

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

M070534498

FACILITY: Mersen USA Bn Corp, Bay City Branch		SRN / ID: M0705
LOCATION: 900 HARRISON ST, BAY CITY		DISTRICT: Saginaw Bay
CITY: BAY CITY		COUNTY: BAY
CONTACT: Brandon Ernst,		ACTIVITY DATE: 05/03/2016
STAFF: Gina McCann	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Inspection to determine compliance with SM-Opt Out PTI # 7-05H.		
RESOLVED COMPLAINTS:		

I (glm) completed a scheduled inspection at Mersen USA BN Corp. (M0705) in Bay City Michigan on May 3, 2016. Mr. Brandon Ernst, Environmental Technician, and David Milbourne, Safety Manager accompanied me during the inspection. The inspection included a tour of the site production and support facilities as well as some record review. A records request was emailed on May 12, 2016 and records were received on May 16, 2016.

The facility receives graphite stock of various size and composition. The majority of the graphite is sawed, machined, and purified. Some is coated with silicone carbide. Emissions are controlled by liquid scrubbers or baghouses. The facility can operate most processes 24 hours, seven days a week, but fluctuate production based no customer demand.

PTI 7-05H was issued July 15, 2015. This permit modification affected flexible groups FG-SIC and FG-PuriFurnaces. The permit modification was for not installing the High Temp Scrubber from Midland, as was planned with PTI 7-05G, renaming four reactors, moving the two "A" reactors so that they vent through another scrubber, installing two new "B" reactors in place of the "A" reactors, and adding the "T" furnace from Midland. Emission limit changes were not requested during this modification.

#### EU-VCI Impregnation: Compliant

A single, enclosed station is used for polycarbodiimide-tetrachloroethylene (TCE) used and reclaimed and maintained. We met with Jason Lohrmann, VCI operator. Mr. Lohrmann explained the he sprays a TCE polybinder mixture onto treated graphite and places in the VCG machine for impregnation. Once the reaction has taken place, up to 40 plus hours of time, the product is then placed on an air dry table, then into a low bake oven (~518°F) and lastly into an oven (~1800°F) for final cure which turns the polycarbide into carbon.

Mr. Lohrmann also explained the process of how usage is tracked for the facility. Raw material brought in at the beginning of the month is counted as a storage count to Mr. Ernst and at the end of the month Mr. Lohrmann reports the amount used. Mr. Ernst tracks on a spreadsheet he calls the HAPs spreadsheet. The facility does reclaim some of the material, but counts it as discarded.

Emission calculations for this unit are based on mass balance. Emissions for this process are vented to SV-VCI with no pollution control. The permit limit is 2.0 tpy for TCE. I viewed 12-month rolling records for 2009 through current and the emissions ranged from 0.7 tpy in 2011 to 0.01 tpy in 2013.

#### EU-Mersen Impreg: Compliant

A single station is used for specialty graphite impregnation. It is also a low volume production activity. Coating use (methyltrichlorosilane) is determined by scale measurement. Emissions are determined by pounds used \* concentration \* % removal HCl. The site process uses formaldehyde, phenol, an aluminum phosphate solution and "Permafил" (diallyl phthalate, dibenzoyl peroxide, tricresyl phosphate).

I requested usage records for December 2013, January thru December 2014, and January thru December 2015. I received records for December 2013, 2014 and 2015, March 2016 and April 2016. The total gallons used per month ranged from a low of 11.47 in December 2014 to a high of 31.53 in April 2016. PTI # 7-05H limits the material usage to 200 gallons per month as applied, minus water.

While onsite I viewed two, 12 inch, stacks that were approximately 20-15 feet from ground level. The current opt-out permit does not list stack/vents. During the file review I viewed PTI #968-84B which was the original permit for this emission unit, prior to rolling it into an opt-out permit. The stack

requirements were in this permit as a maximum diameter of 12 inches at an exit point not less than 25 feet above ground level.

#### FG-SIC: Non-Compliant

FG-SIC is the flexible group that consists of reactor vessels for chemical Vapor Deposition (CVD) of silicon carbide coating or tantalum carbide coating using methyltrichlorosilane, dimethyldichlorosilane, or chlorine. The CVD process emits hydrogen chloride (HCl), which is controlled by caustic scrubbers. The CVD process uses methyltrichlorosilane (MTS).

