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

B295233788

FACILITY: SILBOND CORP		**SRN / ID:** B2952
LOCATION: 9901 SAND CREEK HWY, WESTON		**DISTRICT:** Jackson
CITY: WESTON		**COUNTY:** LENAWEE
CONTACT: Melissa J. McCormick , Manager, Technical Service and Development		**ACTIVITY DATE:** 03/17/2016
STAFF: Michael Gabor	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Full Compliance Evaluation (FCE) and Inspection (PCE) of Silbond Corporation, a Synthetic Minor / Opt-Out Source.		
RESOLVED COMPLAINTS:		

Synthetic Minor / Opt-Out Source. Full Compliance Evaluation (FCE) and Inspection (PCE) of Silbond Corporation (to become Evonik Industries), located at 9901 Sand Creek Highway, Weston, Michigan 48111.

State Registration Number (SRN): B2952

Facility Contacts

Melissa McCormick (MM), Site Manager, 517-436-9338, melissa.mccormick@evonik.com

Dr. Nicolas Soler (NS), Technical Manager, 517-436-9330, nicolas.soler@evonik.com

Brent Richards (BR), ESHQ Coordinator, 517-436-9318, brent.richards@evonik.com

Mark Hillard (MH), Process Lead person, mark.hillard@evonik.com

Purpose

On March 17, 2016, I conducted a scheduled, unannounced inspection of the Silbond Corporation, recently acquired by Evonik Industries (EI), facility located in Weston, Michigan (Lenawee County) at 9901 Sand Creek Highway. The purpose of the inspection was to determine the facility's compliance status with applicable federal and state air pollution regulations, particularly with the Michigan Natural Resources and Environmental Protection Act 451 of 1994, Part 55, Air Pollution Control and the administrative rules, and the conditions of EI Air Use Permit to Install (PTI) number 22-97C, issued May 6, 2011. This facility was last inspected on April 3, 2012.

Facility Location

The facility is located in the unincorporated community of Weston, which is a part of Fairfield Township. It is immediately surrounded by residential areas on its southern and western boundaries, and agricultural fields on

its remaining boundaries.

Regulatory Applicability

The facility is a Synthetic Minor / Opt-Out Source for volatile organic compounds (VOC) and hazardous air pollutants (HAP) emissions. EI accepted VOC and HAP emission limits in order to remain below major source emission thresholds. The facility is regulated by PTI 22-97C, and is also subject to Title 40 of the Code of Federal Regulations (CFR), Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Reciprocating Internal Combustion Engines (RICE) and to Title 40 of CFR, Part 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. A compliance determination was not made regarding the NESHAP standard, except for verifying the presence of a non-resettable hour meter. The facility confirmed verbal compliance with this respective NESHAP standard. EI also operates under several PTI exemptions found under Michigan Air Pollution Control Rules R 336.1278 (Rule 278) through R 336.1290 (Rule 290). Specific exemptions that EI operates under are indicated below in the *Emission Unit (EU) / Flexible Group (FG) Details* section. The facility also reports its emissions to the Michigan Air Emissions Reporting System (MAERS) and is designated as a Fee Category II source.

Emission Unit (EU) / Flexible Group (FG) Details

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Stack Identification
EUBOILER1	200 hp natural gas fired boiler, exempt under Rule R 336.1282(b)(i).	SV0001
EUBOILER2	200 hp natural gas fired boiler, exempt under Rule R 336.1282(b)(i).	SV0002
EUBOILER 3	500 hp natural gas fired boiler, exempt under Rule R 336.1282(b)(i).	SV0003
EUHOTOILHEATER	Direct process hot oil heater, exempt under Rule R 336.1290.	SV0013

EUWWEVAPCOND	Waste water evaporator and condenser in building 701, exempt under Rule R 336.1290.	SV0018
EUREACTOR502-101	500 gallon reactor, R-502-101 in building 502, used for producing Ultra High Purity tetraethyl orthosilicate (TEOS) (UHPT). This reactor is controlled by a chilled water condenser.	SV0022
EUREACTOR102-100	4000 gallon reactor, R-102-100, located in building 102, is used for the ethyl silicate and catalyst production. This reactor is controlled by condensers and a flare.	SV0014 (FLARE)
EUGRINDING	Grinding, exempt under Rule R 336.1285(l)(vi).	SV0019
EUREACTOR102-80	2000 gallon reactor, R-102-80, located in building 102, a two column vacuum distillation process used for manufacturing Silbond Pure, EG and LBEG. This process is controlled by a chilled water condenser.	SV0016
EUREACTOR102-200	500 gallon hydrolyzing reactor, R-102-200, located in building 102, used for manufacturing ethyl polysilicate products Silbond 40 and 50.	SV0017
EUREACTOR102-300	2000 gallon neutralizer reactor, R-102-300, located in building 102, used for manufacturing ethyl polysilicate products Silbond 40 and 50.	SV0017

