

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



B217830526

FACILITY: Cadillac Casting, Inc		SRN / ID: B2178
LOCATION: 1500 Fourth Ave., CADILLAC		DISTRICT: Cadillac
CITY: CADILLAC		COUNTY: WEXFORD
CONTACT: Erik Olsen, Environmental Manager		ACTIVITY DATE: 07/29/2015
STAFF: Kurt Childs	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MAJOR
SUBJECT: MI-ROP-B2178-2014 compliance inspection.		
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 ALine 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, EUALINE, for which applicable requirements are contained in FGMACT. The following emission units are subject to CAM requirements in the ROP: EUALINE (CO, VOC), EUSPOGREENSAND (PM), EUSPOBREAKSORT (PM), EUSPOSHAKEOUT (PM), EUMELTING (CO and PM) 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 mostly cloudy, 75, S. wind @ 5mph. 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 an RTO. This is a CAM 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 currently operating only 2 days per week during the night shift.

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).

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 (16,287 tons for FY 2014).

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 5/17/2011. 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 was reported during the first semi-annual reporting period. The RTO temperature dropped below the 1500 degree limit for 2.5 hours due to a failure of the burner photo eye. The unit was repaired in a timely manner.

This is a CAM subject emission unit; the CAM reporting was submitted in a timely manner and with certification. The RTO temperature exceedence was also reported on the CAM excursions/exceedence report, no monitor downtime occurred.

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 during third shift.

Observation of the temperature monitoring and recording unit was made during the inspection. Since the line was not operating the RTO was cooling down and showed a temperature of 629 degrees.

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

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 in October 2011, at which time compliance with the DMIPA limit was demonstrated.

VOC emission testing is no longer required by the ROP.

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 – baghouse is vented internally through a HEPA filter during the winter.

12K – baghouse is vented internally through a HEPA filter during the winter (Sometimes year around).

Sly - baghouse is permanently vented internally through a HEPA filter.

At the time of the inspection the 12K baghouse and its associated shot blast machine and grinders were not operating. The 12k is an older shaker style baghouse and was down for maintenance. According to Mr. Olson, It may be replaced or removed and replaced with the existing 40K baghouse in the near future.

Emission/Material Limits/Records

Compliance with the PM emission limits (0.03 lbs/1,000 lbs, 7 pph, 2.5 tons per month, 29.8 TPY) 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.

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	2
12,000 CFM	Not Operating
Sly (A-Line finishing)	Not Operating

The Sly baghouse is equipped with a HEPA 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 one deviation occurred and was reported. The incident involved the

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;5.17lbs/hr, 9.1 tons/year max., records attached).

The facility 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 (10 tons per hour maximum monthly usage and a maximum 12-month rolling time period usage of 28,281 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 only one scrubber was operating (only one mold machine was operating) it had a flow rate of 100 gpm and pH readings for each of the scrubbers were 0.08 and 0.15.

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 in October 2011, at which time 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. 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 DMIPA emissions as well as resin usage. Review of the records showed compliance with the permit limits.

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 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 124 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, with the exception of one reading of 5.5 after which the scrubber liquid was changed out, the readings were in compliance with the permitted limits. The pH exceedance should be noted on future ROP report certifications.

40K baghouse blowdown system resulting in high differential pressure readings. The problem was addressed in a timely manner. This is a CAM subject emission unit; the 40K baghouse malfunction was also reported as a CAM excursion using the proper forms.

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, 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 (Tons)	2014 Emissions (Tons)
CO	800	63.85
PM	38	3.66
VOC	7.74	1.36
Lead	0.65	0.06
SO ₂	38	0.54
Manganese	1.35	0.10

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 rate averages were 15,059 tons/month max. and 148,396 tons annually for 2014.

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 1552 degrees and the venturi scrubber differential pressure and flow rate were 77 inches and 323 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 HEPA 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 2 inches. Review of plant records (attached) indicates the baghouse has been operating between 1 and 2 inches and readings have only been taken twice a week. It is not clear how the desulphurization ladle baghouse operating parameters were established, stack testing is not required. Specific operating parameters for the desulphurization baghouse are not included in the MAP. Mr. Olson plans to modify the permit to revise the proper operating range for the baghouse based on recent observed data and internal venting with no apparent adverse impacts.

