B. PM/VE Test Protocol

Performance Test Protocol for Particulate Matter and Visible Emissions

Group 1 Aluminum Furnace

MI Metals, Inc.

301 Commerce Blvd
Oldsmar, Florida 34677

Air Permit Facility 1030114 – Emission Unit ID 001

Table of Contents

1. **Introduction** 4

2. **Source Descriptions** **5**
   - 2.1. Introduction 5
   - 2.2. Remelt Furnace 5

3. **Test Objectives** 6

4. **Performance Test Conditions and Furnace Operation** **7**
   - 4.1. Introduction 7
   - 4.2. Testing Rationale 7
   - 4.3. Stack Parameters 8
   - 4.4. Particulate/Opacity Testing 8
   - 4.5. Baghouse Operating Conditions 8
   - 4.6. Ongoing Compliance Demonstration 8

5. **Compliance Test Summary and Schedule** 9

6. **Quality Assurance**
   - 6.1. Internal Quality Assurance 10
     - 6.1.1.Chain of Custody Procedure 10
     - 6.1.2.Source Test Preparation 10
     - 6.1.3.Source Test Analysis 10
     - 6.1.4.Leak Check Procedure 10
     - 6.1.5.Equipment Calibration 10
     - 6.1.6.Analytical Instrumentation 10
     - 6.1.7.Methods Validation 10
     - 6.1.8.Record Keeping 10
     - 6.1.9.Reporting 10
   - 6.2. External Quality Assurance 10
   - 6.3. Data Quality Objectives 11
     - 6.3.1.Continuous Monitoring Systems 11

List of Tables

Table 1	Proposed Compliance Testing Schedule	9

List of Appendices

Appendix A	CMS Performance Evaluation Test Plan	12
Appendix B	Stack Test Port / Platform Diagram	14
Appendix C	Description of Scrap Aluminum	17
Appendix D	Typical Operating Cycles for Charges	20
Appendix E	Air Emission Calculations	22
Appendix F	Operating Cycle Comparison	24
Appendix G	Log Forms	26

Section 1 – Introduction

This performance test plan and protocol for Particulate Matter (PM) and Visible Emissions (VE) testing has been prepared for the MI Metals, Inc. (MI) facility located at 301 Commerce Blvd., Oldsmar FL 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 specific requirements in 40 CFR 63.1511, as well as the requirements set forth in 40 CFR 63.7(c) for 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.

MI Metals 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 metal from any grades or Institute of Scrap and Recycling Industries (ISRI) codes listed in the Description of Scrap Aluminum (**Appendix C**) up to a maximum permitted *process rate* based on operating cycle of 2.2 tons Al/hour, up to a maximum permitted reactive flux rate based on operating cycle of 0.885 pounds of chlorine per ton aluminum charged (refer to **Appendix E** for Chlorine Flux Emissions Calculations), and lime feed rate of 10.4 pounds per hour. A batch 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 for Particulate Matter (PM) and Visible Emissions (VE) has been prepared to comply with FDEP's PM emission limits in accordance with FDEP 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 PM Standard of 3.59 x (2.2 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 FDEPs 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 63 Subpart RRR – National Emission Standards for Hazardous Air Pollutants (NESHAP) 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 permitted *process rate* based on operating cycle 2.2 tons aluminum/hour, up to a maximum permitted reactive flux rate based on operating cycle of 0.885 pounds chlorine/ton aluminum charged, and lime feed rate of 10.4 pounds/hour at a 3 hour block average baghouse inlet temperature. Permit conditions and calculations are based on a batch operating cycle.

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

MI 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 metal from any grades or ISRI codes listed in the Description of Scrap Aluminum (**Appendix C**) up to a combined maximum of 60% by weight Tutu plus Toto, up to a maximum permitted *process rate* based on operating cycle of 2.2 tons Al/hr, up to a maximum permitted reactive flux rate based on operating cycle of 0.885 pounds of chlorine per ton aluminum charged (refer to **Appendix E** for Chlorine Flux Emissions Calculations), and lime feed rate of 10.4 pounds per hour. 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 or 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. Lime addition is monitored daily to ensure that the lime feed rate is set at 10.4 pounds per hour and that a total count of five (5) 50 pound bags of lime per day are used as established by the DF test.

The only fuel is natural gas that is fired through a set of two 10 million British thermal units per hour (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 aluminum scrap alloy listed in Description of Scrap Aluminum (**Appendix C**).

