

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection**

B217841008

FACILITY: Cadillac Casting, Inc		SRN / ID: B2178
LOCATION: 1500 4th Ave., CADILLAC		DISTRICT: Cadillac
CITY: CADILLAC		COUNTY: WEXFORD
CONTACT: Erik Olsen , Environmental Manager		ACTIVITY DATE: 08/07/2017
STAFF: Kurt Childs	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: 2017 FCE Site inspection and records review.		
RESOLVED COMPLAINTS:		

CADILLAC CASTING, INC. (B2178)

FACILITY DESCRIPTION

Cadillac Casting, Inc. (CCI) is located in the city of Cadillac in Wexford County. The facility is located on the north side of the city in a predominantly industrial/commercial area with residential areas to the south and east of the plant. CCI operates a ductile iron foundry with melt operations performed in one cupola, which has an afterburner, quench unit, venturi scrubber and demister for control. Molten iron from the cupola is held in three 62-ton electric induction holding furnace. Castings are produced on two separate lines; the A-Line and the SPOLINE. The two mold/casting lines operate independently and are equipped with a sand system, pouring and cooling area, and use wet scrubbers and baghouses to control emissions. There is also a finishing department that includes shot blasting and grinding operations also controlled by baghouses.

REGULATORY ANALYSIS

The facility is a Title V subject source (ROP No. MI-ROP-B2178-2014) because the potential to emit for volatile organic compounds, particulate matter, and carbon monoxide exceeds the major source threshold and because the facility's PTE for HAPs exceeds the major source threshold. The facility is subject to the Iron and Steel Foundry NESHAP, Subpart EEEEE. NESHAP subject emission units are EUMELTING and EUALINE, for which applicable requirements are contained in FGMACT of the ROP. The following emission units are subject to CAM requirements in the ROP: EUALINE (CO, VOC), EUSPOGREENSAND (PM), EUSPOBREAKSORT (PM), EUSPOSHAKEOUT (PM), EUMELTING (CO) and EUFINISHING (PM).

The current ROP was issued on October 13, 2014. This inspection was conducted to determine the current compliance status of the facility with regard to the ROP, and the Air Pollution Control Rules.

COMPLIANCE EVALUATION

At the time of the inspection the weather was clear, 70, NE wind @ 10mph. Prior to entering the facility plant operations were evaluated from off-site. No opacity or odors were noted. The cupola exhaust was generating an attached steam plume; however, no opacity was observed tailing off the steam plume. No opacity was noted from any of the other stacks including the North and South Multiwash scrubbers, finishing baghouses, or A-line. I did not observe any fugitive dust from yard areas around the plant.

At the facility AQD staff (Kurt Childs) met with Erik Olson, HSE Manager for Cadillac Casting, Inc.

EUALINE

Emission unit includes mold pouring, cooling and shakeout of phenolic urethane cold box molds. Molten iron from the cupola/holding furnaces is transferred to the EUALINE. Emissions from pouring and cooling are captured and controlled by a RTO. This is a Compliance Assurance Monitoring subject emission unit for CO and VOC in the permit. The emission unit is also subject to Subpart EEEEE for pouring. Metal pouring on the A-Line is still only operating only 2 days per week during the night shift. And was not operating at the time of the inspection.

Emission/Material Limits

EUALINE has limits that restrict the emission of VOC, lead, PM-10, CO and benzene. Compliance with the emission limits is demonstrated through compliance testing and control equipment (RTO) monitoring to demonstrate proper operation. Compliance is also demonstrated via monthly emission records that are calculated utilizing emission factors from testing and material usage/production rates. Based on this inspection, parametric monitoring, proper control equipment operation, emission records and compliance testing demonstrate compliance with the emissions limits (Records attached).

