ATTACHMENT D

Performance Test Protocol for Particulate Matter/Visible Emissions Group 1 Aluminum Furnace

MI Metals, Inc.
301 Commerce Blvd.
Oldsmar, Florida 34677

Air Permit Facility 1030114

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Section 1
Introduction

The performance test plan and protocol has been prepared for MI Metals, Inc. (MI) facility located at 301 Commerce Blvd., Oldsmar, Florida 34677. The plan is in accordance with the requirements of FDEP's F.A.C. Rule 62-296.320(4)(a) and Rule 62-296.320(4)(b). The plan has been prepared based on the specific requirements in 40 CFR 63.1511, as well as the requirements set forth in 40 CFR 63.7(c) for a quality assurance and quality control program.

This facility is classified as a Secondary Aluminum Production Facility with a primary Standard Industrial Classification Code (SIC) 3354 Aluminum Extruded Products, and secondary SIC 3365 Aluminum Foundries.

This facility operates a furnace with a dimensional capacity of 25 tons of aluminum and an actual holding capacity of 22.5 tons. The furnace processes scrap aluminum containing painted or unpainted material from any Grades or ISRI Codes listed in Description of Scrap Aluminum (Appendix C), up to a maximum *process rate* based on *operating cycle* of 2.2 tons aluminum/hour and up to a maximum reactive flux rate based on *operating cycle* of 0.885 pounds chlorine/ton aluminum charged. *Operating cycle* is defined in accordance with 40 CFR 63.1503 as the period beginning when the feed material is first charged and ending when the casting process is completed.

This facility is a non major area source, since the potential emissions are less than 10 tons per year of any hazardous air pollutant (HAP), less than 25 tons per year of any combination of HAPs, and less than 100-tons per year of any regulated air pollutant. As an area source it is required to comply with the USEPA's MACT emission limit for dioxins/furans (DF) only. This facility is not subject to the USEPA's MACT emission limits for particulate matter (PM) and hydrogen chloride (HCL).

This performance test plan has been prepared to comply with FDEP's PM emission limits in accordance with F.A.C. Rule 62-296.320(4)(a) and FDEP's Visible Emissions (VE) limits in accordance with F.A.C. Rule 62-296.320(4)(b). This test plan and protocol will provide the strategy and the basis for the furnace compliance demonstrations with the FDEP's PM standard of $3.59 \times (2.2 \text{ tons Al/hour})^{0.62} = 5.85$ pounds PM/hour and 25.6 tons PM/year and as set forth in F.A.C. Rule 62-296.320(4)(a) and FDEP's VE standard maximum of less than 20 % opacity in accordance with F.A.C. Rule 62-296.320(4)(b).

A separate Performance Test Protocol for Dioxins/Furans (DF) has also been prepared to comply with USEPA 40 CFR Part 63 Subpart RRR – National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production.

It is MI's intent to use results of this and future tests as documentation of compliance with FDEP's permit issued to Facility 1030114 to allow operation of the furnace with scrap aluminum listed in Description of Scrap Aluminum (Appendix C) up to a combined maximum of 60% by weight Tutu plus Toto, up to a maximum *process rate* based on *operating cycle* of 2.2 tons aluminum/hour, and up to a maximum reactive flux rate based on *operating cycle* of 0.885 pounds chlorine/ton aluminum charged. Permit conditions and calculations are based on *operating cycle*. *Operating cycle* is defined in accordance with 40 CFR 63.1503 as the period beginning when the feed material is first charged and ending when the casting process is completed.

Section 2
Source Descriptions

2.1 Introduction

This section provides a description of the facility source subject to the FDEP's F.A.C. Rule 62-296.320(4) including design specifications, operating information, and source-specific operating parameters to be monitored and recorded during source operation. Some of these parameters will be correlated to the regulated emissions and used to verify compliance with the standard on an ongoing basis. Typical *Operating Cycles* for *Charges* are summarized in Appendix D.

2.2 Remelt Furnace

This facility operates a furnace with a dimensional capacity of 25 tons of aluminum and an actual holding capacity of 22.5 tons. The furnace processes scrap aluminum containing painted or unpainted material from any Grades or ISRI Codes listed in Description of Scrap Aluminum (Appendix C) up to a combined maximum of 60% by weight Tutu plus Toto, up to a maximum *process rate* based on *operating cycle* of 2.2 tons aluminum/hour, and up to a maximum reactive flux rate based on *operating cycle* of 0.885 pounds chlorine/ton aluminum charged. The furnace is never emptied during casting since there is always a heel left for the next charge. This heel accounts for the difference between the actual holding capacity and the *charge feed amount*. Essentially, the furnace is continually alternating between being charged and tapped and is never emptied. The furnace also experiences holding phases during which the level of molten aluminum is simply being maintained and aluminum is neither being added nor removed.