Modification of the permit resulting in PTI #7-05H was due to changes within this flexible group. Emission units EU1251Sic (was EU-4ASic), EU1252Sic (was EU-5ASic), EU-1191Sic (was EU-4BSic), and EU1192Sic (was EU-5BSic) were renamed. Reactors EU-A2Sic and EU-A3Sic were moved to the E5 area and vented to scrubber SicE5Scrubber. The emission units EU-B4Sic and EU-B5Sic were installed where the "A" reactors were moved from and vented to SicABSscrubber.

At the time of the inspection, EU-B3Sic was not operating and has not operated in months. Mr. Ernst and I viewed the following readings associated with the following scrubbers:

EUTAC and/or EU-E2Sic pH= 10 liquid flow= 216 gpm

SicB3scrubber pH=11.4 liquid flow = 61.7 gpm

SiCE3/E4Scrubber pH=8.92 liquid flow= 300 gpm

SicABSscrubber pH=10 liquid flow 86 gpm

SicE5Scrubber pH=8.70 liquid flow= 299 gpm

Only EU-119aSic was in operation at the time of the inspection.

I viewed usage records for 2013 thru current. The PTI limits hydrogen chloride emissions to 800 pound per month. April 2016 reported highest emissions at 44.45 pounds. I also viewed scrubber logs for the following months: December 2013, March 2014, September 2014, January 2015, July 2015, December 2015 and March 2016. Flow recorded on 12-30-2015, while reactor E2 (Sic1Scrubber) was in operation was zero and recorded pH on 3-2-16 pH, while reactor E3 (SicE3/E4Scrubber) was in operation, was recorded at 6.56. Special conditions III.1 and III.3 require pH maintained at 8.0 or higher and the liquid flow shall be 108 gpm or 156 gpm or higher, respectively, to reduce emissions by at least 99 percent.

Special condition VI.3 requires the "permittee to record the pH and liquid flow of each SIC scrubber once per 8 hr time period whenever any or all emission unit(s) of the FG-SIC is in operation." Mr. Ernst said the operators record the pH and scrubber flow at the beginning of each shift and disagreed that the readings should be taken when the emission units are in operation.

#### FG-PuriFurnaces: Non-Compliant

FG-PuriFurnaces is the flexible group consisting of 23 graphite purification furnaces. Graphite is purified using chlorine gas (Cl<sub>2</sub>). Emissions are controlled by scrubbers that use sodium hydroxide (NaOH) and sodium bisulphide (NaHSO<sub>3</sub>) to neutralize the acid and bleach formed by this process. Modification of the permit resulting in PTI #7-05H was due to changes within this flexible group. Purification furnace "T" was moved from the Midland facility and installed in the Bay City plant as part of the modification process. The furnace is scrubbed by the dual column F1Scrubber.

Operators record the chlorine feed rate to FG-PuriFurnaces and then it is entered into the HAPs spreadsheet. Attached is hourly chlorine feed rates for part of April 2016 and do not exceed 40 pounds per hour. Mr. Ernst said that, visual and audio alarms are set off when the scrubber falls out of range and then the operator manually shuts off the chlorine feed. The permit requires the input of chlorine to immediately cease when the scrubber parameters are out of range. Immediately means, at once, without delay or without pausing beforehand. The manual shutoff valve is not preferred because it leaves room for error. It is recommended to make this autonomous.

Chlorine emissions are controlled by a dual column scrubber. The facility logs pH and liquid flow rate once per shift or every 8 hours. The permit requires the permittee to monitor and record, on a per shift

basis, the following process parameters for the pH and scrubber flow at the beginning of each shift and disagreed that the readings should be taken when the emission units are in operation.

During the inspection the liquid flow of the scrubbing solution in the north and south towers were 72 gpm and 64 gpm, respectively, or a total of 136 gpm. During file review and conference with the permit engineer who had worked on this permit, I determined the flow rate required by the permit (60 gpm) was a combined flow rate of the two columns. I also observed the pH on the north and south towers at 8.91 and 9.03 respectively, while the pressure differential was 0.9 "W.C.

