**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
*We Protect Hoosiers and Our Environment.*

*Mitchell E. Daniels Jr.*
**Governor**

*Thomas W. Easterly*
**Commissioner**

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
**www.idem.IN.gov**

TO: Interested Parties / Applicant

DATE: November 7, 2011

RE: Modern Aluminum Castings / 167-30578-00154

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

# Notice of Decision: Approval - Effective Immediately

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 13-15-5-3, this permit is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3 and IC 13-15-6-1 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) calendar days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

(1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
(2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
(3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

(1) the name and address of the person making the request;
(2) the interest of the person making the request;
(3) identification of any persons represented by the person making the request;
(4) the reasons, with particularity, for the request;
(5) the issues, with particularity, proposed for considerations at any hearing; and
(6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures
FNPER.dot12/03/07

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# New Source Review and Minor Source Operating Permit OFFICE OF AIR QUALITY

## Modern Aluminum Castings
## 1400 North 14th Street
## Terre Haute, Indiana 47807

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

This permit is issued to the above mentioned company under the provisions of 326 IAC 2-1.1, 326 IAC 2-6.1 and 40 CFR 52.780, with conditions listed on the attached pages.

Indiana statutes from IC 13 and rules from 326 IAC, quoted in conditions in this permit, are those applicable at the time the permit was issued. The issuance or possession of this permit shall not alone constitute a defense against an alleged violation of any law, regulation or standard, except for the requirement to obtain a MSOP under 326 IAC 2-6.1.

| Operation Permit No.: M167-30578-00154 | |
|---|---|
| Issued by:<br><br>Iryn Calilung, Section Chief<br>Permits Branch<br>Office of Air Quality | Issuance Date: November 7, 2011<br><br>Expiration Date: November 7, 2016 |

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## SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 and A.2 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

### A.1 General Information [326 IAC 2-5.1-3(c)][326 IAC 2-6.1-4(a)]

The Permittee owns and operates a stationary aluminum foundry making sand-casted parts, using clean melt charge.

| | |
|---|---|
| Source Address: | 1400 North 14th Street, Terre Haute, Indiana 47807 |
| General Source Phone Number: | 812-232-0007 |
| SIC Code: | 3365 (Aluminum Foundries) |
| County Location: | Vigo |
| Source Location Status: | Attainment for all criteria pollutants |
| Source Status: | Minor Source Operating Permit Program<br>Minor Source, under PSD and Emission Offset Rules<br>Minor Source, Section 112 of the Clean Air Act<br>Not 1 of 28 Source Categories |

### A.2 Emission Units and Pollution Control Equipment Summary

This stationary source consists of the following emission units and pollution control devices:

(a) One (1) natural gas-fired melting process, with a combined maximum throughput melting rate of 0.76 tons per hour, and consisting of the following:

(1) One (1) reverberatory furnace, identified as REV-1, constructed in January, 2002, with a maximum throughput melt rate of 660 pounds per hour (0.33 tons per hour), melting only clean charge, with a maximum heat input rate of 1.5 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(2) One (1) reverberatory furnace, identified as REV-2, constructed in July, 2002, with a maximum throughput melt rate of 660 pounds per hour (0.33 tons per hour), melting only clean charge, with a maximum heat input rate of 1.5 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(3) One (1) natural gas-fired crucible furnace, identified as Cru-1, constructed in January, 2009, with a maximum throughput melt rate of 200 pounds per hour (0.10 tons per hour), melting only clean charge, with a maximum heat input rate of 0.230 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(b) One (1) Molding and Sand System, with a combined maximum sand throughput rate of 18.56 tons per hour, and a combined maximum metal throughput rate of 0.76 tons per hour, using baghouse DC-SAND-1 for particulate control, exhausting through stack SV-SAND-1, and consisting of the following:

(1) One (1) sand system, identified as Sand, constructed in January, 1972, consisting of a mullor mixer, and conveyors;

(2) One (1) B&P 2016 sand molding machine, identified as Mold-1, constructed in January, 1993;

(3) One (1) B&P 2620 sand molding machine, identified as Mold-2, constructed in January, 1997;

(4) One (1) Osborn Roto-lift sand molding operation, consisting of two machines, identified as Mold-3;

(5) One (1) Airset sand molding machine, identified as AMold;

(6) One (1) permanent mold process, identified as PMold, consisting of two (2) machines, using no sand in its process;

(7) One (1) Jolt Squeezer machine operation, identified as Squeeze Mold-1.

(c) One (1) Pouring, Casting, and Cooling system, and one (1) Shakeout and Knockout system, with a maximum metal throughput rate of 0.76 tons per hour and a maximum sand throughput of 18.56 tons per hour.

(d) Three (3) Supplemental Sand Silos, pneumatically loaded, consisting of the following:

(1) Two (2) supplemental sand silos, identified as SSAND-1 and SSAND-2, constructed in January, 1997, each with a maximum storage capacity of silica sand of 20 tons and a maximum annual throughput rate of 50 tons per year, using a bin vent for particulate control, and exhausting through stack SV-SSAND-1, and SV-SSAND-2, respectively;

(2) One (1) supplemental sand silo, identified as SSAND-3, constructed in January, 2001, with a maximum storage capacity of silica sand of 15 tons, and a maximum annual throughput rate of 38 tons per year, using a bin vent for particulate control, and exhausting through stack SV-SSAND-3.

(e) One (1) Finishing operation, with a maximum metal throughput rate of 0.76 tons per hour, consisting of the following:

(1) One (1) bandsaw, identified as BSaw-1, constructed in January, 1954, using no controls, and exhausting inside the plant;

(2) One (1) bandsaw, identified as BSaw-2, constructed in January, 1991, using no controls, and exhausting inside the plant.

(3) Twenty (20) grinders, collectively identified as Grind-1, constructed in January, 2001, using no controls, and exhausting inside the plant;

(4) One (1) Hand Burring Machine, identified as Burr-1, constructed in January, 2001, using no controls, and exhausting inside the plant;

(5) One (1) Vibratory Wet Deburr Machine, identified as VBurr-1, constructed in January, 2001, using no controls, and exhausting inside the plant;

(6) Two (2) Rivet Machines, installed in 2001, using no controls, and exhausting inside the plant;

(7) Twenty (20) burr guns, installed in 2001, using no controls, and exhausting inside the plant;

(8) Twenty (20) hand sanders, installed in 2001, using no controls, and exhausting inside the plant.

(f) One (1) Shot Peen Machine, identified as Peen-1, constructed in January, 1976, with a maximum metal throughput rate of 0.76 tons per hour, using no controls, exhausting to SV-Peen-1.

(g) One (1) core-making process, with a combined maximum throughput capacity of 0.10 tons per hour, consisting of the following:

(1) One (1) Cold Box Core Making operation, identified as CBCore, constructed in January, 1996, consisting of two machines, using no controls, and exhausting through stack SV-CBCore;

(2) One (1) Warm Box Core Making operation, identified as WBCore, constructed in January, 1980, consisting of two core machines, using no controls, and exhausting inside the plant;

(3) One (1) Shell/Harrison Core Making operation, identified as SHCore, constructed in January, 2010, consisting of two core machines;

(4) One (1) Airset Core Making operation, identified as ACore, constructed in January, 2010, using no controls, and exhausting inside the plant;

(5) One (1) Oil Sand Core Making operation, identified as OSCore, constructed in January, 1955, consisting of two core machines and one (1) natural gas-fired combustion drying oven, with a maximum heat input capacity of 0.30 MMBtu/hr, using no controls, and exhausting inside the plant;

(6) Six (6) natural gas-fired drying ovens with a combined maximum heat input capacity of 0.66 MMBtu/hr, using no controls, and exhausting inside the plant.

(h) One (1) welding process, consisting of the following:

(1) One (1) MIG Welding Station, identified as MIG1, constructed in January, 1960, with a maximum electrode rod consumption of 0.10 pounds per hour, using no controls, and exhausting inside the plant;

(2) One (1) TIG Welding Station, identified as TIG1, constructed in January, 1960, with a maximum electrode rod consumption of 0.10 pounds per hour, using no controls, and exhausting inside the plant.

(i) One (1) Paint and Powder Coating Booth, identified as PB-1, constructed in January, 2009, using one high volume low pressure gun and powder gun, with a maximum throughput of 438 gallons per year, using dry filters for particulate control, exhausting through stack SV-PB-1.

(j) Various natural gas-fired combustion units, consisting of space heaters and office heaters, with a combined maximum heat input capacity of 0.575 MMBtu/hr, using no controls, and exhausting inside the plant.

## SECTION B GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-1.1-1]

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-1.1-1) shall prevail.

B.2 Revocation of Permits [326 IAC 2-1.1-9(5)]

Pursuant to 326 IAC 2-1.1-9(5)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.

B.3 Affidavit of Construction [326 IAC 2-5.1-3(h)] [326 IAC 2-5.1-4]

This document shall also become the approval to operate pursuant to 326 IAC 2-5.1-4 when prior to the start of operation, the following requirements are met:

(a) The attached Affidavit of Construction shall be submitted to the Office of Air Quality (OAQ), verifying that the emission units were constructed as proposed in the application or the permit. The emission units covered in this permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM if constructed as proposed.

(b) If actual construction of the emission units differs from the construction proposed in the application, the source may not begin operation until the permit has been revised pursuant to 326 IAC 2 and an Operation Permit Validation Letter is issued.

(c) The Permittee shall attach the Operation Permit Validation Letter received from the Office of Air Quality (OAQ) to this permit.

B.4 Permit Term [326 IAC 2-6.1-7(a)][326 IAC 2-1.1-9.5][IC 13-15-3-6(a)]

(a) This permit, M167-30578-00154, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit.

(b) If IDEM, OAQ, upon receiving a timely and complete renewal permit application, fails to issue or deny the permit renewal prior to the expiration date of this permit, this existing permit shall not expire and all terms and conditions shall continue in effect, until the renewal permit has been issued or denied.

B.5 Term of Conditions [326 IAC 2-1.1-9.5]

Notwithstanding the permit term of a permit to construct, a permit to operate, or a permit modification, any condition established in a permit issued pursuant to a permitting program approved in the state implementation plan shall remain in effect until:

(a) the condition is modified in a subsequent permit action pursuant to Title I of the Clean Air Act; or

(b) the emission unit to which the condition pertains permanently ceases operation.

B.6 Enforceability

Unless otherwise stated, all terms and conditions in this permit, including any provisions designed to limit the source's potential to emit, are enforceable by IDEM, the United States Environmental Protection Agency (U.S. EPA) and by citizens in accordance with the Clean Air Act.

B.7 Severability

The provisions of this permit are severable; a determination that any portion of this permit is invalid shall not affect the validity of the remainder of the permit.

B.8 Property Rights or Exclusive Privilege

This permit does not convey any property rights of any sort or any exclusive privilege.

B.9 Duty to Provide Information

(a) The Permittee shall furnish to IDEM, OAQ, within a reasonable time, any information that IDEM, OAQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. Upon request, the Permittee shall also furnish to IDEM, OAQ copies of records required to be kept by this permit.

(b) For information furnished by the Permittee to IDEM, OAQ, the Permittee may include a claim of confidentiality in accordance with 326 IAC 17.1. When furnishing copies of requested records directly to U. S. EPA, the Permittee may assert a claim of confidentiality in accordance with 40 CFR 2, Subpart B.

B.10 Annual Notification [326 IAC 2-6.1-5(a)(5)]

(a) An annual notification shall be submitted by an authorized individual to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this permit.

(b) The annual notice shall be submitted in the format attached no later than March 1 of each year to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(c) The notification shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

B.11 Preventive Maintenance Plan [326 IAC 1-6-3]

(a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) no later than ninety (90) days after issuance of this permit, including the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Permittee's control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The Permittee shall implement the PMPs.

(b) A copy of the PMPs shall be submitted to IDEM, OAQ upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions.

(c) To the extent the Permittee is required by 40 CFR Part 60/63 to have an Operation Maintenance, and Monitoring (OMM) Plan for a unit, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for that unit.

B.12 Prior Permits Superseded [326 IAC 2-1.1-9.5]

(a) All terms and conditions of permits established prior to M167-30578-00154 and issued pursuant to permitting programs approved into the state implementation plan have been either:

(1) incorporated as originally stated,

(2) revised, or

(3) deleted.

(b) All previous registrations and permits are superseded by this permit.

B.13 Termination of Right to Operate [326 IAC 2-6.1-7(a)]

The Permittee's right to operate this source terminates with the expiration of this permit unless a timely and complete renewal application is submitted at least one hundred twenty (120) days prior to the date of expiration of the source's existing permit, consistent with 326 IAC 2-6.1-7.

B.14 Permit Renewal [326 IAC 2-6.1-7]

(a) The application for renewal shall be submitted using the application form or forms prescribed by IDEM, OAQ and shall include the information specified in 326 IAC 2-6.1-7. Such information shall be included in the application for each emission unit at this source. The renewal application does require an affirmation that the statements in the application are true and complete by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

Request for renewal shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(b) A timely renewal application is one that is:

(1) Submitted at least one hundred twenty (120) days prior to the date of the expiration of this permit; and

(2) If the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) If the Permittee submits a timely and complete application for renewal of this permit, the source's failure to have a permit is not a violation of 326 IAC 2-6.1 until IDEM, OAQ takes final action on the renewal application, except that this protection shall cease to apply if, subsequent to the completeness determination, the Permittee fails to submit by the deadline specified, pursuant to 326 IAC 2-6.1-4(b), in writing by IDEM, OAQ any additional information identified as being needed to process the application.

B.15 Permit Amendment or Revision [326 IAC 2-5.1-3(e)(3)][326 IAC 2-6.1-6]

(a) Permit amendments and revisions are governed by the requirements of 326 IAC 2-6.1-6 whenever the Permittee seeks to amend or modify this permit.

(b) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(c) The Permittee shall notify the OAQ no later than thirty (30) calendar days of implementing a notice-only change. [326 IAC 2-6.1-6(d)]

B.16 Source Modification Requirement

A modification, construction, or reconstruction is governed by the requirements of 326 IAC 2.

B.17 Inspection and Entry
[326 IAC 2-5.1-3(e)(4)(B)][326 IAC 2-6.1-5(a)(4)][IC 13-14-2-2][IC 13-17-3-2][IC 13-30-3-1]

Upon presentation of proper identification cards, credentials, and other documents as may be required by law, and subject to the Permittee's right under all applicable laws and regulations to assert that the information collected by the agency is confidential and entitled to be treated as such, the Permittee shall allow IDEM, OAQ, U.S. EPA, or an authorized representative to perform the following:

(a) Enter upon the Permittee's premises where a permitted source is located, or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

(b) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, inspect, at reasonable times, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;

(d) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with this permit or applicable requirements; and

(e) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, utilize any photographic, recording, testing, monitoring, or other equipment for the purpose of assuring compliance with this permit or applicable requirements.

B.18 Transfer of Ownership or Operational Control [326 IAC 2-6.1-6]

(a) The Permittee must comply with the requirements of 326 IAC 2-6.1-6 whenever the Permittee seeks to change the ownership or operational control of the source and no other change in the permit is necessary.

(b) Any application requesting a change in the ownership or operational control of the source shall contain a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new Permittee. The application shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The application which shall be submitted by the Permittee does require an affirmation that the statements in the application are true and complete by an "authorized individual" as defined by 326 IAC 2-1.1-1(1).

(c) The Permittee may implement notice-only changes addressed in the request for a notice-only change immediately upon submittal of the request. [326 IAC 2-6.1-6(d)(3)]

B.19 Annual Fee Payment [326 IAC 2-1.1-7]

(a) The Permittee shall pay annual fees due no later than thirty (30) calendar days of receipt of a bill from IDEM, OAQ,.

(b) The Permittee may call the following telephone numbers: 1-800-451-6027 or 317-233-4230 (ask for OAQ, Billing, Licensing, and Training Section), to determine the appropriate permit fee.

B.20 Credible Evidence [326 IAC 1-1-6]

For the purpose of submitting compliance certifications or establishing whether or not the Permittee has violated or is in violation of any condition of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether the Permittee would have been in compliance with the condition of this permit if the appropriate performance or compliance test or procedure had been performed.

**SECTION C SOURCE OPERATION CONDITIONS**

Entire Source

**Emission Limitations and Standards [326 IAC 2-6.1-5(a)(1)]**

C.1 Permit Revocation [326 IAC 2-1.1-9]

Pursuant to 326 IAC 2-1.1-9 (Revocation of Permits), this permit to operate may be revoked for any of the following causes:

(a) Violation of any conditions of this permit.

