a Helpful Checklist for Inspecting Afterburners



### 4.2 Inspection Requirements

You must inspect every afterburner at least once a year. Repairs must be made according to your OM&M plan. Follow Checklist 3, and record the results of your inspection.

#### **Checklist 3: Actions to Take When Conducting the Annual Inspection of an Afterburner**

- G Inspect all burners, pilot light assemblies, and pilot light sensing devices for proper operation.
- G Clean the pilot light sensors.
- G Inspect the combustion air for proper adjustment.
- G Inspect baffles and other internal structures to ensure their structural integrity.
- G Inspect dampers, fans, and blowers for proper operation.
- G Inspect sealing to make sure it is proper.
- G Inspect motors for proper operation.
- G Inspect the refractory lining of the combustion chamber. Clean and replace the refractory lining as necessary.
- G Inspect the shell of the afterburner for corrosion and hot spots.
- G For the burn cycle that follows the inspection, document the proper operation of the afterburner. Document adjustments to the afterburner.
- G Verify that the afterburner is in good operating condition.
- G Follow your operation, maintenance, and monitoring plan when making repairs.



# Plan Requirements



## 4.3 Plan Requirements

### 4.3.1 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 State or local regulatory agency that issues operating permits to sources of air pollution. The regulatory agency will review your plan and may require changes before approving your permit application. If needed, you may change the original plan; you will have to give the revised plan to the regulatory agency for their review. Checklist 4 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 (see section 4.1.2 for more information).

#### **Checklist 4: The Seven Basic Components of an OM&M Plan**

- G 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.
- G The schedule for monitoring the parameters in the list.
- G A description of the actions you will take to properly operate and maintain each sweat furnace and the afterburner or other emission control device.
- G A description of the actions you will take to properly operate and maintain the device that monitors the parameters in the list.
- G The actions you will take to monitor the parameters on your list.
- G 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.
- G The schedule you will follow to maintain a sweat furnace or emission control device.



## Plan Requirements



### 4.3.2 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, which is described in section 4.4.1.

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:

40 CFR §63.6(e)(3) explains the purpose of an SSM plan, what it should include, and how to keep SSM records.

- G What you will do to determine the cause of malfunctions.
- G How you will record the cause of malfunctions.
- G How you will record the time the malfunction began and ended.
- G What you will do to repair malfunctioning equipment.
- G 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.

### 4.3.3 What is a site-specific test plan?

Before conducting a performance test, you must prepare and submit a “site-specific test plan” to the State or local regulatory agency that issues operating permits to sources of air pollution. That plan must meet the specifications in 40 CFR §63.7(c). You may not conduct a performance test until the regulatory agency has approved your site-specific test plan. You must submit the site-specific test plan at least 60 days before the first performance test.

If you choose to conduct a performance test, you likely would want to hire a testing contractor to perform the test. The contractor would also be able to prepare the site-specific test plan for you. Your State or local air pollution control agency should have a list of contractors in your area.



## Notification & Reporting Requirements



### 4.4 Notifications and Reporting Requirements

Checklist 5 on the following page lists the notifications and reports you are required to submit.

#### 4.4.1 What reporting requirements are associated with the performance test?

You must notify your regulatory agency of your intent to conduct a performance test at least 60 days before the scheduled date of the test. You must also notify them of the scheduled date of the test.

You must report the results of performance tests to your regulatory agency. Submit a complete report that documents test methods and procedures, operation of the sweat furnace and add-on pollution control equipment, and the operating parameters and their acceptable values. Submit the report with your notification of compliance status (within 60 days after the compliance date that applies to you).



## Here is a Checklist of Your Reporting Requirements



### Checklist 5: Summary of Sweat Furnace Reporting Requirements

| Report   | Deadline   |
|--|--|
| G Initial notification                                       | 120 days after effective date or startup   |
| G Notification of anticipated date of performance test       | 60 days before performance test  |
| G Site-specific test plan                                    | 60 days before performance test  |
| G OM&M plan  | As part of part 70 or part 71 permit application   |
| G Notification of compliance status report                   | 60 days after compliance date  |
| G Excess emissions reports                                   | Semi-annually, 60 days after calendar half   |
| G Annual compliance certification/summary report             | Semi-annually, 60 days after calendar half   |
| G SSM reports  | 30 days after calendar half when a SSM occurred  |
| G Report of actions inconsistent with SSM plan               | 2 working days after event (phone report) and 7 working days after event (letter report) |
| G Report of malfunctions outside of SSM plan that affect CMS | 24 hrs. after event (phone report) and 14 days after event (letter report)               |



## Notification & Reporting Requirements



### 4.4.2 What must I include in the notification of compliance status report?

You must submit a complete “notification of compliance status report” within 60 days of the compliance date that applies to you. Checklist 6 lists the items that you must report. If you do not need to conduct a performance test, then some of the items in Checklist 6 do not apply to you.

An official of your company must sign the report and certify its accuracy.

