

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

N694440674

FACILITY: Rex Performance Products		SRN / ID: N6944
LOCATION: 2700 Wills Road, MARYSVILLE		DISTRICT: Southeast Michigan
CITY: MARYSVILLE		COUNTY: SAINT CLAIR
CONTACT: John Von Zellen , Supervisor/Maintenance/Environmental		ACTIVITY DATE: 07/11/2017
STAFF: Sebastian Kallumkal	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Onsite Inspection and RATA observation		
RESOLVED COMPLAINTS:		

On Tuesday, July 11, 2017, Michigan Department of Environmental Quality-Air Quality Division staff Mark Dziadosz, Robert Joseph and Sebastian Kallumkal conducted a targeted, annual inspection at the REX Performance Products, Inc. located at 2700 Wills Road, Marysville, Michigan. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; and Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451 and the requirements of the Renewable Operating Permit (ROP) No.: MI-ROP-N6944-2017, AQD Consent Order No. 21-2010 and to witness the RATA for the Compliance Assurance Monitoring System (CAMS). The test plan was submitted electronically on June 7, 2017, and approved on June 19, 2017.

The Consent Order AQD No. 21-2010 was finalized and was effective on January 18, 2011. This consent order was issued because the facility did not submit timely administratively complete initial ROP application and allowed the facility to operate the equipment in compliance with the PTI No. 162-00E (previous PTI) in absence of the application shield and until the issuance of the initial ROP. The previously issued Consent Order AQD No. C-2006 is null and void after CO 21-2010 was issued. On August 12, 2017, AQD received a request the facility to terminate Consent Order AQD CO 21-2010. The request is currently under AQD review.

We arrived at the site at about 10:50 AM. We met Mr. John von Zellen, Maintenance Manager and Ms. Ms. Marsha Hicks, Environmental and Quality Coordinator at the facility. We introduced ourselves and stated the purpose of our inspection.

#### INSPECTION:

John accompanied us to the CAMS monitor room where the testing was being conducted. Steve, BTEC, Inc. was conducting the test. He told me that the current run (#6) started at 10:35 AM. They used separate Reference Monitors (RM) for each vent (east and west). We also met Jake, the CAMS maintenance person.

East = 206 ppm; West = 180 ppm

The REX monitor showed 182.1 ppm (30 lb/hr) for both vents combined. REX combines both sample collected from each vent and analyzes in a single monitor. The RATA consists of a minimum of nine 21-minute runs.

Next, John took us for tour of the facility. All three extruders (Units 1 and 2 combined) were running.

EUEXTRUDER3 (Line 3): 28.4 kg/hr Isobutane; 600 lb/hr material  
 EUEXTRUDER 4 (Line 4): 36 kg/hr isobutane; 1000 lb/hr material (installed in 2016)  
 EUEXTRUDER 1 and EUEXTRUDER2 (Lines 1 & 2): 24 kg/hr isobutane; 1200 lb/hr material

We also inspected the exhaust vents. The testers were measuring the exhaust gas flow rate through each vent for each run.

The pressure differential for exhaust vents were measuring using pressure gauges.

West exhaust = 0.11"WC

East exhaust = 0.04"WC

John explained that the production area is equipped with 16 gas detectors (sniffers) to detect isobutane leaks. The alarms (light) were set at:

<10% LEL = Green

10-19% LEL = Amber steady

20-59% LEL = Flashing amber

>60% LEL = Red. The system shuts down.

The facility also has two VOC alarms. If the concentration is greater than 50 ppm, the lights on the south wall start flashing.

The reclaim extruder (EURECLAIM) was running at the time of the inspection. EURECLAIM2 installed in 2016 was not running.

I observed that, compared to my previous year inspection, the facility upgraded its eco-ducts, which disperse ions into various areas of the facility, with better quality material. They have pedestal fans on the ground level (floor sweepers) which would help the dispersion of ions to the floor level. He told me the floor level ion dispersion increased the efficiency of the control equipment. The eco-ducts appeared to be in good shape. I did not see any torn eco-ducts in the areas.

John explained that the facility has nine air makeup units (4 large units and 5 small units). Each air makeup unit has eight ion producer units and each ion producer unit has 5 bulbs. So, they have total 360 bulbs for the control system. Each ion producer unit has red indicator light which would not shine if any of the bulbs is burned. Each month one of the ion producers is maintained by the facility. The facility's Preventive Maintenance/Malfunction Abatement Plan (PMP/MAP) requires the bulbs be replaced as preventive maintenance on an annual basis. John told us that the bulbs are replaced on an annual basis.

During the inspection, I visually inspected the other wall vents of the building. I explained to them that the vents should not be opened because keeping the vents opened would cause the exhaust to bypass the monitor. John agreed to keep all the vents closed at all the time except the monitored vents.

REX Performance currently operates 24 hours per day and 7 days per week. Its current main production is sheets for the Sealy Mattresses and packaging materials.

