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

B295243705

FACILITY: SILBOND CORP		**SRN / ID:** B2952
LOCATION: 9901 SAND CREEK HWY, WESTON		**DISTRICT:** Jackson
CITY: WESTON		**COUNTY:** LENAWEE
CONTACT: Nicolas Soler , Technical Manager		**ACTIVITY DATE:** 03/15/2018
STAFF: Mike Kovalchick	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** SM OPT OUT
SUBJECT: Scheduled inspection of chemical plant that makes ethyl silicates.		
RESOLVED COMPLAINTS:		

Synthetic Minor / Opt-Out Source. Full Compliance Evaluation (FCE) and Inspection (PCE) of Silbond Corporation (Company) located at 9901 Sand Creek Highway, Weston, Michigan 48111. (SRN B2952)

Facility Contacts

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

Sunitha Asapu (Sa), Plant Engineer, 517-436-9327, Sunitha.asapu@evonik.com

www.silbond.com

www.evonik.com

Purpose

On March 15, 2018, I conducted a scheduled, unannounced inspection of the Silbond Corporation, (recently acquired by Evonik Industries but still goes by the name Silbond), 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 March 17, 2016.

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. See attached aerial photo. Attachment (1) is map of the facility.

Regulatory Applicability

The facility is a Synthetic Minor / Opt-Out Source for volatile organic compounds (VOC) and hazardous air pollutants (HAP) emissions. The Company 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. The Company 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 the Company 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. (Note: Going forward this facility will no longer be fee subject as it does not meet the fee criteria.)

EMISSION UNIT SUMMARY TABLE

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-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.	SV0021
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 materials and some only store finished products but a number of these tanks can be used for storing both raw materials and finished products.	N/A
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

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 8:45 am, proceeded to the facility's visitor's office to request access for an inspection, provided my identification, and asked if Brent Richards BR (former facility contact) was available. BR met with me after I had watched a safety training video and was then escorted by BR to the facility's conference room where I was joined by Sunitha Asapu (SA) and Dr. Nicolas Soler (NS).

Facility Background

The Company 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 the Company 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.

The Company 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 Company's 2017 Michigan Air Emissions Reporting System (MAERS) reported the following facility-wide emissions using MAERS emission factors (EF) and EF derived and used from their 1997 permit application:

SOURCE REPORTED EMISSIONS		
Pollutant	**Amount**	**Unit**
AMMONIA	127.00	LB
CO	3333.45	LB
LEAD	0.02	LB
NOX	5988.18	LB
PM10,PRIMARY	301.59	LB
PM2.5,PRIMRY	301.59	LB
SO2	32.46	LB
VOC	101766.01	LB or 50.88 Tons

(VOC emission limit: 65 tons per year (tpy)).

Pre-Inspection Meeting

I conducted a pre-inspection meeting initially with BR, SA, and NS.

The pre-inspection began with a couple of questions I had on MAERS. I noted that required attachments were not provided in MAERS on how fugitive emissions were calculated or how tank losses were calculated at the facility. SA indicated that she would provide the background information on that.

I asked whether the Company experienced any recent issues or changes facility wide or with any of their air pollution control equipment. They indicated that there haven't been any changes at the facility since the last inspection.

I asked about the status of the Leak Detection and Repair (LDAR) results summary. SA provided the summary report. See Attachment (2). She indicated that they hired a consultant company to conduct the survey. It took 2 individuals a week to survey all the pipes/fittings etc. and no reportable leaks were found.

Next, I asked them to go through the tank list that is associated with their PTI permit to see if there has been any additions or subtractions from the list. They noted that tanks T-106 and T-113 were currently out of service but would be repaired and returned to service at some point. No new tanks have been added. Attachment (3) is the tank list.

We then discussed the four, onsite reciprocal internal combustion engines (RICEs) used to power three emergency generators and one fire water pump and a summary spreadsheet previously provided by the facility. See Attachment (4). 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. One new engine had been added while one of the engines was currently out of service. I did request to view all four engines and each engine's non-resettable hour's meter.

I requested the records indicated below, under the **Recordkeeping Review** section, for February 2017 through February 2018. Records were requested by March 19, 2018. 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 air pollution control device, 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

The Company escorted me for the onsite tour portion of the inspection. No photos were taken since equipment needs to be intrinsically safe due to a fire hazard.

We first looked at a new emergency generator that had been installed for a lab. It was natural gas fired in 2017 and rated at 125 KW. They call it the 202 generator. It only had been used 24.7 hours since it was installed in 2017. (It is tested for 20 minutes per week.)

Next, we went to look at the flare. It was operating. It was hard to see as it was surrounded by a metal enclosure that was formally used to capture the heat. There was no opacity. There appeared to be some build-up of some type of residue below the flare and the flare itself appeared to be old.