You may submit the report in several ways:

- in an application for an operating permit
- in an amendment to an application for an operating permit, or
- as a separate document.

You may also submit the report in parts; you do not need to duplicate previously-submitted parts. You must submit all the parts within 60 days of the compliance date that applies to you.

Submit the report to your regulatory agency. In addition, if your sweat furnace is in a State with an approved operating permit program but for which delegation of authority under section 112(l) of the Clean Air Act has neither been requested nor approved, you must also submit the report to the Regional Administrator in the regional office of the U.S. Environmental Protection Agency for your state. The State or local regulatory agency with jurisdiction over your sweat furnace can inform you about the status of their operating permit program.



## Here is a Checklist for Your Notification of Compliance Status



### Checklist 6: What to Include in the Notification of Compliance Status Report

- G A complete performance test report for each sweat furnace that contains the following information:
  - G All the data from the test.
  - G All measurements from the test.
  - G All calculations from the test.
- G Approved site-specific test plan.
- G Performance evaluation test results for each continuous monitoring system.
- G Acceptable value or range of values for the parameters of the afterburner or other add-on control device that you will monitor to ensure that the sweat furnace does not emit too much.
- G Supporting documentation for the acceptable parameter values.
- G Description of the procedure used to establish the acceptable parameter values. Include the operating cycle or time period used in the performance test.
- G Information that shows that your capture/collection system satisfies the requirements of the regulation.
- G If you operate an afterburner to control emissions from a sweat furnace and you do not need to conduct a performance test, information that documents the design residence time and design operating temperature of the afterburner. The afterburner manufacturer's specifications may be sufficient.
- G Approved operation, maintenance, and monitoring plan.
- G Current startup, shutdown, and malfunction plan.



## Notification & Reporting Requirements



### 4.4.3 What information on emissions must I report?

You must submit an “excess emissions/summary report” to your regulatory agency every 6 months. The report is due 60 days after the end of each 6-month period.

You must submit a report even if your sweat furnace and add-on pollution control equipment operated properly (within the normal parameters). State in the report that excess emissions were not made during the report period. You must also provide the information specified in 40 CFR §63.10(c).

You must provide additional information in the excess emissions/summary report if a sweat furnace or add-on pollution control equipment did not operate properly. The required information depends on the following circumstances:

- If the afterburner temperature or the actual value of any other significant parameter went outside the range required for compliance with the emission standard.
- If an action taken during startup, shutdown, or a malfunction was inconsistent with your startup, shutdown, and malfunction plan.

### 4.4.4 What else must I report on a regular schedule?

Every year, you must certify continuing compliance with the regulation. You complied if your sweat furnace and add-on pollution control equipment operated properly (within the normal parameters), and you met all the monitoring, recordkeeping, and reporting requirements.

### 4.4.5 What must I report about startups, shutdowns, and malfunctions?

When actions that you take during startups, shutdowns, and malfunctions are consistent with the procedures in your SSM plan, you must keep records demonstrating that you followed the procedures in your SSM plan (for example, this may take the form a checklist). On a semi-annual basis, you must submit a report confirming that you took actions consistent with your plan during startups, shutdowns, and malfunctions that occurred during the semi-annual reporting period. These reports are due 30 days after the end of the calendar half (e.g., due 7/30 for the calendar half covering 1/1 through 6/30).

If you take actions during a startup, shutdown, or malfunction that are not consistent with your SSM plan, you must record the actions that you took during the event. You must then report the event to your regulatory agency (e.g., by telephone) within 2 working days of commencing the actions inconsistent with your plan. You must also submit a letter within 7 working days after the end of the event reporting that you took actions inconsistent with your plan.



## Notification & Reporting Requirements



If a malfunction occurs that affects your continuous monitoring system (e.g., temperature monitoring device) and that was not previously described in your SSM plan, you must report the actions you took by making an initial (e.g., telephone) report of the event within 24 hours after commencing the actions inconsistent with your plan. You must also submit a follow-up written report within 2 weeks after commencing the actions. This report must certify that corrective actions have been made or include plans to take corrective actions. See 40 CFR §63.8(c)(ii) for more information about this report.

### **4.4.6 What must new or reconstructed sources report?**

If you meet the following conditions, you must notify your regulatory agency that your new or reconstructed furnace is subject to the regulation (see section 4.1.1 for an explanation of new and reconstructed sweat furnaces).

- You begin operating the sweat furnace after February 11, 1999, and
- You will not need to apply for approval of construction or reconstruction.

If you intend to build a new sweat furnace or reconstruct a sweat furnace, you must notify your regulatory agency of your intent. The notification must include all the information specified in 40 CFR §63.5(d), which applies to applications for approval of construction or reconstruction. You must submit the application before the planned date of construction or reconstruction.