At the time of our inspection they had various finished products in the production room. Some of the products are kept in the production room for 24 hours while others are kept for 5 days for de-gassing prior to removing to other areas of the plant.

During the inspection, I collected copies of the CAMS hourly emission report and April through June CAMS reports, Daily, Monthly, Quarterly, Semi-Annual, and Annual checklist for the CAMS. The isobutane usage, smoke tests, quarterly CGA, etc. are submitted quarterly with the excess emission reports.

Mark Dziadosz (AQD-TPU) observed that the facility's monitor readings were consistently lower than the RM. He discussed that finding with Jake, the maintenance technician for the CAMS and the testers. They indicated that the facility's monitor analyzes cold samples, but RM analyses heated sample and humidity may be contributing to the difference.

During the post inspection meeting, we discussed this issue with John, Marsha and Michael Cuffa. General Manager, REX Performance. They agreed to install a sample heater if necessary. Mark indicated that he would review the monitor installation plan and discuss it with his supervisor to see if heated sampling would be necessary. Later, at the office, he discussed the findings with his peers and supervisors and concluded that heated sampling would not be necessary because the exhaust gas is at room temperature. (More details in the attached emails).

#### **PROCESS:**

The facility manufactures polyethylene foam products. It has four extruders: one 600 lb/hr FG-90 (EUEXTRUDER1), one 1200 to 1500 lb/hr FG-90 (EUEXTRUDER4), and two 500 lb/hr FG-75 (EUEXTRUDER2 and EUEXTRUDER3). They use polyethylene beads as the primary polymer and liquid isobutane (blowing agent) as the raw material. A heated cross over is fixed in the end of the extruders so that the melted plastic can be fed to the either a profile or sheet die. Each extruder utilizes either of the two-downstream handling/takeoff equipment that are used for foam sheet production and for profile parts production. Extruder 1 and Extruder 2 can be run individually or is run alone or combined with a single die. The Extruder 3 and Extruder 4 are always run separately. The extruders produce packaging materials, and sheets for mattresses, etc. John told us that they are getting out of the swim noodle production business.

The blowing agent, isobutane is injected in to the extruders with the melted plastic. The melt is then transported down the barrel under pressure to mix the blowing agent and plastic thoroughly and develop the correct pressure and temperature within the melt to produce the desired properties in the finished products. As the mix is pushed out of the die, the release of pressure allows the blowing agent to expand causing the formation of cells in the plastic, which produce the foam property.

In the profile manufacturing mode which is a straight shot out of the front of the extruders, the shape is set by the dye. It is cooled through a water spray bath and then cut to size.

In sheet production mode, heated adapters are used to move the melt from either extruder to the offset die so that one set of sheet takeoff equipment can be utilized for both extruders. In sheet production, the melt is extruded through a circular die and it is then split and straightened to form a flat sheet. The sheet is transported over cooling cans and then wound into rolls for storage and shipment.

In the polyethylene scrap recycling process, the scrap foam is shredded in one of the two shredding machines. The shredded scrap material is conveyed by air to storage bags located adjacent to the Reclaim Extruders (EURECLAIM and EURECLAIM2). Shredded material is then conveyed from one of the two storage bags to the reclaim extruder using a vacuum transportation tube. Once conveyed to the Reclaim Extruder and melted, the melt is then extruded through a strand/palletizing die and immediately cut into beads. This extrusion and cutting occurs in a water bath. The beads are instantly cooled and transported by the cooling water to a separator. After the water is removed, the beads are sent to a centrifugal bead dryer to remove any remaining moisture. The beads are boxed, stored, and eventually returned to the production line along with new feed stock and converted to foam.

The VOC (isobutane) emissions are controlled with an Air Code Ionization Control System (ICS). The ICS consists of nine air makeup units with eight ionization unit in each. It has a total of 72 ionization units (pods) with five bulbs per pod for a total of 360 bulbs. The bulbs in one air makeup unit (40 bulbs = eight ionization unit and five bulbs in each ionization unit) are changed every month and all 360 bulbs are changed on annual basis. The ionization tubes provide positive and negative charged ions to the air supply fans located at different locations inside the extrusion production (extrusion hall) area.

Each ionization pod contains a cluster of tubes. The tubes operate a medium voltage corona, minimizing the formation of ozone, and create an appropriate mixture of positive and negative ions. These ions free electrons from the oxygen molecules in the air and allow those molecules to break the pollutant molecular structures into less harmful chemicals. The ions react with the VOCs and supposedly reduce them into carbon dioxide and water.

The positive and negative ions are dispersed through ventilation supply ducts (Ecoducts) to all areas of the production floor and reclaim room. These rooms meet the requirements for a permanent total enclosure, accounting for 100% capture, and act as the "reaction chamber". The exhaust from this reaction chamber is through two axial fans. Each exhaust hood consists of two inlets and one outlet through the wall of the building about 15 feet from the floor. The facility adds humidity (spraying moisture) enhance the reaction.

Many ecoducts are arranged over the four extruders where most of the isobutane is emitted. They have installed particulate filters to protect the bulbs from dust. These filters are routinely inspected and replaced on a semi-annual basis.