The furnace operates as a continuous batch process, with aluminum scrap being placed on the deck of the charging tabled by means of forklifts or bobcats. There is a maximum of 3 charges during the course of the day. An alloying metal may be added to the molten aluminum 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 Amlox 72F or equivalent per 21.6 tons aluminum or a maximum of 60 pounds Amlox 72F (or equivalent) per day. This equates to a maximum of 0.885 pounds chlorine per ton of aluminum charged based on operating cycle. The maximum potential stoichiometric amounts of HAPs produced from these fluxes are 7.17 tons HCl per year and 7.17 tons total HAPs per year. Refer to Appendix E for Chlorine Flux Emissions Calculations.

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 62-296.320(4)(b).

This 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 is gathered during the performance test will define the furnace operating limits and demonstrate ongoing compliance with emission limits.

4.2 Testing Rationale

This 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 an operating cycle of 0.885 pounds chlorine/ton aluminum charged and at 60% by weight ISRI Code Tutu (highest potential emission), and the greatest reactive flux rate. 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.

If it is impractical to test PM/VE within 90-100% of the maximum permitted process rate or reactive flux rate, this emission unit may be tested at less than the maximum permitted process rate or reactive flux rate; in this case, subsequent emission unit operation is limited to 110% of the test rate until a new test is conducted. Once the unit is so limited, operation at a higher rate is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to authorize operation at 110% of the higher rate but not to exceed the maximum permitted rate.

There will be 3 separate PM performance test runs on 3 different work days. All PM test runs will be approximately 4 hours in length to cover an entire PM test operating cycle. The highest potential emission of PM occurs during the shorter 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 emission (VE) evaluator will conduct a FDEP 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.

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

- The total quantity (in tons) of all scrap aluminum charged
- The total duration (in hours) of the *operating cycle*
- The total quantity (in tons) of Tutu material charged
- The quantity (in pounds) of flux added to charge
- The quantity (in pounds) of lime added per day
- The 3-hour block average baghouse inlet temperature (in °F)

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. The weight of fluxes and lime will be based on manufacturer's pre-weighed packages.

4.3 Stack Parameters

Baghouse stack gas emission parameters will be measured using 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 by assigning a value of 30.0 for dry molecular weight, in lieu of actual measurements for processes burning natural gas, 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 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 subsequent performance test for each batch process will consist of three separate PM test runs for approximately 4 hours each in order to test an entire operating cycle. 12 sample points will be located and sampled per traverse for each sample port for PM. Each traverse point will be sampled for 10 minutes as the sample probe is started all the way out and pushed all the way into the 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 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. An 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 temperatures 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 62-296.320(4)(b) emission limits of 5.85 pounds PM/hour and less than 20% opacity, the process rate of up to 2.2 tons aluminum/hour based on operating cycle, the reactive flux rate of up to 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 establishes 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 62-296.320(4)(b).
- Testing is being conducted to demonstrate compliance with the PM and VE emission limits specified for the remelt furnace.
- The testing program will be conducted in accordance with FDEPs 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 (DF and PM/VE Testing)

Sequence of Events		Tasks
First Week	1st Day	Arrive on the site, set up equipment, and prepare DF Test Run #1
	2nd Day	Perform DF Test Run #1 on the furnace
	3rd Day	Process DF Test Run #1 sample and Perform DF Test Run #2 on the furnace
	4th Day	Process DF Test Run #2 sample and Perform DF Test Run #3 on the furnace
	5th Day	Process DF Test Run #3 sample
Second Week	1st Day	Arrive on the site, set up equipment, and prepare PM Test Run #1
	2nd Day	Perform PM test run #1 and VE test on furnace
	3rd Day	Perform PM test run #2
	4th Day	Perform PM test run #3 and dismantle test equipment and depart

Note: In the event of a malfunction or mishap, variance to the above schedule may be granted at the discretion of the EPA, FDEP, or PDEM.

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 describe 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 represented below.

6.1.1 Chain-Of-Custody (COC) Procedures

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

6.1.2 Source Test Preparation

MI will provide or, as required, make 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 analysis 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 accordance with the OM&M Plan.

6.1.9 Reporting

All reporting will be done in accordance with FDEPs permit issued to Facility 1030114. The "Initial Notification of Compliance Status Report" will be submitted within 60 days following the compliance date for the affected source. This report will summarize all of the affected 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 established and used by outside testing firms and laboratories. All contractors will comply with 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 (EPA600/4-77-0276). Data quality will be verified by including sample blanks and spikes as required by the applicable methods 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 Control Objectives

The test plan is to identify data quality objectives that are associated with the monitoring of process parameters, the measurement 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 System

The systems that are operated to collect and monitor the affected source or emission unit to demonstrate compliance are classified as Continuous Monitoring Systems (CMS). 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 on a continuous basis as defined by the regulations. The following CMSs will be operated to demonstrate compliance with the NESHAPs operational requirements for the MI facility.

