

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

P074272463

FACILITY: Siliconature Corporation		SRN / ID: P0742
LOCATION: 4255 68th Street SE, CALEDONIA		DISTRICT: Grand Rapids
CITY: CALEDONIA		COUNTY: KENT
CONTACT: Kevin Biehl , Operations Manager		ACTIVITY DATE: 05/30/2024
STAFF: April Lazzaro	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Unannounced, scheduled inspection.		
RESOLVED COMPLAINTS:		

Air Quality Division staff, April Lazzaro and Materials Management Division staff Wade O’Boyle arrived at the facility at approximately 10:25 AM and were met by Ryan Adams, Production Manager who asked if we would wait as they were finishing up with a time sensitive work task. Once that was completed, we were joined by Ryan Adams and Kevin Biehl, Operations Manager for the opening meeting. During that meeting, the purpose of the routine compliance inspection was detailed.

FACILITY DESCRIPTION

Siliconature Corporation operates one silicone plastic film coating operation, where silicone resin coatings are applied onto plastic film via one of two rotogravure applicators. Opt-out Permit to Install (PTI) No. 158-16B was issued on April 22, 2021, for one plastic film coating line controlled by non-fugitive enclosures and a regenerative thermal oxidizer (RTO), and four solvent storage tanks. The emissions generated from the associated purge and cleanup solvent use are included with the emission unit. A Flexible Group (FG) for the facility contains limitations on Hazardous Air Pollutants (HAPs) and Volatile Organic Compounds (VOCs) that restrict emissions below major source levels. Originally, the facility was permitted for two plastic film coating lines, however only one was installed. During the inspection, the facility mentioned that they are in the process of preparing a permit application for a second coating line and additional RTO. No installation activities were observed during the inspection. Upon arriving at the facility, no odors or visible emissions were noted.

COMPLIANCE EVALUATION

During the inspection, we were escorted by Ryan Adams of Siliconature.

PTI No. 158-16B

EU-CoatingLine-01

EMISSION LIMIT

Line 1 consists of a corona treatment unit, two coating applicator areas, eight drying ovens and eight curing ovens. The coating applicators and drying ovens are controlled by non-fugitive enclosures (NFE) and a RTO. The curing ovens and corona treatment are vented to the atmosphere uncontrolled. Emissions generated from the associated purge and cleanup solvents used on the line are included with the emission unit and controlled by the RTO. The VOC emissions from the coating line are limited to 18.6 tons per 12-month rolling time period. The emissions spreadsheet was requested and received timely. Reported VOC emissions through March 2024 are 2.09 tons. In addition to the total emissions, AQD requested formulation data for four materials to evaluate accuracy. This evaluation determined that the records reviewed appeared accurate regarding VOC content in the coatings. Currently, Siliconature uses a calculation to subtract out a large amount of VOC’s that are sent out for disposal. The basis for the waste subtraction is based on the statement that, “the amount of VOC that is in the coating waste that is stored in RCRA closed containers and shipped to the TSDF for treatment and disposal is estimated using worst case parameters. The resin coatings contain approximately 90 - 95% VOC by weight. In the waste VOC calculations, a worst case VOC content of only 80% by

weight is assumed.” This assessment was designated at the beginning of facility operations, and requires an additional assessment. As detailed below, Siliconature is not properly storing waste materials in closed containers. Siliconature indicates that they disposed of 6,600 lbs of VOC in the waste in May 2024, and for the 12-months prior 77,000 lbs of VOC’s were subtracted from the total coating VOCs used. While the approach to waste disposal and subtracting those VOC contributions from the monthly emissions had previously been accepted, due to the observations made during the inspection this is no longer the case. The AQD will be requesting additional testing of the waste materials, and an updated method of determining emissions from waste coating disposal.

PROCESS/OPERATIONAL RESTRICTIONS(S)

The permit requires that the permittee shall capture all waste coatings, reducers, clean-up solvents, etc (materials) and store them in closed containers. The waste collection area was observed and found to be unacceptable. During the inspection, we observed 55 gallon drums of waste material with the bungs open and waste coating material spilling out of the bung holes. (see photos below) The observations made during the inspection indicate that Siliconature is not storing waste in closed containers, and as such this is a violation of PTI No. 158-16B, EU-CoatingLine-01, Special Condition III.1.

The malfunction abatement plan (MAP) had been previously submitted and does not include monitoring of the RTO pressure drop indicators for the ceramic media. A request will be made to update the MAP and resubmit it within 45 days.

DESIGN/EQUIPMENT PARAMETERS

The RTO that controls this line is a three-chamber design. The temperature at the time of the inspection was a self-sustained 1,623°F. Self-sustained means that at the time the reading was taken, no natural gas was being used to fire the flame, it was maintaining the temperature by burning the gasses generated by the rotogravure application coating line. There is a visual display screen, and the computer is monitoring and recording the RTO temperature every 15 seconds. The permit requires a minimum temperature of 1,500°F and a 99% destruction efficiency. The 2019 stack test confirmed compliance with the 99% destruction requirement.

