

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

N304456614

FACILITY: EMERALD GRAPHICS INC	SRN / ID: N3044
LOCATION: 4949 GREENBROOKE DR SE, KENTWOOD	DISTRICT: Grand Rapids
CITY: KENTWOOD	COUNTY: KENT
CONTACT: Brian Dillon , Paint Manager	ACTIVITY DATE: 01/08/2021
STAFF: April Lazzaro	COMPLIANCE STATUS: Compliance
SUBJECT: Partial Compliance Evaluation, records review.	
RESOLVED COMPLAINTS:	

Staff, April Lazzaro contacted Brian Dillon at Emerald Graphics, Inc. to initiate a records request and review as part of an Air Quality Division partial compliance inspection of the facility. I explained to Mr. Dillon over the phone that the records review would be part of a Full Compliance Evaluation that would include an on-site inspection of the facility at a later date.

FACILITY DESCRIPTION

Emerald Graphics, Inc. (Emerald) is a plastic parts coating facility with three coating lines and is permitted pursuant to General Permit to Install (PTI) No. 401-08 and Opt-out PTI No. 91-12. Emerald applies paint to plastic parts for the automotive and appliance industries. Very little plastic molding is conducted on-site, as most of the parts they coat are customer owned/provided.

COMPLIANCE EVALUATION

The records request was sent to Mr. Dillon via email and included a deadline for submittal of the information. Mr. Dillon was in the middle of another facility audit and requested an extension for submittal which was approved. The information requested was submitted timely. The data was received in PDF files.

COMPLIANCE EVALUATION

PTI No. 401-08

This is a General PTI for coating lines and covers volatile organic compound (VOC) emissions for both the EU-ROBOT line, which is controlled by a catalytic oxidizer and consists of five booths; the EU-BUTTON line, which exhausts uncontrolled and consists of three booths and a new line that has been added since the last inspection referred to as EUGRAPHICS.

FG-COATING

Emission Limits

Emission limits for VOC's from each coating line (EU-BUTTON, EU-ROBOT and EUGRAPHICS) are 2,000 lb/month including all associated purge and clean-up operations, and 10 tons per year on a 12-month rolling time period. Emissions information for each line was provided and reviewed. The EU-ROBOT line uses a control factor for the use of the catalytic oxidizer while the EU-BUTTON line and EUGRAPHICS do not. Emerald is maintaining a list of VOC and HAP containing material used. EUGRAPHICS has not been in use and emissions are zero.

VOC emissions information for the two operational lines were provided and reviewed. The highest reported monthly VOC emissions from EU-BUTTON line during the time period of January 2019-October 2020 occurred in June of 2020 at 144.61 pounds. No methyl ethyl ketone (MEK) nor isopropyl alcohol (IPA) wipes are utilized on the EU-BUTTON line, and no control efficiency has been applied to the data which is correct. The reported 12-month rolling VOC emissions through October 2020 were 430.79 pounds or 0.22 tons.

The review of the EU-ROBOT line found an omission from emissions totals. After the last inspection, the emissions from the use of the alcohol wipes were determined by the facility and added to the monthly emissions records. However, those emissions have not been properly transferred into the monthly or 12-month rolling totals for this emission unit as required. Since all the data was present, I discussed it with Mr. Dillion to point out how these uncontrolled emissions were not in the total. I conferred with Emerald's IT staff Michael Kurt, who made the appropriate change to the database. The addition of these emissions do not affect compliance with the emission limit as currently calculated using a destruction efficiency of 95% for the booth emissions, (which includes MEK in-booth gun flush use) and zero destruction efficiency for the IPA emissions. I quickly recalculated monthly emissions with the addition of the MEK and IPA use. The highest reported monthly VOC emissions from EU-ROBOT line during the time period of January 2019-October 2020 occurred in January 2019 at 1,406.31 pounds. The recalculated 12-month rolling VOC emissions through October 2020 were 6,928 pounds or 3.46 tons. This is a difference in emissions of 2,727 pounds of VOC for the 12-month rolling period.

A review of the annual Michigan Air Emissions Reporting System (MAERS) data was conducted, and I found that the emissions that are not included in the 12-month rolling data is being reported to the system. So, all fees have been assessed appropriately and this is a correction that needs to be made to the current system and easily corrected.

Process/Operational Restrictions

The process and operation restrictions will be evaluated during the on-site inspection.

Design/Equipment Parameters

The design and equipment parameters are in place to ensure the catalytic oxidizer that has been installed is operating properly. The Applicability Criteria for the General Permit to Install states that proper operation of the catalytic oxidizer requires an overall minimum of 76% reduction efficiency. The facility utilizes a 100% capture efficiency factor and conducts periodic "smoke" puff testing to ensure air flow is into the booths. This was determined as an acceptable methodology during previous inspections.