(b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.

(c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.

(d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.

(e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of this article.

C.2 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-1 (Applicability) and 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of thirty percent (30%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.3 Open Burning [326 IAC 4-1] [IC 13-17-9]

The Permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6. The previous sentence notwithstanding, the Permittee may open burn in accordance with an open burning approval issued by the Commissioner under 326 IAC 4-1-4.1.

C.4 Incineration [326 IAC 4-2] [326 IAC 9-1-2]

The Permittee shall not operate an incinerator except as provided in 326 IAC 4-2 or in this permit. The Permittee shall not operate a refuse incinerator or refuse burning equipment except as provided in 326 IAC 9-1-2 or in this permit.

C.5 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

C.6 Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

(a) Notification requirements apply to each owner or operator. If the combined amount of regulated asbestos containing material (RACM) to be stripped, removed or disturbed is at least 260 linear feet on pipes or 160 square feet on other facility components, or at least thirty-five (35) cubic feet on all facility components, then the notification requirements of 326 IAC 14-10-3 are mandatory. All demolition projects require notification whether or not asbestos is present.

(b) The Permittee shall ensure that a written notification is sent on a form provided by the Commissioner at least ten (10) working days before asbestos stripping or removal work or before demolition begins, per 326 IAC 14-10-3, and shall update such notice as necessary, including, but not limited to the following:

(1) When the amount of affected asbestos containing material increases or decreases by at least twenty percent (20%); or

(2) If there is a change in the following:

(A) Asbestos removal or demolition start date;

(B) Removal or demolition contractor; or

(C) Waste disposal site.

(c) The Permittee shall ensure that the notice is postmarked or delivered according to the guidelines set forth in 326 IAC 14-10-3(2).

(d) The notice to be submitted shall include the information enumerated in 326 IAC 14-10-3(3).

All required notifications shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The notice shall include a signed certification from the owner or operator that the information provided in this notification is correct and that only Indiana licensed workers and project supervisors will be used to implement the asbestos removal project.

(e) Procedures for Asbestos Emission Control
The Permittee shall comply with the applicable emission control procedures in 326 IAC 14-10-4 and 40 CFR 61.145(c). Per 326 IAC 14-10-1, emission control requirements are applicable for any removal or disturbance of RACM greater than three (3) linear feet on pipes or three (3) square feet on any other facility components or a total of at least 0.75 cubic feet on all facility components.

(f) Demolition and Renovation
The Permittee shall thoroughly inspect the affected facility or part of the facility where the demolition or renovation will occur for the presence of asbestos pursuant to 40 CFR 61.145(a).

(g) Indiana Licensed Asbestos Inspector
The Permittee shall comply with 326 IAC 14-10-1(a) that requires the owner or operator, prior to a renovation/demolition, to use an Indiana Licensed Asbestos Inspector to

thoroughly inspect the affected portion of the facility for the presence of asbestos. The requirement to use an Indiana Licensed Asbestos inspector is not federally enforceable.

**Testing Requirements [326 IAC 2-6.1-5(a)(2)]**

C.7 Performance Testing [326 IAC 3-6]

(a) For performance testing required by this permit, a test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

no later than thirty-five (35) days prior to the intended test date.

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date.

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ if the Permittee submits to IDEM, OAQ a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

**Compliance Requirements [326 IAC 2-1.1-11]**

C.8 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U. S. EPA.

**Compliance Monitoring Requirements [326 IAC 2-6.1-5(a)(2)]**

C.9 Compliance Monitoring [326 IAC 2-1.1-11]

Compliance with applicable requirements shall be documented as required by this permit. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment. All monitoring and record keeping requirements not already legally required shall be implemented no later than ninety (90) days after issuance of this permit.

C.10 Instrument Specifications [326 IAC 2-1.1-11]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale.

(b) The Permittee may request that the IDEM, OAQ approve the use of an instrument that does not meet the above specifications provided the Permittee can demonstrate that an alternative instrument specification will adequately ensure compliance with permit conditions requiring the measurement of the parameters.

**Corrective Actions and Response Steps**

C.11 Response to Excursions or Exceedances

Upon detecting an excursion where a response step is required by the D Section or an exceedance of a limitation in this permit:

(a) The Permittee shall take reasonable response steps to restore operation of the emissions unit (including any control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing excess emissions.

(b) The response shall include minimizing the period of any startup, shutdown or malfunction. The response may include, but is not limited to, the following:

(1) initial inspection and evaluation;

(2) recording that operations returned or are returning to normal without operator action (such as through response by a computerized distribution control system); or

(3) any necessary follow-up actions to return operation to normal or usual manner of operation.

(c) A determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include, but is not limited to, the following:

(1) monitoring results;

(2) review of operation and maintenance procedures and records; and/or

(3) inspection of the control device, associated capture system, and the process.

(d) Failure to take reasonable response steps shall be considered a deviation from the permit.

(e) The Permittee shall record the reasonable response steps taken.

C.12 Actions Related to Noncompliance Demonstrated by a Stack Test

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall submit a description of its response actions to IDEM, OAQ, no later than seventy-five (75) days after the date of the test.

(b) A retest to demonstrate compliance shall be performed no later than one hundred eighty (180) days after the date of the test. Should the Permittee demonstrate to IDEM, OAQ that retesting in one hundred eighty (180) days is not practicable, IDEM, OAQ may extend the retesting deadline

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

**Record Keeping and Reporting Requirements [326 IAC 2-6.1-5(a)(2)]**

C.13 Malfunctions Report [326 IAC 1-6-2]

Pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

(a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ) or appointed representative upon request.

(b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to OAQ, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.

(c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).

(d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

C.14 General Record Keeping Requirements [326 IAC 2-6.1-5]

(a) Records of all required monitoring data, reports and support information required by this permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be physically present or electronically accessible at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, for all record keeping requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance or the date of initial start-up, whichever is later, to begin such record keeping.

C.15 General Reporting Requirements [326 IAC 2-1.1-11] [326 IAC 2-6.1-2] [IC 13-14-1-13]

(a) Reports required by conditions in Section D of this permit shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(b) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or

before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) The first report shall cover the period commencing on the date of issuance of this permit, and ending on the last day of the reporting period. Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit, "calendar year" means the twelve (12) month period from January 1 to December 31 inclusive.

**SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS**

**Emissions Unit Description:**

(a) One (1) natural gas-fired melting process, with a combined maximum throughput melting rate of 0.76 tons per hour, and consisting of the following:

(1) One (1) reverberatory furnace, identified as REV-1, constructed in January, 2002, with a maximum throughput melt rate of 660 pounds per hour (0.33 tons per hour), melting only clean charge, with a maximum heat input rate of 1.5 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(2) One (1) reverberatory furnace, identified as REV-2, constructed in July, 2002, with a maximum throughput melt rate of 660 pounds per hour (0.33 tons per hour), melting only clean charge, with a maximum heat input rate of 1.5 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(3) One (1) natural gas-fired crucible furnace, identified as Cru-1, constructed in January, 2009, with a maximum throughput melt rate of 200 pounds per hour (0.10 tons per hour), melting only clean charge, with a maximum heat input rate of 0.230 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(b) One (1) Molding and Sand System, with a combined maximum sand throughput rate of 18.56 tons per hour, and a combined maximum metal throughput rate of 0.76 tons per hour, using baghouse DC-SAND-1 for particulate control, exhausting through stack SV-SAND-1, and consisting of the following:

(1) One (1) sand system, identified as Sand, constructed in January, 1972, consisting of a mullor mixer, and conveyors;

(2) One (1) B&P 2016 sand molding machine, identified as Mold-1, constructed in January, 1993;

(3) One (1) B&P 2620 sand molding machine, identified as Mold-2, constructed in January, 1997;

(4) One (1) Osborn Roto-lift sand molding operation, consisting of two machines, identified as Mold-3;

(5) One (1) Airset sand molding machine, identified as AMold;

(6) One (1) permanent mold process, identified as PMold, consisting of two (2) machines, using no sand in its process.

(7) One (1) Jolt Squeezer machine operation, identified as Squeeze Mold-1.

(c) One (1) Pouring, Casting, and Cooling system, and one (1) Shakeout & Knockout system, with a maximum metal throughput rate of 0.76 tons per hour and a maximum sand throughput of 18.56 tons per hour.

(d) Three (3) Supplemental Sand Silos, pneumatically loaded, consisting of the following:

(1) Two (2) supplemental sand silos, identified as SSAND-1 and SSAND-2, constructed in January, 1997, each with a maximum storage capacity of silica sand of 20 tons and a

maximum annual throughput rate of 50 tons per year, using a bin vent for particulate control, and exhausting through stack SV-SSAND-1, and SV-SSAND-2, respectively;

(2) One (1) supplemental sand silo, identified as SSAND-3, constructed in January, 2001, with a maximum storage capacity of silica sand of 15 tons, and a maximum annual throughput rate of 38 tons per year, using a bin vent for particulate control, and exhausting through stack SV-SSAND-3.

(e) One (1) Finishing operation, with a maximum metal throughput rate of 0.76 tons per hour, consisting of the following:

(1) One (1) bandsaw, identified as BSaw-1, constructed in January, 1954, using no controls, and exhausting inside the plant;

(2) One (1) bandsaw, identified as BSaw-2, constructed in January, 1991, using no controls, and exhausting inside the plant.

(3) Twenty (20) grinders, collectively identified as Grind-1, constructed in January, 2001, using no controls, and exhausting inside the plant;

(4) One (1) Hand Burring Machine, identified as Burr-1, constructed in January, 2001, using no controls, and exhausting inside the plant;

(5) One (1) Vibratory Wet Deburr Machine, identified as VBurr-1, constructed in January, 2001, using no controls, and exhausting inside the plant.

(6) Two (2) Rivet Machines, installed in 2001, using no controls, and exhausting inside the plant;

(7) Twenty (20) burr guns, installed in 2001, using no controls, and exhausting inside the plant;

(8) Twenty (20) hand sanders, installed in 2001, using no controls, and exhausting inside the plant.

(f) One (1) Shot Peen Machine, identified as Peen-1, constructed in January, 1976, with a maximum metal throughput rate of 0.76 tons per hour, using no controls, exhausting to SV-Peen-1.

(g) One (1) core-making process, with a combined maximum throughput capacity of 0.10 tons per hour, consisting of the following:

(1) One (1) Cold Box Core Making operation, identified as CBCore, constructed in January, 1996, consisting of two machines, using no controls, and exhausting through stack SV-CBCore;

(2) One (1) Warm Box Core Making operation, identified as WBCore, constructed in January, 1980, consisting of two core machines, using no controls, and exhausting inside the plant;

(3) One (1) Shell/Harrison Core Making operation, identified as SHCore, constructed in January, 2010, consisting of two core machines and a natural gas-fired combustion unit with a maximum heat input capacity of 0.15 MMBtu/hr, using no controls, and exhausting inside the plant;

(4) One (1) Airset Core Making operation, identified as ACore, constructed in January, 2010, using no controls, and exhausting inside the plant;

(5) One (1) Oil Sand Core Making operation, identified as OSCore, constructed in January, 1955, consisting of two core machines and one (1) natural gas-fired combustion drying oven, with a maximum heat input capacity of 0.30 MMBtu/hr, using no controls, and exhausting inside the plant.

(6) Six (6) natural gas-fired drying ovens with a combined maximum heat input capacity of 0.66 MMBtu/hr, using no controls, and exhausting inside the plant;

(h) One (1) welding process, consisting of the following:

(1) One (1) MIG Welding Station, identified as MIG1, constructed in January, 1960, with a maximum electrode rod consumption of 0.10 pounds per hour, using no controls, and exhausting inside the plant;

(2) One (1) TIG Welding Station, identified as TIG1, constructed in January, 1960, with a maximum electrode rod consumption of 0.10 pounds per hour, using no controls, and exhausting inside the plant.

(i) One (1) Paint and Powder Coating Booth, identified as PB-1, constructed in January, 2009, using one high volume low pressure gun and powder gun, with a maximum throughput of 438 gallons per year, using dry filters for particulate control, exhausting through stack SV-PB-1.

(j) Various natural gas-fired combustion units, consisting of space heaters and office heaters, with a combined maximum heat input capacity of 0.575 MMBtu/hr, using no controls, and exhausting inside the plant.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**Emission Limitations and Standards [326 IAC 2-6.1-5(a)(1)]**

D.1.1 Particulate Emissions [326 IAC 6.5-1-2]

Pursuant to 326 IAC 6.5-1-2, particulate matter emissions from each emission unit at this source shall not exceed seven-hundredths (0.07) gram per dry standard cubic meter (g/dscm), or three-hundredths (0.03) grain per dry standard cubic foot (dscf).

D.1.2 Prevention of Significant Deterioration (PSD) [326 IAC 2-2]

(a) In order to render 326 IAC 2-2 (PSD) not applicable, the Permittee shall melt only clean charge in the two reverberatory melt furnaces and one crucible furnace, identified as REV-1, REV-2, and Cru-1, at all times.

(b) Clean charge shall be defined as furnace charge materials, including molten aluminum; T-bar; sow; ingot; billet; pig; aluminum scrap known by the owner or operator to be entirely free of paints, coatings, and lubricants; uncoated/unpainted aluminum chips that have been thermally dried or treated by a centrifugal cleaner; aluminum scrap dried at 343 °C (650°F) or higher; aluminum scrap delacquered/decoated at 482 °C (900 °F) or higher, and runaround scrap.

Compliance with this condition shall render 326 IAC 2-2 not applicable because it will not be one (1) of the twenty-eight (28) source categories Compliance with this condition shall also render 40 CFR 63, Subpart RRR not applicable.

D.1.3 Preventive Maintenance Plan [326 IAC 1-6-3]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for the sand system and its control device, DC-Sand-1.

**Compliance Determination Requirements [326 IAC 2-6.1-5(a)(2)]**

D.1.4 Particulate Control

In order to comply with Condition D.1.1, the Permittee shall comply with the following:

(a) The baghouse DC-SAND-1 for particulate control shall be in operation at all times that the sand and molding system, is in operation.

D.1.5 Testing [326 IAC 2-1.1-11]

In order to demonstrate the compliance status with Condition D.1.1, the Permittee shall perform a material mass balance for the sand system for PM, PM10, and PM2.5, within 180 days from the issuance of this permit, utilizing methods approved by the Commissioner. Section C - Performance Testing contains the Permittee's obligation with regard to the performance testing required by this condition.

**Compliance Monitoring Requirements [326 IAC 2-6.1-5(a)(2)]**

D.1.6 Visible Emissions Notations

(a) Visible emission notations of the sand system stack exhaust, stack SV-SAND-1, shall be performed once per day during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances shall be considered a deviation from this permit.

D.1.7 Baghouse Parametric Monitoring

(a) The Permittee shall record the pressure drop across the baghouse used in conjunction with the sand system at least once per day when the sand system is operating. When for any one reading, the pressure drop across the baghouse is outside the normal range of 1.0 and 7.0 inches of water or a range established during the latest stack test, the Permittee shall take reasonable response steps in accordance with Section C - Response to Excursions or Exceedances. A pressure reading that is outside the above mentioned range is not a deviation from this permit. Failure to take response steps in accordance with Section C - Response to Excursions or Exceedances, shall be considered a deviation from this permit.

(b) The instruments used for determining the pressure shall comply with Section C -

Instrument Specifications, of this permit, shall be subject to approval by IDEM, OAQ, and shall be calibrated at least once every six (6) months.

**Record Keeping and Reporting Requirements [326 IAC 2-6.1-5(a)(2)]**

D.1.8 Record Keeping Requirements

(a) To document the compliance status with Condition D.1.6, the Permittee shall maintain records of daily visible emission notations of sand system stack exhaust, stack SV-SAND-1. The Permittee shall include in its daily record when a visible emission notation is not taken (e.g., the sand system did not operate that day).

(b) To document the compliance status with Condition D.1.7, the Permittee shall maintain records once per day of the pressure drop. The Permittee shall include in its daily record when a pressure drop reading is not taken and the reason for the lack of a pressure drop reading (e.g., the sand system did not operate that day).