- Charge amount will be recorded on the Furnace Charge Log (**Appendix G**)
- Baghouse inlet temperature will be recorded every 15 minutes and the average temperature over a 3 hour period will be calculated.
- Lime addition monitoring procedures will include reading the lime feed rate setting and counting the total number of 50 pound bags of lime that have been used per day. Results of 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**)
- Reactive flux feed will be recorded on the Daily Operation Log – Reactive Flux Feed Rate (**Appendix G**).

The operating parameters for this aluminum furnace based on the Performance Test results will be established in the OM&M Plan.

Appendix A
CMS Performance Evaluation Test Plan

CMS Performance Evaluation Test Plan

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

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

The operating parameters for this aluminum furnace based on the Performance Test results will be established in the OM&M Plan.

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 Part 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, Lime Feed Inspection/Maintenance Completion Log, Baghouse Inspection/Maintenance Completion Log, and the Daily Operation Log – Reactive Flux Feed Rate (**Appendix G**) are to be completed in accordance with the OM&M Plan.

CMS Evaluation Program Objectives

The PM performance test *process rates* based on the operating cycle is to be within 10% up to the maximum permitted process rate of 2.2 tons aluminum/hr, the reactive flux feed rates based on operating cycle are to be within 10% up to a maxiumum of).885 pounds chlorine/ton aluminum charged, and the lime feed rate is to be 10.4 pounds/hour durin the CMS evaluation program.

CMS Evaluation Program Summary

The CMS systems will be checked and/or calibrated as required 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 the description of the observation (numeric readings will be accompanied with appropriate units).

If applicable, regulatory personnel will be offered a briefing of the critical systems 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

TOP VIEW
SIDE VIEW
METHOD NO. 1 DETAIL
L. HUBBARD COMPANY, INC
H9 ENGINEERING, INC

STACK 48"
30"
18"
54"
BAGHOUSE
CATWALK
PLATFORM
HB ENGINEERING, INC.

Appendix C
Description of Scrap Aluminum

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 pig or ingot block 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 for a sweat furnace operation & poured into a uniform slabs or sow blocks with a minimum weight of 500 pounds, and a maximum weight of 2,200 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. Equivelant to ISRI code Tall.

ISRI (Institute if 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, casting, 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 ne, clean, un-alloyed aluminum wire or cable free from hair wire, ACSR, wire screen, iron, insulation and other non-metallic items.

Tata – New Production Aluminum Extrusions – shall consist of one allow (typically 6063). Material (includes bales, bins, bags 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 other alloys other than 6063 must be agreed upon by buyer and seller.

Toto – Aluminum Extrusion "10/10" – shall consist of new production and old/used 6063 extrusions (includes bales, bins, bags 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, dirt and other contaminants.

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

Appendix D
Typical Operating Cycles for Charges

Typical Operating Cycles for Charges

Shorter Operating Cycle

1. Operating cycle begins when aluminum scrap is initially added into furnace.
2. A maximum of 8.8 – 17.3 tons charge feed amount of scrap is added into the furnace.
3. Charge feed consists of approximately 40 -60% by weight of baled, binned, bagged and/or shredded extrusion from ISRI Codes Toto/Tutu (includes painted material).
4. Balance of charge material is mill finish, primary ingot, and billet butt (unpainted materials) from Grades and ISRI Codes listed in the Description of Scrap Aluminum (Appendix A).
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 0.368 to 0.741 pounds of chlorine/ton charge.
6. Casting begins at approximately 2 – 6 hours after cycle begins.
7. Operating cycle ends when casting ends at approximately 4 – 10 hours after operating cycle begins.

Longer Operating Cycle

1. Operating cycle begins when aluminum scrap is initially added into furnace.
2. A maximum of 21.6 tons charge feed amount of scrap is added into the furnace.
3. Charge feed consists of approximately 40 -60% by weight of baled, binned, bagged and/or shredded extrusion from ISRI Codes Toto/Tutu (includes painted material).
4. Balance of charge material is mill finish, primary ingot, and billet butt (unpainted materials) from Grades and ISRI Codes listed in the Description of Scrap Aluminum (Appendix A).
5. A maximum of twenty pounds of Amlox 72F or equivalent flux is added during the 15 minutes before the casting. 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 – 10 hours.
7. The furnace is placed on "hold mode" for approximately 0 – 14 hours before casting. No charge or flux is added during this hold period.
8. Casting begins at approximately 8 – 20 hours after cycle begins.
9. Operating cycle ends when casting ends at approximately 10 – 20 hours after operating cycle begins.

