

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

E456967930

FACILITY: Arkema, Inc.	SRN / ID: E4569	
LOCATION: 1415 Steele Avenue, S.W., GRAND RAPIDS	DISTRICT: Grand Rapids	
CITY: GRAND RAPIDS	COUNTY: KENT	
CONTACT: Michael Markowski , Plant Manager	ACTIVITY DATE: 06/07/2023	
STAFF: April Lazzaro	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Unannounced, scheduled inspection.		
RESOLVED COMPLAINTS:		

Air Quality Division (AQD) staff , April Lazzaro conducted an unannounced, scheduled inspection of Arkema, Inc. (Arkema) located at 1415 Steele Avenue, SW, Grand Rapids, Michigan. The purpose of this inspection was to determine compliance with Permit to Install Number 100-07D and other applicable air quality rules and regulations. Prior to entry into the facility, staff observed the surrounding area for odors or opacity; none were noted that could be associated with Arkema.

Upon arrival at the facility, I met with Mike Markowski, Plant Manager. I was notified that the environmental contact is Sadi Overland, who was out of the office. We discussed the purpose of the inspection, and Mr. Markowski accompanied me on the plant inspection.

Facility Description

Arkema produces resins by chemical reaction, including waterborne, conventional and high solids solvent-borne resins and high-performance coatings for architectural, industrial, construction applications as well as other applications. The resin manufacturing process is primarily comprised of charging one of four hot oil heated kettle reaction tanks with various ingredients to form a polymer. All powders are added to the kettles by hand, based upon the weight needed for the recipe. The liquids are pumped from various locations, being smaller satellite drums to larger totes and tanks. The reaction is terminated when the polymer achieves the desired specifications. The product is then transferred to a thinning tank where solvent or other additives are added to the product for desired viscosity before transferring the final product to bulk storage tanks, tanker trucks, or drums. The permit identifies each of the four reactor process trains as individual emission units. Each emission unit includes the kettle, packed distillation column, total condenser, column condenser, fume scrubber, thinning tanks and associated condensers and ancillary tanks and equipment. Each emission unit is then vented to a regenerative thermal oxidizer before being emitted to the air. Each of the reaction trains has a newly installed emergency vent, whereby emissions can bypass the RTO if needed. According to Arkema, this has not occurred.

The facility operates up to seven (7) days per week, twenty-four (24) hours per day.

Arkema stated that the roof of the facility is considered a confined space, and as such no access was granted during the inspection when requested. It is noted that AQD staff are not to enter a confined space.

Regulatory Analysis

Arkema has federally enforceable limits to restrict emissions of Hazardous Air Pollutants (HAPs) below the major source thresholds and as such is considered an Opt-out source for HAPs. The limits for Volatile Organic Compounds (VOCs) are not facility wide limits, and as such they are considered a synthetic minor source for VOC. Arkema is a minor source of the other criteria pollutants.

A review of file information found no information related to the Chemical Manufacturing Area Sources National Emissions Standards for Hazardous Air Pollutants (NESHAP) found in 40 CFR Part 63 Subpart VVVVVV. An assessment of applicability of this NESHAP will be requested since it applies to Plastic Materials and Resins Manufacturing that utilize specific HAPs listed in the rule. Information and forms for this notification can be found at the following website:

<https://www.epa.gov/stationary-sources-air-pollution/example-notification-reports-national-emission-standards-hazardous>

Compliance Evaluation

PTI No. 100-07D

FGRESINPROD

This flexible group covers the resin and coating resin manufacturing processes. Several different control devices are used in the various processes including: packed column scrubber/partial condenser operating in tandem where present, total condenser, thermal oxidizer, and a condenser and drum containing carbon that controls odors from the resin truck loading rack.

Permitted equipment includes:

EUUNIT1 a 1100 gallon hot oil heated reactor process train including packed distillation column; total condenser; column condenser; fume scrubber; two thinning tanks; two thinning tank condensers; and ancillary tanks and equipment.