EUREACTOR102-10	2000 gallon color treatment reactor, R102-10, located in building 102, used for manufacturing ethyl polysilicate products Silbond 40 and 50.	SV0017
EUREACTOR102-30	2000 gallon reactor, R-102-30, located in building 102, used for manufacturing conventional binders which are Silbond H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE but is also used for manufacturing Silbond H-803 and the hybrid binders; HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor is controlled by a single condenser.	SV0012
EUREACTOR102-40	2000 gallon reactor, R-102-40, located in building 102, used for manufacturing conventional binders; H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE but is also used for manufacturing Silbond 40 and 50, Silbond H-803 and the hybrid binders; HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor is controlled by two chilled water condensers in series.	SV0017
EUREACTOR102-50	Building 102, this reactor is used to store the conventional binder H-803 during production after it has been processed in reactor R-102-30 but prior to being transferred to reactor R-102-40 to be distilled.	SV0012, SV0017
EUREACTOR501-10	Building 501, single process reactor, R-	SV0021

	501-10 used for manufacturing hybrid binders which are Silbond HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor may also be used for manufacturing Silbond H-803 and the conventional binders H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE. This reactor is controlled by a condenser.	
EUREACTOR501-50	Building 501, single process reactor, R-501-50 used for manufacturing hybrid binders which are Silbond HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor may also be used for manufacturing Silbond H-803 and the conventional binders H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE. This reactor is controlled by a condenser.	SV0011
EUDRUMMING	Transfer of products from tanks to drums, this process is exempt under Rule 336.1290.	SV0024
EUTMB-70	Repackaging of products from bulk into drums, controlled by a hood, this process is exempt under Rule 336.1290.	N/A
STORAGE TANKS	See attached list, various size storage tanks ranging from 55 gallons to 50,000 gallons. As specified on the list, a number of these tanks are exempt from permitting but the VOC emissions from these tanks shall be included in calculating VOC emissions from FGFACILITY. Some of these tanks are used for storing only raw	N/A

	materials and some only store finished products but a number of these tanks can be used for storing both raw materials and finished products.	

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.

All of these emission units are part of "FGFACILITY".

FLEXABLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGFACILITY	All process equipment source-wide including equipment covered by other permits, grandfathered equipment and exempt equipment.	See above

Arrival & Facility Contacts

Visible emissions or odors were not observed upon my approach to the facility via West Weston Road. I arrived at approximately 9:07 am, proceeded to the facility's visitor's office to request access for an inspection, provided my identification, and asked if Philip Gaietto (former facility contact) was available. I was informed that he recently left the EI and instead BR was paged. BR met with me and had me view a safety training video and was then escorted by BR to the facility's conference room.

Facility Background

EI employs a silicon based chemical manufacturing process to produce a source of liquid silica, known as tetra ethyl ortho silicate (TEOS) or by its common name, ethyl silicates. The process includes combining silicon with

ethanol, with the use of catalysts, to produce a hydrolyzed from of very fine silica particles. The various grades of ethyl silicates produced and supplied by EI are then used to manufacture corrosion-resistant coatings, zinc-rich primers, and precision investment casting and are also used by the industrial chemical and electronic sectors.

EI currently employs about 53 persons and operates 365 days per year under eight or twelve hour shifts. The permitted-operations at the facility mainly occur in buildings 102, 502, and 701 using large batch reactors. Associated VOC / HAP emissions are controlled using chilled water condensers. EI does not discharge its wastewater, so EUWWEVAPCOND and an evaporator pond are utilized.

The EI 2015 Michigan Air Emissions Reporting System (MAERS) reported the following facility-wide emissions using MAERS emission factors (EF) and EF derived and used for their 1997 permit application:

- 1.41 tons CO,
- 0.01 pounds Lead,
- 2.99 tons NOx,
- 255.98 pounds PM10, Primary,
- 255.98 pounds PM2.5, Primary,
- 31.43 pounds SO2, and
- 47.67 tons VOC (emission limit: 65 tons per year (tpy)).