Appendix E
Air Emission Calculations

Air Emission Calculations

Refer to Safety Data Sheet: Amlox 72F is maximum 60% Magnesium Chloride + 40% Potassium Chloride.

Chemistry:

Magnesium Chloride	$MgCl_2$	Atomic Weight (g/mol)
	Magnesium	1 x 24.305 = 24.305
	2 x Chloride	2 x 35.453 = 70.906
	Total	**95.211 g/mol**

Weight Fraction ($Cl_2/MgCL_2$) = 70.906 ÷ 95.211 = **0.7447**

Potassium Chloride	KCl	Atomic Weight (g/mol)
	Potassium	1 x 39.0983 = 39.0983
	Chloride	1 x 35.453 = 35.453
	Total	**74.5513 g/mol**

Weight Fraction (Cl/KCl) = 35.453 ÷ 74.5513 = **0.4756**

Conversion Factor Ratio:

$$\frac{\text{lbs Cl}}{\text{lb Amlox 72F}} = [\%\ MgCl_2 \times \text{Weight Fraction}(Cl_2/MgCl_2)] + [\%\ KCl \times \text{Weight Fraction}(Cl/KCl)]$$

= [0.6 x 0.7447] + [0.4 x 0.4756]

= **0.637** lbs Cl per lb Amlox 72F

$$\frac{\text{Max lbs Cl}}{\text{ton Al}} = [30\ (\text{lbs Amlox 72F}) \times 0.637\ (\text{lbs Cl/lb Amlox 72 F})] \div [21.6\ (\text{ton Al/day})]$$

= **0.885** Max lbs Cl per ton Al charged

Appendix F
Operating Cycle Comparison

OPERATING CYCLE COMPARISON FOR PM / VE TESTINGParameter	Typical *Shorter* Operating Cycle	Typical *Longer* Operating Cycle	PM / VE Performance Test Operating Cycle
Total Scrap Aluminum Charge Feed Amount (ton)	≤ 8.8 to 17.3	≤ 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 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
Amlox Flux / Equivalent(lb/operating cycle)	**≤ 10**	**≤ 20**	**11**
Equiv. Amount of Chlorine (lb Cl/operating cycle)	**~6.37** (6.37 = 10 x 0.637)	**~12.74** (12.74 = 20 x 0.637)	**7.01** (7.01 = 11 x 0.637)
Flux Rate (lb Cl/ton Al charged)	**~0.724** (0.724 = 6.37/8.8) **~0.368** (0.368 = 6.37/17.3)	**~0.590** (0.590 = 12.74/21.6)	*** **~0.815** (0.815 = 7.01/8.6) (Testing rate of 0.815 is within 10% of the permitted maximum (0.885))
Flux addition	During 15 minutes before casting begins	During 15 minutes before casting begins	During 15 minutes before casting begins
Melt Process (hrs)	~2-4	~8-10	~2
Holding Mode (hrs)	0	~0-10	0
Operating Cycle (hrs)	~4-10	~10-24	~4
Process Rate (ton Al/hr)	~1.23 – 2.2	~0.9 - 2.16	**~2.15** (2.15 = 8.6/4) (Testing rate of 2.15 is within 10% of the permitted maximum (2.2))

Comments: * - Highest charge feed amount (generates the permitted maximum process rate based on a 4-hr operating cycle)

** - Highest potential emissions (maximum permitted rate during testing)

*** - Highest flux rate (within 10% of permitted maximum based on charge and flux amounts)

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.

No charge or flux is added during any holding period.

Maximum potential Particulate Matter (PM) emissions occur from paint on the extrusions.

Daily operation will not exceed permitted limits.

Appendix G
Log Forms

MI Metals – Oldsmar
Permit 103011 EU ID 001
Daily Operation Log – Operating Cycle Process Rate

Month_____ **Year**_____

Operating Max of 1.35 tons aluminum processed/hour based on operating cycle.