Pollutant	Limit	Max Actual Emissions 12 Mos. Rolling
CO	29.1 tpy	0.235 tons
PM10	5.6 tpy	0.678 tons
VOC	26.7 tpy	0.526 tons
Lead	0.23 tpy	0.00037 tons
Benzene	0.30 pph	0.30 pph (2016 stack test)
Benzene	1.0 tpy	0.10 tons
MATERIAL	Limit	Max Actual Usage 12 mos. Rolling
Metal poured	67,000 tpy	7973 tons

The most recent testing conducted on 5/17/2011 demonstrated compliance with the ROP emission limits (See Testing/Sampling discussion below).

The facility has a material limit of 67,000 tons of metal poured per 12-month period. Compliance is demonstrated via metal pour records. Records supplied by the facility (attached) show compliance with the metal use limits.

Process/Operational Restrictions/Monitoring/Recordkeeping

To demonstrate proper operation of the RTO the permit requires the temperature to be continuously monitored and recorded to document that the temperature is maintained at a minimum of 1500 degrees. Review of facility records showed compliance with the RTO monitoring requirements. Proper operation is also required to be evaluated via daily visible emission observations. Since EUALine is normally operated at night, visible observations may provide limited information of proper operation.

Testing/Sampling

Emission testing for PM-10, VOC, CO, lead and benzene must be performed every 5 years. The most recent testing was conducted on 5/2-5/2016. The test report was submitted 31 days late and reviewed at the time of submittal and the reported emissions were in compliance with the permitted limits.

Reporting

Review of the most recent annual and semiannual ROP certification reports showed that they were submitted by the deadline and one deviation for the late test report submittal was reported during the first semi-annual reporting period.

This is a CAM subject emission unit; the CAM reporting was submitted in a timely manner and with certification. No CAM excursions/exceedances occurred and there were two incidents of monitor downtime noted.

Stack/Vent Restrictions

Visual evaluation of the stack (SV007) showed that it appeared to meet the required dimension requirements.

Inspection Observations

EUALINE was not operating during the inspection since it is operated at night. As a result, the RTO was on idle and not running at operating temperatures.

EUALINEMOLD

A-Line core and mold making process that consists of two new and two old Sutter phenolic urethane cold box mold machines. Emissions are controlled by two Dakota brand sulfuric acid scrubbers.

Emission/Material Limits

EUALINEMOLD has limits that restrict the emission of VOC 27.5 lbs/hr, 35.3 tons/yr. and DMIPA 0.07 lb/hr. Compliance with the emission limits is demonstrated through compliance testing and control equipment (sulfuric acid scrubbers) monitoring to demonstrate proper operation. Compliance is also demonstrated via monthly emission records that are calculated utilizing emission factors/testing and material usage/production rates. Based on this inspection, parametric monitoring, proper control equipment operation, emission records and compliance testing (see Testing/Sampling regarding VOC testing) demonstrate compliance with the emissions limits (VOC;3.62lbs/hr., 4.2 tons/year max., DMIPA 0.027lb./hr., records attached).

EUALINEMOLD has a sand usage limit of 41.5 tons per hour and 106,000 tons per 12-month period. Review of the facility records shows compliance with the sand use limits (6.4 tons per hour maximum monthly usage and a maximum 12-month rolling time-period usage of 13,179 tons).

Process/Operational Restrictions/Monitoring

To demonstrate proper operation of the sulfuric acid scrubbers the permit requires a minimum liquid flow rate of 50 gallons per minute and a maximum pH of 5 in the scrubber liquid. The permit requires continuous monitoring and recordkeeping of these parameters. Review of facility records showed that they were conducting the required monitoring and recordkeeping and that the readings were in compliance with the permitted limits. At the time of the inspection the scrubber flow rate was 95.6 gpm and pH readings for each of the scrubbers were 2.74 and 3.18.

The facility is maintaining the required records of VOC and DMIPA emissions as well as resin usage. Review of the records showed compliance with the permit limits.

Testing/Sampling

Emission testing for DMIPA must be performed every 5 years.

The most recent testing was conducted on July 25, 2016. The test report was reviewed at the time it was received and demonstrated compliance with the DMIPA limit.

Reporting

Review of the most recent annual and semiannual ROP certification reports showed that they were submitted by the deadline. No deviations were reported.

