

Secondary Aluminum Production Facility NESHAP— Area Source Requirements

The U.S. Environmental Protection Agency (EPA) sets standards to control hazardous air pollution through National Emissions Standards for Hazardous Pollutants (NESHAP) as part of the 1990 Clean Air Act Amendments. Standards may be established for both Major and Area Sources. A major source is a facility with maximum theoretical emissions greater than 10 tons per year of any one hazardous air pollutant (HAP) regulated by EPA, or greater than 25 tons per year of combined HAP emissions. Refer to the fact sheet [MTE and PTE Calculation Examples \(SB-113\)](#) for assistance in determining whether your facility is considered a major or area source, or contact the Department of Natural Resources' (DNR's) Small Business Environmental Assistance Program (SBEAP) for help. The following is a summary of the Secondary Aluminum Production Facility NESHAP—originally issued on March 23, 2000 and amended on September 18, 2015—as it affects Area Sources.

Secondary Aluminum NESHAP

Secondary aluminum production facility regulated by this rule uses clean charge, aluminum scrap, or dross from aluminum production, as the raw material and performs one or more of the following processes: scrap shredding, scrap drying/delacquering/decoating, thermal chip drying, furnace operations (i.e., melting, holding, sweating, refining, fluxing, or alloying), recovery of aluminum from dross, in-line fluxing, or dross cooling. A secondary aluminum production facility may be independent or part of a primary aluminum production facility. Emissions units affected by requirements in the NESHAP include: aluminum scrap shredders, thermal chip dryers, scrap dryers/delacquering kilns/decoating kilns, melting and/or holding furnaces (group 1 and group 2), sweat furnaces, dross-only furnaces, and rotary dross coolers.

Major sources of hazardous air pollutants must comply with every section of the rule applicable to their specific emissions units. Area sources are only required to meet the sections of the rule related to dioxin and furan (D/F) emissions. Area sources are those businesses with emissions of hazardous air pollutants below the major source level. **There is no lower threshold that exempts very small sources of emissions from the requirements in this NESHAP.** However, facilities used for research and development and do not produce a saleable product are not affected by the rule. Area sources are not required to obtain a Title V permit (major source operation permit) solely because they are affected by this rule. New units must be in compliance upon start-up. For all units installed prior to February 11, 1999, compliance was required by March 23, 2003. Units constructed before February 14, 2012 must comply with the amended sections of the rule by March 16, 2016.

Aluminum die casters, foundries or extruders are *not affected* by the rule so long as they:

- ⇒ melt only clean charge, unpainted/uncoated customer returns, and internal runaround, and
- ⇒ do not operate thermal chip dryers, scrap dryers/delacquering kilns/decoating kilns, or sweat furnaces.

The one exception is for aluminum die casters, foundries, or extruders that are area sources and that operate thermal chip dryers. The furnaces are not subject to the rule so long as the dryer operates with only clean charge.

Area Sources Affected

Secondary aluminum production facilities that are area sources must meet the D/F limits on the following units:

- ① Sweat furnaces
- ② Thermal chip dryers
- ③ Scrap dryers/delacquering kilns/decoating kilns
- ④ Group 1 furnaces (or secondary aluminum production unit [SAPU] with one or more Group 1 furnaces)

These units are described in more detail on the following pages.

Clean Charge

Clean charge is considered:

- ✓ molten aluminum;
- ✓ T-bar, sow, ingot, billet, pig;
- ✓ alloying elements;
- ✓ uncoated/unpainted chips, thermally dried or treated by a centrifugal cleaner;
- ✓ aluminum scrap dried at no less than 650°F;
- ✓ aluminum scrap delacquered or decoated at no less than 900°F;
- ✓ oil and lubricant free, unpainted/uncoated gates and risers;
- ✓ oil and lubricant free, unpainted/uncoated scraps, shapes or products not contaminated; or
- ✓ runaround scrap, as it is defined in the rule.

