

Saginaw Metal Casting Operation (SMCO)
CAM / MAP PLAN DESCRIPTION – FABRIC FILTER COLLECTORS
Date: March 24, 2021

The information provided in this document fulfills Federal Compliance Assurance Monitoring (CAM) requirements pursuant to 40 CFR Part 64 and the State of Michigan Malfunction Abatement Plan (MAP) requirements pursuant to Rule 911 (2).

The CAM Plan can be found in Sections 1 – IV and the MAP plan can be found in Section V. This plan is applicable to fabric filter collectors located throughout the facility.

I. Background

A. Emissions Unit

Description: SMCO uses several fabric filter collectors to control PM/PM10/PM2.5 emissions from foundry processes. These processes are summarized in Appendix A.

Facility: General Motors LLC – Saginaw Metal Casting Operations
 1629 N. Washington
 Saginaw, MI 48601

B. Applicable Regulation, Emissions Limit, and Monitoring Requirements

Renewable Operating Permit No. MI-ROP-B1991-2015c and pending renewal Permit to Install No. 36-12J

A summary of the CAM applicable emissions limits for each process controlled by a fabric filter collector can be found in Appendix A.

Control Technology: Several pulse jet fabric filter collectors and cartridge collector

Monitoring Requirements: Visible Emissions, Pressure drop

Potential Pre-Control Emissions: See Appendix A for the estimated potential pre-control emissions for each fabric filter collector.

II. Monitoring Parameters and Frequency; Inspection Activities; Corrective Actions

	Visible Emissions (VE)	Pressure drop
A. Indicator	VE from the fabric filter collector exhaust will be monitored weekly on production days.	Pressure drop across the fabric filter collector is measured with a differential pressure gauge.
B. Indicator Range	An excursion is defined as the presence of visible emissions which appears to be above 5% opacity if performed using USEPA Method 9.	See Appendix A for the Indicator Range for each fabric filter collector. An excursion is a departure from the indicator range shown in Appendix A based on a 3-hour average. If outside the indicator range, malfunction abatement activities will commence
C. ByPass System Detection	There is no bypass of the fabric filter collectors.	

III. PERFORMANCE CRITERIA

	Visible Emissions (VE)	Pressure drop
A. Data Representativeness	Measurements are made at the fabric filter exhaust	Pressure taps are located at each fabric filter collector's inlet and outlet.
B. Verification of Operational Status	Not Applicable	
C. QA/QC Practices & Criteria	The observer will be familiar with fabric filter operations and visible emissions.	The pressure gauges are calibrated annually
D. Monitoring Frequency	VE observations are performed weekly.	Pressure drop is monitored continuously
E. Data Collection Procedure	The VE observations are documented by the observer.	Pressure drop is recorded every 15 minutes
F. Averaging Period	NA	3-hour average to determine an excursion

IV. Justification

A. Rationale for Selection of Performance Indicators

Visible emissions were selected as a performance indicator because it is indicative of good operation and maintenance of the fabric filter collector. When the fabric filter collector is operating properly, there will not be any visible emissions from the exhaust. Any increase in visible emissions indicates reduced performance of the fabric filter collector, therefore, the presence of visible emissions which appear to be above 5% opacity if performed using USEPA Method 9 is used as a performance indicator.

In general, fabric filter collectors are designed to operate at a relatively constant pressure drop. Monitoring pressure drop provides a means of detecting a change in operations that could lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the airflow has increased. A decrease in pressure drop may indicate broken or loose bags, but this is also indicated by the presence of visible emissions, indicator No.1. A pressure drop across the fabric filter collector also serves to indicate that there is airflow through the control device.

B. Rational for Selection of Indicator Ranges

The selected indicator range is the presence or absence of visible emissions which appears to be above 5% opacity if performed using USEPA Method 9.. This range was selected because any observed visible emission is an indicator that there may be fabric filter collector malfunction. When visible emissions greater than 5 % is observed, the site Environmental Engineer will observe the plume using an EPA Method 9 test procedure.

GM selected the fabric filter collector pressure drop indicator ranges based on site experience with fabric filter collector operations, and these indicator ranges are specified under applicable emission unit's permit monitoring and recordkeeping requirements. Actual operating

experience for each fabric filter collector supports the continued use of the ranges. Additionally, compliance stack testing results support the ranges. (See Appendix B for summary of stack testing results and the pressure drop ranges during the test.)

As needed, based on semiannual inspections and pressure drop monitoring, bags or cartridges will be replaced. Additionally, SMCO is currently evaluating the use of leak detection monitors, but a final decision on their use has not been made.