This melting/holding furnace has no charging side wells and is classified as a Group 1 furnace because it processes coated and non-coated aluminum. The furnace is equipped with a baghouse air pollution control device that includes lime coated fabric filters with an intermittent lime injection feeder.

The only fuel is natural gas that is fired through a set of two 10 mmBtu/hr burners for a total of 20 mmBTU/hr. Process and combustion emissions from the furnace are vented through a single flue stack. The furnace processes coated and uncoated scrap aluminum alloy listed in Description of Scrap Aluminum (Appendix C).

The furnaces operate as a continuous batch process, with aluminum scrap being placed on the deck of the charging table by means of forklifts. There is a maximum of three charge periods during the course of the day. An alloying metal may be added to the molten aluminum bath depending upon the type of product being manufactured. The front door of the furnace is opened immediately before placing the charging table into position and is closed as soon as the charging is finished.

Reactive chlorine flux is injected into the furnace molten metal bath with a degassing wand during a 15 minute period just prior to casting. The furnace bath is fluxed as needed with a maximum of 30 pounds of Amlox 72F or equivalent/21.6 tons aluminum or maximum 60 pounds of Amlox 72F or equivalent/day = typical 20 pounds of Amlox 72F or equivalent/charge x maximum 3 charges/day. This equates to a maximum 0.885 pounds chlorine/ton aluminum charged. The maximum potential stoichiometric amounts of Hazardous Air Pollutants (HAPS) produced from these fluxes are 7.17 ton HCl/year and 7.17 ton total HAPS/year. Air Emission Calculations are presented in Appendix E.

Section 3
Test Objectives

The aluminum furnace is required to meet FDEP's limit of 5.85 pounds PM/hour and less than 20 percent opacity in accordance with F.A.C. Rule 62-296.320(4)(a) and Rule 62-296.320(4)(b).

The emission test methodology is designed to establish the highest level of PM emissions possible from the furnace under normal operating conditions from each source.

Section 4
Performance Test Conditions and Furnace Operation

4.1 Introduction

This section provides the rationale used in establishing performance test conditions and for determining the number of test runs to be performed. In addition, it defines operating parameters proposed for the furnace during testing, sampling and monitoring methods, and how the data gathered during the performance test will define the furnace operating limits and demonstrate ongoing compliance with the emission limit.

4.2 Testing Rationale

The performance test for PM will be conducted while operating within 10% of the highest permitted *process rate* based on *operating cycle* of 2.2 tons aluminum/hour, within 10 % of the greatest permitted reactive flux rate based on *operating cycle* of 0.885 pounds chlorine/ton aluminum charged, and at 60% by weight of ISRI (Institute of Scrap and Recycling Industries) Code Tutu (highest potential emission). Refer to Appendix F for summary of *Operating Cycle* Comparison for PM/VE Testing. Daily operation at equal or lower operation levels will ensure ongoing compliance since performance test results would have passed regulatory standards. The performance test will be conducted as much as possible during daylight hours to provide safe working conditions and to obtain accurate measurements/readings.

There will be 3 separate PM performance test runs conducted during 3 different days. All PM test runs will be approximately 4 hours in length to cover entire PM test *operating cycle*. The highest *process rate* of 2.2 tons aluminum/hour occurs during the shorter 4 hour *operating cycle.* Refer to Appendix F for summary of *Operating Cycle* Comparison for PM/VE Testing. Actual start/stop times and charge weights may vary depending on the process operations of the day.

Concurrent with the first 1 hour (highest potential emission) of the first test run for PM sampling, a certified visible emissions (VE) evaluator will conduct a FDEP's visible emission performance test in accordance with Reference Method 9 for 1 hour readings to determine the level of opacity emitted from the baghouse discharge stack.

The tons aluminum/hour of *process rate* based on *operating cycle,* pounds chlorine/ton aluminum of reactive flux rate based on *operating cycle,* and % by weight of Tutu will be calculated for all three PM performance test runs base on the following recorded information:

- The total quantity (in tons) of scrap aluminum charged
- The total length (in hours) of *operating cycle*
- The total quantity (in tons) of Tutu material charged
- The quantity (in pounds) of flux added to charge

A calibrated scale accurate to 1% or better will be used to weigh charge material. Equivalent potential amount of chlorine from fluxes will be calculated from stoichiometric equations. Weight of fluxes will be based on manufacturer's pre-weighed packages or calibrated scale.

4.3 Stack Parameters

Baghouse stack gas emission parameters will be measured using United States Environmental Protection Agency (USEPA) Reference Methods for Sampling of Stationary Sources. Specifically, USEPA Reference Method 1 will be used to establish the sample and velocity traverse points. USEPA Reference Method 2 will be used to determine the stack gas differential pressure (from which the stack gas velocity can be calculated). USEPA Reference Method 3 will be used to determine the stack gas composition (*i.e.*, carbon dioxide (CO_2), oxygen (O_2), and nitrogen (N_2), while USEPA Reference Method 4 will be used to measure the stack gas moisture content. The baghouse vertical emission stack has a 4 feet diameter with a combination permanent/temporary sampling platform in accordance with 62-297, F.A.C. (Refer to drawing in Appendix B).