Sweat Furnaces

A sweat furnace is a unit specifically designed to reclaim aluminum from scrap that contains large quantities of iron. The aluminum has a lower boiling point than iron and will melt off in the furnace at the right temperature, while the iron remains solid. 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 D/F TEQ greater than 3.5×10^{-10} gr per dry standard cubic foot (dscf) [0.80 nanogram (ng) per dry standard cubic meter (dscm)] at 11% oxygen. To meet this limit, a sweat furnace would likely require installation of an afterburner on the furnace exhaust.

An **alternate limit** is to operate an afterburner with a residence time of 0.8 second or greater and an operating temperature of 1600°F or greater. If the afterburner installed has a residence time shorter than 0.8 second or cannot be operated at sufficiently high temperature, there is no option but to meet the emissions limit of 3.5×10^{-10} gr per dscf.

Compliance Demonstration

An initial compliance test is required to demonstrate that each afterburner meets the level of emissions required in the limit. If you opt for the alternate limit, you 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 in operation.

Operating Requirements

Install and operate an afterburner on the furnace exhaust as needed. The afterburner must meet the specifications in the alternate limit or demonstrate compliance through the stack test. If a stack test was conducted, maintain the average temperature of the afterburner for each 3-hour period at or above the average operating temperature recorded during the test. The afterburner must operate according to the Operation, Maintenance, and Monitoring (OM&M) Plan. See below for elements required in the OM&M Plan.

Monitoring Requirements

Install a continuous measurement device for the afterburner temperature. The device must record the average temperature for each 15-minute block and calculate 3-hour block averages. In addition, the afterburner should be inspected annually and repairs completed according to the OM&M Plan.

Thermal Chip Dryers

A thermal chip dryer is a device that uses heat to evaporate water, oil, or oil/water mixtures from unpainted/uncoated aluminum chips. Preheating units used solely to drive off water are not considered thermal dryers for this rule.

Emission Limits

An owner or operator of a thermal chip dryer must have emissions of dioxin/furan toxic equivalents (D/F TEQ) of not more than 3.5×10^{-5} grains (gr) per ton [2.50 micrograms (μg) per megagram (Mg)] of feed/charge. It may be necessary to install an afterburner to the exhaust of a thermal chip dryer to meet the emission limit.

Compliance Demonstration

An initial performance test is required within 180 days of when a new unit starts operation. When controlled by an afterburner, the average operating temperature of the afterburner will also be measured during the performance test. The feed/charge weight must be recorded during the test.

Operating Requirements

The thermal chip dryer may not be operated with anything but unpainted/uncoated aluminum. Operate a device that measures and records the weight of each charge. Maintain the average temperature in the afterburner for each 3-hour period at or above the operating temperature recorded during the performance test. The afterburner should be operated according to the OM&M Plan. See below for elements required in the OM&M Plan.

Monitoring Requirements

Record the content of each feed/charge batch, and certify that the feed/charge materials consist of only unpainted/uncoated aluminum every 6 months. The certification should state: “Only unpainted aluminum chips were used as feedstock in any thermal chip dryer during this reporting period.”

Install a continuous measurement device for the afterburner temperature. The device must record the average temperature for each 15–minute block and calculate 3-hour block averages. In addition, the afterburner should be inspected annually and repairs completed according to the OM&M Plan.

Scrap Dryer/Delacquering Kiln/Decoating Kiln

A scrap dryer/delacquering kiln/decoating kiln refers to a unit primarily used to remove organic contaminants such as oil, paint, lacquer, ink, plastic, and/or rubber from aluminum scrap—including used beverage containers—prior to melting.

Emission Limits

An owner or operator of a scrap dryer/delacquering kiln/decoating kiln must have emissions of D/F TEQ of not more than 3.5×10^{-6} gr per ton [0.25 μg per Mg] of feed/charge. It may be necessary to install an afterburner and a lime-injected fabric filter to control emissions sufficiently to meet the limit.