Pre-Inspection Meeting

I conducted a pre-inspection meeting initially with NS, BR, and MH, and MM shortly joined the meeting as well. I provided a copy of and reviewed the Michigan Department of Environmental Quality (MDEQ) brochures entitled *Rights and Responsibilities Environmental Regulatory Inspections* and *Boiler NESHAP Navigation Tool*. I also invited EI to complete the customer service survey upon receipt of my inspection report. I informed the facility's staff of my intent to conduct a facility inspection and to review the various records required by their permit.

The pre-inspection began with a background summary of EI, which was provided by MM. The summary included various operational characteristics, product line descriptions, etc. as summarized above.

I asked whether EI experienced any recent issues or changes facility wide or with any of their air pollution control (APC) equipment. MM replied that no immediate issues were noted. MM did indicate that Silbond Corporation was recently acquired by EI, and will eventually submit necessary paperwork to update the facility name. They currently still operate as Silbond Corporation, but will shortly changeover to EI.

I did inform MM that the facility was late with providing their last 2015 Leak Detection and Repair (LDAR) results

summary, which was received by the JDO on March 7, 2016. Permit Special Condition (SC) VI.2 requires LDAR results to be reported to the District within 30 days after completion of the monitoring event. I reminded the facility to timely submit their LDAR results summary in the future.

Next, I inquired whether EI had any immediate plans to modify their permit and / or a process lines, etc. MM replied that EI may be making process changes in the future as the acquisition process continues. I reminded MM of the option to have a pre-permit application meeting with the Jackson District Office (JDO) and AQD permit staff to discuss future process / permit changes.

We then discussed the four, onsite reciprocal internal combustion engines (RICEs) used to power three emergency generators and one fire water pump and the a summary spreadsheet previously provided by the facility (attached). Only one of the four RICE is subject to Part 60, Subpart JJJJ, for which compliance was assessed, while the other three are subject to Part 63, Subpart ZZZZ, for which compliance was not assessed. I did request to view all four engines and each engine's non-resettable hour's meter.

Since EI operates serval exempt boilers, I provided MM the department's *Boiler NESHAP Navigation Tool* pamphlet and suggested that MM use it to determine whether the facility is subject to NESHAP subpart 5D or 6J.

Next, we discussed the facility's 2015 Report Year MAERS report, as I had several questions, which included (1) How were the facility-wide fugitive emissions calculated and (2) why were some of the EUs (EUREACTOR102-200, -300, -10, EUREACTOR102-50) not included in the MAERS report. The facility indicated that they would include a response to my MAERS questions with their recordkeeping submittal. On April 4, 2016, the facility provided the following answers to the above questions. Answer to Question 1: Fugitive emissions were calculated based upon SOCMI values and hours ran to produce the number of pounds during a given time period. Answer to Question 2: These emission units are part of production processes which share the same stack (SV0017). These were not included since the emissions were reported under other emission units associated with stack SV0017. For future reports, I will request that they provide the information contained in their answers from above.

Together with the facility staff, we reviewed the Special Conditions (SCs) of PTI 22-97C. I also requested the records indicated below, under the *Recordkeeping Review* section, for March 2015 through February 2016. Records were initially requested by March 28, 2016, but an extension was granted until April 6, 2016. Specific points of discussion are documented under this section or under the *Onsite Inspection Narrative* section.

The permit requires that VOC / HAP emissions be controlled via chilled water condensers, which must maintain exhaust gas temperatures from each vent condenser at or below 20 degrees centigrade per SC IV.1. The facility confirmed that each condenser is equipped with a temperature gauge, per SC IV.3, and that each is calibrated in-house and temperatures are either monitored manually or are networked to the central control room. If the temperature were to ever rise above 20 degrees centigrade, the process would be halted immediately.

Temperatures are also tracked via each product's batch record.

The facility is also required to have an additional APC, a flare associated with EUREACTOR102-100 that must be installed, maintained, and operated in a satisfactory manner per SC IV.2. This flare is required to destroy hydrogen emission generated by this EU. It is also equipped with a natural gas pilot flame to ensure continued operation. If the flare's flame blows out, an interlock would shut down this process.

Onsite Inspection Narrative

MM and her staff (NS, BR, and MH) escorted me for the onsite tour portion of the inspection. I was first shown the shipping and receiving operations in building 109, including EUDRUMMING. I observed the final product transferred to 55-gallon drums using a bottom feed method to minimize emissions. I observed a total of four loading stations, which were associated with one stack.