EUUNIT2 a 4200 gallon hot oil heated reactor process train including packed distillation column; total condenser; column condenser; fume scrubber; one thinning tank; one thinning tank condenser; one blend tank; and ancillary tanks and equipment.

EUUNIT3 a 800 gallon hot oil heated reactor process train including total condenser; fume scrubber; one thinning tank; one thinning tank condenser; and ancillary tanks and equipment.

EUUNIT4 a 2300 gallon hot oil heated reactor process train including packed distillation column; total condenser; column condenser; fume scrubber; two thinning tanks; two thinning tank condensers; and ancillary tanks and equipment.

EULOADRACKS a bulk tank farm resin truck loading rack and building 4 resin truck loading rack controlled by a condenser and carbon adsorption unit.

EUDISPERSION a dual process train including two 6100 gallon steam heated dispersion reactors and two vent condensers; and ancillary tanks and equipment.

EUSOLVENTTANKS consists of thirteen storage tanks for solvents. None of the tanks are subject to the 40 CFR Part 60 Subpart Kb requirements for storage tanks.

EURESINTANKS consists of fourteen storage tanks for resins. None of the tanks are subject to the 40 CFR Part 60 Subpart Kb requirements for storage tanks.

EURINSETANKS consists of four storage tanks. None of the tanks are subject to the 40 CFR Part 60 Subpart Kb requirements for storage tanks.

EUMISCTANKS consists of storage tanks for materials other than solvents and resins. None of the tanks are subject to the 40 CFR Part 60 Subpart Kb requirements for storage tanks.

EMISSION LIMITS

Emissions of VOC's are limited to 18.2 pph and 46.5 tons per year (tpy) based upon a 12-month rolling time period. Records for the time period of January 2022-May 2023 were reviewed. The records provided report that the 12-month rolling emissions of VOC ending in May 2023 were 19.60 tpy.

The permit lists what underlying applicable requirements are used to demonstrate compliance with the 18.2 pph emission limit which include monitoring the temperature of the RTO and loading rack carbon drum, as well as the recordkeeping provisions for each. The 2012 stack test indicated an hourly emission rate of 0.13 pph. The 2012 testing also showed a 95% destruction efficiency and a 1 second retention time. Additionally, stack testing data from 2012 is used to demonstrate compliance with the pound per hour limit and to calculate emissions pursuant to the recordkeeping requirements of the permit.

MATERIAL LIMITS

The permit states that Arkema shall not process more than 12,951,000 pounds of solvent, including a maximum of 3,600,000 pounds of a xylene/ethylbenzene mixture, per year, based on a 12-month rolling time period as determined at the end of each calendar month. The reported total solvent use for the period ending in May 2023 was 5,720,944 pounds. The reported xylene/ethylbenzene mixture use for the period ending in May 2023 was 1,195,197 pounds. The reported values indicate compliance with the material limits.

PROCESS/OPERATIONAL RESTRICTIONS

The permit limits production of organic resins to not more than 40,000,000 pounds, and dispersions are limited to 15,000,000 pounds per year, based on a 12-month rolling time period as determined at the end of each calendar month. The reported organic resin produced for the time period ending in May 2023 was 27,303,357 pounds and the dispersions produced was 2,443,793 pounds. The reported values indicate compliance with the production limitations.

The permittee is required to implement and maintain an updated, approvable malfunction abatement plan (MAP) The MAP provided is deficient in relation to the RTO in the following ways:

- Does not include a complete preventative maintenance program, including identification of supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air cleaning devices.
- Does not include a description of the items that shall be inspected, the frequency of the inspections or repairs, nor does it include an identification of the major replacement parts maintained in inventory.