An alternative limit of emissions of D/F TEQ of not more than 7.0×10^{-5} gr per ton [5.0 μg per Mg] of feed charge is allowed, so long as the kiln is equipped with an afterburner that:

- ⇒ has a design residence time of at least 1 second, and
- ⇒ is operated at a temperature of at least 1400°F (760 °C) at all times.

Compliance Demonstration

An initial performance test is required within 180 days of when a new unit started operation. When using an afterburner to meet the emission limit, the average operating temperature of the afterburner will also be measured during the performance test. The feed/charge weight must be recorded during the test.

Operating Requirements

Visible labels are required on each unit identifying the emission limit and means of compliance, including operating parameter ranges, and control device temperature and residence time requirements. Operate a device that measures and records the weight of each charge. Maintain the average temperature in the afterburner for each 3-hour period at or above the operating temperature recorded during the performance test. The afterburner should be operated according to the Operation, Maintenance, and Monitoring (OM&M) Plan. See below for elements required in the OM&M Plan.

Monitoring Requirements

Ensure the labels are properly affixed to the unit at least once every six months. Record the content of each feed/charge batch. Install a continuous measurement device for the afterburner temperature. The device must record the average temperature for each 15–minute block and calculate 3-hour block averages. In addition, the afterburner should be inspected annually and repairs completed according to the OM&M Plan.

Group 1 Furnaces

New and existing secondary aluminum processing units (SAPU) that contain one or more Group 1 furnace are affected. A Group 1 furnace is any furnace designed to melt, hold, or process aluminum that contains paint, lubricants, coatings, or other foreign materials with or without reactive fluxing, or to process clean charge with reactive fluxing. Units at area sources that process only clean charge are not affected by the rule.

Emission Limits

Any Group 1 furnace must meet limits for the whole SAPU of emissions of D/F TEQ no more than 2.1×10^{-4} gr per ton [15 μg per Mg] of feed/charge. The emission limit must be met on a 3-day, 24-hour rolling average of D/F emissions. This limit may be demonstrated on the basis of aluminum production weight in each group 1 furnace rather than on the feed/charge for the SAPU.

When part of a SAPU, Group 1 furnaces may also use the following equation (equation 3 in the rule) to calculate the 3-day, 24-hour emission limit for each SAPU:

$$L_{c_{D/F}} = \frac{\sum_{i=1}^n (L_{i_{D/F}} \times T_{i})}{\sum_{i=1}^n (T_{i})}$$

Where:

- $L_{i_{D/F}}$ = The D/F emission limit for individual emission unit i , for a group 1 furnace
- $L_{c_{D/F}}$ = The daily D/F emission limit for the secondary aluminum processing unit
- T_{i} = The mass of feed/charge for 24 hours for individual emission unit i

Group 1 furnaces processing only clean charge cannot be included in this calculation since the limit does not apply. Furnaces may be changed between classifications, either from processing only clean charge to processing other than clean charge and from controlled to uncontrolled. This change in classification will change how the furnace complies with the rule. Refer to the rule for details on the process to change the classification of a furnace, including how frequently these changes are allowed to occur.

Compliance Demonstration

Visible labels are required on each unit that identify the emission limit and means of compliance, including operating parameter ranges. An initial performance test is required within 180 days of when a new unit starts operation.

If no add-on control device is used, the unit must be operated within the range of charge materials, scrap contaminant levels, and operating parameter levels established in the site-specific monitoring plan. A melting/holding furnace may use only clean charge.

When using reactive fluxing, the rate of flux added (in pounds per hour) must be maintained at or below that established during the performance test for each furnace cycle. In the case of a **sidewell** furnace, reactive flux (except for cover flux) can only be added to the sidewell unless emissions from **both** the sidewell and hearth are combined to demonstrate compliance with the emissions limit.