4.4 Particulate/Opacity Testing

Baghouse stack gas emissions will also be sampled and analyzed for PM utilizing USEPA Reference Method 5 sampling train. As noted previously, the remelt furnace operates as a continuous batch process. Therefore, the performance test for each batch process will consist of three separate PM test runs for approximately 4 hours each in order to sample the entire test *operating cycle*. 10 sample points will be sampled per port for PM. Each traverse point will be sampled for 12 minutes as probe is started all the way out and pushed all the way into stack (total 120 minutes per port). One sample port will be tested at a time. A diagram showing the testing port locations is included as Appendix B. Concurrent with the first 1 hour run for PM sampling, a certified visible emissions (VE) evaluator will conduct a USEPA Reference Method 9 test for 1 hour readings to determine the level of opacity emitted from the baghouse discharge stack. *Operating cycle* is defined in accordance with 40 CFR 63.1503 as the period beginning when the feed material is first charged and ending when the casting process is completed.

4.5 Baghouse Operating Conditions

Baghouse inlet temperature will be recorded to establish the 3-hour block average, lime addition will be recorded, and baghouse pressure drop will be monitored in accordance with the Operation Monitoring and Maintenance (OM&M) Plan.

4.6 Ongoing Compliance Demonstration

Following demonstrated compliance with F.A.C. Rule 62-296.320(4)(a) and Rule 62-296.320(4)(b) emission limits of 5.85 pounds PM/hour and less than 20 percent opacity, the *process rate* of 2.2 tons aluminum/hour based on *operating cycle*, the reactive flux rate of 0.885 pounds chlorine/ton aluminum charged based on *operating cycle*, and 60% combined weight of ISRI Code Tutu or Toto will become the furnace maximum operating limits in accordance with FDEP permit issued to Facility 1030114. The OM&M Plan will establish monitoring parameters and record keeping requirements to demonstrate ongoing compliance.

Section 5
Compliance Test Summary and Schedule

A summary of the compliance testing purpose and a proposed schedule are as follows:

- Testing is being performed to satisfy requirements of FDEP's F.A.C. Rule 62-296.320(4)(a) and Rule 62-296.320(4)(b).
- Testing is being conducted to demonstrate compliance with the PM and VE limits specified for the remelt furnaces.
- This testing program will be conducted in accordance with FDEP's permit issued to Facility 1030114. A daily schedule is provided in Table 1. FDEP and PDEM will receive notification from MI of actual test dates at least 15 days before test begins.
- Test results will be submitted by MI to the FDEP and PDEM within 45 days of last test completion.

Table 1
Proposed Compliance Testing Schedule

TEST DAY	TASKS
First	Arrive on the site and set up equipment.
Second	Perform DF Test Run #1 on the furnace.
Third	Perform DF Test Run #2 on the furnace.
Fourth	Perform DF Test Run #3 on the furnace.
Fifth	Perform PM Test Run #1 and VE Test on the furnace.
Sixth	Perform PM Test Run #2 on the furnace.
Seventh	Perform PM Test Run #3 on the furnace. Dismantle equipment, pack, and depart.

Section 6
Quality Assurance

6.1 Internal Quality Assurance

Internal quality procedures will be used to review and control data gathered by MI personnel and contractors during the testing events. These procedures will cover such information as emission tests, data parameters for process and emission control units, raw material samples, record keeping, and reporting. Specific quality control (QC) procedures will be followed to ensure the continuous production of valid data throughout the course of this test program. The QC checks and procedures described in this section represent an integral part of the overall sampling and analytical scheme. Strict adherence to prescribed procedures is quite often the most applicable QC check. A discussion of both the sampling and analytical QC checks that will be utilized during this program is presented below.

6.1.1 Chain-of-Custody Procedure

The environmental testing firm's field personnel will be responsible for labeling each individual sample and completing a chain-of-custody sheet to track samples through the analysis process.

6.1.2 Source Test Preparation

MI will provide or, as required, make the necessary facilities available as follows:

- Sampling ports located as required by the regulations for the applicable test methods
- Safe sampling platform(s)
- Safe access to sampling platform(s)
- Utilities for sampling and testing equipment

6.1.3 Source Test Analysis

All source testing analyses will be completed per the requirements of the referenced test methods. The applicable test methods are identified in Section 4.

6.1.4 Leak Check Procedures

All leak check procedures will be completed per the requirements of the referenced test methods.

6.1.5 Equipment Calibration

All process equipment calibration will be completed in accordance with the OM&M Plan.

6.1.6 Analytical Instrumentation

All analytical instrumentation will be as identified in the requirements of the referenced test methods.