(c) All records shall be maintained in accordance with Section C - General Record Keeping Requirements of this permit.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
**OFFICE OF AIR QUALITY**
**COMPLIANCE AND ENFORCEMENT BRANCH**

**MINOR SOURCE OPERATING PERMIT**
**ANNUAL NOTIFICATION**

This form should be used to comply with the notification requirements under 326 IAC 2-6.1-5(a)(5).

| | |
|---|---|
| **Company Name:** | Modern Aluminum Castings |
| **Address:** | 1400 North 14th Street |
| **City:** | Terre Haute, Indiana 47807 |
| **Phone #:** | 812-232-0007 |
| **MSOP #:** | M167-30578-00154 |

I hereby certify that Modern Aluminum Castings is:
- ☐ still in operation.
- ☐ no longer in operation.

I hereby certify that Modern Aluminum Castings is:
- ☐ in compliance with the requirements of MSOP M167-30578-00154.
- ☐ not in compliance with the requirements of MSOP M167-30578-00154.

| |
|---|
| **Authorized Individual (typed):** |
| **Title:** |
| **Signature:** |
| **Date:** |

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

| |
|---|
| **Noncompliance:** |
| |
| |
| |
| |

## MALFUNCTION REPORT

## INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
## OFFICE OF AIR QUALITY
## COMPLIANCE AND ENFORCEMENT BRANCH
**FAX NUMBER: (317) 233-6865**

**This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6 and to qualify for the exemption under 326 IAC 1-6-4.**

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE IT HAS POTENTIAL TO EMIT 25 TONS/YEAR PARTICULATE MATTER ?_____, 25 TONS/YEAR SULFUR DIOXIDE ?_____, 25 TONS/YEAR NITROGEN OXIDES?_____, 25 TONS/YEAR VOC ?_____, 25 TONS/YEAR HYDROGEN SULFIDE ?_____, 25 TONS/YEAR TOTAL REDUCED SULFUR ?_____, 25 TONS/YEAR REDUCED SULFUR COMPOUNDS ?_____, 25 TONS/YEAR FLUORIDES ?_____, 100 TONS/YEAR CARBON MONOXIDE ?_____, 10 TONS/YEAR ANY SINGLE HAZARDOUS AIR POLLUTANT ?_____, 25 TONS/YEAR ANY COMBINATION HAZARDOUS AIR POLLUTANT ?_____, 1 TON/YEAR LEAD OR LEAD COMPOUNDS MEASURED AS ELEMENTAL LEAD ?_____, OR IS A SOURCE LISTED UNDER 326 IAC 2-5.1-3(2) ?_____. EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION _____.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC _____ OR, PERMIT CONDITION # _____ AND/OR PERMIT LIMIT OF _____

THIS INCIDENT MEETS THE DEFINITION OF "MALFUNCTION" AS LISTED ON REVERSE SIDE ? Y N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ? Y N

COMPANY:_____PHONE NO. ( )_____
LOCATION: (CITY AND COUNTY)_____
PERMIT NO. _____ AFS PLANT ID: _____ AFS POINT ID: _____ INSP:_____
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON:_____
_____

DATE/TIME MALFUNCTION STARTED: _____/_____/ 20____ _____ AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION: _____

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE_____/_____/ 20____ _____ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO2, VOC, OTHER:_____

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: _____
_____

MEASURES TAKEN TO MINIMIZE EMISSIONS:_____
_____

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL* SERVICES:_____
CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS:_____
CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT:_____
INTERIM CONTROL MEASURES: (IF APPLICABLE)_____
_____
_____

MALFUNCTION REPORTED BY:_____TITLE:_____
(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY:_____DATE:_____TIME:_____
*SEE PAGE 2

**Please note - This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6 and to qualify for the exemption under 326 IAC 1-6-4.**

**326 IAC 1-6-1 Applicability of rule**

Sec. 1. This rule applies to the owner or operator of any facility required to obtain a permit under 326 IAC 2-5.1 or 326 IAC 2-6.1.

**326 IAC 1-2-39 "Malfunction" definition**

Sec. 39. Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner.

***Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

_____
_____

Mail to: Permit Administration and Support Section

Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

Modern Aluminum Castings
1400 North 14th Street
Terre Haute, Indiana 47807

Affidavit of Construction

I, _____, being duly sworn upon my oath, depose and say:
(Name of the Authorized Representative)

1. I live in _____ County, Indiana and being of sound mind and over twenty-one (21) years of age, I am competent to give this affidavit.

2. I hold the position of _____ for _____.
(Title) (Company Name)

3. By virtue of my position with _____, I have personal
(Company Name)
knowledge of the representations contained in this affidavit and am authorized to make these representations on behalf of _____.
(Company Name)

4. I hereby certify that Modern Aluminum Castings, 1400 North 14th Street, Terre Haute, Indiana 47807, completed construction of the stationary aluminum foundry making sand casted parts, on _____ in conformity with the requirements and intent of the construction permit application received by the Office of Air Quality on May 24, 2011, and as permitted pursuant to New Source Construction Permit and Minor Source Operating Permit No. M167-30578-00154, Plant ID No. 167-00154 issued on _____.

5. **Permittee, please cross out the following statement if it does not apply:** Additional (operations/facilities) were constructed/substituted as described in the attachment to this document and were not made in accordance with the construction permit.

Further Affiant said not.

I affirm under penalties of perjury that the representations contained in this affidavit are true, to the best of my information and belief.

Signature_____
Date_____

STATE OF INDIANA)
)SS

COUNTY OF _____ )

Subscribed and sworn to me, a notary public in and for _____ County and State of Indiana

on this _____ day of _____, 20 _____. My Commission expires: _____.

Signature_____
Name_____ (typed or printed)

# Indiana Department of Environmental Management
# Office of Air Quality

## Addendum to the Technical Support Document (ATSD) for a New Source Review and Minor Source Operating Permit

**Source Background and Description**

| | |
|---|---|
| **Source Name:** | **Modern Aluminum Castings** |
| **Source Location:** | **1400 North 14th Street, Terre Haute, Indiana 47807** |
| **County:** | **Vigo** |
| **SIC Code:** | **3365 (Aluminum Foundries)** |
| **Operation Permit No.:** | **M167-30578-00154** |
| **Permit Reviewer:** | **Jack Harmon** |

On September 29, 2011, the Office of Air Quality (OAQ) had a notice published in the Tribune Star, Terre Haute, Indiana, stating that Modern Aluminum Castings had applied for a New Source Review and Minor Source Operating Permit to operate its existing stationary aluminum foundry making sand-casted parts. The notice also stated that the OAQ proposed to issue a Minor Source Operating Permit (MSOP) for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

**Comments and Responses**

On October 27, 2011, Modern Aluminum Castings, via its representative, submitted comments to IDEM, OAQ on the draft MSOP.

The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes. IDEM, OAQ does not make any changes to the original TSD, but the Permit will have the updated changes. The comments and revised permit language are provided below with deleted language as ~~strikeouts~~ and new language **bolded**.

**Comment 1:**

The source has requested to make minor descriptive changes to the permit in order to clarify the description of the unit, or the throughput of the unit.

**Response to Comment 1:**

IDEM agrees with the recommended changes, since the changes will help to clarify the description of the emission unit. In one instance, the throughput of the process has been corrected. The permit has been revised as follows:

A.2 Emission Units and Pollution Control Equipment Summary

---

(b) ---

(4) One (1) Osborn ~~3161~~ Roto-lift sand molding operation, consisting of two machines, identified as Mold-3;

---

(c) One (1) Pouring, Casting, and Cooling system, and one (1) Shakeout **and Knockout** system, with a maximum metal throughput rate of 0.76 tons per hour and a maximum sand throughput of ~~17.56~~ **18.56** tons per hour.

---

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

---

(b) ---

(4) One (1) Osborn ~~3161~~ Roto-lift sand molding operation, consisting of two machines, identified as Mold-3;

---

(c) One (1) Pouring, Casting, and Cooling system, and one (1) Shakeout **and Knockout** system, with a maximum metal throughput rate of 0.76 tons per hour and a maximum sand throughput of 18.56 tons per hour.

---

**Comment 2:**

The source has requested changes to the calculations shown in Appendix A of the Technical Support Document for the Natural Gas Combustion calculations for the furnaces at the facility. The potential to emit NOx has been overstated because the emissions for the same furnaces have been calculated for the Melting Process calculations, also shown in Appendix A. The source also requested that a footnote be added to the Combustion worksheet, explaining this issue.

**Response to Comment 2:**

IDEM agrees that the NOx emissions are overstated for the furnaces. The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes. Likewise, the Appendix A of the TSD is used for historical purposes. IDEM, OAQ does not make any changes to the original TSD, but this Addendum to the Technical Support Document (ATSD) will explain the changes and the calculations sheets will be changed and shown as Appendix A to this ATSD. The Potential to Emit table will be shown as revised below in this ATSD. There is no change to the permit level or rule applicability due to this change, and the Permit will not change as the result of this comment. The potential NOx emissions for this source has decreased by 1.4 tons per year as the result of this change.

**Comment 3:**

The source has requested changes to the calculations shown in Appendix A of the Technical Support Document for the Sand System calculations for the facility, to correct the footnote explaining the source of the PM10 emission factors used in the calculations and to also to remove the reference to the control efficiency of the baghouse. The control efficiency was shown for reference only, and did not impact the potential to emit for the sand system.

**Response to Comment 3:**

IDEM agrees that the origin of the PM10 emission factor was misstated, and that the Control Efficiency of the baghouse can be removed, since it was used for historical reference purposes only. The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes. Likewise, the calculations shown in Appendix A of the TSD are used for historical purposes. IDEM, OAQ does not make any changes to the original TSD, but this Addendum to the Technical Support Document (ATSD) will explain the changes and the calculations sheets will be changed and shown as Appendix A to this ATSD. The Potential to Emit table will be shown as revised below in this ATSD. There is no change to the permit level, rule applicability, or permit condition as the result of this change, and the Permit will not change as the result of this comment. There was no change to the level of potential emissions as the result of this comment.

**Comment 4:**

The source has requested changes to the calculations shown in Appendix A of the Technical Support Document for the Pouring/ Casting/ Cooling and Shakeout & Knockout calculations worksheet, shown in Appendix A of the TSD, as follows:

(a) The Shakeout portion of the spreadsheet should be labeled to include the Knockout process, and this change should also be reflected on the Summary page of the calculations;

(b) For the Shakeout & Knockout portion of the worksheet, emission factors for PM10, and PM2.5 were used from AP-42, and were misstated in the original footnotes. The emission factors for SO2 and NOx were stated as being from the AIRS listing, and the footnotes should remove that misstatement. Lastly, the footnote discussing the self-disclosure factors for CO emissions should be removed as well.

(c) The source had submitted a revision to the Shakeout & Knockout process emission factors, on July 15, 2011, but those factors were never changed in the calculations shown in Appendix A of the TSD. The source also commented that the CO emissions for Shakeout and Knockout have been double-counted because the CO emission factor of 6.0 lb/ton of metal produced includes shakeout and knockout as well as pouring, casting, and cooling. The source has requested that the revised emission factors be shown in the calculation shown in Appendix A of the TSD.

**Response to Comment 4:**

Idem agrees that the description of the process should be changed, and that the footnotes should be corrected, as discussed above. IDEM also agrees that the emission factors from AP-42 submitted by the source should have been used in the calculation sheets shown in Appendix A of the TSD. The correct emission factors are 3.2 lb/ton of metal poured for PM, and 2.24 lb/ton of metal poured for PM10. Applying these corrected factors results in an increase in the potential to emit of 9.4 tons per year of PM, and 6.2 tons per year of PM10 and PM2.5. This change is shown in the table below. The emissions calculations for CO will remain the same for Pouring/Casting and Cooling, but the emission factor for Shakeout and Knockout will be removed. These changes in the potential to emit does not change the permit level, nor any rule applicability, nor any permit condition. The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes. Likewise, the calculations shown in Appendix A of the TSD are used for historical purposes. IDEM, OAQ does not make any changes to the original TSD, but this Addendum to the Technical Support Document (ATSD) will explain the changes and the calculations sheets will be changed and shown as Appendix A to this ATSD. No changes were made to the Permit as the result of this comment.

The updated Potential to Emit for this source, reflecting the changes made as discussed above, is as follows:

| Emission Unit | PM | PM-10 | PM-2.5 | SO2 | NOx | VOC | CO | GHG, as CO2e | Worst HAP | Total HAPs |
|---|---|---|---|---|---|---|---|---|---|---|
| | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) |
| | | | | | | | | | (Hexane) | |
| Natural Gas Combustion Units | **0.01** ~~0.04~~ | **0.06** ~~0.16~~ | **0.06** ~~0.16~~ | **0.004** ~~0.013~~ | **0.74** ~~2.15~~ | **0.04** ~~0.12~~ | **0.62** ~~1.81~~ | 2601.69 | 1.328E-02 | 1.393E-02 |
| Melting Process | 4.99 | 4.99 | 4.99 | 0.01 | 2.23 | 0.10 | 0.06 | 0.00 | 0.000E+00 | 0.000E+00 |
| Molding, Sand System, and Sand Silos | 126.92 | 43.94 | 43.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Pouring/Casting/Cooling Process | **13.98** ~~15.31~~ | **6.86** ~~8.19~~ | **6.86** ~~8.19~~ | **0.07** ~~0.13~~ | **0.03** ~~0.07~~ | **0.47** ~~4.46~~ | **19.97** ~~39.95~~ | 0.00 | 0.000E+00 | 0.000E+00 |
| Shakeout & Knockout | **10.65** | **7.46** | **7.46** | **0.00** | **0.00** | **3.99** | **0.00** | 0.00 | 0.000E+00 | 0.000E+00 |
| Finishing Operation | 56.59 | 5.66 | 5.66 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Shot Peen Machine | 7.02 | 7.02 | 7.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Core Making Process | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.70 | 0.00 | 0.00 | 1.470E+00 | 3.760E+00 |
| Welding Process | 4.82E-03 | 4.82E-03 | 4.82E-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Paint/Powder Coating Process | 2.63 | 2.63 | 2.63 | 0.00 | 0.00 | 1.13 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Fugitive Paved/Unpaved Roads | 0.013 | 0.003 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| **Total** | **222.8** ~~213.5~~ | **78.6** ~~72.6~~ | **78.6** ~~72.6~~ | **0.086** ~~0.161~~ | **3.00** ~~4.45~~ | **13.4** ~~13.5~~ | **20.65** ~~41.81~~ | 2,601.69 | 1.47E+00 | 3.774E+00 |

## IDEM Contact

(a) Questions regarding this proposed Minor Source Operating Permit (MSOP) can be directed to Jack Harmon at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 233-4228 or toll free at 1-800-451-6027 extension 3-4228.

(b) A copy of the permit is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.idem.in.gov

**Appendix A: Emission Calculations**

**Company Name:** Modern Aluminum Castings
**Address City IN Zip:** 1400 North 14th Street, Terre Haute, IN 47807
**Permit Number:** MSOP 167-30578-00154
**Reviewer:** Jack Harmon
**Application Date:** 2011

**Summary of Emissions**

**Uncontrolled Potential Emissions**

| Emission Unit | PM | PM-10 | PM-2.5 | SO2 | NOx | VOC | CO | GHG, as CO2e | Worst HAP | Total HAPs |
|---|---|---|---|---|---|---|---|---|---|---|
| | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) |
| | | | | | | | | | (Hexane) | |
| Natural Gas Combustion Units | 0.01 | 0.06 | 0.06 | 0.004 | 0.74 | 0.04 | 0.62 | 2601.69 | 1.328E-02 | 1.393E-02 |
| Melting Process | 4.99 | 4.99 | 4.99 | 0.01 | 2.23 | 0.10 | 0.06 | 0.00 | 0.000E+00 | 0.000E+00 |
| Molding, Sand System, and Sand Silos | 126.92 | 43.94 | 43.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Pouring/Casting/Cooling Process | 13.98 | 6.86 | 6.86 | 0.07 | 0.03 | 0.47 | 19.97 | 0.00 | 0.000E+00 | 0.000E+00 |
| Shakeout & Knockout | 10.65 | 7.46 | 7.46 | 0.00 | 0.00 | 3.99 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Finishing Operation | 56.59 | 5.66 | 5.66 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Shot Peen Machine | 7.02 | 7.02 | 7.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Core Making Process | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.70 | 0.00 | 0.00 | 1.470E+00 | 3.760E+00 |
| Welding Process | 4.82E-03 | 4.82E-03 | 4.82E-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Paint/Powder Coating Process | 2.63 | 2.63 | 2.63 | 0.00 | 0.00 | 1.13 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Fugitive Paved/Unpaved Roads | 0.013 | 0.003 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| **Total** | **222.8** | **78.6** | **78.6** | **0.086** | **3.00** | **13.4** | **20.65** | **2,601.69** | **1.47E+00** | **3.774E+00** |

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | | | |
|---|---|---|---|
| Reverb furnace REV-1 @ 1.5 MMBtu/hr | *** | 0.00 |
| Reverb furnace REV-2 @ 1.5 MMBtu/hr | *** | 0.00 |
| Crucible furnace, Cru-1, @ 0.230 MMBtu/hr | *** | 0.00 |
| Dryer ovens, 6@ 0.11 MMBtu/hr, each | | 0.66 |
| Shell Core htr, 1@ 0.15 MMBtu/hr | | 0.15 |
| Oil sand core dryer 1@0.30 MMBtu/hr | | 0.30 |
| Space htrs, office htrs, total 0.575 MMBtu/hr | | 0.58 |
| Total MMBtu/hr | | 1.69 |

| Heat Input Capacity MMBtu/hr | | HHV mmBtu/mmscf | Potential Throughput MMCF/yr |
|---|---|---|---|
| 1.69 | total less furnaces | 1000 | 14.8 |
| 4.92 | total with furnaces | 1000 | 43.1 |

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/MMCF | 1.9 | 7.6 | 0.6 | 100<br>**see below | 5.5 | 84 |
| Potential Emission in tons/yr | 0.014 | 0.056 | 0.004 | 0.738 | 0.041 | 0.620 |

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32
*** NOx emissions are not included in this calculation for these units because these emissions are counted in the Melting Process worksheet on Page 5 of these calculations. However, these units were included in the Greenhouse Gases calculations shown on page 4 of these calculations.