C. Performance Test

During 2015, 2016 and 2018 performance tests were performed on some of the processes controlled by fabric filter collectors. A summary of the performance test results and pressure drop monitoring ranges during each test can be found in Appendix B. All results showed compliance with applicable emission limits. Copies of test reports have been previously submitted AQD's Technical Programs Unit and the Bay City District Office. This testing confirms that the chosen indicator range for the pressure drop correlates with compliance with the particulate ranges. Method 9 visible emissions were recorded during the tests for EU-PSANDPROCESS and EU-SPMPROCESSAND to demonstrate compliance with the 10 % opacity limit in these two emission units. There have been no significant changes to the processes or fabric filter collectors that would affect fabric filter collector performance since the testing occurred.

V. Malfunction Abatement Plan (Michigan Rule 911)

A. Preventive Maintenance Program (Rule 911(2)(a))

In general, GM will follow the preventative maintenance program recommended by the equipment manufacturer. Maintenance will be performed by SMCO maintenance personnel or outside contractors. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range.

The fabric filter collector (baghouse only) inspection will consist of one of the following techniques:

1. Semi-annual check for sand on the clean side of the fabric filter collector and check bag integrity
2. Continuous electronic leak detection monitoring

The cartridge collector will be inspected semi-annually for proper operation.

Some replacement parts will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra bags, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible

B. Air Cleaning operating variables (Rule 911(2)(b))

The identification of the source and air-cleaning device operating variables that will be monitored to detect a malfunction or failure, their normal operating range, and monitoring method are described in Section II above and Appendix A.

C. Corrective procedures or operational changes (Rule 911(2)(c))

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant's Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Engineer shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant's Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant's Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant's Environmental Engineer, or designee, will contact EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

SMCO CAM/MAP Plan for Fabric Filter Collectors

Revision Date
3-24-2021

Appendix A

Baghouse Id	Emission unit	Annual controlled emission - permit basis TPY	Potential uncontrolled emission based on control efficiency TPY	CAM, MAP or Both	MAP subject emission limit	CAM subject emission limit	Emission limit value (lb/hr), unless otherwise noted	Indicator Justification	Indicator	Indicator Range	Indicator	Indicator Range (inches water column)
Z02-BH-01 Z02-BH-02	EU-PSANDPROCESS	PM 1.18 PM10 0.305 PM2.5 0.305 Combined for both baghouses	PM 78.7 PM10 20.3 PM2.5 20.3 for each baghouse based on 95 % control	MAP	PM/PM10/PM2.5	NA	PM 8.7 PM10 0.23 PM2.5 0.23	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.5 - 10
Z02-BH-03 (with Z02-RTO-03 discharge location)	EU- PSANDCASTLINE	PM 5.37 PM10 10.73 PM2.5 10.73	PM 107.4 PM10 214.6 PM2.5 214.6 based on 95 % control through baghouse	Both	PM/PM10/PM2.5	PM/PM10/PM2.5	PM - 2.85 PM10 - 5.55 PM2.5 - 5.55	Permit Condition			Baghouse Pressure Drop	1.0 - 7.0
Z02-CC-03 (with Z02-RTO-03 discharge location)	EU- PSANDCASTLINE	PM 1.79 PM10 3.58 PM2.5 3.58	PM 35.8 PM10 35.8 PM2.5 71.6 based on 95 % control through cartridge collector	Both	PM/PM10/PM2.5	PM/PM10/PM2.5	Limits for EU-PSANDCASTLINE tested at exhaust stack on RTO (SV-Z02-RTO-03)				Cartridge Collector Pressure Drop	0.1 - 8.0
Z02-BH-06	EU-PSANDSCCSH	PM 6.26 PM10 12.52 PM2.5 12.52	PM 125.2 PM10 250.4 PM2.5 150.4 based on 95 % control through baghouse	Both	PM/PM10/PM2.5	PM/PM10/PM2.5	PM - 2.36 PM10 - 4.73 PM2.5 - 4.73	Permit Condition	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10
Z02-BH-04	EU-SPMPROCESSAND	PM 0.73 PM10 0.19 PM2.5 0.19	PM 48.7 PM10 12.7 PM2.5 12.7 based on 98.5 % control through baghouse	MAP	PM/PM10/PM2.5	NA	PM - 0.19 PM10 - 0.13 PM2.5 - 0.13	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.5 - 10
Z05-BH-01, 02 and 03	EU-SPMCASTLINE (castlines 1,2,3)	PM 7.35 PM10 7.35 PM2.5 7.35 Combined for three baghouses	PM 147.0 PM10 147.0 PM2.5 147.0 for each baghouse based on 95 % control	Both	PM/PM10/PM2.5	PM/PM10/PM2.5	PM - 7.07 PM10 - 7.07 PM2.5 - 7.07 combined for all three	Permit Condition	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10