- Does not include the normal operating ranges for the RTO. (temperature or flow)
- A description of the method of monitoring or surveillance procedures. (ie, which temperature value as identified above should be used for compliance purposes)

The MAP plan lists the condensers, scrubbers and rack loading carbon drum but references an additional internal maintenance system for the preventative maintenance activities, which was not provided. A request to update the MAP to include the control devices listed in the permit to meet the requirements of Rule 911 will be made. The plan should also include the knock-out pot that is in place to catch any resin prior to the RTO. The plan should be further modified to remove items that are unrelated to the requirements of the permit.

DESIGN/EQUIPMENT PARAMETERS

The permittee shall not operate FGRESINPROD unless the packed column scrubber/partial condenser or total condenser, whichever is appropriate is installed, maintained and operated in a satisfactory manner. I was informed verbally that they are on a quarterly maintenance schedule. Additionally, there were some pieces of equipment that have gauges, and some that don't. The gauges are not being used to monitor proper operation, and some were not easily accessible due to their height or location. As noted above, this equipment shall be added to the MAP and submitted to the AQD.

The permit requires that the temperature of the RTO is maintained at a minimum temperature of 1,500°F and maintain daily records of the temperature. Arkema is also required to keep a record of the RTO flow rates. At the time of the inspection, the TO was operating at a 1566°F with a flow rate of 1,771 (down from 2,846 CFM during the previous inspection and up from 1,500 cfm during the 2012 stack test). There is no operating range for air flow of the RTO identified in the MAP. It is unclear what the purpose of this operating parameter is, however, it appears to possibly be a requirement that applied to the old oxidizer when it was a single chamber flow through incin-o-tube design that was carried forward through permit revisions.

It was noted that there were two different temperatures for the RTO was being displayed on the control panel. One was the readout from the programmable logic controller (PLC) and one from the temperature recorded on a circular chart. These two temperatures were 40°F different, with the PLC being the lower temperature. A request for additional information was made and Arkema stated that the values for the PLC are an average of two thermocouples and the paper chart tracks temperature from an average of three thermocouples. Arkema stated that the thermocouples cannot be calibrated, and a maintenance schedule for assessing accurate temperatures and/or a thermocouple replacement schedule should be added to the MAP.

A review of the temperature records provided show that starting the week of April 22, 2023, the temperatures were often below 1,500°F, which continued through the June 12, 2023. Arkema continued to operate FGRESINPROD during this time, which is a violation of the temperature requirements of PTI No. 100-07D, FGRESINPROD, Special Condition No. IV.2. A Violation Notice (VN) will be issued. Arkema indicated via email communication that there was a problem with the natural gas regulator and that a valve was replaced during the week of June 12, 2023. According to Arkema, this has corrected the temperature issue. The current Malfunction Abatement Plan (MAP) states that no employee is authorized to start a new batch or finish batches until the thermal oxidizer is operating normally. With the fluctuations in temperatures, it is unclear whether this aspect of the plan was followed.

During the on-site inspection, it was identified that the RTO chamber valves were making different sounds during the chamber valve switches. Based on this observation, and the fact that the RTO has not been tested since 2012, the AQD will request that Arkema conduct a stack test. Additionally, during a review of the RTO inspection reports conducted by an outside contractor, the RTO inlet ductwork has contained large quantities of resinous material, after the knockout pot in place and designed to eliminate this occurrence. It has also been recommended by the outside contractor for the past two years that Arkema should assess the cause of this so it can be corrected. It is also noted that the knock-out pot is part of the emissions control system but is not included in the MAP. Due to the issues with resin being found during the last two RTO inspections, and gallons having to be removed from the ductwork, this may not be properly operating. As such the knock-out pot should be added to the MAP and operational parameters developed.

The permittee shall not fill resin trucks unless the resin truck loading rack control system is installed, maintained, and operated in a satisfactory manner. This includes vapor-tight connections, proper operation of the condenser and carbon adsorption system and maintaining a temperature of the condenser of less than 105°F. Historically, temperatures have been taken downstream at the carbon drum, which is not the same as the condenser. Arkema should evaluate whether there is a difference in temperatures between the two locations and whether the temperature at the carbon drum is appropriate as it relates to the requirements of the permit. This is also notable since there is a length of piping that travels a distance between the condenser and the drum, whereby the temperature of the exhaust stream will cool relative to ambient conditions. Written procedures for the operation of all the control measures described above are to be accessible near the transfer equipment and included in the MAP. Such procedures were not discussed or observed during the inspection. However, a review of the MAP provided did not identify the proper operating parameters for the condenser or carbon control. As such, as required by the permit this should be included in the updated MAP upon resubmittal.