**Methodology**

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas
Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

See page 2 for HAPs emissions calculations.

updated 12/10

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**
**HAPs Emissions**

**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Application Date:** **2011**

| | HAPs - Organics | | | | | Totals |
|---|---|---|---|---|---|---|
| | Benzene | Dichlorobenzene | Formaldehyde | **Hexane** | Toluene | |
| Emission Factor in lb/MMcf | 2.1E-03 | 1.2E-03 | 7.5E-02 | 1.8E+00 | 3.4E-03 | |
| Potential Emission in tons/yr | 1.550E-05 | 8.856E-06 | 5.535E-04 | **1.328E-02** | 2.509E-05 | 1.389E-02 |

| | HAPs - Metals | | | | | Totals |
|---|---|---|---|---|---|---|
| | Lead | Cadmium | Chromium | Manganese | Nickel | |
| Emission Factor in lb/MMcf | 5.0E-04 | 1.1E-03 | 1.4E-03 | 3.8E-04 | 2.1E-03 | |
| Potential Emission in tons/yr | 3.690E-06 | 8.118E-06 | 1.033E-05 | 2.805E-06 | 1.550E-05 | 4.044E-05 |

Methodology is the same as page 1.

**Total HAPs** **1.393E-02**

The five highest organic and metal HAPs emission factors are provided above.
Additional HAPs emission factors are available in AP-42, Chapter 1.4.
See Page 3 for Greenhouse Gas calculations.

updated 12/10

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**
**Greenhouse Gas Emissions**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | Greenhouse Gas | | |
|---|---|---|---|
| | CO2 | CH4 | N2O |
| Emission Factor in lb/MMcf | 120000 | 2.3 | 2.2 |
| Potential Emission in tons/yr | 2585.952 | 0.050 | 0.047 |
| Summed Potential Emissions in tons/yr | 2586.05 | | |
| CO2e Total in tons/yr | 2601.69 | | |

**Methodology**
The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low Nox burner is 0.64.
Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.
Greenhouse Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (21) + N2O Potential Emission ton/yr x

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

**Reverberatory Furnace REV-1, using no controls**

| TYPE OF MATERIAL | | Throughput LBS/HR | 1 TON/2000 lbs | TON/HR | Capacity million British thermal units per hour/hr | Capacity mmcf/hr |
|---|---|---|---|---|---|---|
| Aluminum, with no flux | | 660 | 2000 | 0.33 | 1.50 | 0.0015 |
| Using clean-charge melt | | | | | | |
| | **PM** | **PM10 / PM2.5** | **SOx** | **NOx** | **VOC** | **CO** |
| lb/ton | 1.50 | 1.50 | | | | |
| lb/mmcf | | | 1.05 | 157.5 | 7.35 | 4.20 |
| Potential Emissions lbs/hr | 0.50 | 0.50 | 0.0016 | 0.236 | 0.0110 | 0.006 |
| Potential Emissions lbs/day | 11.9 | 11.9 | 0.038 | 5.7 | 0.265 | 0.151 |
| **Potential Emissions tons/year** | **2.17** | **2.17** | **0.007** | **1.03** | **0.048** | **0.028** |

Source of Emission Factors: based on determination of clean charge melt factors used in Cast Metals Technology permit (135-00024), and accepted for this source.
There are no flux materials used in this furnace.
PM and PM-10/2.5 emissions based on tons per hour throughput; SO2, Nox, VOC, and CO are based on natural gas mmcf/hr.

**Reverberatory Furnace REV-2, using no controls**

| TYPE OF MATERIAL | | Throughput LBS/HR | 1 TON/2000 lbs | TON/HR | Capacity million British thermal units per hour/hr | Capacity mmcf/hr |
|---|---|---|---|---|---|---|
| Aluminum, with no flux | | 660 | 2000 | 0.33 | 1.50 | 0.0015 |
| Using clean-charge melt | | | | | | |
| | **PM** | **PM10 / PM2.5** | **SOx** | **NOx** | **VOC** | **CO** |
| lb/ton | 1.50 | 1.50 | | | | |
| lb/mmcf | | | 1.05 | 157.5 | 7.35 | 4.20 |
| Potential Emissions lbs/hr | 0.50 | 0.50 | 0.0016 | 0.236 | 0.0110 | 0.006 |
| Potential Emissions lbs/day | 11.9 | 11.9 | 0.038 | 5.7 | 0.265 | 0.151 |
| **Potential Emissions tons/year** | **2.17** | **2.17** | **0.007** | **1.03** | **0.048** | **0.028** |

Source of Emission Factors: based on determination of clean charge melt factors used in Cast Metals Technology permit (135-00024), and accepted for this source.
There are no flux materials used in this furnace.
PM, PM10 and PM2.5 emissions based on tons per hour throughput; SO2, Nox, VOC, and CO are based on natural gas mmcf/hr.
Assume PM10=PM2.5

**Crucible Furnace Cru-1, using no controls**

| TYPE OF MATERIAL | | Throughput LBS/HR | 1 TON/2000 lbs | TON/HR | Capacity million British thermal units per hour/hr | Capacity mmcf/hr |
|---|---|---|---|---|---|---|
| Aluminum, with no flux | | 200 | 2000 | 0.10 | 0.23 | 0.00023 |
| Using clean-charge melt | | | | | | |
| | **PM** | **PM10/ PM2.5** | **SOx** | **NOx** | **VOC** | **CO** |
| lb/ton | 1.50 | 1.50 | | | | |
| lb/mmcf | | | 1.05 | 157.5 | 7.35 | 4.20 |
| Potential Emissions lbs/hr | 0.15 | 0.15 | 0.0002 | 0.036 | 0.0017 | 0.001 |
| Potential Emissions lbs/day | 3.6 | 3.6 | 0.006 | 0.9 | 0.041 | 0.023 |
| **Potential Emissions tons/year** | **0.66** | **0.66** | **0.001** | **0.16** | **0.007** | **0.004** |
| **TOTAL ALL MELTING UNITS** | **4.99** | **4.99** | **0.01** | **2.23** | **0.10** | **0.06** |

Source of Emission Factors: based on determination of clean charge melt factors used in Cast Metals Technology permit (135-00024), and accepted for this source.
There are no flux materials used in this furnace.
Note: the combined total throughput for the melting process at this source is 0.76 tons per hour. Therefore, the total of all three furnaces represents the unlimited potential to emit.
PM, PM10 and PM2.5 emissions based on tons per hour throughput; SO2, Nox, VOC, and CO are based on natural gas mmcf/hr.
Assume PM10=PM2.5

Methodology for all of the above Tables:
PM, PM10, PM2.5 emissions (tons/yr) = throughput (tons/hr) * emission factor (lb/ton) * 24 hours/day * 365 days per year / 2000 lb/ton
SO2, NOx, VOC, and CO emissions (tons/yr) = maximum gas usage capacity (mmcf/hr) * emission factor (lb/MMCF) * 24 (hr/day) * 365 (days/yr) / 2000 (lb/ton)

**Appendix A: Emission Calculations**
**Sand System and Sand Molding**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | Potential Throughput sand (tons/hr) | PM Control (%) |
|---|---|---|
| Sand System and Sand Molding | 18.56 | |

| | PM | PM10 |
|---|---|---|
| Emission Factors (lb/ton sand handled) | 1.56 | 0.54 |
| Uncontrolled Potential To Emit (lb/hr) | 29.0 | 10.02 |
| Uncontrolled Potential To Emit (ton/yr) | 126.82 | 43.90 |

PM and PM2.5 emission factors for Sand system and molding is based on mass balance from Cast Metals Technology permit (135-00024), and conditionally accepted for this source, contingent upon mass balance testing.
PM10 emission factor for Sand system and molding is based on AP-42

| | Potential Throughput sand (tons/hr) | PM Control (%) |
|---|---|---|
| Supplemental Sand Silos | 0.016 | |

| | PM | PM10 |
|---|---|---|
| Emission Factors (lb/ton sand handled) | 1.56 | 0.54 |
| Uncontrolled Potential To Emit (lb/hr) | 0.02 | 0.01 |
| Uncontrolled Potential To Emit (ton/yr) | 0.11 | 0.04 |

| | (Tons /yr) | |
|---|---|---|
| Sand Silos | Throughput/Yr | Throughput /hr |
| SSAND-1 | 50.0 | 0.006 |
| SSAND-2 | 50 | 0.006 |
| SSAND-3 | 38 | 0.004 |
| **Total Sand Silos** | **138.0** | **0.016** |

PM, PM10 and PM2.5 emission factors for Sand system and molding is based on mass balance from Cast Metals Technology permit (135-00024), and accepted for this source, .
Assume PM10=PM2.5

| | | |
|---|---|---|
| **TOTAL SAND SYSTEM AND MOLDING (Tons/yr)** | **126.92** | **43.94** |

Methodology for the above Tables:
Uncontrolled Potential to emit (tons/yr) = potential maximum throughput (ton/hr) * emission factor (lb/ton) * 8760 (hr/yr) / 2000 (lb/ton)
Controlled Potential to emit (tons/yr) = Uncontrolled potential to emit (tons/yr) * (1- control efficiency %)

**Appendix A: Emission Calculations**
**Pouring/Casting/Cooling/Shakeout**

**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Application Date:** **2011**

| | | Potential Throughput metal (tons/hr) | | PM Control (%) | | |
|---|---|---|---|---|---|---|
| Pouring/Casting/Cooling | | 0.76 | total | | | |

| | PM | PM10 | SO2 | NOx | VOC | CO |
|---|---|---|---|---|---|---|
| Emission Factors (lb/ton metal produced) | 4.2 | 2.06 | 0.02 | 0.01 | 0.140 | 6.00 |
| Uncontrolled Potential To Emit (lb/hr) | 3.19 | 1.57 | 0.02 | 0.01 | 0.11 | 4.56 |
| Uncontrolled Potential To Emit (ton/yr) | 14.0 | 6.9 | 0.07 | 0.03 | 0.47 | 20.0 |

Pouring/Casting/Cooling PM, PM10, SO2, Nox, and VOC emission factors were from FIRE 6.25
Assume PM10=PM2.5

Methodology:
Uncontrolled Potential to Emit (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential to Emit (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

| | | Potential Throughput metal (tons/hr) | | PM Control (%) | | |
|---|---|---|---|---|---|---|
| Shakeout & Knockout | | 0.76 | total | | | |

| | PM | PM10 | SO2* | Nox* | VOC | CO |
|---|---|---|---|---|---|---|
| Emission Factors (lb/ton metal produced) | 3.20 | 2.24 | 0.00 | 0.00 | 1.20 | 0.00 |
| Uncontrolled Potential To Emit (lb/hr) | 2.43 | 1.70 | 0.00 | 0.00 | 0.91 | 0.00 |
| Uncontrolled Potential To Emit (ton/yr) | 10.7 | 7.5 | 0.00 | 0.00 | 3.99 | 0.0 |

Shakeout PM and PM10 emission factors were from AP-42.
Assume PM10=PM2.5
* SO2 and Nox emissions are not included in Shakeout & Knockout section because these emisions are already counted in Pouring/Casting/Cooling table above.

Methodology:
Uncontrolled Potential to Emit (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential to Emit (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

**Appendix A: Emission Calculations**
**Finishing (Grinders, Deburr, Bandsaw)**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | Potential Throughput castings (tons/hr) | | PM Control (%) |
|---|---|---|---|
| **Finishing (Grinders, Deburr, Bandsaw)** | 0.76 | total | |

| | PM | PM10 |
|---|---|---|
| Emission Factors lbs/ton finished casting | 17.0 | 1.7 |
| Uncontrolled Potential To Emit (lb/hr) | 12.9 | 1.3 |
| Uncontrolled Potential To Emit (ton/yr) | 56.6 | 5.7 |

PM emission factor for Casting Finishing is from AP-42 Ch. 12.10 (Iron Foundries).
PM10 emission factor for Casting Finishing is from AP-42 Ch. 12.13 (Steel Foundries).
Assume PM10=PM2.5
Methodology:
Uncontrolled Potential Emissions (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential Emissions (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

**Appendix A: Emission Calculations**
**Shotblast**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | Potential Throughput castings (tons/hr) | | PM Control (%) |
|---|---|---|---|
| Shot Peen Machine (Peen-1) | 0.76 | total | |

| | PM | PM10 |
|---|---|---|
| Emission Factors lbs/ton finished casting | 2.11 | 2.11 |
| Uncontrolled Potential To Emit (lb/hr) | 1.6 | 1.6 |
| Uncontrolled Potential To Emit (ton/yr) | 7.02 | 7.024 |

PM and PM-10/2.5 emission factor for Shot Peen is based on dust collector study mass balance, and has been accepted.
Assume PM10=PM2.5
Methodology:
Uncontrolled Potential Emissions (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential Emissions (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

**Appendix A: Emission Calculations**
**Core Making**

**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Application Date:** **2011**

| | | | | | | | HAPS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Material | Density (Lb/Gal) | Lbs VOC/Gallon | Actual Usage* (Gal / yr) | Maximum Usage** (Gal / yr) | Maximum VOC (lb/yr) | **Potential VOC tons per year** | Hexane (tons/yr) | Phenol (tons/yr) | Formal-dehyde (tons/yr) | Methanol (tons/yr) | TEA (tons/yr) |
| Acme Flow 2185 for Cold Box | 6.05 | 6.05 | 55.0 | 240.9 | 1457.45 | 0.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.73 |
| **TOTAL COLD BOX** | | | | | **1457.45** | **0.73** | **0.00** | **0.00** | **0.00** | **0.00** | **0.73** |
| 17-550 Warm Box Catalyst | 9.34 | 5.14 | 110.0 | 481.8 | 2476.45 | 1.24 | 0.00 | 0.00 | 0.00 | 1.24 | 0.00 |
| FB-905 for Warm Box | 10.09 | 10.09 | 110.0 | 481.8 | 4861.36 | 2.43 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| **TOTAL FOR WARM BOX** | | | | | **7337.814** | **3.67** | **0.00** | **0.00** | **0.01** | **1.24** | **0.00** |
| Emulite 523-683 Binder for Oil Sand | 8.01 | 6.00 | 110.0 | 481.8 | 2890.80 | 1.45 | 0.00 | 0.00 | 1.45 | 0.00 | 0.00 |
| **TOTAL FOR OIL SAND** | | | | | **2890.800** | **1.45** | **0.00** | **0.00** | **1.45** | **0.00** | **0.00** |
| Parting Agent, Unipart HS | 5.64 | 5.36 | 20.0 | 87.6 | 469.54 | 0.23 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| **TOTAL FOR HARRISON SHELL SAND** | | | | | **469.536** | **0.23** | **0.14** | **0.00** | **0.00** | **0.00** | **0.00** |
| Phenoset-RB r part (2:1) | 10.34 | 6.72 | 110.0 | 481.8 | 3237.70 | 1.62 | 0.00 | 0.10 | 0.01 | 0.08 | 0.00 |
| **TOTAL AIRSET CORES** | | | | | **3237.696** | **1.62** | **0.00** | **0.10** | **0.01** | **0.08** | **0.00** |
| | | | | | | **7.70** | **0.14** | **0.10** | **1.47** | **1.32** | **0.73** |
| **Potential Emissions** | | | | | | **VOC** | **TOTAL HAPs** | | **3.76** | | |

METHODOLOGY

* Actual usage obtained form source, and is based on 2000 operating hours per year.