6.1.7 Methods Validation

All method validation will be completed per the requirements of the referenced test methods.

6.1.8 Record Keeping

All record keeping will be done in compliance with the OM&M Plan.

6.1.9 Reporting

All reporting will be done in compliance with FDEP's permit issued to Facility 1030114. The "Initial Notification of Compliance Status Report" will be submitted 60 days following the compliance date for the affected source. This report will summarize all of the collected data and establish the monitoring parameters values that will be tracked to demonstrate continuous compliance with the standard.

6.2 External Quality Assurance

External quality assurance (QA) procedures will be those established and used by outside testing firms and laboratories. All contractors will comply with the requirements of their QA programs during the testing event. The environmental testing firm will follow the QA methods published in the *Quality Assurance Handbook for Air Pollution Measurement Systems,* Volume III (EPA 600/4-77-0276). Data quality will be verified by including sample blanks and spikes as required by the applicable method's requirements.

Information or data generated by outside testing firms or laboratories will be handled and maintained at a minimum per the previously described internal quality procedures.

6.3 Data Quality Objectives

The test plan is to identify data quality objectives that are associated with the monitoring of process parameters, the measurements of direct process emissions, and other process observations that are made to demonstrate compliance with the NESHAPs.

Operation of the remelt furnace requires that specific operating parameters be monitored during the performance test. The data collected must be evaluated to address the data quality objectives that are associated with the measurement, collection, and data processing activities.

6.3.1 Continuous Monitoring Systems

The systems that are operated to collect and monitor the affected source or emission unit to demonstrate compliance are classified as continuous monitoring systems (CMSs). A CMS is defined as a comprehensive term that may incorporate, but is not limited to, continuous emission monitoring instruments, continuous opacity monitoring systems, continuous parametric monitoring systems, or other manual or automatic monitoring devices that are used to demonstrate compliance with an applicable regulation on a continuous basis, as defined by the regulation. The following CMSs will be operated to demonstrate compliance with the NESHAPs operational requirements for the MI facility.

- *Charge feed amount* will be recorded on the Furnace Charge Log (Appendix G).

- Baghouse inlet temperature will be recorded every 15 minutes and the averaged temperature over a 3-hour period will be calculated.

- Lime addition will be recorded on the Lime Feed Inspection/Maintenance Completion Log (Appendix G).

- Baghouse pressure drop will be recorded on the Baghouse Inspection/Maintenance Completion Log (Appendix G).

Appendix A
CMS Performance Evaluation Test Plan

CMS Performance Evaluation Test Plan

Facilities that are subject to a NESHAPs that have operational requirements that must be monitored using CMSs are required to prepare this additional plan. The CMSs associated with this plan are as follows:

- Furnace *charge feed amount*
- Baghouse inlet temperature
- Baghouse lime addition rate
- Baghouse pressure drop

Scope of the Plan as Specified by 40 CFR Part 63.8(e).

This plan covers the performance evaluation of the multiple CMSs as specified for this source in the NESHAPs for Secondary Aluminum Production (40 CFR 63 Subpart RRR). The types of systems installed to address these CMSs have been listed above.

The issues that affect the evaluation of the CMS devices will be observed and recorded as specifically identified in this plan. USEPA guidance documents (*e.g.,* Compliance Assurance Monitoring (CAM) Technical Guidance) and the manufacturers' specifications of the selected monitoring devices are being used to establish this plan.

General Operation Description

Furnace Charge Log is completed in accordance with the OM&M Plan.

CMS Evaluation Program Objectives

The PM performance test *process rates* based on *operating cycle* are to be within 10 % of the maximum *process rate* of 2.2 tons aluminum/hour and the reactive flux feed rates based on *operating cycle* are to be within 10 % of the maximum reactive flux feed rate of 0.885 pounds chlorine/ton aluminum during the CMS evaluation program.

CMS Evaluation Program Summary

The CMS systems will be checked and/or calibrated as required semiannually in accordance with the OM&M Plan.

CMS Data Quality Objectives

The observations that result from this plan will be recorded assigning each record with the name of the device being monitored, the time of the observation, the initials of the individual making the observation, and a description of the observation (numeric readings will be accompanied with appropriate units).

If applicable, regulatory personnel will be offered a briefing of the critical system location and the planned schedule of events on the day of the actual performance testing.

The environmental testing contractor will be provided all relevant information regarding the monitoring devices during the setup period for the performance test.