During discussions with facility staff during the inspection, AQD learned that the RTO has experienced heavy silicone particulate accumulation over the five years it has been operating. This occurrence is commonly referred to as fouling of the ceramic media by process materials. During annual inspections conducted by the RTO manufacturer, this was monitored and determined that the fouling had become severe enough to affect the performance of the unit and as such, the ceramic media was replaced in February 2024. As noted above, the AQD will request an updated MAP to include RTO pressure drop monitoring parameters as an indicator of ceramic media fouling. Observations of the exterior of the unit found that silicone particulate had been left on the ground following the ceramic media replacement. Additionally, the plastic film that is coated at the facility was observed to be accumulated around the RTO, which is a hazard. While not necessarily an AQD regulated issue, it is indicative of a lack of attention to detail. It is noted that during one of the annual inspections of the RTO, the contractor noted the film around the unit then, and it was still present in large quantities.

The rotogravure coating applicator and the coating are contained in an enclosed booth that is characterized as a non-fugitive enclosure (NFE) that is required to have a capture efficiency of 100%. As I walked into the area that housed the coating line, there was no smell of solvent whatsoever. This is an olfactory indication that the appropriate capture efficiency is being achieved. The company also utilizes a magnehelic gauge to measure the pressure drop between the rotogravure application area and the outside. The reading as identified in the MAP is one that is greater than a differential pressure of -0.007” H₂O. The value observed during the inspection was observed for coating applicator B (A was not in use), was -0.031 which indicates compliance with the permit requirements. There is a visual display screen, and the computer is monitoring and recording the pressure drop every 10 seconds.

Extensive records of RTO temperature and NFE pressure drop were requested and received, and the final communication between AQD and the company regarding data interpretation was conducted on July 3, 2024. A review of information did not identify any permit exceedances.

TESTING/SAMPLING

The AQD has received and approved a request to use manufacturer's formulation data to determine VOC content instead of federal Reference Test Method 24. It is noted that to confirm the VOC coating content, only SDS's were provided. Siliconature needs to maintain this information based on the manufacturer's formulation data as required by the permit. There was a concern with proprietary information being made available using this method. If Siliconature does not want to provide manufacturer's formulation data in the future, Method 24 testing will be required.

The stack testing for EU-CoatingLine-01 was conducted timely.

MONITORING/RECORDKEEPING

The spreadsheet obtained has a materials specifications tab that has a row for each individual material used. Each material is identified by its own identifier instead of the trade name to maintain confidentiality. This is acceptable as it lists VOC and HAPs contained in each to demonstrate compliance with the limits. It is noted that Siliconature is maintaining original records with this information, however that is not necessary for the public record of emissions.

The recordkeeping being maintained appeared to meet the requirements of the PTI, with the exception of the material disposal practices as noted above.

REPORTING

NA

STACK/VENT RESTRICTIONS

The stacks were not measured, however they appeared to be installed per the permit requirements.

FG-Tanks

This FG covers four solvent storage tanks, one resin storage tank and multiple mix tanks. These four tanks for the solvents are housed outside and consist of double walled containment tanks, with submerged fill pipes and conservation vents. The solvents are then piped into the facility mix room where Siliconature staff distribute the solvents to a container for each batch of coating as it is formulated. The mix room area was clean, however there were coating containers observed without lids at the time of the inspection. Both AQD and MMD noted that this is an area for improvement. Emissions generated in the mix room are vented uncontrolled via floor sweep exhaust ventilation and a dedicated stack.

FG-FACILITY

This flexible group contains conditions that apply source-wide to all process equipment at the facility.

Each individual HAP is limited to less than 8.98 tons per 12-month rolling time period and aggregate HAPs are limited to 22.4 tons per 12-month rolling time period. The highest individual HAP emission for the 12-month period ending in May 2024 is from toluene use at 0.77 tons. The total HAP emissions for the 12-month period ending in May 2024 are 0.82 tons.

Total source-wide VOC emissions are limited to 30.0 tons per 12-month rolling time period. Current source-wide VOC emissions for the 12-month period ending in May 2024 were reported at 2.24 tons.

During the inspection we observed the gravure cleaning room. In this room, diluted 100% pure sulfuric acid and soda water are used to clean the gravure applicators. The emissions are vented to the ambient air through a hood to a stack. This activity is new and was not evaluated during the permitting process. As such, pursuant to Rule 278a, an exemption eligibility demonstration will be requested.

CONCLUSION

Siliconature Corporation was in non-compliance at the time of the inspection.



Image 1(Unsealed Drum) : Unsealed drum with contents on floor.

NAME April Lagano

DATE 07/08/2024

SUPERVISOR HH

Image 2(Unsealed drum) : Unsealed drum with contents on floor. View photo one turn clockwise.