The facility is maintaining the required emission and monitoring records. As indicated above, with the exception of the desulphurization ladle baghouse, 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 in May 2011 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 and included reporting of one deviation from the combustor temperature limit. The temperature dropped below 1,350 degrees due to the malfunction of the water spray control. Duration of the incident was one hour. This incident was also reported on the CAM excursion/deviation report.

Stack/Vent Restrictions

Visual evaluation of the stack (SV011) showed that it appeared to meet the height requirement.

Inspection Observations

As a result of the inspection some errors in EUMELTING of the ROP were noted. SC VI.16 refers to the RTO but should refer to the desulphurization ladle baghouse. Several conditions in I. Emission Limits list the Monitoring/Testing Method as SC VI.16 but should refer to SC VI.13 (except for SC I.5).

Mr. Olson stated that CCI is planning on installing a slag slurry system that will quench the slag in water as it exits the cupola. This will result in a more manageable form of slag but will add another stack to the building that will have a water vapor plume. Mr. Olson is preparing a letter to AQD that will outline the project and Part 2 rule exemption they intend to install it under.

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. Permit to Install No. 90-13 was issued on September 11, 2013, which allowed for the installation of an 80,000 cfm baghouse that collects emissions at the breakline to improve the working environment. This PTI was incorporated into the ROP upon renewal 10/13/2014.

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)	2014 Emissions 12 mos. rolling avg. (tons)
CO	250	139.59 Max.
VOC	107	40.49 Max.
Lead (EUSPOPOURANDCOOL)	7.92 (lbs)	2.89 (lbs) Max.
PM (EUSPOPOURANDCOOL)	6.5	2.73 Max.
PM (EUSPOGREENSAND)	32	6.61
PM (EUSPOBREAKANDSORT)	24	1.70
PM (SPOSHAKEOUT)	24	4.09

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 136,255 tons were poured during 2014.

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	1.5
#1 80K	1 - 10	4, 4, 2, (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	158	12.7
South Multiwash	277	9.6

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 in October and December 2011. Testing demonstrated compliance with all emission limits, except PM from green sand controlled by the Carter Day baghouse. The facility subsequently re-bagged and resealed the bags and demonstrated compliance upon retesting in December 2011. A VN was issued at that time for the PM limit exceedance and has been resolved.

Reporting

Review of the most recent annual and semiannual ROP certification reports showed that they were submitted by the deadline and contained a deviation for failure of the Carter Day baghouse blowdown system. The incident lasted 3.5 hours. This is a CAM subject emission unit; the deviation was also reported as an excursion/exceedance on the CAM report using the proper forms.

Stack/vent Restrictions

Visual observations of the stacks show they appear to meet the height requirements. The south multiwash stack has recently been replaced in-kind and the north multiwash is scheduled for replacement.

Inspection Observations

Pouring from FGSPOLINE does not appear to be subject to Subpart EEEEE because it does not appear to meet the requirement of being discharged to the atmosphere through a conveyance. There is a powered roof vent directly above the pouring station; however this appears to be excluded from being considered a conveyance under Subpart EEEEE. There are three stacks that vent cooling emissions to the outside uncontrolled. Only "new" cooling operations are regulated under Subpart EEEEE.

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 of 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.

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 minute before and after being off-blast. Review of the facility's records showed that in 2014 they had one occasion where temperature dropped below the limit.

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 and the flow rate above 115 gallons per minute.

In accordance with the NESHAP, the facility has a mold ignition plan in place and a copy of the plan is on file with the AQD at the District Office.

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 February 19, 2015, 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 are attached and indicate no visible fugitive emissions in 2015 and a highest 6-minute average of 13.3% in 2014.

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. The 2014 first semi-annual report includes a temperature chart from the melting system combustor documenting the loss of temperature due to the water spray control failure.

COMPLIANCE STATUS/ISSUES

EUMELTING:

Desulfurization Ladle Baghouse – failure to conduct daily differential pressure readings and properly address continued pressure drop readings below the ROP listed range of 3-8 inches.

NAME  DATE 8-10-15 SUPERVISOR 