Appendix B
Stack Test Port /Platform Diagram

SIDE VIEW

TOP VIEW

US EPA Reference Method No. 1

D = 48 in.
A > 0.5 D and B > 2 D

A = 144 in. > 0.5 D
B = 192 in. > 2 D

Test Port Locations meet US EPA requirements for Method No. 1

METHOD NO. 1 DETAIL

L. HABERNY COMPANY, INC CHAGRIN FALLS, OHIO	DRAWING NO 1 of 2
BAGHOUSE STACK TOREMI METALS INC	SCALE SEE ABOVE
STACK DETAIL	DATE 08/24/2003
PREPARED BY JEL HABIB	REV
HB ENGINEERING, INC NORTHBROOK, ILLINOIS	

MI METALS/METAL INDUSTRIES OLDSMAR, FL	DRAWING NO 2 of 2
STACK TEST PLATFORM	SCALE SEE ABOVE
PREPARED BY: [illegible]	DATE [illegible]
	REV
HB ENGINEERING, INC.	

Appendix C
Description of Scrap Aluminum

MI METALS – OLDSMAR
DESCRIPTION OF SCRAP ALUMINUM
revised 7/18/08

Grades

Aluminum Extrusions (includes bales, bin, bag, shreds and butt ends) – shall consist of clean aluminum extrusions including window & door frames. Must be free of iron inserts, screw, plastic, rubber or other foreign materials.

Low Copper Aluminum – shall consist of clean, uncoated aluminum plate, may include clips or punching. ISRI grade Taboo may be included in this grade.

New Beverage Can Stock – shall consist of new clean pre-consumer aluminum can stock (printed or unprinted) and may include clips or punching skeletons, & cans in various states of production but may not include whole cans from packaging lines. Equivalent to ISRI code Take.

Remelt Aluminum Ingot – shall consist of remelted aluminum scrap from a sweat furnace operation & poured into a uniform pigs or ingot blocks with a minimum weight of 25 pounds, and a maximum weight of 75 pounds. Must be free of slag or dross materials and prepared in a uniform material handleable form. Similar to ISRI code Throb.

Remelt Aluminum Sows – shall consist of remelted aluminum scrap from a sweat furnace operation & poured into a uniform slabs or sow blocks with a minimum weight of 500 pounds, and a maximum weight of 2200 pounds. Must be free of slag or dross materials and prepared in a uniform material handleable form. Similar to ISRI code Throb.

Bare Aluminum Wire – shall consist of clean aluminum wire free of iron or insulation. ISRI code Tassel, Taste, Talon, and Tann may be included in this grade.

Aluminum Nodules – shall consist of clean aluminum wire recovered from a chopping operation and must be free of iron, copper, & brass wire, aluminum hair wires and free of dirt, oil, and foreign materials. Equivalent to ISRI code Tall.

ISRI (Institute of Scrap and Recycling Industries) Codes

Taint/Tabor - Clean Mixed Old Alloy Sheet Aluminum - shall consist of clean old alloy aluminum sheet of two or more alloys, free of foil, venetian blinds, castings, hair wire, screen wire, food, or beverage containers, radiator shells, airplane sheet, bottle caps, plastic, dirt, and other non-metallic items. Oil and grease not to total more than 1%. Up to 10% Tale permitted.

Take - New Aluminum Can Stock – shall consist of new low copper aluminum can stock and clippings, clean, lithographed or not lithographed, and coated with clear lacquer but free of lids with sealers, iron, dirt and other foreign contamination. Oil not to exceed 1%.

Tall - E. C. Aluminum Nodules – shall consist of clean E. C. aluminum, chopped or shredded, free of screening, hair-wire, iron, copper, insulation, and other non-metallic items. Must be free of minus 20 mesh material. Must contain 99.45% aluminum content.

Talon - New Pure Aluminum Wire & Cable – shall consist of new, clean, unalloyed aluminum wire or cable free from hair wire, ACSR, wire screen, iron, insulation and other non-metallic items.

Tann - New Mixed Aluminum Wire & Cable – shall consist of new, clean, unalloyed aluminum wire or cable which may contain up to 10% 6000 series wire and cable free from hair wire, wire screen, iron, insulation and other non-metallic items.

Tata - New Production Aluminum Extrusions – shall consist of one alloy (typically 6063). Material (includes bales, bin, bag, and shreds) may contain "butt ends" from the extrusion process but must be free of any foreign contamination. Anodized material is acceptable. Painted material or alloys other than 6063 must be agreed upon by buyer and seller.

Toto – Aluminum Extrusions "10/10" – shall consist of new production and old/used 6063 extrusions (includes bales, bin, bag, and shreds) that may contain up to (but not exceed) 10 % painted extrusions and 10% 6061 alloy extrusions. Must not contain other alloys of aluminum. Material should be free of zinc corners, iron attachments, felt, plastic, paper, cardboard, thermo break, and dirt and other contaminants.

Tutu – Aluminum Extrusion Dealer Grade – shall consist of old extruded aluminum of typically alloy 6063, 6061, or 7075 that contain more than 10 % painted extrusions (includes bales, bin, bag, and shreds). Material must be free of iron, thermo break, saw chips, zinc corners, dirt, paper, cardboard, and other foreign contamination.

