Alliance
SOURCE TESTING

The Alliance Advantage 2 2 2

Real Alloy Recycling, Inc.
267 North Filmore Road
Coldwater, MI 49036
(South)

Test Dates: December 16-17, 2015

AST Project No. 2015-0508

Regulatory Information

Permit No.'s	MDEQ Title V Permit No. MI-ROP-N5957-2012A MI-PTI-110-15
State Registration Number (SRN)	N5957

Source Information

Source Name	*Source ID*	*Target Parameters*
Rotary Furnace #1 & #2	FGIMROTFURN1/2-S2	PM2.5 & PM10

Contact Information

Test Location
Real Alloy Recycling, Inc.
267 N. Fillmore Road
Coldwater, MI 49036

Kerry Strange
kerry.strange@realalloy.com
(517) 279-4041

Brady Myers
brady.myers@realalloy.com
(517) 279-4036

Jeff Ferg
jeff.ferg@realalloy.com
(216) 755-8822

Test Company
Alliance Source Testing, LLC
214 Central Circle SW
Decatur, AL 35603

Project Manager
Chris LeMay
chris.lemay@stacktest.com
(256) 260-3973

Field Team Leader
Mike Belfoure
mike.belfoure@stacktest.com
(724) 255-3446

Report Coordinator
Laura Aymett
laura.aymett@stacktest.com
(256) 260-3981

QA/QC Manager
Brandy Hughes
brandy.hughes@stacktest.com
(615) 476-0559

Analytical Laboratory
Alliance Source Testing, LLC
214 Central Circle SW
Decatur, AL 35603
Heather Morgan
heather.morgan@stacktest.com
(256) 260-3972

Alliance Source Testing, LLC (AST) has completed the source testing as described in this report. Results apply only to the source(s) tested and operating condition(s) for the specific test date(s) and time(s) identified within this report. All results are intended to be considered in their entirety, and AST is not responsible for use of less than the complete test report without written consent. This report shall not be reproduced in full or in part without written approval from the customer.

To the best of my knowledge and abilities, all information, facts and test data are correct. Data presented in this report has been checked for completeness and is accurate, error-free and legible. Onsite testing was conducted in accordance with approved internal Standard Operating Procedures. Any deviations or problems are detailed in the relevant sections on the test report.

This document was prepared in portable document format (.pdf) and contains pages as identified in the bottom footer of this document.

Chris LeMay, QSTI
Alliance Source Testing, LLC

1/18/16
Date

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APPENDICES

1.0 Introduction

Alliance Source Testing, LLC (AST) was retained by Real Alloy Recycling, Inc. (RAR) to conduct compliance testing at the Coldwater South facility in Coldwater, Michigan. This facility is subject to the provisions of the Michigan Department of Environment Quality (MDEQ) Title V Permit No. MI-ROP-N5957-2012A and MDEQ Permit To Install (PTI) Permit No. 110-15 issued July 2015. Portions of the facility are subject to provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Secondary Aluminum Production facilities as detailed in 40 CFR 63, Subpart RRR. This test program was conducted to demonstrate compliance with provisions in the MDEQ permits and Consent Order 35-2014.

Testing was conducted to determine emission rates and emission factors of particulate matter less than 10 microns (PM10) and particulate matter less than 2.5 microns (PM2.5) from the baghouse shared by two (2) rotary furnaces – Rotary Furnace No. 1 and Rotary Furnace No. 2. Emissions from the rotary furnaces are commonly ducted and routed to a lime-injected baghouse. The furnaces were operated at or near maximum production capacity for the selected test materials.

1.1 Facility Description

RAR is a secondary aluminum production facility (SIC 3341) which produces molten aluminum and specification ingot from the melting and recovery of aluminum from aluminum scrap, sow and pig. The recovery of aluminum from aluminum scrap and aluminum dross and the subsequent production of aluminum ingot have been defined by EPA as secondary aluminum production processes.

1.2 Source and Control System Descriptions

The rotary furnaces are used to process aluminum dross and scrap aluminum. Each furnace is designed to rotate on its axis, mixing and tumbling the charge while heating. The furnace then tilts forward to pour out the molten aluminum (tapping) and dump out the remaining slag or Salt Cake.