** Maximum Usage = Actual usage (gal/yr) extrapolated to 8,760 hours per year.

Pounds of VOC per Gallon Coating and Density obtained form source from MSDS sheets

Maximum VOC (lbs/yr) = Maximum usage (gal/yr) x Lbs VOC/gal

Potential VOC tons per year = Maximum VOC (lb/yr) / 2000 lb/ton

HAPS data obtained from MSDS sheets and follow above calculation methods.

**Appendix A: Emissions Calculations**
**Welding and Thermal Cutting**

**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Application Date:** **2011**

| PROCESS | Number of Stations | Max. electrode consumption per station (lbs/hr) | | EMISSION FACTORS* (lb pollutant/lb electrode) | | | | EMISSIONS (lbs/hr) | | | | HAPS (lbs/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELDING | | | | PM = PM10 | Mn | Ni | Cr | PM = PM10 | Mn | Ni | Cr | |
| Metal Inert Gas (MIG)(carbon steel) | 1 | 0.10 | | 0.0055 | 0.0005 | | | 0.001 | 0.000 | 0.000 | 0 | 0.000 |
| Tungsten Inert Gas (TIG)(carbon steel) | 1 | 0.10 | | 0.0055 | 0.0005 | | | 0.001 | 0.000 | 0.000 | 0 | 0.000 |
| | Number of Stations | Max. Metal Thickness Cut (in.) | Max. Metal Cutting Rate (in./minute) | EMISSION FACTORS (lb pollutant/1,000 inches cut, 1" thick)** | | | | EMISSIONS (lbs/hr) | | | | HAPS (lbs/hr) |
| FLAME CUTTING | | | | PM = PM10 | Mn | Ni | Cr | PM = PM10 | Mn | Ni | Cr | |
| Oxyacetylene | 0 | 0 | 0 | 0.1622 | 0.0005 | 0.0001 | 0.0003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Oxymethane | 0 | | | 0.0815 | 0.0002 | | 0.0002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Plasma** | 0 | 0 | 0 | 0.0039 | | | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| EMISSION TOTALS | | | | | | | | | | | | |
| Potential Emissions lbs/hr | | | | | | | | 1.10E-03 | | | | 0.00 |
| Potential Emissions lbs/day | | | | | | | | 2.64E-02 | | | | 0.00 |
| Potential Emissions tons/year | | | | | | | | 4.82E-03 | | | | 0.00 |

**Methodology:**

*Emission Factors are default values for carbon steel unless a specific electrode type is noted in the Process column.

**Emission Factor for plasma cutting from American Welding Society (AWS). Trials reported for wet cutting of 8 mm thick mild steel with 3.5 m/min cutting speed (at 0.2 g/min emitted). Therefore, the emission factor for plasma cutting is for 8 mm thick rather than 1 inch, and the maximum metal thickness is not used in calculting the emissions.

Using AWS average values: (0.25 g/min)/(3.6 m/min) x (0.0022 lb/g)/(39.37 in./m) x (1,000 in.) = 0.0039 lb/1,000 in. cut, 8 mm thick

Plasma cutting emissions, lb/hr: (# of stations)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 8 mm thick)

Cutting emissions, lb/hr: (# of stations)(max. metal thickness, in.)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 1" thick)

Welding emissions, lb/hr: (# of stations)(max. lbs of electrode used/hr/station)(emission factor, lb. pollutant/lb. of electrode used)

Emissions, lbs/day = emissions, lbs/hr x 24 hrs/day

Emissions, tons/yr = emissions, lb/hr x 8,760 hrs/year x 1 ton/2,000 lbs.

**Appendix A: Emission Calculations**
**Paint**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

**Powder Coat**

| Material | Density (Lb/Gal) | Lbs VOC/Gallon | Actual Usage* (lbs / yr) | Maximum Usage** (lbs / yr) | Maximum VOC (lb/yr) | **Potential VOC tons per year** | PM (lb/hr) | PM (tons/yr) | PM10, 2.5 (lb/hr) | PM10, 2.5 (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|
| White | 0.00 | 0.00 | 55.0 | 240.9 | 0.00 | 0.00 | 0.33 | 1.45 | 0.33 | 1.45 |
| Black | 0.00 | 0.00 | 110.0 | 481.8 | 0.00 | 0.00 | 0.25 | 1.10 | 0.25 | 1.10 |
| **TOTAL Powder Coat** | | | | | **0.000** | **0.00** | **0.58** | **2.54** | **0.58** | **2.54** |
| | | | | | | | | **2.54** | | **2.54** |

**Paint**

| Material | Density (Lb/Gal) | Lbs VOC/Gallon | Actual Usage* (Gal / yr) | Maximum Usage** (Gal / yr) | Maximum VOC (lb/yr) | **Potential VOC tons per year** | PM (lb/hr) | PM (tons/yr) | PM10, 2.5 (lb/hr) | PM10, 2.5 (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|
| Red Laquer Coating | 7.98 | 5.16 | 60.0 | 438.0 | 2260.08 | 1.13 | 0.02 | 0.09 | 0.02 | 0.09 |
| **TOTAL Paint** | | | | | **2260.08** | **1.13** | **0.02** | **0.09** | **0.02** | **0.09** |
| **Potential Emissions - both Powder Coating and Paint** | | | | | | **1.13** | | **2.63** | | **2.63** |
| | | | | | | **VOC** | | **PM** | | **PM10, 2.5** |

Methodology
Both powder coating and paint operations are seldom used and are insignificant activities. Therefore, the small usage per year based on 1200 hours was extrapolated to 8760 hours per year to obtain maximum annual usage.

Powder Coat contains no VOCs; therefore, only emissions are particulate, which were calculated based on only a 50% transfer efficiency.

**Appendix A: Emissions Calculations**
**Particulate Matter from Fugitive Sources**
**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit #:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Date:** **2011**

**Paved Roads**

E= [(k x (sL)^0.91) x (W/)^1.02](1-(P/4N))

AP-42, Section 13.2.2-1

| Factor | Description | Source | Summer Months PM Value | Summer Months $PM_{10}$ Value | Summer Months $PM_{2.5}$ Value | Winter Months PM Value | Winter Months $PM_{10}$ Value | Winter Months $PM_{2.5}$ Value |
|---|---|---|---|---|---|---|---|---|
| E = | Emission factor (lb/VMT, vehicle miles traveled) | Calculation, above | 0.19 | 0.04 | 0.01 | 0.66 | 0.13 | 0.03 |
| k = | PM Particle size multiplier (lb/VMT) | AP-42, Section 13.2.1 | 0.011 | 0.0022 | 0.00054 | 0.011 | 0.0022 | 0.00054 |
| sL = | Road surface silt loading ($g/m^2$) | AP-42, Section 13.2.1-2 | 0.60 | 0.60 | 0.60 | 2.40 | 2.40 | 2.40 |
| P = | Number of "wet" days in an averaging period | | 120 | 120 | 120 | 120 | 120 | 120 |
| N = | Number of days in the averaging period | | 365 | 365 | 365 | 365 | 365 | 365 |
| W = | Average vehicle weight (ton) | | 27.5 | 27.5 | 27.5 | 27.5 | 27.5 | 27.5 |

**Average Annual Emission Factors**

| | Non-Winter Months | Winter Months | Average Factor |
|---|---|---|---|
| PM | 9 | 3 | **0.30** |
| $PM_{10}$ | 9 | 3 | **0.06** |
| $PM_{2.5}$ | 9 | 3 | **0.01** |

**PM Emissions from Paved Roads**

| Activity | Average Vehicle Weight (tons) | No. of Vehicles (vehicles/yr) | Miles Traveled per vehicle (miles/vehicle) | Annual Mileage (VMT/yr) | Uncontrolled PM Emissions (tpy) | Uncontrolled PM-10 Emissions (tpy) | Uncontrolled PM 2.5 Emissions (tpy) |
|---|---|---|---|---|---|---|---|
| Passenger Vehicles | 1 | 2,190 | 0.04 | 83 | 0.013 | 0.003 | 0.001 |
| **Total** | | | | | **0.013** | **0.003** | **0.001** |

**Unpaved Roads**

The following calculations determine the amount of emissions created by unpaved roads, based on 8,760 hours of use and AP-42, Ch 13.2.2 (11/2006).

0.375 trip/hr x
0.066 mile/trip x
2 (round trip ) x
8760 hr/yr = 433.62 miles per year

**PM**

Ef = k*[(s/12)^0.9]*[(W/3)^b]
= 10.87 lb/mile
where k = 4.9 (particle size multiplier for PM) (k=4.9 for PM-30 or TSP)
s = 8.4 mean % silt content of unpaved roads
b = 0.45 Constant for PM
W = 36 tons average vehicle weight
M = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)

E = 10.87 lb/mi x 433.62 mi/yr = 2.36 tons/yr
2000 lb/ton

Taking natural mitigation due to precipitation into consideration:
Eext = E * [(365-p)/365] = **PM** **1.55** tons/yr

where p = 125 days of rain greater than or equal to 0.01 inches(see Fig. 13.2.2-1)

---

**PM-10, 2.5**

Ef = k*[(s/12)^0.9]*[(W/3)^b]
= 3.33 lb/mile
where k = 1.5 (particle size multiplier for PM-10) (k=4.9 for PM-30 or TSP)
s = 8.4 mean % silt content of unpaved roads
b = 0.45 Constant for PM-10
W = 36 tons average vehicle weight
M = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)

E = 3.33 lb/mi x 433.62 mi/yr = 0.72 tons/yr
2000 lb/ton

Taking natural mitigation due to precipitation into consideration:
Eext = E * [(365-p)/365] = **PM-10,2.5** **0.47** tons/yr

where p = 125 days of rain greater than or equal to 0.01 inches(see Fig. 13.2.2-1)

| | | | |
|---|---|---|---|
| **Total Fugitive Roads Emissions** | **PM** | 1.56 | tons/yr uncontrolled |
| | **PM-10** | 0.48 | tons/yr uncontrolled |
| | **PM2.5** | 0.47 | tons/yr uncontrolled |

# Indiana Department of Environmental Management
# Office of Air Quality

## Technical Support Document (TSD) for a New Source Review and Minor Source Operating Permit (MSOP)

### Source Description and Location

| | |
|---|---|
| **Source Name:** | **Modern Aluminum Castings** |
| **Source Location:** | **1400 North 14th Street, Terre Haute, Indiana 47807** |
| **County:** | **Vigo** |
| **SIC Code:** | **3365 (Aluminum Foundries)** |
| **Operation Permit No.:** | **M167-30578-00154** |
| **Permit Reviewer:** | **Jack Harmon** |

On May 24, 2011, the Office of Air Quality (OAQ) received an application from Modern Aluminum Castings related to the operation of an existing stationary aluminum foundry making sand-casted parts, using clean melt charge. Additional information was received on July 21, August 23, and September 19, 2011.

### Existing Approvals

There have been no previous approvals issued to this source.

### County Attainment Status

The source is located in Vigo County.

| Pollutant | Designation |
|---|---|
| $SO_2$ | Better than national standards. |
| CO | Unclassifiable or attainment effective November 15, 1990. |
| $O_3$ | Attainment effective February 6, 2006, for the Terre Haute area, including Vigo County, for the 8-hour ozone standard.[1] |
| $PM_{10}$ | Unclassifiable effective November 15, 1990. |
| $NO_2$ | Cannot be classified or better than national standards. |
| Pb | Not designated. |

[1]Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005.

Unclassifiable or attainment effective April 5, 2005, for PM2.5.

(a) Ozone Standards

Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to ozone. Vigo County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(b) $PM_{2.5}$

Vigo County has been classified as attainment for $PM_{2.5}$. On May 8, 2008 U.S. EPA promulgated the requirements for Prevention of Significant Deterioration (PSD) for $PM_{2.5}$ emissions. These rules became effective on July 15, 2008. Indiana has three years from the publication of these

rules to revise its PSD rules, 326 IAC 2-2, to include those requirements. The May 8, 2008 rule revisions require IDEM to regulate PM10 emissions as a surrogate for $PM_{2.5}$ emissions until 326 IAC 2-2 is revised.

(c) Other Criteria Pollutants
Vigo County has been classified as attainment or unclassifiable in Indiana for all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

**Fugitive Emissions**

(a) The fugitive emissions of criteria pollutants, hazardous air pollutants, and greenhouse gases are counted toward the determination of 326 IAC 2-6.1 (Minor Source Operating Permits) applicability.

(b) Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7, and there is no applicable New Source Performance Standard that was in effect on August 7, 1980, fugitive emissions are not counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability. Although this operation is an aluminum foundry, it melts only a clean charge, and it is not considered a secondary metal production plant, and, therefore, is not considered one of the twenty-eight source categories as defined in 326 IAC 2-2. Fugitive emissions are counted, however, in the permit level determination, pursuant to 326 IAC 2-6.1.

**Background and Description of Permitted Emission Units**

The Office of Air Quality (OAQ) has reviewed an application, submitted by Modern Aluminum Castings on May 24, 2011, at the request of IDEM, OAQ, Compliance and Enforcement Branch, for its initial air quality operating permit. The source has constructed and operated all of its emissions units without obtaining the proper permits. IDEM, OAQ has reviewed the application, and has drafted a proposed a New Source Review/Minor Source Operating Permit (MSOP) for this source.

**Unpermitted Emission Units and Pollution Control Equipment**

The source consists of the following unpermitted emission units:

(a) One (1) natural gas-fired melting process, with a combined maximum throughput melting rate of 0.76 tons per hour, and consisting of the following:

(1) One (1) reverberatory furnace, identified as REV-1, constructed in January, 2002, with a maximum throughput melt rate of 660 pounds per hour (0.33 tons per hour), melting only clean charge, with a maximum heat input rate of 1.5 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(2) One (1) reverberatory furnace, identified as REV-2, constructed in July, 2002, with a maximum throughput melt rate of 660 pounds per hour (0.33 tons per hour), melting only clean charge, with a maximum heat input rate of 1.5 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(3) One (1) natural gas-fired crucible furnace, identified as Cru-1, constructed in January, 2009, with a maximum throughput melt rate of 200 pounds per hour (0.10 tons per hour), melting only clean charge, with a maximum heat input rate of 0.230 MMBtu/hr, using no controls, and exhausting inside the plant. This furnace uses no flux materials.

(b) One (1) Molding and Sand System, with a combined maximum sand throughput rate of 18.56

tons per hour, and a combined maximum metal throughput rate of 0.76 tons per hour, using baghouse DC-SAND-1 for particulate control, exhausting through stack SV-SAND-1, and consisting of the following:

(1) One (1) sand system, identified as Sand, constructed in January, 1972, consisting of a mullor mixer, and conveyors;

(2) One (1) B&P 2016 sand molding machine, identified as Mold-1, constructed in January, 1993;

(3) One (1) B&P 2620 sand molding machine, identified as Mold-2, constructed in January, 1997;

(4) One (1) Osborn 3161 Roto-lift sand molding operation, consisting of two machines, identified as Mold-3;

(5) One (1) Airset sand molding machine, identified as AMold;

(6) One (1) permanent mold process, identified as PMold, consisting of two (2) machines, using no sand in its process;

(7) One (1) Jolt Squeezer machine operation, identified as Squeeze Mold-1.

(c) One (1) Pouring, Casting, and Cooling system, and one (1) Shakeout system, with a maximum metal throughput rate of 0.76 tons per hour and a maximum sand throughput of 18.56 tons per hour.

(d) Three (3) Supplemental Sand Silos, pneumatically loaded, consisting of the following:

(1) Two (2) supplemental sand silos, identified as SSAND-1 and SSAND-2, constructed in January, 1997, each with a maximum storage capacity of silica sand of 20 tons and a maximum annual throughput rate of 50 tons per year, using a bin vent for particulate control, and exhausting through stack SV-SSAND-1, and SV-SSAND-2, respectively;

(2) One (1) supplemental sand silo, identified as SSAND-3, constructed in January, 2001, with a maximum storage capacity of silica sand of 15 tons, and a maximum annual throughput rate of 38 tons per year, using a bin vent for particulate control, and exhausting through stack SV-SSAND-3.