WITH ADD-ON CONTROL DEVICE

Each sidewell furnace must be operated so that the molten metal remains above the passage between the sidewell and the hearth. If the metal goes below the level of the passage, operators must either:

- ✓ add reactive flux only to the sidewell, or
- ✓ must have the hearth exhausted to the control device as well.

WITHOUT ADD-ON CONTROL DEVICE

If no control device is used to meet the emission limit for a Group 1 furnace, then the owner/operator must meet the following operating conditions.

- Maintain the total reactive flux injection rate at or below the average rate established during the performance test.
- Operate the furnace in accordance with work practice standards or pollution prevention measures documented in the OM&M Plan and within any parameters, values, or ranges established in the Plan.
- Develop a scrap inspection program to monitor the level of contamination in the scrap.

SCRAP INSPECTION PROGRAM	SCRAP CONTAMINATION MONITORING
√ proven method to collect representative samples	√ calculation method
√ method to measure oil and coatings content	√ procedures for characterization of distinct scrap types
√ scrap inspector training program	√ documentation of contaminant level of scrap prior to performance test
√ correlation between visual inspection and physical measure of oil and coatings content	√ limitations on the furnace feed/charge including the proportion of scrap of each distinct type used during the performance test
√ comparison of randomly selected scrap with visual inspection results for oil and coatings	√ method to ensure that no scrap with a contaminant level higher than that used in performance test is charged to the furnace
√ system to assure only acceptable scrap is charged to furnace	√ certification of scrap contaminant level
√ record keeping to document conformance with plan	

When testing an uncontrolled Group 1 furnace that processes other than clean charge, there are specific requirements for reducing emissions during the test. Refer to s. 63.1512(e)(4), Clean Air Act, for detailed requirements.

General Compliance Demonstration Requirements

Each affected unit will need to follow these requirements, as well as those specified above.

Initial Performance Testing

For units constructed or reconstructed after February 14, 2012, where an initial performance test is required the test must be completed within 180 days of the compliance deadline for new emissions units under the amended rule. The original rule had required 90 days for units considered new at the time of its promulgation.

Equation for Determining Compliance

When determining compliance with the emissions limit from the performance test results for any of the feed/charge rate based limits, except for Group 1 furnaces/SAPUs, the following equation should be used (equation 7 in the rule):

$$E = \frac{C \times Q \times K_1}{P}$$

E = emission rate of D/F (lb/ton)

C = concentration of D/F (gr/dscf)

Q = volumetric flow rate of exhaust gas (dscf/hr)

K₁ = conversion factor (1 lb/7000 gr)

P = production rate (ton/hr)

For Group 1 furnaces/SAPUs, calculate the aluminum mass-weighted D/F emissions using equation 11 from the rule:

$$E_{C_{D/F}} = \frac{\sum_{i=1}^n (E_{iD/F} \times T_{ii})}{\sum_{i=1}^n (T_{ii})}$$

Where:

E_{CD/F} = The mass-weighted D/F emissions for the secondary aluminum processing unit; and

E_{iD/F} = Measured D/F emissions for individual emission unit, or group of co-controlled emission units i.

T_{ii} = The mass of feed/charge for 24 hours for individual emission unit i

Capture/Collection System

Anyone installing a control device to meet an emission limit must also have a capture and collection system designed and installed to meet engineering standards of minimum exhaust rates. See the American Conference of Governmental Industrial Hygienists' Industrial Ventilation: a Manual of Recommended Practice, chapters 3 and 5, for more information. The system must vent the captured emissions through a closed system, except where dilution air is added to control temperature at the inlet of a fabric filter. The system must be inspected at least once each calendar year, and may include volumetric flow rate measurements or verification of a permanent total enclosure.