I reviewed scrubber records for the following months: December 2013, March 2014, September 2014, January 2015, July 2015, December 2015 and April 2016. Differential pressure across the scrubber packing in the scrubber column shall not exceed 3.0 inches of water column ("W.C.), maintain pH at or above 8.0 and the combined dual column scrubbing solution flow maintained at or above 60 gpm. The following records were identified as out of range during records review.

Date	pH
1-26-2015	5.65
1-31-2015	7.12
3-6-2014	7.38
3-29-2016	7.22

Special Condition VI.2 requires the permittee to calculate the chlorine emission rate from EU-PuriFurn16 monthly, for the preceding 12-month rolling time period. The facility is keeping combined records for all furnaces. The emission limit of 850 lb/year cannot be determined without this information.

#### FG-Machining: Compliant

This flexible group consists of a number of baghouses each with an exhaust gas flow rate of less than 30,000 acfm to control particulate from graphite machining. The baghouses appeared to be in good working condition and there were no visible emission from any of the baghouses at the time of the inspection. The facility has the option of venting exhaust interior or exterior of the plant.

PM10 emissions reported to MAERS for 2015 was 3.81 tpy. Emissions are calculated based off the collected material that is shipped off site. At the time of the inspection we viewed one of the magnehelics for a baghouse at 2.2 "W.C., which is within the manufacturer's range.

#### FG-CleanupSolvents-Compliant

Cleanup solvents are used in small quantities at a few work stations. Propanol, hexane, and petroleum distillates (Safety Klenn 105 solvent) are tracked for VOC usage. Most of the VOCs and acetone are used in the inspection are in half-liter squirt bottles. The limit for VOCs and also for Acetone is a 12-month rolling as determined at the end of each calendar month of 0.7 tpy. A review of records for 2013 thru current found that VOC and acetone emissions are below 0.2 tpy. Reported emissions to MAERS for 2015 were 410.98 (0.21 tpy) pounds of VOCs.

#### FG-Facility: Non-Compliant

This flexible group should include FG-SIC, FG-PuriFurnaces, EU-VCIImpregrantion, EU-MersenImpreg and EU-InstapackFoam. The facility does not include EU-InstapackFoam. According to 2015 MAERS throughput reported for this unit is 2.83 tpy. The facility provided an MSDS for the material used in this process in an email dated, May 12, 2016. Component A contains polymeric Diphenylmethane Diisocyanate or MDI at 45 %, therefore additional facility HAP emissions for this unit are 1.27 tpy.

Tetrachloroethylene, formaldehyde, phenol, chlorine, hydrogen chloride, and hexane are used at different processes at the site. The facility is limited to emissions of 9 tpy for an individual HAP and 22 tpy for combined HAP emission. I viewed records for 2011 thru current. October 2011 reported the highest 12 month rolling emissions at 1.25 tpy for aggregate HAPs and tetrachloroethylene emissions at 0.7 tpy for an individual HAP. With the addition of the HAPs from EU-InstapackFoam the aggregate emissions would be less than the permitted limit.

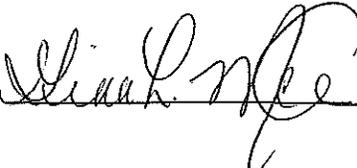
#### Miscellaneous

The facility also has two emergency generators that are subject to the area source RICE MACT.

Attached are inspection records for the generators which include oil changes, air filter, battery, etc. service.

Additionally, the facility has two processes that are exempt from R201 permitting. EU-InstapakFoam and formerly known EU-BayCityPyro. The InstapakFoam process consists of two components injected at equal parts to form molded flexible polyurethane foam used in packaging of product and was once permitted under PTI 146-85. 40 CFR Part 63 OOOOOO does not appear to apply to this process since the facility does not use methylene chloride for cleanup or as a mold release.

The other R201 exempt process is the Bay City Pyro process and was permitted under PTI 253-86 as a reactor to vacuum outgas graphite and also pyrolytic coat graphite. According to the permit evaluation VOC emissions from the pyro process were expected to be 0.02 tpy. The facility tracks propane usage for the pyro process and said they were using R290. In an email dated May 31, 2016 a copy of R28a was provided along with the exemption booklet. A formal request will be made for the permit exemption demonstrations if needed. It is the facility's responsibility to maintain exemption demonstration information.

NAME  DATE 6/1/16 SUPERVISOR 