Near the flare we observed various tanks associated with EU STORAGE TANKS, which also appeared to be equipped with conservation vents, per SC IV.4. They appeared to be in fair condition.

We then went into the boiler room after walking past a tall distillation column. There was 3 natural gas fired boilers. EUBOILER1, EUBOILER2, and EUBOILER3 provide the facility with heat and steam. The larger one was installed on 2/14/1981 rated at 20.9 MM BTU. They generally only need to operate this one. Alternately, they operate the other 2 which are smaller at the same time. They were installed in 1959 and appeared to be beyond their normal life expectancy.

Next, we went into one of the reactor buildings. They noted that there are several centralized chiller systems that control the various reactors. All the chiller systems that are used for the reactor condensers are set at around -11 degrees C. all the time. This keeps the condensers always well below the 20 degree C. requirement. I noted from a control room display that for X-102-901 (Building 102 Device) the condenser temperature was -2.0 C. The temperature of the hydrogen gas going to the flare was -0.03 degrees. C. It was noted that a second set of chillers are used for process cooling besides the condensers. They are set at around 44 degrees F.

Finally, we observed a EU-GRINDING grinding process. It was controlled by a dust collector labeled F-102-101. The bags to the dust collector were open/exposed exhausting indoors. No opacity was noted. Fines that are collected automatically drop down into a collection barrel. No spillage was noted.

Facility Wide Observations

During the facility tour, I did not confirme the presence of stacks specified by the facility's PTI as the stacks were confirmed during a previous inspection 2 years ago.

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

Post-Inspection Meeting

We returned to Company'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 10:15 am.

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 February 2017 through February 2018. Records were received on 3/19/2018.

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
FGFACILITY	IV.1	Company maintains condenser temperatures well below 20 degrees.	Yes Condenser operation observed during onsite inspection.
	IV.2	Observed flare in operation.	Yes See Attachment (5) which is the flare operation and maintenance plan. Condenser and flare operation observed during onsite inspection.
	IV.3	Yes Temperature gauges observed during onsite inspection.	
	VI.1	Yes Temperature gauges observed during onsite inspection indicated temperatures below 20 degrees centigrade.	
		Requested records to also demonstrate compliance with SC I.1, 65 tpy VOC emission limit per 12-month rolling time period.	Yes / 56.46 tons, highest 12-month rolling VOC emissions reported for February 2018.

			/ See Attachment (6)
	VI.4	Requested records to also demonstrate compliance with SC I.2, 8 tpy of each individual HAP emission limit per 12-month rolling time period.	Yes / 0.001 tons, highest 12-month rolling AGGREGATE HAP emissions was the same for each month. / See Attachment (6).
		Requested records to also demonstrate compliance with SC I.3, 18 tpy aggregate HAPs emission limit per 12-month rolling time period.	Yes / 0.001 tons, highest 12-month rolling AGGREGATE HAP emissions reported was for the same for each month. / See Attachment (6)
	VI.5	Yes / See Attachment (7)	
NSPS JJJJ-Subject RICE Emergency Generator G-202-002	Subpart JJJJ / §60.4245(a) through (b).	Company keeps maintenance records, manufacture's certification of meeting emission standards, hours of operation records, and a picture of the non-resettable hour meter.	Yes / See attached picture of resettable hour meters. See Attachment (8).
EUHOTOILHEATER	RULE 290 Exemption	Yes Using emissions data from MAERS 2017, facility appears to be in compliance with Rule 290(2)(a)(ii)(A)'s 1,000 pounds per month uncontrolled emissions limit.	
EUWWEVAPCOND	RULE 290 Exemption	Yes Using emissions data from MAERS 2017, facility appears to be in compliance with Rule 290(2)(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 Using emissions data from MAERS 2017, facility appears to be in compliance with Rule 290(2) (a)(ii)(A)'s 1,000 pounds per month

			uncontrolled emissions limit.
EUTMB-70	RULE 290 Exemption	Yes Using emissions data from MAERS 2017, facility appears to be in compliance with Rule 290(2)(a)(ii)(A)'s 500 pounds per month controlled emissions limit.	

Attachment (9) is background information/spreadsheets on how MAERS emissions were calculated for 2017. It appears that the method used to calculate VOC emissions is a conservative one that likely over estimates VOC emissions.

Compliance Summary

Based upon the visual observations and the review of the records, the Company appears to be in compliance with the requirements of their PTI. Throughout the entire onsite inspection and subsequent recordkeeping review, the Company's staff extended their full cooperation and diligently responded to my post-inspection questions and requests.

Image 1(Aerial photo) : Aerial photo of Silbond.

NAME M. Kowalchuk DATE 3/20/2018 SUPERVISOR