## Recordkeeping Requirements



### 4.5 Recordkeeping Requirements

You must maintain files that contain all the reports and notifications that are required by this regulation. You must keep records for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, or record. The records from the most recent 2 years must be on the premises of the facility at which the sweat furnace is located. You may use microfilm, computer disks, magnetic tape, or microfiche to store records. You may submit information on paper or on a labeled computer disk. If you use the latter, you must create the electronic documents in formats that allow EPA's staff, or the staff of your State, local, or Tribal air pollution control agency, to open them with software they use (e.g., Word Perfect, Microsoft Word).

If you control emissions of dioxins and furans with an afterburner, you must keep additional records.

- G Records of 15-minute block average operating temperature of the afterburner.
- G Records of any period when the average temperature in any 3-hour block period falls below the value necessary to prevent excess emissions.
- G Explanations, which may be brief, of the cause of temperatures that are too low.
- G Descriptions of the actions taken to repair the afterburner.
- G Records of annual inspections of afterburners.

You must keep the records specified in 40 CFR §63.10(c) if you operate a continuous monitoring system. These records include: all required monitoring measurements, information about malfunctions, the data and time of periods during which the monitoring system was inoperative or out-of-control, and other records.

You must keep records of the annual inspections of emission capture/collection and closed vent systems, and records for any approved alternative monitoring procedure or test method. Additionally, you must have at hand the current startup, shutdown, and malfunction plan. You must also have the records that document how you followed the plan. Checklist 7 on the following page lists the records you must keep.



## Here is a Helpful Checklist of Your Recordkeeping Requirements



### Checklist 7: Summary of Sweat Furnace Recordkeeping Requirements

- G For afterburner: records of 15-minute average operating temperature, including any period when average temperature in any 3-hr block period falls below compliant operating parameter value with a brief explanation of cause and corrective action taken; records of annual inspection
- G For capture/collection systems: records of annual inspection
- G Copies of all notifications and reports and their supporting documentation
- G Records of occurrence and duration of each SSM or malfunction of operation of process and control equipment
- G Records of actions inconsistent with your SSM plan and actions consistent with your SSM plan
- G Records of measurements needed to demonstrate compliance
- G Records of performance test results
- G Records of any approved alternative monitoring or test procedure
- G SSM plan
- G OM&M plan



## Additional Requirements



### 4.6 Additional Requirements

Appendix A to the regulation lists all the elements in the “General Provisions” which also apply to secondary aluminum producers. You must meet these requirements as indicated in Appendix A of the rule. In addition, the rule contains many other requirements which apply to other types of equipment at secondary aluminum production facilities. If you operate any of these other types of equipment (e.g., scrap shredders, chip dryers, other types of furnaces), you should read the applicable parts of the rule.



# Appendix A



## Appendix A – Glossary of Terms

### Common Definitions for Some Terms Used in this Document

#### **Afterburner**

A device that uses controlled flame combustion to convert combustible materials to noncombustible gases. Other names for an afterburner are thermal oxidizer and incinerator.

#### **Capture/Collection Systems**

Equipment that is used to capture and collect air pollution (e.g., particulate matter).

#### **Control Device**

Equipment, other than inherent process equipment, that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere (e.g., afterburner).

#### **Dioxins and Furans (D/F)**

Tetra-, penta-, hexa-, and octachlorinated dibenzo dioxins and furans.

#### **Emission**

Any discharge or release of an air contaminant to the ambient air.

#### **Excess Emissions**

Any emissions greater than those permitted by the sweat furnace emission limitation.

#### **HAP**

Any hazardous air pollutant listed in or pursuant to section 112(b) of the Clean Air Act.

#### **Major Source**

An stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.

#### **Operating Cycle**

The period including the charging and melting of scrap aluminum and the fluxing, refining, alloying, and tapping of molten aluminum (the period from tap-to-tap).

#### **Residence Time**

For an afterburner, the duration of time required for gases to pass through the afterburner combustion zone.



## Appendix A



### **Sweat Furnace**

A furnace used exclusively to reclaim aluminum from scrap materials that contain substantial quantities of iron by using heat to separate the low-melting point aluminum from the scrap while the higher melting point iron remains in solid form.

### **TEQ**

The international method of expressing toxicity equivalents for dioxins and furans as defined in “Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and -Dibenzofurans (CDDs and CDFs) and 1989 Update” (EPA-625/3-89-016).



# Appendix B



## Appendix B – Sweat Furnace Brochure

*we will add the brochure here*



## Appendix C



### Appendix C – Example Reporting Forms and Plans

This section will include examples of the following:

- ✓ OM&M plan
- ✓ SSM plan
- ✓ Initial notification
- ✓ Notification of intent to conduct a performance test
- ✓ Notification of compliance status report
- ✓ Excess emissions/summary report
- ✓ Annual compliance certification
- ✓ SSM report
- ✓ Test report

These are still under development.



# Appendix D



## **Appendix D – Secondary Aluminum Production Rule**

*If we add the rule text here in 10 pt. font with minimal spacing, it takes up 33 pages.*