It is noted that Arkema is currently using two loading racks, and the third is out of service. The newest loading rack is not connected to the loading rack control system. Currently Building 4 resin truck loading rack as described in the process equipment description is the controlled loading rack. The bulk tank farm resin truck loading rack is out of service because that unloading no longer occurs. The newer dispersion loading rack is not listed in the permit.

MONITORING/RECORDKEEPING

Arkema appears to be properly monitoring the temperature and flow of the RTO, and the exit temperature of the loading rack condenser is measured at the carbon drum control device.

As indicated above, Arkema should evaluate whether this location is appropriate. It was learned that the temperature records for the condenser and carbon control on the loading rack are kept on the individual bills of lading for the material transfers. As such, they were not readily available, and Arkema noted that there were gaps in the recordkeeping. As such, this is a violation of PTI No. 100-07D, FGRESINPROD, Special Condition No. VI.4.h for failure to maintain records.

The facility appears to be maintaining appropriate material usage records. One item of note is that the monthly throughput of resin does not appear to change from month to month. Arkema should ensure that actual resin throughput information is being used, and not estimates. Additionally, the facility spreadsheet indicates, that the records are based on stack test data from 2012 showed an average 0.13 lb/ hr VOC at 95% average destruction efficiency.

STACK

The stack height of the RTO was measured and found to be in compliance with the permit limit, however the diameter was not measured.

FGFACILITY

This flexible group covers all process equipment source-wide and includes all equipment covered by other permits, grand-fathered equipment, and all exempt equipment.

Emissions are limited to less than 9.7 tpy per 12-month rolling time period for individual HAPs, while aggregate HAPS are limited to less than 24.0 tpy per 12-month rolling time period. Records obtained through May 2023 indicate 12-month rolling aggregate HAP emissions of 6.02 tons (up from 5.85 tons during the previous inspection) with xylene being the highest HAP emitted at 3.40 tons (up from 2.98 tons during the previous inspection) per 12-month rolling time period. It is noted that the facility is still reporting MEK as a HAP. This chemical was delisted as a HAP in 2005.

EXEMPT EMISSION UNITS

The facility has one diesel fuel fire pump that runs for readiness checks for 30 minutes once per week. This unit was installed in 1969 and is exempt from Rule 201 permitting under Rule 282(2)(b)(ii). This unit may be subject to 40 CFR Part 63 Subpart ZZZZ the National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, for Area Sources.

Arkema operates two boilers that are used to supply heat to the facility. The smaller boiler (4.2 MMBTU) is used primarily in the summer months, while the larger boiler (14.65 MMBTU) is used primarily during the winter months. Arkema also has a hot oil heater (17.89 MMBTU). All of which use natural gas as the fuel. All three (3) of these units are exempt from Rule 201 permitting under Rule 282(2)(b)(i). The two (2) boilers are not presently subject to the provisions of the Standards of Performance for Small Industrial-Commercial-Institutional Steam generating units because the small boiler is under 10 MMBTU and the larger boiler, while installed at this location in 1996, was

originally installed and operated in 1967 prior to the promulgation date of June 9, 1989.

SUMMARY

Based upon the observations made during the inspection and a review of the records it appears that Arkema, Inc. is in non-compliance with PTI No. 100-07D and a Violation Notice (VN) will be issued. The VN will also include a request for a NESHAP VVVVVV applicability determination, stack testing the RTO and a requirement to update the MAP.

NAME April Lazzaro

DATE 06/30/2023

SUPERVISOR HH