EUCOREMOLDMAKING

Core making processes that consist of various phenolic urethane cold box core machines. Emissions are controlled by one sulfuric acid scrubber. The process was operating at the time of the inspection producing differential cases.

Emission/Material Limits

EUCOREMOLDMAKING has limits that restrict the emission of VOC and DMIPA (VOC; 179 tons/month, DMIPA; 0.044 tons/month). Compliance with the emission limits is demonstrated through compliance testing and control equipment (sulfuric acid scrubber) monitoring to demonstrate proper operation. Compliance is also demonstrated via monthly emission records that are calculated utilizing emission factors/testing and material usage/production rates. Based on this inspection, parametric monitoring,

proper control equipment operation, emission records and compliance testing demonstrate compliance with the emissions limits (VOC: 33.8 tons/month; DMIPA 0.003 tons/month, records attached)

The facility is maintaining the required records of VOC and DIMPA emissions as well as resin usage. Review of the records showed compliance with the permit limits (VOC; 1.07 tons/month, DMIPA; 12.38 lbs/month).

Process/Operational Restrictions/Monitoring

The old scrubber that was located in the mold cooling area has been replaced by a new, larger Dakota brand scrubber located near the core mold making area adjacent to the Melt department. The change was made pursuant to Rule 285(d). Mr. Olson stated that stack dimensions remained the same though the stack has been relocated.

To demonstrate proper operation of the sulfuric acid scrubber the permit requires a minimum liquid flow rate of 50 gallons per minute and a maximum pH of 5 in the scrubber liquid. The permit requires continuous monitoring and daily recording of the scrubber liquid flow rate and daily monitoring and recording of the pH. At the time of the inspection the flow rate was observed to be 95.6 gpm. pH is not continuously monitored but checked daily and recorded. Review of facility records (attached) showed that they were conducting the required monitoring and recordkeeping and that the readings were in compliance with the permitted limits.

The facility is also required to perform daily VE readings of the scrubber exhaust stack. Staff reviewed a sampling of observation records which did not indicate any opacity problems. As previously indicated, no opacity was observed during the inspection.

Testing/Sampling

Emission testing for DMIPA must be performed every 5 years.

The most recent testing was conducted on July 26, 2017. The test report was reviewed at the time it was received and compliance with the DMIPA limit was demonstrated.

Reporting

Review of the most recent annual and semiannual ROP certification reports showed that they were submitted by the deadline and that no deviations were reported.

EUFINISHING

Shot blasting and grinding operations that are controlled by three separate baghouses. This emission unit is CAM subject for PM.

Baghouse control includes the following:

40K – Grinding baghouse is vented internally through a HEPPA filter during the winter.

12K – shot blast baghouse is vented internally through a HEPPA filter during the winter
(Sometimes year around)

Sly – A-Line finishing baghouse is permanently vented internally through a HEPPA filter.

The grinding and shot blast operations were running but the A-Line finishing was not.

Emission/Material Limits/Records

Compliance with the emission limits (PM) is demonstrated through baghouse monitoring to demonstrate proper operation and compliance testing. Based on this inspection, parametric monitoring, stack testing and proper baghouse operation demonstrate compliance with the emissions limits.

Pollutant	Limit	Actual Emissions
PM	0.03 lbs/1,000 lbs	0.003 lbs/1,000 lbs (2016 testing)

PM	7 pph	0.5 pph (calculated from records)
PM	2.5 tons, 12-mos rolling	0.12 tons, 12-mos rolling
PM	29.8 tons per year	0.89 tons so far in 2017
VE	5% opacity	No VE observed.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the baghouses the permit requires monitoring continuously and recording once daily the pressure drop. Review of facility records showed pressure drop readings for baghouses to be consistently below the ROP listed operating ranges. At the time of the inspection the differential pressure readings were as follows:

Baghouse	Differential Pressure Reading (inches wc)
40,000 CFM	3
12,000 CFM	6
Sly (A-Line finishing)	NA

The differential pressure readings were within the required operating ranges. The Sly baghouse is equipped with a HEPPA filter that vents to the in-plant air. The other two baghouses are vented in to the plant seasonally to conserve heat. Daily visible emission observations are required when the baghouses are venting externally. At the time of the inspection no visible emissions were observed from the 40K baghouse.