Several changes were made to monitoring of the oxidizer temperatures based on the 2017 compliance inspection. The inlet temperature is maintained at the 650°F set point, and there is an increase of temperature across the catalyst of approximately 25°F. This temperature change is typical for this unit and has been incorporated into the Preventative Maintenance/Malfunction Abatement Plan. This is a bit lower than

the expected temperature rise in a catalytic oxidizer based on research. A review of temperature records indicates this has been indicative of typical operations.

This catalytic oxidizer has not had a destruction efficiency test since it was installed at this location in 2009. However, the facility has the catalyst in the catalytic oxidizer tested once every five years. The test consists of two samples, inlet catalyst and outlet catalyst. The reports provided to explain the results of testing use a couple different methods to show catalyst efficiency. The 2015 catalyst graphical report indicated that the inlet catalyst efficiency was decreased, however the outlet catalyst efficiency was very good. The laboratory scientist that wrote the report indicated in 2015 that the data indicated a 95% destruction efficiency at 650°F. As a result of this report, Emerald Graphics changed the recordkeeping to reflect a 95% destruction efficiency.

The 2020 catalyst sampling shows markedly different results. The two samples were not labeled inlet and outlet, so it was not possible for the laboratory to make the distinction. The 2020 catalyst graphical report indicates that for the oxidizer to achieve a 90% destruction efficiency the temperatures required for sample #1 is 859°F, and sample #2 is 784°F. The approximate destruction efficiency at the current operating temperature of 650°F is 67%. This value is below the permit required 76% destruction efficiency as described above.

The narrative of the report describes that this oxidizer is oversized for the current loading, and under current conditions could still achieve >95% destruction efficiency. The rationale behind this is that since there is “extra” catalyst in the unit, it could be possible for VOC destruction to take place due to available catalyst surface area.

I spoke with the scientist who wrote the report who further explained that since there is extra catalyst available for conversion within the unit, it should be able to achieve the 95% destruction efficiency at the temperatures in the table, however this approach is theoretical.

However, this oxidizer is operating at 650°F, not at the elevated temperatures that would increase performance to that as described in the graphical laboratory report.

Based on the review of data, and the discussion with the laboratory scientist, it has been determined that stack testing will be requested. A letter will be sent to Mr. Dillon requesting stack testing be completed within 60 days.

Testing/Sampling

Specific testing of the coating formulations are not required at this time.

Monitoring/Recordkeeping

During the extensive recordkeeping review, AQD staff was able to determine compliance with each of the recordkeeping provisions, and some modifications to the data format have been recommended to the company as indicated above.

Stack/Vent Restrictions

Stack parameters will be evaluated during the on-site inspection.

Other Requirements

Evaluation for replacement or modification of equipment in FG-COATING will be evaluated during the on-site inspection.

FG-SOURCE

Emission Limits

Emission limits for VOC's from all operations at the facility are limited to 30 tons per 12-month rolling time period. Reported facility VOC emissions are at 3.60 tons per 12-month rolling time period ending in October 2020.

PTI No. 91-12

This is an Opt-out PTI limiting the emissions of Hazardous Air Pollutants (HAP) to less than the major source thresholds.

FGFACILITY

Emission Limits

Each individual HAP is limited to less than 9.0 tons per 12-month rolling time period. The highest reported HAP is xylene at 0.15 tons per 12-month rolling time period ending in October 2020.

Aggregate HAPs are limited to less than 22.5 tons per 12-month rolling time period. The reported total facility HAP emissions are 0.20 tons per 12-month rolling time period ending in October 2020.

Since MEK and IPA are not HAPs, the emissions noted above would not change with the recordkeeping corrections noted above.

Testing/Sampling

The facility had previously requested and received permission to utilize manufacturer's formulation data to determine HAP content of coatings. This is still being done.

Monitoring/Recordkeeping

During the extensive recordkeeping review, AQD staff was able to determine compliance with each of the recordkeeping provisions. The review found that the emissions generated by the IPA wipes and MEK flush solvent was being maintained in the monthly records but was not being transferred into the 12-month rolling VOC totals for the source. However, the changes to the records still indicate compliance at this time.

CONCLUSION

Emerald Graphics, Inc. was in compliance at the time of the partial compliance evaluation records review. Any changes in emissions that could occur following stack testing of the catalytic oxidizer will be evaluated upon the receipt of valid test results. Finally, Emerald will be taking on new work soon and any equipment

changes or additions will need to be evaluated and a permit modification submitted prior to the changes or additions taking place.

NAME April Lazzaro

DATE 01/08/2021

SUPERVISOR HH