SMCO CAM/MAP Plan for Fabric Filter Collectors

Revision Date
3-24-2021

Appendix A

Baghouse Id	Emission unit	Annual controlled emission - permit basis TPY	Potential uncontrolled emission based on control efficiency TPY	CAM, MAP or Both	MAP subject emission limit	CAM subject emission limit	Emission limit value (lb/hr), unless otherwise noted	Indicator Justification	Indicator	Indicator Range	Indicator	Indicator Range (inches water column)
Z02-BH5 (East & West), 2 baghouses, 1 stack	EU-SPMCASTLINE4	PM 13.97 PM10 8.32 PM2.5 8.32 Combined for both baghouses	PM 279.4 PM10 166.4 PM2.5 166.4 Combined for both baghouses based on 95 % control	Both (CAM is new for renewal)	PM/PM10/PM2.5	PM/PM10/PM2.5	PM - 6.02 PM10 - 3.63 PM2.5 - 3.63	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10
Z03-CC-02	EU-PSANDCORERROOM - sand handling and mixing	PM 3.67 PM10 3.67 PM2.5 3.67	PM 73.4 PM10 73.4 PM2.5 73.4	MAP	PM/PM10/PM2.5	Not applicable	PM 1.35 PM10 1.35 PM2.5 1.35	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10
Z05-CC-01	EU-Finish - PS and SPM deflash, decore, degate	PM 2.61 PM10 2.61 PM2.5 2.61	PM 52.2 PM10 52.2 PM2.5 52.2	MAP	PM/PM10/PM2.5	Not applicable	PM 0.86 PM10 0.86 PM2.5 0.86	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10
Z03-CC-01	EU-Finish - shotblast	PM 0.54 PM10 0.54 PM2.5 0.54	PM 10.8 PM10 10.8 PM2.5 10.8	MAP	PM/PM10/PM2.5	Not applicable	PM 0.20 PM10 0.20 PM2.5 0.20	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10
SV-Z05-CC-2	EU-SPMCORERROOM - sand handling and mixing	PM 1.02 PM10 1.02 PM2.5 1.02	PM 20.4 PM10 20.4 PM2.5 20.4	MAP	PM/PM10/PM2.5	Not applicable	PM 0.34 PM10 0.34 PM2.5 0.34	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10
Z05-CC-04	EU-SPMCASTLINE - mold coating	PM 2.04 PM10 2.04 PM2.5 2.04	PM 40.8 PM10 40.8 PM2.5 40.8	MAP	PM/PM10/PM2.5	Not applicable	PM 0.88 PM10 0.88 PM2.5 0.88	MAP	Visible emissions	> 5 % opacity	Baghouse Pressure Drop	0.1 - 10

SMCO CAM/MAP Plan for Fabric Filter Collectors

Revision Date
3-24-2021

Appendix B - Stack Testing Summary

Emission Unit	CAM Subject (Y/N)	Pollutants	Emission Limits (Lbs/Hr)	Test Result	Percent of Limit	Monitoring Range during test	Report date
EU-PSANDPROCESS	Yes	PM (SV-Z02-BH-1)	0.87	0.38	43.68%	Pressure drop: 1.76 - 2.28 inches water Opacity: 0 % (Method 9) for both tests	10/26/2015
		PM (SV-Z02-BH-2)	0.87	0.13	14.94%		
EU-PSANDCASTLINE	Yes	PM	2.85	0.37	12.98%	Baghouse pressure drop: 0.4 - 0.50 inches water Cartridge collector pressure drop: 0.73 - 1.02 inches water RTO combustion temp: 1420 - 1463 F	1/4/2016
		PM10	5.55	0.37	6.67%		
		PM2.5	5.55	0.37	6.67%		
		NOx	4.46	1.17	26.23%		
		VOC	4.07	1.62	39.80%		
EU-PSANDSCCSH	Yes	PM	2.36	N/A	NA	Not tested	
		PM10	4.73	N/A	NA		
		PM2.5	4.73	N/A	NA		
EU-SPMCASTLINE	Yes	PM	7.07	0.54	7.64%	Castline 1 Pressure drop: 3.63 - 3.8 inches water Castline 2 Pressure drop: 0.58 - 0.78 inches water Castline 3 Pressure drop: 1.0 - 1.15 inches water	Castline 1 and 3: 10/28/2016 Castline 2: 4/11/2016
		NOx	1.9	0.1	5.26%		
		CO	12.47	1.32	10.59%		
		VOC	10.81	1.94	17.95%		
EU-SPMPROCESSAND	No	PM (SV-Z02-BH-4)	0.19	0.126	66.32%	Pressure drop: 0.7 - 1.5 inches water Opacity: 0 % (Method 9)	7/16/2015
EU-SPMCASTLINE4	Yes	PM	6.02	0.21	3.49%	East baghouse pressure drop: 0.2 - 0.4 inches water West baghouse pressure drop: 0.3 - 0.4 inches water	11/29/2018
		PM10	3.63	0.49	13.50%		
		PM2.5	3.63	0.49	13.50%		
		NOx	2.59	0.09	3.47%		
		CO	10.77	0.9	8.36%		
		VOC	9.19	0.4	4.35%		