Reporting

Review of the most recent annual and semiannual ROP certification reports showed that they were submitted by the deadline and that no deviations occurred.

EUMELTING

Metal melting system consisting of an 84" water wall cupola with recuperative hot blast. The system includes three electric holding furnaces, a 5-ton desulphurization ladle and four tundish ladles. Also includes the cupola charging system. Emissions from the cupola are controlled by an afterburner (combustor), venturi scrubber and demister. Emissions from the desulphurization ladle are controlled by a baghouse.

Emission/Material Limits

EUMELTING has limits that restrict the emission of PM, CO, SO2, VOC, manganese and lead from the cupola. Compliance with the emission limits is demonstrated through compliance testing and control equipment monitoring to demonstrate proper operation. Compliance is also demonstrated via monthly emission records that are calculated utilizing emission factors from testing and material usage/production rates. Based on this inspection, parametric monitoring, proper control equipment operation, emission records and compliance testing demonstrate compliance with the emissions limits (see below).

Pollutant	Emission Limit	2017 Emissions
PM	18.0 pph	3.35 pph (calculated)
PM	3.17 tons/month	0.65 tons/month max
PM	38.0 tons/yr	4.45 tons (through 7/17, est.7.68 tons total for 2017)
CO	375.0 lbs/hr.	24.81 lbs/hr. (2016 Test)
CO	66.7 tons/month	3.63 tons/month max
CO	800 tons 12-mos rolling	24.71 tons (through 7/17, est. 42 tons total for 2017)
CO	8.0 lbs/ton of metal charged	0.59 lbs/ton (calculated)
VOC	3.6 pph	0.4 pph (calculated)

VOC	0.65 tons/month	0.0781 tons/month max
VOC	7.74 tons/year, 12-mos rolling	0.53 tons (through 7/2017, est. 0.9 tons for 2017)
SO2	17.7 lbs/hr.	1.2 lbs/hr. (calculated)
SO2	3.2 tons/month	0.2398 tons/month max
SO2	38.0 tons/yr.	1.63 tons (through 7/2017, est. 2.76 tons for 2017)
SO2	0.38 lbs/ton of metal charged	0.039 lbs/ton of metal charged (calculated)
Lead	0.054 tons/month	0.0043 tons/month max
Lead	0.65 tons/yr	0.03 tons (through 7/2017, 0.05 tons for 2017)
Lead	0.0065 lbs/ton of metal charged	0.0007 lbs/ton of metal charged (calculated)
Lead	0.3 pph	0.02 pph (calculated)
Manganese	1.35 tons/yr 12-mos rolling	0.12 tons (through 7/2017, est. 0.22 tons for 2017)
Manganese	0.62 lbs/hr.	0.01 lbs/hr. (calculated)

The most recent testing demonstrated compliance with the ROP emission limits. (See Testing/Sampling discussion below)

The facility has a charge limit of 16,667 tons per month and 200,000 ton annually. Compliance is demonstrated via charge records. Records of the material charge rates to the furnace were supplied by the facility (attached). Review of the facility records shows charge rates were 13,073 tons/month max. and 83329 tons for 2017 so far.

Process/Operational Restrictions/Monitoring/Recordkeeping

To demonstrate proper operation of the cupola control, the permit requires the following monitoring and recordkeeping: afterburner burner to be maintained at a minimum temperature of 1,350 degrees, which is monitored and recorded on a continuous basis, the venturi pressure drop to be maintained at a minimum of 42 inches and a minimum water flow rate of 115 gallons/minute with the parameters monitored and recorded on an hourly basis. At the time of the inspection the afterburner temperature was 1472 degrees and the venturi scrubber differential pressure and flow rate were 73 inches and 289 gpm respectively.