Weight Throughput or Produced

For any device required for measuring weight (feed/charge, production, reactive flux injection, etc.), there are specific requirements for installation, calibration, operation and maintenance as well as an accuracy requirement. Refer to the rule for these details. It will be necessary to maintain records for each unit with a feed/charge or production throughput based limit. Both the types and amounts of materials fed/charged or produced must be recorded. The owner/operator will also be required to certify every 6 months as to compliance with the types of materials allowed to be fed/charged to the units.

Labeling

Inspect the labels for each Group 1 furnace and scrap dryer/delacquering kiln/decoating kiln at least once per calendar month to confirm that posted labels are intact and legible.

Add-on Control Devices

There are detailed requirements on installation, operation, and maintenance of control devices themselves as well as the associated monitoring or recording systems. Refer to the rule for these specific details.

Operation, Maintenance and Monitoring

An OM&M Plan is required for each affected emissions unit, showing how respective emissions limits are met. The plan must be included with any permit application, or be submitted within 90 days of completion of the initial performance test or the compliance deadline if no test is performed. Both the initial plan and any changes to the plan must be approved by the DNR (Title V only) or EPA (area sources). While waiting to receive approval of the plan, the facility shall operate according to the provisions in the plan.

The plan must include the following:

- process and control device parameters and operating ranges or levels to be monitored;
- monitoring schedule for each affected unit;
- procedures for proper operation and maintenance of each emissions unit and control device;
- procedures for proper operation and maintenance of monitoring devices calibration, certification of accuracy, CEM or COM quality control/quality assurance procedures);
- procedures to monitor emission unit and control device parameters (inspections, weight measurements, etc.);
- corrective actions for control device operation maintenance schedule for each emission unit and control device (determine and record cause of deviation or excursion, time and date it began and ended, record corrective actions taken and time initiated and completed); and
- maintenance schedule for each control device, consistent with manufacturer's recommendations;
- documentation of work practice and pollution prevention measures for Group 1 furnaces without an add-on control device (including the scrap inspection plan); and
- procedures for changing furnace classifications.

Start-up, Shut-down and Malfunction Plan

The owner/operator must also prepare a plan to describe procedures for operating emissions units during start-up, shut-down, and malfunction (SSM). The plan must include a program of corrective action for malfunctions of either the emissions unit or control device equipment used to comply with the standard. For each event, the owner/operator should maintain records of actions taken during start-up, shut-down or malfunction and whether they were consistent with the written plan for such events.

These records would include items like:

- ✓ the cause of a malfunction;
- ✓ when it began and ended;
- ✓ corrective actions to be taken;
- ✓ records of actions taken to correct a malfunction and minimize emissions; and
- ✓ when those actions were initiated and completed.

Notification of Compliance Status Report

A notification of compliance status report is due 60 days after the compliance deadline for existing sources, or for new sources within 90 days of the initial performance test or the compliance deadline if no test is performed. The report must include the following items:

- (1) describe how the facility is affected by the rule and how compliance will be demonstrated;
- (2) provide a complete report on the performance test for each affected unit;
- (3) approved site-specific test plan and test results for each continuous emissions monitoring system or continuous opacity monitor;
- (4) labeling required on specified units;
- (5) operating parameter ranges or values established over a specified time period for each affected emissions unit;
- (6) design information and documentation for capture/collection systems to demonstrate compliance;
- (7) supporting documentation demonstrating compliance for bag leak detection system;
- (8) manufacturer's specifications on residence time and temperature in afterburner for scrap dryer/delacquering kiln/ decoating kiln or sweat furnace for alternate emissions limitations; and
- (9) approved OM&M plan, including any site specific monitoring plan required for a Group 1 furnace without add-on controls.

Note that for data collected using test methods supported by EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT Web site (<https://www3.epa.gov/ttn/chief/ert/index.html>), you must submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). CEDRI can be accessed through the EPA's Central Data Exchange (CDX) (https://cdx.epa.gov/epa_home.asp).