Then I observed a centralized system used to cool water (through refrigeration) for the chilled water condensers and the associated water cooling towers. I was also shown the emergency generator located in building 104. I requested to observe the non-resettable hour meter, but the facility staff was not sure of its location. The staff member responsible for the emergency generator engines was not onsite during the inspection. I responded that my recordkeeping request would include pictures of each meter.

We then proceeded to building 102, which housed a large number of reactors. I first observed EUTMB-70, which included one station used to re-package a bulk product brought onsite into smaller containers. It was not in operation during the inspection. I was then shown the Reactor 102 Control Room, and observed various readouts including exhaust gas temperature readings from vent condensers below 20 degrees centigrade, per SC IV.1. The displayed temperature readings were taken using gauges, per SC IV.3, that transmitted readings directly to the Control Room.

I also observed EU-GRINDING, which vents in-plant, per the exemption found under Rule 285(l)(VI). To control emissions, I observed that this process was equipped with a bag house collection system and a vapor condenser system.

While still in building 102, I observed EUREACTOR102-100. This reactor is used to make several products. Then I observed EUREACTOR102-80, which is also used to make several products. Next, I observed EUREACTOR102-200, which then feeds into EUREACTOR102-300, and finally EUREACTOR102-10 to produce several products. I also observed EUREACTOR102-30, EUREACTOR102-40, and EUREACTOR102-50, which operate independently to make several products.

Then we proceeded outside and I observed various tanks associated with EU STORAGE TANKS, which also

appeared to be equipped with conservation vents, per SC IV.4. I also observed the new loading area that was constructed under a Rule 201 exemption. The facility contacted and shared an exemption demonstration with AQD staff during the summer of 2015.

Next, I was shown an operational flare associated with EUREACTOR102-100 that must be installed, maintained, and operated in a satisfactory manner, per SC IV.2. Afterwards I observed EUBOILER1, EUBOILER2, and EUBOILER3 that provide the facility with heat and steam. I also observed EUHOTOILHEATER, which is a heat source for EUREACTOR102-100.

We then preceded to buildings 501 and 502 and I observed EUREACTOR501-10 and EUREACTOR501-50, which were not in operation, and EUREACTOR502-101, respectively. I then observed the onsite evaporative pond associated with EUWWEVAPCOND. Next, I observed the fire water pump emergency generator located in building 1002, followed by the emergency generators located in buildings 201 and 901. I did not observe the "Terry Wells" emergency generator. It is located at an offsite well. I concluded my inspection by observing EUWWEVAPCOND located in building 701.

Facility Wide Observations

During the facility tour, I also confirmed the presence of stacks specified by the facility's PTI, but I did not conduct actual measurements to confirm compliance. All of the permit-specified stacks were accounted for during the inspection.

In addition, it appeared that all of the observed reactors were equipped with chilled water condensers and temperature gauges to monitor the vent gas exhaust gases, per SCs IV.1 and IV.3, respectively. Accessible gauges indicated temperatures below 20 degrees centigrade, per SC IV.1.

Overall, IP appears to be practicing excellent facility housekeeping, as I did not observe any spills, leaks, odors, etc. from any of the reactors and associated piping, storage tanks, other processing areas, or APC equipment.

Post-Inspection Meeting

We returned to EI's conference room and held a brief post-inspection meeting. I informed facility staff that I did not have any immediate compliance concerns and that I would make a final determination upon review of the requested recordkeeping items. I thanked the staff for their excellent cooperation and assistance, and departed the facility at approximately 12:45 pm.

Recordkeeping Review

Below is a summary of the requested records, as specified by the following permit SCs or records requested to

demonstrate compliance with a specific SC for the period of March 2015 through February 2016. A summary email of my records request was sent to EI staff on March 18, 2016 (attached). Records were requested by COB March 28, 2016, with an extension granted to COB April 6, 2016. Records were submitted timely by MM.