To demonstrate proper operation of the desulphurization ladle baghouse the permit requires the following monitoring and recordkeeping: maintain the pressure drop between 3 to 8 inches. The outlet of this baghouse is equipped with a HEPPA filter that vents back into the in-plant environment. The permit requires the differential pressure of the baghouse to be recorded daily. At the time of the inspection the differential pressure reading was 3.5 inches. stack testing is not required. Specific operating parameters for the desulphurization baghouse are not included in the MAP.

The facility is maintaining the required emission and monitoring records. As indicated above, review of the records showed compliance with the permit limits.

Testing/Sampling

Emission testing for CO, lead, PM, manganese, SO2, and VOC must be performed once every 5 years.

The facility conducted compliance testing on October 25, 2016 that demonstrated compliance with all emission limits contained in the ROP.

Reporting

Review of the most recent annual and semiannual ROP certification reports showed that they were submitted on time with two deviations for a flowrate monitor malfunction and one for excess opacity. These deviations were reviewed at the time the report was submitted and were determined to be resolved.

Stack/Vent Restrictions

There have been no changes to the stack and it appears to meet the ROP specifications.

FGSPOLINE

Process used to produce iron castings from molten iron using green sand molds and set cores. Equipment includes a Spomatic mold line, iron pouring and cooling, green sand system, and sorting and shakeout. Emissions from the processes are controlled by three baghouses and two multiwash scrubbers.

Emission/Material Limits/Records

FGSPOLINE has limits that restrict the emissions of PM, CO, lead and VOC. Compliance with the emission limits is demonstrated through compliance testing and control equipment monitoring to demonstrate proper operation. Compliance is also demonstrated via monthly emission records that are calculated utilizing emission factors from testing and material usage/production rates. Based on this inspection, parametric monitoring, proper control equipment operation, emission records and compliance testing demonstrate compliance with the emissions limits as follows: (Records attached):

Pollutant	Emission Limit, 12 mos. rolling avg. (tons)	2017 Emissions 12 mos. rolling avg. (tons)
CO	250	79.96 max
VOC	107	29.48 max
Lead (EUSPOPOURANDCOOL)	7.92 (lbs)	1.53 max
PM (EUSPOPOURANDCOOL)	6.5	0.55 max
PM (EUSPOGREENSAND)	32	2.28 max
PM (EUSPOBREAKANDSORT)	24	4.76 max
PM (SPOSHAKEOUT)	24	2.81 max

The facility has a metal pour limit of 180,000 ton per 12-month period. Compliance is demonstrated via pour records. Records of the material pour rates were supplied by the facility (attached) and indicate that a maximum of 75,407 tons have been poured so far during 2017.

Design Parameters/Testing/Monitoring/Records

To demonstrate proper operation of the baghouses the permit requires monitoring continuously and recording once daily the pressure drop. Review of facility records showed pressure drop readings to be within the specified ranges. At the time of the inspection the differential pressure readings for the baghouses were as follows:

Baghouse	Parameter Limit Range (Inches wc)	Differential Pressure (Inches wc)
Carter Day	1.5 - 5	1.6
#1 80K	1 - 10	3,3,3, (manometer on each section of BH)
#2 80K	1 - 9	2.1

Proper operation of the North and South Multiwash scrubbers is demonstrated through maintaining a water flow rate above 150 gallons per minute and recording the rate continuously as well as maintaining the pressure drop of each unit above 7 inches. At the time of the inspection the readings for the scrubbers were as follows:

Scrubber	Flow Rate (gpm)	Differential Pressure (Inches wc)
North Multiwash	182	9.8
South Multiwash	284	8.5

The facility is maintaining the required emission records. Review of the records showed compliance with the permit limits. (Attached)

Testing/Sampling

Emission testing for PM, CO, lead and VOC must be performed once every 5 years.

The facility conducted compliance testing October 26 and 27 2016. The test report was reviewed at the time of submittal and testing demonstrated compliance with all emission limits.