Day	First Charge					Second Charge					Third Charge					total/day	Initial
	Tons Al process	Cycle begin am pm	Cycle end am pm	Cycle hours	Ton Al \ hr	Tons Al process	Cycle begin am pm	Cycle end am pm	Cycle hours	Ton Al \ hr	Tons Al process	Cycle begin am pm	Cycle end am pm	Cycle hours	Ton Al \ hr	Amlox max 60 lb	
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																	
26																	
27																	
28																	
29																	
30																	
31																	

Conversion Factor: 1 lbs Amlox 72F = 0.655 lbs HCl

	Hours	Tons Al	Lbs Amlox	Tons HCl	Tons HAP	Tons PM	Tons DF
Month							
12 Month							
Max Limit	8760	19,272	N/A	7.17	7.17	25.6	2.89×10^{-7}

MI Metals – Oldsmar
Permit 103011 EU ID 001
Furnace Charge Log

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 [ ] 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 = 1.35 Tons Al/Hour

Sign _____

MI Metals – Oldsmar
Permit 103011 EU ID 001
Daily Operation Log – Reactive Flux Rate

Month_____ Year_____

Amlox 72F or equivalent is reactive chlorine flux injected over 15 minute period; Conversion factor 0.637 lbs Cl/lbs Amlox 72F.
Operating Max of 0.815 lbs Cl/ton Al based on operating cycle.

Day	First Charge							Second Charge							Initial
	Charge Begin	Flux Begin am pm	Flux End Cast Begin am pm	Lbs Amlox 15 Min	Lbs Cl X 0.637	Tons Al	Lbs Cl Ton Al	Charge Begin	Flux Begin am pm	Flux End Cast Begin am pm	Lbs Amlox 15 Min	Lbs Cl X 0.637	Tons Al	Lbs Cl Ton Al	
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															
26															
27															
28															
29															
30															
31															

MI Metals – Oldsmar
Permit 103011 EU ID 001
Daily Operation Log – Reactive Flux Rate

Month_____ Year_____

Amlox 72F or equivalent is reactive chlorine flux injected over 15 minute period; Conversion factor 0.637 lbs Cl/lbs Amlox 72F. Operating Max of 0.815 lbs Cl/ton Al based on operating cycle.

Day	Third Charge (if necessary)							Initial
	Charge Begin	Flux Begin am pm	Flux End Cast Begin am pm	Lbs Amlox 15 Min	Lbs Cl X 0.637	Tons Al	Lbs Cl Ton Al	
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								
26								
27								
28								
29								
30								
31								

MI Metals – Oldsmar
Permit 103011 EU ID 001
Lime Feed Inspection/Maintenance Completion Log

Month_____ **Year**_____

Monitor sittings/Inspect Feeder at the beginning of each shift

Day	First Shift			Second Shift			Third Shift			50 Lbs Bags Used (5/Day)	Total Lime Used (250 lb/day)	Deviation/Blockage, Cause, Corrective Action Taken. *(inspect every 4 hours for 3 days after blockage)*
	Lbs/Hr 10.4	Free Flow	Initial	Lbs/Hr 10.4	Free Flow	Initial	Lbs/Hr 10.4	Free Flow	Initial			
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												
26												
27												
28												
29												
30												
31												

MI Metals – Oldsmar
Permit 103011 EU ID 001
Lime Feed Inspection *After Blockage* Completion Log

Date Blockage Occurred_____

Monitor sittings/Inspect Feeder Every 4 Hours for 3 Days After Blockage

Time	Day 1			Day 2			Day 3		
	Lbs/Hr 10.4	Free Flow	Initial	Lbs/Hr 10.4	Free Flow	Initial	Lbs/Hr 10.4	Free Flow	Initial
12 am									
4 am									
8 am									
12 pm									
4 pm									
8 pm									

MI Metals – Oldsmar
Permit 103011 EU ID 001
Process Inspection/Maintenance Completion Log

Month_____ **Year**_____

Sign after work completed per OM&M Plan

Day	Dailyt			Weekly				Monthly			Initial
	Check/Refill Water	Check Al/Gas Leaks	Check Visible Emissions	Add Algaecide Scale Chem	Check Refractory	Clean Air Filter	Cleanup Area	Remove Sludge/Dross	Grease Motor/Pumps	Check Unit Labeling	
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											
26											
27											
28											
29											
30											
31											

MI Metals – Oldsmar
Permit 103011 EU ID 001
Baghouse Inspection/Maintenance Completion Log

Month_____ Year_____

Day	Daily								Monthly			Annual			3 Year	Initial
	Pressure < 8" W.C.			Temperature ≤ 186° F			Mal-function	Equip Operation	Buildup/ Leaks	Oil / Grease	Detector/ Alarm	Bag Condition	Shaker	Fan / Housing	Replace Worn Bags	
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																
26																
27																
28																
29																
30																
31																