(e) One (1) Finishing operation, with a maximum metal throughput rate of 0.76 tons per hour, consisting of the following:

(1) One (1) bandsaw, identified as BSaw-1, constructed in January, 1954, using no controls, and exhausting inside the plant;

(2) One (1) bandsaw, identified as BSaw-2, constructed in January, 1991, using no controls, and exhausting inside the plant.

(3) Twenty (20) grinders, collectively identified as Grind-1, constructed in January, 2001, using no controls, and exhausting inside the plant;

(4) One (1) Hand Burring Machine, identified as Burr-1, constructed in January, 2001, using no controls, and exhausting inside the plant;

(5) One (1) Vibratory Wet Deburr Machine, identified as VBurr-1, constructed in January,

2001, using no controls, and exhausting inside the plant;

(6) Two (2) Rivet Machines, installed in 2001, using no controls, and exhausting inside the plant;

(7) Twenty (20) burr guns, installed in 2001, using no controls, and exhausting inside the plant; and

(8) Twenty (20) hand sanders, installed in 2001, using no controls, and exhausting inside the plant.

(f) One (1) Shot Peen Machine, identified as Peen-1, constructed in January, 1976, with a maximum metal throughput rate of 0.76 tons per hour, using no controls, exhausting to SV-Peen-1.

(g) One (1) core-making process, with a combined maximum throughput capacity of 0.10 tons per hour, consisting of the following:

(1) One (1) Cold Box Core Making operation, identified as CBCore, constructed in January, 1996, consisting of two machines, using no controls, and exhausting through stack SV-CBCore;

(2) One (1) Warm Box Core Making operation, identified as WBCore, constructed in January, 1980, consisting of two core machines; using no controls, and exhausting inside the plant;

(3) One (1) Shell/Harrison Core Making operation, identified as SHCore, constructed in January, 2010, consisting of two core machines and a natural gas-fired combustion unit with a maximum heat input capacity of 0.15 MMBtu/hr, using no controls, and exhausting inside the plant;

(4) One (1) Airset Core Making operation, identified as ACore, constructed in January, 2010, using no controls, and exhausting inside the plant;

(5) One (1) Oil Sand Core Making operation, identified as OSCore, constructed in January, 1955, consisting of two core machines and one (1) natural gas-fired combustion drying oven, with a maximum heat input capacity of 0.30 MMBtu/hr, using no controls, and exhausting inside the plant;

(6) Six (6) natural gas-fired drying ovens with a combined maximum heat input capacity of 0.66 MMBtu/hr, using no controls, and exhausting inside the plant.

(h) One (1) welding process, consisting of the following:

(1) One (1) MIG Welding Station, identified as MIG1, constructed in January, 1960, with a maximum electrode rod consumption of 0.10 pounds per hour, using no controls, and exhausting inside the plant;

(2) One (1) TIG Welding Station, identified as TIG1, constructed in January, 1960, with a maximum electrode rod consumption of 0.10 pounds per hour, using no controls, and exhausting inside the plant.

(i) One (1) Paint and Powder Coating Booth, identified as PB-1, constructed in January, 2009, using one high volume low pressure gun and powder gun, with a maximum throughput of 438 gallons per year, using dry filters for particulate control, exhausting through stack SV-PB-1.

(j) Various natural gas-fired combustion units, consisting of space heaters and office heaters, with a

combined maximum heat input capacity of 0.575 MMBtu/hr, using no controls, and exhausting inside the plant.

## Enforcement Issues

IDEM is aware that equipment has been constructed and operated prior to receipt of the proper permit. IDEM is reviewing this matter and will take the appropriate action. This proposed approval is intended to satisfy the requirements of the construction permit rules.

## Emission Calculations

See Appendix A of this TSD for detailed emission calculations.

## Permit Level Determination – MSOP

The following table reflects the unlimited potential to emit (PTE) of the entire source before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

| Pollutant | Potential To Emit (tons/year) |
|---|---|
| PM | 213.5 |
| PM10[(1)] | 72.6 |
| PM2.5 | 72.6 |
| $SO_2$ | 0.161 |
| $NO_x$ | 4.45 |
| VOC | 13.5 |
| CO | 41.81 |
| GHGs as $CO_2e$ | 2,599.0 |

(1) Under the Part 70 Permit program (40 CFR 70), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM10), not particulate matter (PM), is considered as a "regulated air pollutant".

| HAPs | Potential To Emit (tons/year) |
|---|---|
| Formaldehyde | 1.47 |
| Methanol | 1.32 |
| TEA | 0.73 |
| Hexane | 0.04 |
| **TOTAL HAPs** | **3.801** |

(a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1) of PM10, PM2.5, SO2, NOx, VOC, and CO are each less than one hundred (100) tons per year, but greater than or equal to twenty-five (25) tons per year. The PTE of all other regulated criteria pollutants are less than twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-6.1. A Minor Source Operating Permit (MSOP) will be issued.

(b) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1) of any single HAP is less than ten (10) tons per year and the PTE of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-7.

(c) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1) greenhouse gases (GHGs) is less than the Title V subject to regulation threshold of one hundred thousand (100,000) tons of $CO_2$

equivalent emissions ($CO_2e$) per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.

**Federal Rule Applicability Determination**

New Source Performance Standards (NSPS)

(a) The requirements of New Source Performance Standard, 326 IAC 12, 40 CFR Part 60.260, Subpart Z, (Standards of Performance for Ferroalloy Production Facilities) are not included in this permit because the source does not operate an electric submerged arc furnace.

(b) The requirements of the New Source Performance Standard, 326 IAC 12, 40 CFR Part 60.190, Subpart S, (Standards of Performance for Primary Aluminum Production Plants) are not included in this permit because the source is not a primary aluminum reduction plant.

(c) There are no other New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included for this proposed permit.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

(d) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Primary Aluminum Reduction Plants, 40 CFR 63.840, Subpart LL, are not included in this permit because the source is not a primary aluminum reduction plant.

(e) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Secondary Aluminum Production, 40 CFR 63, Subpart RRR, are not included in this permit because it does not meet the definition of a secondary aluminum production facility. The definition of a secondary aluminum production states that for purposes of this subpart, aluminum die casting facilities, aluminum foundries, and aluminum extrusion facilities are not considered to be secondary aluminum production facilities if the only materials they melt are clean charge, customer returns, or internal scrap, and if they do not operate sweat furnaces, thermal chip dryers, or scrap dryers/delacquering kilns/decoating kilns. This source is an aluminum foundry that melts only clean charge, customer returns or internal scrap and does not operate a sweat furnace, thermal chip dryer or scrap dryer/delacquering kiln/decoating kiln.

(f) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Primary Nonferrous Metals at Area Source - Zinc, Cadmium, or Beryllium, 40 CFR 63, Subpart GGGGGG, are not included in this permit because this facility is not a zinc, cadmium, or beryllium production facility.

(g) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Secondary Nonferrous Metals Processing - Area Sources, 40 CFR 63, Subpart TTTTTT, are not included in this permit because it does not meet the definition of a brass or bronze ingot making facility, or a magnesium processing facility, or a zinc processing plant.

(h) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Area Source Standards for Aluminum, Copper, and Other Nonferrous Foundries, 40 CFR 63, Subpart ZZZZZZ, are not included in this permit because foundry operations in which only clean charge is melted are excluded from this rule.

(i) There are no other National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) included for this proposed revision.

Compliance Assurance Monitoring (CAM)

(j) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is not included in the permit, because the unlimited potential to emit of the source is less than the Title V major source thresholds and the source is not required to obtain a Part 70 or Part 71 permit.

**State Rule Applicability Determination**

The following state rules are applicable to the source:

(a) 326 IAC 2-6.1 (Minor Source Operating Permits (MSOP))
MSOP applicability is discussed under the Permit Level Determination – MSOP section above.

(b) 326 IAC 2-2 (Prevention of Significant Deterioration(PSD))

This source is not a major stationary source, under PSD (326 IAC 2-2), because the potential to emit of all attainment regulated criteria pollutants are less than 250 tons per year, the potential to emit greenhouse gases (GHGs) is less than 100,000 tons of $CO_2e$ per year, and this source is not one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2-1(gg)(1). Therefore, pursuant to 326 IAC 2-2, the PSD requirements do not apply.

(c) 326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))
The potential to emit of any single HAP is less than ten (10) tons per year and the potential to emit of a combination of HAPs is less than twenty-five (25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-4.1.

(d) 326 IAC 5-1 (Opacity Limitations)
Pursuant to 326 IAC 5-1-2(2) (Opacity Limitations for Vigo County), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(1) Opacity shall not exceed an average of thirty percent (30%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(2) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

(e) 326 IAC 6-4 (Fugitive Dust Emissions Limitations)
Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions Limitations), the source shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4.

(f) 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)
The source is not subject to the requirements of 326 IAC 6-5, because the fugitive emissions sources do not have potential fugitive particulate emissions greater than 25 tons per year. Therefore, the provisions of 326 IAC 6-5 do not apply.

(g) 326 IAC 6.5 (Particulate Emissions)
This source is subject to the requirements of 326 IAC 6.5 because it is located in Vigo County, has the potential to emit one hundred (100) tons or more, or has actual emissions of ten (10) tons or more, of particulate matter per year. Therefore, this source is subject to the requirements of 326 IAC 6.5.

Particulate matter emissions from each emission unit at this source, except the Shot Peen Machine, which has less than ten (10) tons of particulate potential emissions per year, shall not exceed seven-hundredths (0.07) gram per dry standard cubic meter (g/dscm), or three-hundredths (0.03) grain per dry standard cubic foot (dscf).

(h) 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)
This source is not subject to the provision of 326 IAC 6-3-2 because it is already subject to the emission limits requirements of 326 IAC 6.5, and, is therefore exempt from this rule. Therefore, the requirements of 326 IAC 6-3-2 do not apply.

(i) 326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)
The unlimited VOC potential emissions from the entire source is less than twenty-five (25) tons per year. Therefore, the requirements of 326 IAC 8-1-6 do not apply.

(j) 326 IAC 8-2-9 (VOC Rules for Surface Coating)
The paint booth, identified as PB-1, is not subject to the requirements of 326 IAC 8-2-9 because the uncontrolled potential to emit VOC is less than fifteen (15) pounds per day. Therefore, the requirements of 326 IAC 8-2-9 do not apply.

## Compliance Determination, Monitoring and Testing Requirements

(a) The compliance determination requirements applicable to this source are as follows:

(1) The baghouse DC-SAND-1 for particulate control shall be in operation at all times that the sand and molding system, is in operation.

(b) The compliance monitoring requirements applicable to this source are as follows:

| Emission Unit/Control | Operating Parameters | Frequency |
|---|---|---|
| Baghouse DC-SAND-1 | Pressure Drop | Once per day |
| Baghouse DC-SAND-1 | Visible emissions | Once per day |

These monitoring requirements are necessary because these units exhaust to outside atmosphere.

(c) The testing requirements applicable to this source are as follows:

| Testing Requirements | | | | |
|---|---|---|---|---|
| Emission Unit | Control Device | Pollutant | Timeframe for Testing | Frequency of Testing |
| Sand System | Stack SV-SAND-1 | PM, PM10 and PM2.5 | Within 180 days after issuance of permit | One time |

The sand system is subject to material mass balance testing because the emission factors used are alternative emission factors that were conditionally approved by IDEM, subject to a test to verify these factors.

## Conclusion and Recommendation

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant. An application for the purposes of this review was received on May 24, 2011. Additional information was received July 21, and August 23, 2011.

The operation of this source shall be subject to the conditions of the attached proposed New Source Review and MSOP No. 167-30578-00154. The staff recommends to the Commissioner that this New Source Review and MSOP be approved.

**IDEM Contact**

(a) Questions regarding this proposed permit can be directed to Jack Harmon at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 233-4228 or toll free at 1-800-451-6027 extension 3-4228.

(b) A copy of the findings is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.in.gov/idem

**Company Name:** Modern Aluminum Castings
**Address City IN Zip:** 1400 North 14th Street, Terre Haute, IN 47807
**Permit Number:** MSOP 167-30578-00154
**Reviewer:** Jack Harmon
**Application Date:** 2011

**Summary of Emissions**

**Uncontrolled Potential Emissions**

| Emission Unit | PM | PM-10 | PM-2.5 | SO2 | NOx | VOC | CO | GHG, as CO2e | Worst HAP | Total HAPs |
|---|---|---|---|---|---|---|---|---|---|---|
| | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) |
| | | | | | | | | | (Hexane) | |
| Natural Gas Combustion Units | 0.04 | 0.16 | 0.16 | 0.013 | 2.15 | 0.12 | 1.81 | 2599.05 | 3.875E-02 | 4.063E-02 |
| Melting Process | 4.99 | 4.99 | 4.99 | 0.01 | 2.23 | 0.10 | 0.06 | 0.00 | 0.000E+00 | 0.000E+00 |
| Molding, Sand System, and Sand Silos | 126.92 | 43.94 | 43.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Pouring/Casting/Cooling Process | 15.31 | 8.19 | 8.19 | 0.13 | 0.07 | 4.46 | 39.95 | 0.00 | 0.000E+00 | 0.000E+00 |
| Finishing Operation | 56.59 | 5.66 | 5.66 | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Shot Peen Machine | 7.02 | 7.02 | 7.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Core Making Process | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.70 | 0.00 | 0.00 | 1.470E+00 | 3.760E+00 |
| Welding Process | 4.82E-03 | 4.82E-03 | 4.82E-03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Paint/Powder Coating Process | 2.63 | 2.63 | 2.63 | 0.00 | 0.00 | 1.13 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| Fugitive Paved/Unpaved Roads | 0.013 | 0.003 | 0.001 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.000E+00 | 0.000E+00 |
| **Total** | **213.5** | **72.6** | **72.6** | **0.161** | **4.45** | **13.5** | **41.81** | **2,599.05** | **1.47E+00** | **3.801E+00** |

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**

**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Application Date:** **2011**

| | |
|---|---|
| Reverb furnace REV-1 @ 1.5 MMBtu/hr | 1.50 |
| Reverb furnace REV-2 @ 1.5 MMBtu/hr | 1.50 |
| Crucible furnace, Cru-1, @ 0.230 MMBtu/hr | 0.23 |
| Dryer ovens, 6@ 0.11 MMBtu/hr, each | 0.66 |
| Shell Core htr, 1@ 0.15 MMBtu/hr | 0.15 |
| Oil sand core dryer 1@0.30 MMBtu/hr | 0.30 |
| Space htrs, office htrs, total 0.575 MMBtu/hr | 0.58 |
| Total MMBtu/hr | 4.92 |

| Heat Input Capacity MMBtu/hr | HHV mmBtu / mmscf | Potential Throughput MMCF/yr |
|---|---|---|
| 4.92 | 1000 | 43.1 |

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/MMCF | 1.9 | 7.6 | 0.6 | 100 **see below | 5.5 | 84 |
| Potential Emission in tons/yr | 0.041 | 0.164 | 0.013 | 2.153 | 0.118 | 1.808 |

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

**Methodology**

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas
Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

See page 2 for HAPs emissions calculations.

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**
**HAPs Emissions**

**Company Name:** Modern Aluminum Castings
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**Reviewer:** Jack Harmon
**Application Date:** 2011

| | HAPs - Organics | | | | | Totals |
|---|---|---|---|---|---|---|
| | Benzene | Dichlorobenzene | Formaldehyde | **Hexane** | Toluene | |
| Emission Factor in lb/MMcf | 2.1E-03 | 1.2E-03 | 7.5E-02 | 1.8E+00 | 3.4E-03 | |
| Potential Emission in tons/yr | 4.521E-05 | 2.583E-05 | 1.615E-03 | **3.875E-02** | 7.319E-05 | 4.051E-02 |

| | HAPs - Metals | | | | | Totals |
|---|---|---|---|---|---|---|
| | Lead | Cadmium | Chromium | Manganese | Nickel | |
| Emission Factor in lb/MMcf | 5.0E-04 | 1.1E-03 | 1.4E-03 | 3.8E-04 | 2.1E-03 | |
| Potential Emission in tons/yr | 1.076E-05 | 2.368E-05 | 3.014E-05 | 8.181E-06 | 4.521E-05 | 1.180E-04 |

Methodology is the same as page 1.