Reporting

Review of the most recent annual and semiannual ROP certification reports showed that they were submitted by the deadline and contained no deviations. The report was reviewed at the time it was submitted.

FG-MACT

Processes subject to 40 CFR 63, Subpart EEEEE. EUMELTING is subject to the NESHAP requirements for cupola melt systems, while EUALINE is subject to the NESHAP requirements for pouring. The buildings housing foundry processes are also subject to the fugitive opacity emission limit.

Emission/Material Limits

Compliance with the emission limits (Metal HAPs, PM, Opacity) is demonstrated through afterburner, venturi scrubber and RTO monitoring as well as compliance testing. Based on this inspection, as detailed above, parametric monitoring, proper afterburner, venturi scrubber and RTO operation and compliance testing demonstrate compliance with the emissions limits.

The most recent testing demonstrated compliance with the NESHAP emission limits. (See Testing/Sampling discussion below)

Process/Operational Restrictions

The facility operates under an O&M Plan dated June 2007, a copy of the plan was submitted with the ROP renewal application.

The O&M plan covers all the required inspections associated with the capture system detailed in 63.7710 (b)(1). The O&M plan also covers the required control device inspections detailed in 63.7740(b).

All scrap metal must be received in accordance with either a certification plan or a written selection and inspection plan. The facility is operating under a selection and inspection plan for scrap that is dated April 11, 2011. The facility inspects each load and maintains records of inspections. The facility does not use auto scrap as defined under the foundry NESHAP. The facility primarily melts plate and structural scrap as well as processed oil filters. The NESHAP includes specific parameters for the use of oil filters and I requested Mr. Olson review the requirement and evaluate CCI's handling and use of the oil filters.

In accordance with the NESHAP standard, the facility must maintain the cupola combustion zone temperature (15-minute average) above 1,300 degrees, except for 15 minutes before and after being off-blast. There were no incidents of low temperature during the review period.

The NESHAP standard requires that the 3-hour average pressure drop and water flow rate on the wet scrubber not fall below the minimum levels established during performance testing. The facility is complying with this requirement via maintaining the pressure drop above 42 inches at all times and the flow rate above 115 gallons per minute.

In accordance with the NESHAP, the facility has a mold ignition plan in place.

A start up shut down and malfunction plan(SSMP) is also required. District files indicate that this plan was submitted and approved but the files do not include a copy of the plan. I requested that Mr. Olson

send a copy of the SSMP to me for inclusion in the files. The SSMP was received on 8/8/2017.

Testing/Sampling

The facility conducted NESHAP compliance testing in May 2011. The facility demonstrated compliance with the PM, metal HAP and VOHAPS limits for EUMELTING and PM for EUALINE.

The facility performed semi-annual Method 9 testing most recently on April 11, 2017, to demonstrate compliance with the 20% opacity limit for fugitive emissions from foundry buildings and structures.

The results of recent semi-annual Method 9 testing indicated no visible fugitive emissions in 2017.

Monitoring/Recordkeeping

Capture Systems (63.7710(b)(1))

The facility has the required capture system inspection requirements contained within the O&M plan. EUMELTING and EUALINE use a control device to meet the NESHAP emission limits. The facility utilizes an electronic PM system that establishes work orders for the performance of capture system inspections.

Venturi 63.7740(b)

The facility has the required venturi scrubber inspection requirements contained within the O&M plan. The facility utilizes an electronic PM system that establishes work orders for the performance of venturi inspections.

CPMS 63.7710(b) and 63.7741(a)

The facility has established the venturi pressure drop as the monitoring parameter as an indicator of capture system performance. The PM plan also addresses the pressure drop monitoring requirements contained in 63.7741(a).

Reporting

The facility certifies Subpart EEEEE at the bottom of the ROP certification form and attaches additional information as necessary.

COMPLIANCE STATUS/ISSUES

As a result of this Full Compliance Evaluation it appears that CCI is in compliance with the requirements of MI-ROP-B2178-2014.

NAME



DATE

9-6-17

SUPERVISOR