Appendix D
Typical Operating Cycles for Charges

MI METALS – OLDSMAR

TYPICAL *OPERATING CYCLES* for CHARGES revised 10/31/08

Shorter *Operating Cycle*:

1. *Operating cycle* begins when aluminum scrap is initially added into the furnace.
2. A maximum of 8.8 tons *charge feed amount* of scrap aluminum is added into the furnace.
3. Charge feed consists of approximately 40-60% by weight of baled, bin, bag, and shredded extrusion from ISRI Codes Toto/Tutu (includes painted material).
4. Balance of charge material is mill finished, primary ingot, and billet butt (unpainted materials) from Grades and ISRI Codes listed in the Description of Scrap Aluminum.
5. A maximum of ten pounds of Amlox 72F or equivalent flux is added during the 15 minutes before the casting. This is equivalent to 6.37 pounds of chlorine or approximate flux rate of 0.724 pounds of chlorine /ton charge.
6. Casting begins at approximately 2 ½ hours after operating cycle begins.
7. *Operating cycle* ends when casting ends at approximately 4 hours after *operating cycle* begins.

Longer *Operating Cycle* with/without Hold Mode:

1. *Operating cycle* begins when scrap aluminum is initially added into the furnace.
2. A maximum of 21.6 tons *charge feed amount* of scrap aluminum is added into the furnace.
3. Charge feed consists of approximately 40-60% by weight of baled, bin, bag, and shredded extrusion from ISRI Codes Toto/Tutu (includes painted material).
4. Balance of charge material is mill finished, primary ingot, and billet butt (unpainted material) from Grades and ISRI Codes listed in the Description of Scrap Aluminum.
5. A maximum of twenty pounds of Amlox 72F or equivalent flux is added during the 15 minutes before the casting begins. This is equivalent to 12.74 pounds of chlorine or approximate flux rate of 0.590 pounds of chlorine/ton charge.
6. Total aluminum melting time is approximately 8 hours.
7. The furnace is placed on hold mode for approximately 0 to 12 hours before casting. No charge or flux is added during this hold period.
9. Casting begins at approximately 8-20 hours after operating cycle begins.
10. *Operating cycle* ends when casting ends at approximately 12-24 hours after *operating cycle* begins.

Appendix E
Air Emission Calculations

MI METALS – OLDSMAR
PERMIT 1030114 revised 10/31/08
AIR EMISSION CALCULATIONS

Maximum Reactive Flux Usage: 60 lb Amlox 72F or equivalent/day
30 lb Amlox 72F or equivalent/21.6 tons Aluminum

Max *Charge feed Amount* based on *Operating Cycle*: 21.6 tons aluminum

MSDS: Amlox 72F is maximum 60% Magnesium Chloride + 40% Potassium Chloride

Chemistry:

Magnesium Chloride	MgCl2	atomic weight	
	Magnesium	1 x 24.305	= 24.305
	2 x Chloride	2 x 35.453	= 70.906
	Total		95.211
	Weight Fraction {Clm}= 70.906 ÷ 95.211 = 0.7447		
Potassium Chloride	KCl	atomic weight	
	Potassium	1 x 39.0983	= 39.0983
	Chloride	1 x 35.453	= 35.453
	Total		74.5513
	Weight Fraction {Clp}= 35.453 ÷ 74.5513 = 0.4756		
Hydrochloric Acid	HCl	atomic weight	
	H	1 x 1.0079	= 1.0079
	Cl	1 x 35.453	= 35.453
	Total		36.4609
	Weight Fraction {Clh}= 35.453 ÷ 36.4609 = 0.9724		

Conversion Factor Ratio:

$$\frac{\text{pounds Cl}}{\text{pound Amlox 72F}} = \%\ MgCl2 \times \text{Weight Fraction } \{Clm\} + \%\ KCl \times \text{Weight Fraction } \{Clp\}$$

$$= 0.6 \times 0.7447 + 0.4 \times 0.4756 = 0.637$$

$$\frac{\text{pounds HCl}}{\text{pound Amlox 72F}} = \frac{\text{pounds Cl}}{\text{pound Amlox 72F}} \div \text{Weight Fraction } \{Clh\} = 0.637 \div 0.9724 = 0.655$$

Calculations:

$$\frac{\text{max tons HCl}}{\text{year}} = \frac{\text{max 60 pounds Amlox 72F}}{\text{day}} \times 0.655 \text{ HCl} \times \frac{\text{365 days}}{\text{year}} \div \frac{\text{2000 pounds}}{\text{ton}} = 7.17$$

$$\frac{\text{max tons HCl}}{\text{year}} = \frac{\text{max tons Total HAPS}}{\text{year}} = 7.17$$

$$\frac{\text{max pounds Cl}}{\text{ton Al}} = \text{max 30 pounds Amlox 72F} \times \frac{\text{0.637 lb Cl}}{\text{pound Amlox 72F}} \div \text{21.6 tons Al} = 0.885$$