Included with the metal charge is the feed of a salt flux material. The scrap or dross charge and salt mixture is rotated in the furnace while a natural gas burner directed into the open end of the furnace heats the mixture. When all of the aluminum in the batch has melted, the furnace is tilted forward and the molten aluminum is poured into crucibles for transport, transferred to the reverberatory furnace or poured into sow molds to solidify. The remaining slag or salt cake is dumped out of the furnace by tilting and rotating into pans for cooling and ultimately disposal.

Emissions from these process units are captured by hoods and directed to a lime-injected baghouse system for control of the regulated pollutants. The emission control system injects the lime into the air stream prior to the inlet of the baghouse to reduce the concentration of specific pollutants present in the exhaust gases. The baghouse then captures the reacted material and other particulate matter from the melting process.

1.3 Project Team

Personnel involved in this project are identified in the following table.

Table 1-1
Project Team

RAR Personnel	Jeff Ferg Ray Peterson Keegan Hammond
MDNR Personnel	Rex Lane Karen Kajiya-Mills Dave Patterson
AST Personnel	Mike Belfoure Jared Wansor

1.4 Site Specific Test Plan & Notification

Testing was conducted in accordance with the Site Specific Test Plan (SSTP) submitted to the MDEQ on October 9, 2015 and revised test schedule submitted on November 23, 2015.

2.0 Summary of Results

AST conducted compliance testing at the RAR – Coldwater South facility in Coldwater, Michigan on December 16-17, 2015. Testing consisted of determining the emission rates and emission factors of PM2.5 and PM10 at the exhaust of the common baghouse for Rotary Furnace No. 1 and Rotary Furnace No. 2.

Table 2-1 provides a summary of the testing results along with a summary of the process operating and control system data collected during testing. Any difference between the summary results listed in the following table and the detailed results contained in Appendix B is due to rounding for presentation.

Table 2-1
Summary of Results

Emissions Data				
Run Number	**Run 1**	**Run 2**	**Run 3**	**Average**
Date	**12/16/15**	**12/17/15**	**12/17/15**	**--**
Particulate Matter Data				
PM2.5 Emission Rate, lb/hr	1.6	1.9	1.0	1.5
PM2.5 Emission Factor, lb/ton	0.152	0.174	0.097	0.141
Permit Limit, lb/ton	--	--	--	0.292
Percent of Limit, %	--	--	--	**48**
PM10 Emission Rate, lb/hr	1.8	2.1	1.3	1.7
PM10 Emission Factor, lb/ton	0.169	0.188	0.122	0.160
Permit Limit, lb/ton	--	--	--	0.737
Percent of Limit, %	--	--	--	**22**
Process Operating / Control System Data				
Run Number	**Run 1**	**Run 2**	**Run 3**	**Average**
Date	**12/16/15**	**12/17/15**	**12/17/15**	**--**
Total Feed Rate, lb/hr	20,651	21,824	21,187	21,221
Flux Percent, %	14.4	15.3	15.4	15.0
Lime Injection Rate, lb/hr	341.6	332.0	339.7	337.8
Fce 1 Trona Injection Rate, lb/hr	87.0	89.1	97.7	91.3
Fce 2 Trona Injection Rate, lb/hr	89.0	93.7	87.2	90.0

3.0 Testing Methodology

The emission testing program was conducted in accordance with the U.S. EPA Reference Test Methods listed in Table 3-1. Method descriptions are provided below while quality assurance/quality control data is provided in Appendix D.

Table 3-1
Source Testing Methodology

Parameter	U.S. EPA Reference Test Methods	Notes/Remarks
Volumetric Flow Rate	1 & 2	Full Velocity Traverses
Oxygen/Carbon Dioxide	3/3A	Integrated Bag / Instrumental Analysis
Moisture Content	4	Volumetric / Gravimetric Analysis
Particulate Matter less than 10 microns	201A/202	Constant Rate Sampling

3.1 U.S. EPA Reference Test Methods 1 & 2 – Volumetric Flow Rate

The sampling location and number of traverse (sampling) points were selected in accordance with U.S. EPA Reference Test Method 1. A full velocity traverse was conducted in accordance with U.S. EPA Reference Test Method 2 to determine the average stack gas velocity pressure, static pressure and temperature. The velocity and static pressure measurement system consisted of an S-type pitot tube and inclined manometer while the stack gas temperature was measured with a K-type thermocouple and pyrometer.