Excess Emissions/Summary Report

Within 60 days of the end of each 6 month reporting period, for both major and area sources, the owner/operator must submit a report summarizing any excess emissions events. If no deviations from the applicable requirements occur, the owner/operator must submit a report that no excess emissions occurred. An annual compliance certification is also required to certify that, during the year, any excess emissions were properly reported and that all monitoring, recordkeeping and reporting requirements were met. The report must include:

- if any corrective action specified in OM&M for a control device or monitoring system was not initiated within 1 hour of an alarm;
- if there was an excursion of a compliant process or operating parameter value or range (e.g., total flux injection rate, afterburner operating specifications, etc.);
- if any action taken during start-up, shut-down or malfunction was not consistent with the SSM plan;
- if an affected source was not operated according to the requirements of the rule;
- any deviation from 3-day, 24-hour average emission limit for a SAPU;
- certification on thermal chip dryer, e.g., "thermal chip dryer used only unpainted aluminum chips as feedstock during this reporting period";
- certification that sidewall Group 1 furnace with add-on control "was operated such that metal remained above top of passage to hearth during fluxing or reactive flux added only to sidewall or to hearth also directed to control device";
- certification that Group 1 furnace, without add-on control device and using pollution prevention measures, that processes only clean charge "each furnace without add-on control device and subject to work practice or pollution prevention, processed only clean charge"; and
- results of any performance test conducted during the reporting period, including the approved test plan [see the Notification of Compliance Status section for information about the requirement to report test data through EPA's ERT].

Records

All records must be maintained for at least five years from the date of record and must remain on site for at least the first two years. Records may be maintained on microfilm, computer disks, magnetic tape, or microfiche. Reports may be submitted on paper as well as on a labeled computer disk using commonly available and EPA compatible software.

Follow the general provisions for the continuous monitoring systems requirements. See s. 63.10(c) of the Clean Air Act. Continuous monitoring systems include equipment like the temperature monitoring devices installed on afterburners or continuous opacity monitors.

For each unit affected by an emission limit in lb/ton (kg/Mg), the owner/operator must record the amount of feed/charge during each appropriate time period. Charge materials for each thermal chip dryer or Group 1 melting/holding furnace without add-on control devices must be recorded to show that only clean charge was processed. Records are also required to document the monthly inspections for the unit labeling requirements and the annual inspections of capture/collection systems. Any approved alternative monitoring or test procedure should have appropriate records.

AFTERBURNERS

For afterburners, records are required of each 15-minute average operating temperature, including any periods when the average temperature in any 3-hr block falls below the compliant operating parameter value; and for the annual inspection. Reports of incidents when the average temperature failed to meet compliance standards must include an explanation of the cause of the excursion and related corrective actions taken.

GROUP 1 FURNACES

For Group 1 furnaces with or without add-on control devices, records are required for each 15-minute average weight of gaseous or liquid reactive flux injection and calculations for each addition of flux. Records must also be kept for any period where the rate exceeds the compliant operating parameter value and related corrective actions. For Group 1 furnaces without add-on controls, records documenting conformance with an approved, site-specific monitoring plan are required. For Group 1 sidewall furnaces with add-on controls, records are required for the operating logs documenting conformance with standards for maintaining the level of molten metal above the passage to the hearth during fluxing, adding reactive flux only to the sidewall, or controlling the hearth emissions as well.

SAPU

Each SAPU must have records of the total charge weight or the total production for each 24-hour period, and the calculations for each 3-day, 24-hour average emissions.

Permit Requirements

Area sources affected by this rule are not required to apply for a Title V permit. A minor source permit may be required for area sources, or some may be eligible for the Registration Operation Permit. Contact SBEAP or your regional DNR contact for permit information.

Additional Information

To obtain a copy of the full secondary aluminum NESHAP rule, contact the SBEAP or go to EPA's web page specific to the rule at <https://www.epa.gov/stationary-sources-air-pollution/secondary-aluminum-production-national-emission-standards-hazardous>.

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