Section 1: PRODUCT AND COMPANY IDENTIFICATION

American Metal Chemical Company
835 West Smith Road
Medina, Ohio 44256-2424

Company Phone Number: (330) 725-4501 (24 hours)
Company Fax Number: (330) 723-0487

3546 South Morgan Street
Chicago, Illinois 60609-1524

Company Phone Number: (773) 254-1818
Company Fax Number: (773) 254-4722

Product Name: AMLOX-72F **Synonym Name:** N/A
Recommended Use: Non-ferrous Flux.
Issue Date: 01/02/2006
Supersedes Date:

Section 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
May cause eye irritation.
Irritating to eyes, skin and mucous membranes.
Ingestion may cause vomiting, abdominal cramps and diarrhea.

OSHA regulatory status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential acute health effects:

Inhalation: Inhalation may cause irritation or minor burning of mucous membranes.
Skin: Contact with product and/or by-product could cause irritation on the skin.
Eyes: Contact with the product and/or by-product could cause irritation, pain, tearing, reddening, swelling and itching of the eyes.
Ingestion: Contact could cause mild to violent stomach disorders such as diarrhea, upset stomach, burning sensations and digestive tract bleeding. If elimination is blocked by another disorder, ingestion may affect central nervous system.

Potential chronic health effects:

Carcinogenic Effects: Not classified or listed by IARC, NTP, OSHA, EU or ACGIH.
Mutagenic Effects: Not known to be mutagenic.

Target organs: Eyes, lungs, kidneys, bones and skin. See Section 11 for Toxicological Information.

Potential environmental effects: Cleanup spills promptly to avoid product entering the environment. See Section 12 for Ecological Information.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	EC No.	% by Wt.
Magnesium Chloride	7786-30-3		60%
Potassium Chloride	7447-40-7		40%

Appendix F
Operating Cycle Comparison

MI METALS – OLDSMAR

OPERATING CYCLE COMPARISON for *PARTICULATE MATTER/VISIBLE EMISSION* TESTING revised 10/31/08

	Typical Shorter *Operating Cycle*	Typical Longer *Operating Cycle*	Performance Test *Operating Cycle*
Total tons scrap aluminum *charge feed amount*	≤ 8.8	≤ 21.6	~8.6
Charge type	~ 40-60% by weight of baled, bin, bag, and shredded extrusion material from ISRI Codes Toto/Tutu. Remainder material is mill finished, ingot, and butt (unpainted material) from Grades and ISRI Codes listed in the Description of Scrap Aluminum.	~40-60% by weight of baled, bin, bag, and shredded extrusion material from ISRI Codes Toto/Tutu. Remainder material is mill finished, ingot, and butt (unpainted material) from Grades and ISRI Codes listed in the Description of Scrap Aluminum.	**60 % by weight of baled, bin, bag, and shredded extrusion material from ISRI Code Tutu. Remainder material is mill finished, ingot, and butt (unpainted material) from Grades and ISRI Codes listed in the Description of Scrap Aluminum.
Pounds Amlox Flux or equivalent	≤ 10	≤ 20	11
Equivalent pounds Chlorine	6.37 = 10 x 0.637	12.74 = 20 x 0.637	7.01 = 11 x 0.637
Flux rate = Pounds Cl/ton charge	0.724 = 6.37 ÷ 8.8	0.590 = 12.74 ÷ 21.6	0.815 = 7.01 ÷ 8.6 within 10% of ***0.885
Flux addition	during 15 minutes before casting begins	during 15 minutes before casting begins	during 15 minutes before casting begins
Hours Melt Process	~ 2 ½	~ 8	~ 2 ½
Hours Holding Mode	0	~0 to 12	0
Hours *Operating Cycle*	~4	~12-24	~4
Tons Al/Hour *Process Rate*	~2.2	~0.9-1.8	2.15 within 10% of *2.2 = 8.8 ÷ 4

Comments: * highest *process rate*
**highest potential emission
***highest flux rate

Operating cycle is defined in accordance with 40CFR63.1503 as the period beginning when the feed material is first charged and ending when the casting process is completed.

Tons Al/Hour *Process Rate* = Tons Al *Charge Feed Amount* ÷ Hours *Operating Cycle*.

No charge or flux is added during the holding period.

Potential particulate matter emissions occur from paint on extrusions.

Permitted limits will be established during Performance Test.

Daily operation will not exceed permitted limits.