3.2 U.S. EPA Reference Test Method 3/3A – Oxygen/Carbon Dioxide

The oxygen and carbon dioxide concentrations were determined in accordance with U.S. EPA Reference Test Method 3. One (1) integrated Tedlar bag sample was collected during each test run. The bag samples were analyzed onsite with an O_2/CO_2 analyzer. Analyzer calibrations were conducted in accordance with U.S. EPA Reference Test Method 3A. The remaining stack gas constituent were assumed to be nitrogen for the stack gas molecular weight determination. The quality control measures are described in Section 3.5.

3.3 U.S. EPA Reference Test Method 4 – Moisture Content

The stack gas moisture content was determined in accordance with U.S. EPA Reference Test Method 4. The gas conditioning train consisted of a series of chilled impingers. Prior to testing, each impinger was filled with a known quantity of water or silica gel. Post testing, the quantities of water and silica gel were measured to determine the amount of moisture condensed during the test run. Alternatively, each impinger was analyzed gravimetrically before and after each test run on the same analytical balance to determine the amount of moisture condensed.

3.4 U.S. EPA Reference Test Methods 201A/202 – PM10 & PM2.5

The PM10 and PM2.5 testing was conducted in accordance with U.S. EPA Reference Test Methods 201A and 202. The complete sampling system consisted of in-stack 10 um and 2.5 um cyclones and pre-weighed quartz filter; heated glass-lined probe; gas conditioning train; pump and calibrated dry gas meter. The gas conditioning train consisted of four (4) impingers. The first and second impingers were initially empty, the third contained 100 milliliters (mL) of de-ionized water and the fourth impinger contained approximately 200 grams of silica gel. An un-weighed 90 mm Teflon filter was placed between the second and third impinger.

Following the completion of each test run, the sampling train was leak checked at a vacuum pressure greater than or equal to the highest vacuum pressure observed during the run. The contents of impingers 1 and 2 were recovered in Container 1. Impingers 1 and 2, the coil condenser and all connecting glassware were rinsed with water and then with acetone and hexane. The water rinses were added to Container 1 while the solvent rinses were recovered in Container 2. The filter was removed from the filter holder and placed in Container 3. The front half of the condensable filter holder was rinsed with water and then with acetone and hexane. The water rinse was added to Container 1 while the solvent rinses were added to Container 2.

The pre-weighed filter was removed and placed in Container 4. The back-half of the PM10 cyclone, front half of the PM2.5 cyclone and the connecting stainless tubing was rinsed three (3) times with acetone, and recovered in Container 5. The back-half of the PM2.5 cyclone and front half of the filter holder was rinsed three (3) times with acetone to remove any adhering particulate matter and recovered in Container 6. All containers were sealed, labeled and liquid levels marked for transport to the laboratory for analysis.

3.5 Quality Assurance/Quality Control – U.S. EPA Reference Test Method 3A

All volumetric flow rate components were uniquely identified, calibrated and leak-checked as required in the applicable EPA Reference Test Method. Calibrated components included, but were not limited to, pitot tubes, thermocouples and dry gas meters. All sampling systems were checked for leaks before and after each test run.

EPA Protocol 1 Calibration Gases – Cylinder calibration gases were supplied by a certified supplier which meet Protocol 1 (+/- 2%) standards. Copies of all calibration gas certificates can be found in the Quality Assurance/Quality Control Appendix.

Low Level gases were introduced directly to analyzer. After adjusting the analyzer to the Low Level gas concentration and once the analyzer reading was stable, the analyzer reading was recorded. This process was repeated for the High Level gas. Next, Mid Level gases were introduced directly to analyzer and reading was recorded. All recording readings were within +/- 2 percent of the Calibration Span.

All data was reviewed by the Field Team Leader before leaving the facility. Once arriving at AST's office, all written and electronic data was relinquished to the report coordinator and then a final review was performed by the Project Manager.