**Total HAPs** **4.063E-02**

The five highest organic and metal HAPs emission factors are provided above.
Additional HAPs emission factors are available in AP-42, Chapter 1.4.
See Page 3 for Greenhouse Gas calculations.

updated 12/10

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**
**Greenhouse Gas Emissions**

**Company Name: Modern Aluminum Castings**
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| | Greenhouse Gas | | |
|---|---|---|---|
| | CO2 | CH4 | N2O |
| Emission Factor in lb/MMcf | 120000 | 2.3 | 2.2 |
| Potential Emission in tons/yr | 2583.324 | 0.050 | 0.047 |
| Summed Potential Emissions in tons/yr | 2583.42 | | |
| CO2e Total in tons/yr | 2599.05 | | |

**Methodology**
The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low Nox burner is 0.64
Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.
Greenhouse Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (21) + N2O Potential Emission

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**Reverberatory Furnace REV-1, using no controls**

| TYPE OF MATERIAL | | Throughput LBS/HR | 1 TON/2000 lbs | TON/HR | Capacity million British thermal units per hour/hr | Capacity mmcf/hr |
|---|---|---|---|---|---|---|
| Aluminum, with no flux | | 660 | 2000 | 0.33 | 1.50 | 0.0015 |
| Using clean-charge melt | | | | | | |
| | **PM** | **PM10 / PM2.5** | **SOx** | **NOx** | **VOC** | **CO** |
| lb/ton | 1.50 | 1.50 | | | | |
| lb/mmcf | | | 1.05 | 157.5 | 7.35 | 4.20 |
| Potential Emissions lbs/hr | 0.50 | 0.50 | 0.0016 | 0.236 | 0.0110 | 0.006 |
| Potential Emissions lbs/day | 11.9 | 11.9 | 0.038 | 5.7 | 0.265 | 0.151 |
| **Potential Emissions tons/year** | **2.17** | **2.17** | **0.007** | **1.03** | **0.048** | **0.028** |

Source of Emission Factors: based on determination of clean charge melt factors used in Cast Metals Technology permit (135-00024), and accepted for this source.
There are no flux materials used in this furnace.
PM and PM-10/2.5 emissions based on tons per hour throughput; SO2, Nox, VOC, and CO are based on natural gas mmcf/hr.

**Reverberatory Furnace REV-2, using no controls**

| TYPE OF MATERIAL | | Throughput LBS/HR | 1 TON/2000 lbs | TON/HR | Capacity million British thermal units per hour/hr | Capacity mmcf/hr |
|---|---|---|---|---|---|---|
| Aluminum, with no flux | | 660 | 2000 | 0.33 | 1.50 | 0.0015 |
| Using clean-charge melt | | | | | | |
| | **PM** | **PM10 / PM2.5** | **SOx** | **NOx** | **VOC** | **CO** |
| lb/ton | 1.50 | 1.50 | | | | |
| lb/mmcf | | | 1.05 | 157.5 | 7.35 | 4.20 |
| Potential Emissions lbs/hr | 0.50 | 0.50 | 0.0016 | 0.236 | 0.0110 | 0.006 |
| Potential Emissions lbs/day | 11.9 | 11.9 | 0.038 | 5.7 | 0.265 | 0.151 |
| **Potential Emissions tons/year** | **2.17** | **2.17** | **0.007** | **1.03** | **0.048** | **0.028** |

Source of Emission Factors: based on determination of clean charge melt factors used in Cast Metals Technology permit (135-00024), and accepted for this source.
There are no flux materials used in this furnace.
PM, PM10 and PM2.5 emissions based on tons per hour throughput; SO2, Nox, VOC, and CO are based on natural gas mmcf/hr.
Assume PM10=PM2.5

**Crucible Furnace Cru-1, using no controls**

| TYPE OF MATERIAL | | Throughput LBS/HR | 1 TON/2000 lbs | TON/HR | Capacity million British thermal units per hour/hr | Capacity mmcf/hr |
|---|---|---|---|---|---|---|
| Aluminum, with no flux | | 200 | 2000 | 0.10 | 0.23 | 0.00023 |
| Using clean-charge melt | | | | | | |
| | **PM** | **PM10/ PM2.5** | **SOx** | **NOx** | **VOC** | **CO** |
| lb/ton | 1.50 | 1.50 | | | | |
| lb/mmcf | | | 1.05 | 157.5 | 7.35 | 4.20 |
| Potential Emissions lbs/hr | 0.15 | 0.15 | 0.0002 | 0.036 | 0.0017 | 0.001 |
| Potential Emissions lbs/day | 3.6 | 3.6 | 0.006 | 0.9 | 0.041 | 0.023 |
| **Potential Emissions tons/year** | **0.66** | **0.66** | **0.001** | **0.16** | **0.007** | **0.004** |
| **TOTAL ALL MELTING UNITS** | **4.99** | **4.99** | **0.01** | **2.23** | **0.10** | **0.06** |

Source of Emission Factors: based on determination of clean charge melt factors used in Cast Metals Technology permit (135-00024), and accepted for this source.
There are no flux materials used in this furnace.
Note: the combined total throughput for the melting process at this source is 0.76 tons per hour. Therefore, the total of all three furnaces represents the unlimited potential to emit.
PM, PM10 and PM2.5 emissions based on tons per hour throughput; SO2, Nox, VOC, and CO are based on natural gas mmcf/hr.
Assume PM10=PM2.5

Methodology for all of the above Tables:
PM, PM10, PM2.5 emissions (tons/yr) = throughput (tons/hr) * emission factor (lb/ton) * 24 hours/day * 365 days per year / 2000 lb/ton
SO2, NOx, VOC, and CO emissions (tons/yr) = maximum gas usage capacity (mmcf/hr) * emission factor (lb/MMCF) * 24 (hr/day) * 365 (days/yr) / 2000 (lb/ton)

**Appendix A: Emission Calculations**
**Sand System and Sand Molding**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
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| | Potential Throughput sand (tons/hr) | PM Control (%) |
|---|---|---|
| Sand System and Sand Molding | 18.56 | 99.0% |

| | PM | PM10 |
|---|---|---|
| Emission Factors (lb/ton sand handled) | 1.56 | 0.54 |
| Uncontrolled Potential To Emit (lb/hr) | 29.0 | 10.02 |
| Uncontrolled Potential To Emit (ton/yr) | 126.82 | 43.90 |

PM, PM10 and PM2.5 emission factors for Sand system and molding is based on mass balance from Cast Metals Technology permit (135-00024), and conditionally accepted for this source, contingent upon mass balance testing.
Assume PM10=PM2.5

| | Potential Throughput sand (tons/hr) | PM Control (%) |
|---|---|---|
| Supplemental Sand Silos | 0.016 | |

| | PM | PM10 |
|---|---|---|
| Emission Factors (lb/ton sand handled) | 1.56 | 0.54 |
| Uncontrolled Potential To Emit (lb/hr) | 0.02 | 0.01 |
| Uncontrolled Potential To Emit (ton/yr) | 0.11 | 0.04 |

| | (Tons /yr) | |
|---|---|---|
| Sand Silos | Throughput/Yr | Throughput /hr |
| SSAND-1 | 50.0 | 0.006 |
| SSAND-2 | 50 | 0.006 |
| SSAND-3 | 38 | 0.004 |
| **Total Sand Silos** | **138.0** | **0.016** |

PM, PM10 and PM2.5 emission factors for Sand system and molding is based on mass balance from Cast Metals Technology permit (135-00024), and accepted for this source, .
Assume PM10=PM2.5

| | | |
|---|---|---|
| **TOTAL SAND SYSTEM AND MOLDING (Tons/yr)** | **126.92** | **43.94** |

Methodology for the above Tables:
Uncontrolled Potential to emit (tons/yr) = potential maximum throughput (ton/hr) * emission factor (lb/ton) * 8760 (hr/yr) / 2000 (lb/ton)
Controlled Potential to emit (tons/yr) = Uncontrolled potential to emit (tons/yr) * (1- control efficiency %)

**Appendix A: Emission Calculations**
**Pouring/Casting/Cooling/Shakeout**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | | Potential Throughput metal (tons/hr) | | PM Control (%) | | | |
|---|---|---|---|---|---|---|---|
| Pouring/Casting/Cooling | | 0.76 | total | | | | |

| | PM | PM10 | SO2 | NOx | VOC | CO |
|---|---|---|---|---|---|---|
| Emission Factors (lb/ton metal produced) | 4.2 | 2.06 | 0.02 | 0.01 | 0.140 | 6.00 |
| Uncontrolled Potential To Emit (lb/hr) | 3.19 | 1.57 | 0.02 | 0.01 | 0.11 | 4.56 |
| Uncontrolled Potential To Emit (ton/yr) | 14.0 | 6.9 | 0.07 | 0.03 | 0.47 | 20.0 |

Pouring/Casting/Cooling/Shakeout PM and PM10 emission factors were from AP-42
Assume PM10=PM2.5
Pouring/Casting SO2 and NOx emission factors were supplied by the AIRS Facility Subsystem Emission Factor Listing For Criteria Air Pollutants.
CO emission factor is based on Self-disclosure statement per IDEM guidance memo dated August 11, 2006.

Methodology:
Uncontrolled Potential to Emit (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential to Emit (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

| | | Potential Throughput metal (tons/hr) | | PM Control (%) | | | |
|---|---|---|---|---|---|---|---|
| Shakeout | | 0.76 | total | | | | |

| | PM | PM10 | SO2 | NOx | VOC | CO |
|---|---|---|---|---|---|---|
| Emission Factors (lb/ton metal produced) | 0.40 | 0.40 | 0.02 | 0.01 | 1.20 | 6.00 |
| Uncontrolled Potential To Emit (lb/hr) | 0.30 | 0.30 | 0.02 | 0.01 | 0.91 | 4.56 |
| Uncontrolled Potential To Emit (ton/yr) | 1.3 | 1.3 | 0.07 | 0.03 | 3.99 | 20.0 |

Shakeout PM and PM10 emission factors were from Cast Metals Technology permit (135-00024)
Assume PM10=PM2.5
Pouring/Casting SO2 and NOx emission factors were supplied by the AIRS Facility Subsystem Emission Factor Listing For Criteria Air Pollutants.
CO emission factor is based on Self-disclosure statement per IDEM guidance memo dated August 11, 2006.

Methodology:
Uncontrolled Potential to Emit (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential to Emit (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

| | PM | PM10 | SO2 | NOx | VOC | CO |
|---|---|---|---|---|---|---|
| Total Pouring/Casting/Cooling/Shakeout (t/yr) | 15.3 | 8.2 | 0.1 | 0.1 | 4.5 | 39.9 |

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | Potential Throughput castings (tons/hr) | | PM Control (%) |
|---|---|---|---|
| **Finishing (Grinders, Deburr, Bandsaw)** | 0.76 | total | |

| | PM | PM10 |
|---|---|---|
| Emission Factors lbs/ton finished casting | 17.0 | 1.7 |
| Uncontrolled Potential To Emit (lb/hr) | 12.9 | 1.3 |
| Uncontrolled Potential To Emit (ton/yr) | 56.6 | 5.7 |

PM emission factor for Casting Finishing is from AP-42 Ch. 12.10 (Iron Foundries).
PM10 emission factor for Casting Finishing is from AP-42 Ch. 12.13 (Steel Foundries).
Assume PM10=PM2.5
Methodology:
Uncontrolled Potential Emissions (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential Emissions (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

**Appendix A: Emission Calculations**
**Shotblast**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

| | | Potential Throughput castings (tons/hr) | | PM Control (%) |
|---|---|---|---|---|
| Shot Peen Machine (Peen-1) | | 0.76 | total | |
| | PM | PM10 | | |
| Emission Factors lbs/ton finished casting | 2.11 | 2.11 | | |
| Uncontrolled Potential To Emit (lb/hr) | 1.6 | 1.6 | | |
| Uncontrolled Potential To Emit (ton/yr) | 7.02 | 7.024 | | |

PM and PM-10/2.5 emission factor for Shot Peen is based on dust collector study mass balance, and has been accepted.
Assume PM10=PM2.5
Methodology:
Uncontrolled Potential Emissions (lb/hr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton)
Uncontrolled Potential Emissions (ton/yr) = Potential Throughput (ton/hr) x Emission Factor (lb pollutant/ton) x 8760 hr/yr x 1/2000 ton/lb

**Appendix A: Emission Calculations**
**Core Making**

**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Application Date:** **2011**

| | | | | | | | HAPS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Material | Density (Lb/Gal) | Lbs VOC/Gallon | Actual Usage* (Gal / yr) | Maximum Usage** (Gal / yr) | Maximum VOC (lb/yr) | **Potential VOC tons per year** | Hexane (tons/yr) | Phenol (tons/yr) | Formal-dehyde (tons/yr) | Methanol (tons/yr) | TEA (tons/yr) |
| Acme Flow 2185 for Cold Box | 6.05 | 6.05 | 55.0 | 240.9 | 1457.45 | 0.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.73 |
| **TOTAL COLD BOX** | | | | | **1457.45** | **0.73** | **0.00** | **0.00** | **0.00** | **0.00** | **0.73** |
| 17-550 Warm Box Catalyst | 9.34 | 5.14 | 110.0 | 481.8 | 2476.45 | 1.24 | 0.00 | 0.00 | 0.00 | 1.24 | 0.00 |
| FB-905 for Warm Box | 10.09 | 10.09 | 110.0 | 481.8 | 4861.36 | 2.43 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| **TOTAL FOR WARM BOX** | | | | | **7337.814** | **3.67** | **0.00** | **0.00** | **0.01** | **1.24** | **0.00** |
| Emulite 523-683 Binder for Oil Sand | 8.01 | 6.00 | 110.0 | 481.8 | 2890.80 | 1.45 | 0.00 | 0.00 | 1.45 | 0.00 | 0.00 |
| **TOTAL FOR OIL SAND** | | | | | **2890.800** | **1.45** | **0.00** | **0.00** | **1.45** | **0.00** | **0.00** |
| Parting Agent, Unipart HS | 5.64 | 5.36 | 20.0 | 87.6 | 469.54 | 0.23 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| **TOTAL FOR HARRISON SHELL SAND** | | | | | **469.536** | **0.23** | **0.14** | **0.00** | **0.00** | **0.00** | **0.00** |
| Phenoset-RB r part (2:1) | 10.34 | 6.72 | 110.0 | 481.8 | 3237.70 | 1.62 | 0.00 | 0.10 | 0.01 | 0.08 | 0.00 |
| **TOTAL AIRSET CORES** | | | | | **3237.696** | **1.62** | **0.00** | **0.10** | **0.01** | **0.08** | **0.00** |
| | | | | | | **7.70** | **0.14** | **0.10** | **1.47** | **1.32** | **0.73** |
| **Potential Emissions** | | | | | | **VOC** | **TOTAL HAPs** | | **3.76** | | |

METHODOLOGY

* Actual usage obtained form source, and is based on 2000 operating hours per year.

** Maximum Usage = Actual usage (gal/yr) extrapolated to 8,760 hours per year.

Pounds of VOC per Gallon Coating and Density obtained form source from MSDS sheets

Maximum VOC (lbs/yr) = Maximum usage (gal/yr) x Lbs VOC/gal

Potential VOC tons per year = Maximum VOC (lb/yr) / 2000 lb/ton

HAPS data obtained from MSDS sheets and follow above calculation methods.