Appendix G
Record Keeping
Log Forms

MI METALS - OLDSMAR
PERMIT 1030114 EU ID 001
FURNACE CHARGE LOG revised 10/31/08

Date Charged _____ 1st/2nd/3rd _____ Alloy _____ Batch # _____

Weight Pounds Al	Bale			Ingot	Tote Bin/Bag			
	Painted Tutu	Painted Toto	Mill Finish	Primary Ingot	Billet Butt	Painted Tutu	Painted Toto	Mill Finish
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
Total Tons Al								

Tons Al Charge Feed Amount Based on Operating Cycle _____

Max Allowed Charge Feed Amount Based on Operating Cycle = 21.6 tons Al

% Tutu _____ %Toto _____

% Tutu + Toto _____ Max Allowed Tutu + Toto = 60%

Total Hours Operating Cycle _____

Tons Al/Hour Process Rate Based on Operating Cycle _____

Max Allowed Process Rate Based on Operating Cycle = 2.2 Tons Al/Hour

Sign _____

MI METALS - OLDSMAR
PERMIT 1030114 EU ID 001
LIME FEED INSPECTION/MAINTENANCE COMPLETION LOG revised 10/31/08

month/year

monitor setting/inspect feeder at beginning of each shift

	morning			afternoon			night			bags used 50 lbs/bag	total lime used	comments - inspect every 4 hours for 3 days after blockage
date limit	lbs/hr 10.4	free flow	sign	lbs/hr 10.4	free flow	sign	lbs/hr 10.4	free flow	sign	bags/day 5	lbs/day 250	deviation/blockage cause corrective action taken
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31												

MI METALS - OLDSMAR
PERMIT 1030114 EU ID 001
LIME FEED INSPECTION after BLOCKAGE COMPLETION LOG revised 1/30/09

Date blockage occurred monitor setting/inspect feeder every 4 hours for 3 days after blockage

	Day 0			Day 1			Day 2			Day 3		
time	lbs/hr 10.4	free flow	sign	lbs/hr 10.4	free flow	sign	lbs/hr 10.4	free flow	sign	lbs/hr 10.4	free flow	sign
12 am												
4 am												
8 am												
12 pm												
4 pm												
8 pm												

MI METALS - OLDSMAR
PERMIT 1030114 EU ID 001
BAGHOUSE INSPECTION/MAINTENANCE COMPLETION LOG revised 10/31/08

month/year

sign after work completed per OM&M Plan

	daily								monthly			annual			3 year	
date	pressure < 8"W.C.			temperature ≤ °F			mal-function	equip operation	buildup/ leaks	oil/ grease	detector/ alarm	bag cond	shaker	fan/ housing	replace worn bags	sign
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2																
3																
4																
5																
6																
7																
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9																
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MI METALS - OLDSMAR
PERMIT 1030114 EU ID 001
DAILY OPERATION LOG – REACTIVE FLUX FEED RATE revised 11/6/08

month/year _____

Amlox72F or equivalent is reactive chlorine flux injected over 15 minute period; conversion factor 0.637 lbs Cl/lb Amlox72F; max allowed 0.885 lbs Cl/ton Al

	first charge							second charge							
	am pm	am pm	am pm		cast begins when flux ends			am pm	am pm	am pm		cast begins when flux ends			
date	charge begin	flux begin	flux end cast begin	lbs Amlox 15 min	lbs Cl x 0.637	tons Al	lbs Cl ton Al	charge begin	flux begin	flux end cast begin	lbs Amlox 15 min	lbs Cl x 0.637	tons Al	lbs Cl ton Al	sign
1															
2															
3															
4															
5															
6															
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MI METALS - OLDSMAR
PERMIT 1030114 EU ID 001
DAILY OPERATION LOG – REACTIVE FLUX FEED RATE revised 11/6/08

month/year _____

Amlox72F or equivalent is reactive chlorine flux injected over 15 minute period; conversion factor 0.637 lbs Cl/lb Amlox72F; max allowed 0.885 lbs Cl/ton Al

	am pm	am pm	optional third charge am pm		cast begins when flux ends										
date	charge begin	flux begin	flux end cast begin	lbs Amlox 15 min	lbs Cl x 0.637	tons Al	lbs Cl ton Al								sign
1															
2															
3															
4															
5															
6															
7															
8															
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MI METALS - OLDSMAR
PERMIT 1030114 EU ID 001
DAILY OPERATION LOG – OPERATING CYCLE PROCESS RATE revised 1/30/09

month/year _____

max allowed 2.2 tons Al processed/hour based on operating cycle

	first charge					second charge					optional third charge					total/day	
day	tons Al process	cycle begin am pm	cycle end am pm	cycle hours	tons Al / hr	tons Al process	cycle begin am pm	cycle end am pm	cycle hours	tons Al / hr	tons Al process	cycle begin am pm	cycle end am pm	cycle hours	tons Al / hr	Amlox max 60 lb	sign
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3																	
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5																	
6																	
7																	
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Conversion factor: 1 lb Amlox 72F = 0.655 lbs HCl

	hours	tons Al	lbs Amlox 72F	tons HCl	tons HAPS	tons PM	tons D/F
month				NA	NA	NA	NA
12 month							
max limit	8760	19,272	NA	7.17	7.17	25.6	2.89×10^{-7}