EU or FG Designation	Record Request per Permit SC(s) for March 2015 through February 2016 OR otherwise noted.	Comments (if applicable)	Substantial Compliance (Yes or No) / Comments
	IV.1	Requested examples of maintenance records to demonstrate compliance with proper operation of the chilled water condensers associated with the reactors.	Yes / Records attached to the report. / Condenser operation observed during onsite inspection.
	IV.2	Requested examples of maintenance records to demonstrate compliance with proper operation of the slurry tank condenser and flare associated with EUREACTOR102-100.	Yes / Records attached to the report. / Condenser and flare operation observed during onsite inspection.
		Requested a copy of the Flare Operation and Maintenance Plan	Yes / Records attached to the report.
		Requested examples	

FGFACILITY	IV.3	of maintenance records to demonstrate compliance with proper maintenance of the temperature gauges associated with the chilled water condensers.	Yes / Records attached to the report. / Temperature gauges observed during onsite inspection.
	VI.1	Requested one (1) sample temperature record for each reactor (equipped with a chilled water condenser) to demonstrate compliance with SC IV.1, which requires exhaust gases from each vent condenser be maintained at or below 20 degrees centigrade.	Yes / Records attached to the report. / Temperature gauges observed during onsite inspection indicated temperatures below 20 degrees centigrade.
	VI.4	Requested records to also demonstrate compliance with SC I.1, 65 tpy VOC emission limit per 12-month rolling time period.	Yes / 58.46 tons, highest 12-month rolling VOC emissions reported for January 2016. / Records attached to the report.
		Requested records to also demonstrate compliance with SC I.2, 8 tpy of each individual HAP emission limit per 12-month rolling time	Yes / 0.012 tons, highest 12-month rolling AGGREGATE HAP emissions reported for October 2015. /

		period.	Records attached to the report.
		Requested records to also demonstrate compliance with SC I.3, 18 tpy aggregate HAPs emission limit per 12-month rolling time period.	Yes / 0.012 tons, highest 12-month rolling AGGREGATE HAP emissions reported for October 2015. / Records attached to the report.
	VI.5	Requested a sample of batch records to demonstrate compliance with this SC.	Yes / Records attached to the report.
NSPS JJJJ-Subject RICE Emergency Generator G-202-002	Subpart JJJJ / §60.4245(a) through (b).	Requested maintenance records, manufacture's certification of meeting emission standards, hours of operation records, and a picture of the non-resettable hour meter.	Yes / Records attached to the report.
EUHOTOILHEATER	RULE 290 Exemption	Requested actual VOC compounds emitted by this EU and each compound's Initial Threshold Screening Level (ITSL).	Yes / Records attached to the report. / Using emissions data from MAERS 2015, facility appears to be in compliance with Rule 290(a)(ii)(A)'s 1,000 pounds per month uncontrolled emissions limit.

EUWWEVAPCOND	RULE 290 Exemption	Requested actual VOC compounds emitted by this EU and each compound's Initial Threshold Screening Level (ITSL).	Yes / Records attached to the report. / Using emissions data from MAERS 2015, facility appears to be in compliance with Rule 290(a)(ii)(A)'s 500 pounds per month controlled emissions limit.
EUDRUMMING	RULE 290 Exemption	Requested actual VOC compounds emitted by this EU and each compound's Initial Threshold Screening Level (ITSL).	Yes / Records attached to the report. / Using emissions data from MAERS 2015, facility appears to be in compliance with Rule 290(a)(ii)(A)'s 1,000 pounds per month uncontrolled emissions limit.
EUTMB-70	RULE 290 Exemption	Requested actual VOC compounds emitted by this EU and each compound's Initial Threshold Screening Level (ITSL).	Yes / Records attached to the report. / Using emissions data from MAERS 2015, facility appears to be in compliance with Rule 290(a)(ii)(A)'s 500 pounds per month controlled emissions limit.

Compliance Summary

Based upon the visual observations and the review of the records, EI appears to be in substantial compliance with the requirements of their PTI. As indicated above, the facility's VOC emissions (58.46 tons, highest 12-month rolling VOC emissions reported for January 2016) are approaching the 65 tpy VOC emission limit. On April 11, 2016, I sent an email to MM and her staff requesting careful monitoring of their facility-wide VOC emissions, as they are approaching their limit. I advised that they consider modifying their permit, etc. to better reflect any

process changes, etc. I also communicated minor comments regarding my audit of the facility's 2015 MAERS audit. The email has been attached to this report.

Throughout the entire onsite inspection and subsequent recordkeeping review, MM and her staff extended their full cooperation and diligently responded to my post-inspection questions and requests. Overall, I observed a well-organized and maintained operation that also exhibited dedicated attention to environmental compliance.

NAME Michael M. Hahn DATE 4/11/2016 SUPERVISOR