**Appendix A: Emissions Calculations**
**Welding and Thermal Cutting**

**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Application Date:** **2011**

| PROCESS | Number of Stations | Max. electrode consumption per station (lbs/hr) | | EMISSION FACTORS* (lb pollutant/lb electrode) | | | | EMISSIONS (lbs/hr) | | | | HAPS (lbs/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WELDING | | | | PM = PM10 | Mn | Ni | Cr | PM = PM10 | Mn | Ni | Cr | |
| Metal Inert Gas (MIG)(carbon steel) | 1 | 0.10 | | 0.0055 | 0.0005 | | | 0.001 | 0.000 | 0.000 | 0 | 0.000 |
| Tungsten Inert Gas (TIG)(carbon steel) | 1 | 0.10 | | 0.0055 | 0.0005 | | | 0.001 | 0.000 | 0.000 | 0 | 0.000 |
| | Number of Stations | Max. Metal Thickness Cut (in.) | Max. Metal Cutting Rate (in./minute) | EMISSION FACTORS (lb pollutant/1,000 inches cut, 1" thick)** | | | | EMISSIONS (lbs/hr) | | | | HAPS (lbs/hr) |
| FLAME CUTTING | | | | PM = PM10 | Mn | Ni | Cr | PM = PM10 | Mn | Ni | Cr | |
| Oxyacetylene | 0 | 0 | 0 | 0.1622 | 0.0005 | 0.0001 | 0.0003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Oxymethane | 0 | | | 0.0815 | 0.0002 | | 0.0002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Plasma** | 0 | 0 | 0 | 0.0039 | | | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| EMISSION TOTALS | | | | | | | | | | | | |
| Potential Emissions lbs/hr | | | | | | | | 1.10E-03 | | | | 0.00 |
| Potential Emissions lbs/day | | | | | | | | 2.64E-02 | | | | 0.00 |
| Potential Emissions tons/year | | | | | | | | 4.82E-03 | | | | 0.00 |

**Methodology:**

*Emission Factors are default values for carbon steel unless a specific electrode type is noted in the Process column.

**Emission Factor for plasma cutting from American Welding Society (AWS). Trials reported for wet cutting of 8 mm thick mild steel with 3.5 m/min cutting speed (at 0.2 g/min emitted). Therefore, the emission factor for plasma cutting is for 8 mm thick rather than 1 inch, and the maximum metal thickness is not used in calculting the emissions.

Using AWS average values: (0.25 g/min)/(3.6 m/min) x (0.0022 lb/g)/(39.37 in./m) x (1,000 in.) = 0.0039 lb/1,000 in. cut, 8 mm thick

Plasma cutting emissions, lb/hr: (# of stations)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 8 mm thick)

Cutting emissions, lb/hr: (# of stations)(max. metal thickness, in.)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 1" thick)

Welding emissions, lb/hr: (# of stations)(max. lbs of electrode used/hr/station)(emission factor, lb. pollutant/lb. of electrode used)

Emissions, lbs/day = emissions, lbs/hr x 24 hrs/day

Emissions, tons/yr = emissions, lb/hr x 8,760 hrs/year x 1 ton/2,000 lbs.

**Appendix A: Emission Calculations**
**Paint**

**Company Name: Modern Aluminum Castings**
**Address City IN Zip: 1400 North 14th Street, Terre Haute, IN 47807**
**Permit Number: MSOP 167-30578-00154**
**Reviewer: Jack Harmon**
**Application Date: 2011**

**Powder Coat**

| Material | Density (Lb/Gal) | Lbs VOC/Gallon | Actual Usage* (lbs / yr) | Maximum Usage** (lbs / yr) | Maximum VOC (lb/yr) | **Potential VOC tons per year** | PM (lb/hr) | PM (tons/yr) | PM10, 2.5 (lb/hr) | PM10, 2.5 (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|
| White | 0.00 | 0.00 | 55.0 | 240.9 | 0.00 | 0.00 | 0.33 | 1.45 | 0.33 | 1.45 |
| Black | 0.00 | 0.00 | 110.0 | 481.8 | 0.00 | 0.00 | 0.25 | 1.10 | 0.25 | 1.10 |
| **TOTAL Powder Coat** | | | | | **0.000** | **0.00** | **0.58** | **2.54** | **0.58** | **2.54** |
| | | | | | | | | **2.54** | | **2.54** |

**Paint**

| Material | Density (Lb/Gal) | Lbs VOC/Gallon | Actual Usage* (Gal / yr) | Maximum Usage** (Gal / yr) | Maximum VOC (lb/yr) | **Potential VOC tons per year** | PM (lb/hr) | PM (tons/yr) | PM10, 2.5 (lb/hr) | PM10, 2.5 (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|
| Red Laquer Coating | 7.98 | 5.16 | 60.0 | 438.0 | 2260.08 | 1.13 | 0.02 | 0.09 | 0.02 | 0.09 |
| **TOTAL Paint** | | | | | **2260.08** | **1.13** | **0.02** | **0.09** | **0.02** | **0.09** |
| **Potential Emissions - both Powder Coating and Paint** | | | | | | **1.13** | | **2.63** | | **2.63** |
| | | | | | | **VOC** | | **PM** | | **PM10, 2.5** |

Methodology
Both powder coating and paint operations are seldom used and are insignificant activities. Therefore, the small usage per year based on 1200 hours was extrapolated to 8760 hours per year to obtain maximum annual usage.

Powder Coat contains no VOCs; therefore, only emissions are particulate, which were calculated based on only a 50% transfer efficiency.

**Appendix A: Emissions Calculations**
**Particulate Matter from Fugitive Sources**
**Company Name:** **Modern Aluminum Castings**
**Address City IN Zip:** **1400 North 14th Street, Terre Haute, IN 47807**
**Permit #:** **MSOP 167-30578-00154**
**Reviewer:** **Jack Harmon**
**Date:** **2011**

**Paved Roads**

E= [(k x (sL)^0.91) x (W/)^1.02](1-(P/4N))

AP-42, Section 13.2.2-1

| Factor | Description | Source | Summer Months PM Value | Summer Months $PM_{10}$ Value | Summer Months $PM_{2.5}$ Value | Winter Months PM Value | Winter Months $PM_{10}$ Value | Winter Months $PM_{2.5}$ Value |
|---|---|---|---|---|---|---|---|---|
| E = | Emission factor (lb/VMT, vehicle miles traveled) | Calculation, above | 0.19 | 0.04 | 0.01 | 0.66 | 0.13 | 0.03 |
| k = | PM Particle size multiplier (lb/VMT) | AP-42, Section 13.2.1 | 0.011 | 0.0022 | 0.00054 | 0.011 | 0.0022 | 0.00054 |
| sL = | Road surface silt loading ($g/m^2$) | AP-42, Section 13.2.1-2 | 0.60 | 0.60 | 0.60 | 2.40 | 2.40 | 2.40 |
| P = | Number of "wet" days in an averaging period | | 120 | 120 | 120 | 120 | 120 | 120 |
| N = | Number of days in the averaging period | | 365 | 365 | 365 | 365 | 365 | 365 |
| W = | Average vehicle weight (ton) | | 27.5 | 27.5 | 27.5 | 27.5 | 27.5 | 27.5 |

**Average Annual Emission Factors**

| | Non-Winter Months | Winter Months | Average Factor |
|---|---|---|---|
| PM | 9 | 3 | **0.30** |
| $PM_{10}$ | 9 | 3 | **0.06** |
| $PM_{2.5}$ | 9 | 3 | **0.01** |

**PM Emissions from Paved Roads**

| Activity | Average Vehicle Weight (tons) | No. of Vehicles (vehicles/yr) | Miles Traveled per vehicle (miles/vehicle) | Annual Mileage (VMT/yr) | Uncontrolled PM Emissions (tpy) | Uncontrolled PM-10 Emissions (tpy) | Uncontrolled PM 2.5 Emissions (tpy) |
|---|---|---|---|---|---|---|---|
| Passenger Vehicles | 1 | 2,190 | 0.04 | 83 | 0.013 | 0.003 | 0.001 |
| **Total** | | | | | **0.013** | **0.003** | **0.001** |

**Unpaved Roads**

The following calculations determine the amount of emissions created by unpaved roads, based on 8,760 hours of use and AP-42, Ch 13.2.2 (11/2006).

0.375 trip/hr x
0.066 mile/trip x
2 (round trip ) x
8760 hr/yr = 433.62 miles per year

**PM**

Ef = k*[(s/12)^0.9]*[(W/3)^b]
= 10.87 lb/mile
where k = 4.9 (particle size multiplier for PM) (k=4.9 for PM-30 or TSP)
s = 8.4 mean % silt content of unpaved roads
b = 0.45 Constant for PM
W = 36 tons average vehicle weight
M = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)

E = 10.87 lb/mi x 433.62 mi/yr = 2.36 tons/yr
2000 lb/ton

Taking natural mitigation due to precipitation into consideration:
Eext = E * [(365-p)/365] = **PM** **1.55** tons/yr

where p = 125 days of rain greater than or equal to 0.01 inches(see Fig. 13.2.2-1)

---

**PM-10, 2.5**

Ef = k*[(s/12)^0.9]*[(W/3)^b]
= 3.33 lb/mile
where k = 1.5 (particle size multiplier for PM-10) (k=4.9 for PM-30 or TSP)
s = 8.4 mean % silt content of unpaved roads
b = 0.45 Constant for PM-10
W = 36 tons average vehicle weight
M = 0.2 surface material moisture content, % (default is 0.2 for dry conditions)

E = 3.33 lb/mi x 433.62 mi/yr = 0.72 tons/yr
2000 lb/ton

Taking natural mitigation due to precipitation into consideration:
Eext = E * [(365-p)/365] = **PM-10,2.5** **0.47** tons/yr

where p = 125 days of rain greater than or equal to 0.01 inches(see Fig. 13.2.2-1)

| | | | |
|---|---|---|---|
| **Total Fugitive Roads Emissions** | **PM** | 1.56 | tons/yr uncontrolled |
| | **PM-10** | 0.48 | tons/yr uncontrolled |
| | **PM2.5** | 0.47 | tons/yr uncontrolled |

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

*We Protect Hoosiers and Our Environment.*

*Mitchell E. Daniels Jr.*
**Governor**

*Thomas W. Easterly*
**Commissioner**

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
**www.idem.IN.gov**


**SENT VIA U.S. MAIL: CONFIRMED DELIVERY AND SIGNATURE REQUESTED**

TO: Jeffrey Farmer
Modern Aluminum Castings
1400 N 14th St
Terre Haute, IN 47807

DATE: November 7, 2011

FROM: Matt Stuckey, Branch Chief
Permits Branch
Office of Air Quality

SUBJECT: Final Decision
MSOP
167-30578-00154

Enclosed is the final decision and supporting materials for the air permit application referenced above. Please note that this packet contains the original, signed, permit documents.

The final decision is being sent to you because our records indicate that you are the contact person for this application. However, if you are not the appropriate person within your company to receive this document, please forward it to the correct person.

A copy of the final decision and supporting materials has also been sent via standard mail to:
William Rourke (Chairman)
Greg Towler (ERM)
Mary Ann Saggese (Plews, Shadley, Racher & Braun)
OAQ Permits Branch Interested Parties List

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178, or toll-free at 1-800-451-6027 (ext. 3-0178), and ask to speak to the permit reviewer who prepared the permit. If you think you have received this document in error, please contact Joanne Smiddie-Brush of my staff at 1-800-451-6027 (ext 3-0185), or via e-mail at jbrush@idem.IN.gov.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**
*We Protect Hoosiers and Our Environment.*

*Mitchell E. Daniels Jr.*
**Governor**

*Thomas W. Easterly*
**Commissioner**

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
**www.idem.IN.gov**

November 7, 2011

TO: Vigo County Public Library

From: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Subject: **Important Information for Display Regarding a Final Determination**

**Applicant Name:** **Modern Aluminum Castings**
**Permit Number:** **167-30578-00154**

You previously received information to make available to the public during the public comment period of a draft permit. Enclosed is a copy of the final decision and supporting materials for the same project. Please place the enclosed information along with the information you previously received. To ensure that your patrons have ample opportunity to review the enclosed permit, **we ask that you retain this document for at least 60 days.**

The applicant is responsible for placing a copy of the application in your library. If the permit application is not on file, or if you have any questions concerning this public review process, please contact Joanne Smiddie-Brush, OAQ Permits Administration Section at 1-800-451-6027, extension 3-0185.

Enclosures
Final Library.dot 11/30/07

# Mail Code 61-53

| IDEM Staff | MIDENNEY 11/7/2011<br>Modern Aluminum Castings 167-30578-00154 (final) | | |
|---|---|---|---|
| Name and address of Sender |  | Indiana Department of Environmental Management<br>Office of Air Quality – Permits Branch<br>100 N. Senate<br>Indianapolis, IN 46204 | Type of Mail:<br>**CERTIFICATE OF MAILING ONLY** |

AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | Jeffrey L Farmer Modern Aluminum Castings 1400 N 14th St Terre Haute IN 47807 (Source CAATS) via confirm delivery | | | | | | | | | |
| 2 | | William Rourke Chairman Modern Aluminum Castings 1400 N 14th St Terre Haute IN 47807 *(RO CAATS)* | | | | | | | | | |
| 3 | | Mr. Charles L. Berger Berger & Berger, Attorneys at Law 313 Main Street Evansville IN 47700 *(Affected Party)* | | | | | | | | | |
| 4 | | Vigo County Board of Commissioners County Annex, 121 Oak Street Terre Haute IN 47807 *(Local Official)* | | | | | | | | | |
| 5 | | Terre Haute City Council and Mayors Office 17 Harding Ave Terre Haute IN 47807 *(Local Official)* | | | | | | | | | |
| 6 | | Vigo County Health Department 147 Oak Street Terre Haute IN 47807 *(Health Department)* | | | | | | | | | |
| 7 | | Vigo Co Public Library 1 Library Square Terre Haute IN 47807-3609 *(Library)* | | | | | | | | | |
| 8 | | J.P. Roehm PO Box 303 Clinton IN 47842 *(Affected Party)* | | | | | | | | | |
| 9 | | Ms. Mary Ann Saggese Plews Shadley Racher & Braun LLP 1346 North Delaware St. Indianapolis IN 46202 *(Attorney)* | | | | | | | | | |
| 10 | | Mr. Greg Towler Environmental Resources Management (ERM) 11350 N. Meridian St., Suite 320 Carmel IN 46032 *(Consultant)* | | | | | | | | | |
| 11 | | Deb Reeves Vigo County Air Pollution Control 121 Oak Terre Haute IN 47807 *(Local Official)* | | | | | | | | | |
| 12 | | Mark Zeltwanger 26545 CR 52 Nappanee IN 46550 *(Affected Party)* | | | | | | | | | |
| 13 | | John W. & Steven A. McCallister 1401 N. 13th Street Terre Haute IN 47807 (Affected Party) | | | | | | | | | |
| 14 | | Frank Fisbeck & Kay Hanley 1339 N. 13th Street Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 15 | | MDM Computer, Inc. 1313 6th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |

| Total number of pieces Listed by Sender | Total number of Pieces Received at Post Office | Postmaster, Per (Name of Receiving employee) | |
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| 14 | | | The full declaration of value is required on all domestic and international registered mail. The maximum indemnity payable for the reconstruction of nonnegotiable documents under Express Mail document reconstructing insurance is $50,000 per piece subject to a limit of $50, 000 per occurrence. The maximum indemnity payable on Express mil merchandise insurance is $500. The maximum indemnity payable is $25,000 for registered mail, sent with optional postal insurance. See ***Domestic Mail Manual*** **R900, S913**, and **S921** for limitations of coverage on inured and COD mail. See ***International Mail Manual*** for limitations o coverage on international mail. Special handling charges apply only to Standard Mail (A) and Standard Mail (B) parcels. |

FACSIMILIE OF PS Form 3877

# Mail Code 61-53

| | | | |
|---|---|---|---|
| IDEM Staff | MIDENNEY 11/7/2011<br>Modern Aluminum Castings 167-30578-00154 (final) | | AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING |
| Name and address of Sender | ▶ | Indiana Department of Environmental Management<br>Office of Air Quality – Permits Branch<br>100 N. Senate<br>Indianapolis, IN 46204 | Type of Mail:<br>**CERTIFICATE OF MAILING ONLY** |

| Line | Article Number | Name, Address, Street and Post Office Address | Postage | Handing Charges | Act. Value (If Registered) | Insured Value | Due Send if COD | R.R. Fee | S.D. Fee | S.H. Fee | Rest. Del. Fee<br>Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | Church of Christ 1356 5th Ave. Terre Haute IN 47807 (Affected Party) | | | | | | | | | |
| 2 | | Thomas & Annette Miles 1403 6th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 3 | | Fredia Danner 1334 6th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 4 | | Joan L. & Dennis E. Hill 1352 8th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 5 | | David Ray Marshall 1346 8th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 6 | | Lonnie & Darlene Cooper 1342 8th Ave. Terre Haute IN 47087 *(Affected Party)* | | | | | | | | | |
| 7 | | Donald & Jeanne La Vanne 1331 8th Ave Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 8 | | James Flinn 1400 8th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 9 | | Robert G. & Phylis J. Maxwell Revocable Living Trust 1364 8th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 10 | | Charlie & Barbara Nellum 1358 8th Ave. Terre Haute IN 47807 *(Affected Party)* | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |

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