## Compliance Evaluation

MI-ROP-N6944-2017

### FGFACILITY

This includes EUEXTRUDER1, EUEXTRUDER2, EUEXTRUDER3, EUEXTRUDER4, EUEXTRUDER5, EURECLAIM and EURECLAIM2.

ROP Special conditions (SC) I.1 and I.2 limit the facility's annual VOC emission rate to 178 tons per year on 12-month rolling time period basis and 476 lb/8-hr. The submitted emission calculations for July 2016 through June 2017 show that the facility has not exceeded 8-hr and annual VOC emission limits. The 8-hr VOC emissions, so far, were 443 lbs in June 2017. As of June 2017, the 12 month rolling VOC emissions was 131.7 tons which is in compliance with the annual emission limits.

ROP Special Condition III.1 requires the facility to submit a malfunction abatement plan/preventive maintenance plan (MAP/PMP). The facility submitted a MAP/PMP on September 7, 2016.

Special Condition III.2 requires that the permittee maintain the east and west exhaust fan systems such that the individual exhaust fan flow rate is approximately the same as the flow rate measured during the most recent compliance test. Each exhaust fan (East Exhaust Fan and West Exhaust Fan) has two exhaust intakes.

### August 4, 2015 RATA Test

East Stack Exhaust, Average Total Flow rate = 10,836 SCFM

West Stack Exhaust, Average Total Flow rate = 12,175 SCFM

The combined flowrate was approximately 22,968 SCFM.

The exhaust flow rate was measured during July 11, 2017 RATA test. The flow rate will be compared after the report is submitted.

ROP SC IV.1 requires the facility to install and properly maintain an ionization control system. The facility had installed the Air Code Ionization Control System (ICS) and performs routine preventive maintenance for the control equipment. The facility keeps a preventive maintenance log for this control system.

ROP SC IV-2 requires that the facility maintains the non-fugitive enclosure properly. The facility is performing smoke tests for each natural draft opening (NDO) every month. The smoke tests show that the air flows into the non-fugitive enclosure. The facility conducts smoke test every month and submit the results every quarter.

ROP SC IV.3 requires that the permittee to install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the VOC emissions from FGFACILITY on a continuous basis. SC IV.4 requires the permittee to install and operate this Compliance Assurance Monitoring System (CAMS) system to meet the timelines, requirements and reporting detailed in Appendix 9 of the ROP and to use the CAMS data to assure compliance with the daily and annual VOC emission limits.

The facility has installed a continuous VOC monitor which collects air flow from both exhaust vents. The CAMS was installed, calibrated, maintained and operated in accordance with PS8 of Appendix B, 40 CFR Part 60. As specified in the Appendix 9, Requirement 3, the facility's RATA frequency is reduced to once in eight quarters along with Cylinder Gas Audit (CGA) in each of the 7 quarters of the 8 continuous quarter periods. The facility conducted the latest RATA test on July 11, 2017. The RATA limit is 20% and each parameter (VOC ppm and VOC lb/hr) was less than 20% based on raw data. The compliance will be evaluated after the report is submitted. The facility submits quarterly CGA reports with its quarterly excess emission reports. The facility is in compliance with this requirement.

The permittee is required to send reports for quality assurance and Excess Emission Report (EER) and summary report (Appendix 9-Requirement 4) to AQD within 30 days after the end of the quarter. The facility is in compliance with this requirement.

ROP SC V.1 requires the facility to verify the direction of flow at least once every six months and to submit a notification of the test to AQD. The facility verifies direction of flow on a monthly basis and submits the reports quarterly.

ROP SC V.2- requires the facility to verify VOC emission rate from FGFACILITY if requested by the AQD District Supervisor. AQD has not made such a request. Furthermore, the emission rate is verified during RATA. The CAMS provides VOC emissions in PPM and calculates the lb/hr emission rate using exhaust flow rate.

ROP SC V.3 basically requires the facility to conduct quarterly cylinder gas audit (CGA) and one RATA in an 8-quarter period. The facility conducts quarterly CGA and a RATA as required by this condition. Facility submits the notifications and test reports as required.

ROP SC VI.1- The facility has installed a continuous VOC monitor and is continuously monitoring VOC emissions. The monitor is calibrated on a daily basis. Facility keeps the calibration records.

ROP SC VI.2 requires the facility to keep written records of VOC emissions based on 8-hr period and 12-month period. I did not request 8-hr emission calculations. CAMS calculates the hourly emissions. The VOCs are emitted 24 hours. I calculated the 8 hr emissions using the highest daily emissions. The facility is keeping 12-month VOC emissions.

ROP SC VI.3 - Facility keeps records of all verifications of the direction of air flow at the non-fugitive enclosure NDOs.

ROP SC VI.4 requires the facility to keep the 8-hr emission rate based on hourly basis. I did not request 8-hr emission calculations. CAMS calculates the hourly emissions. The VOCs are emitted 24 hours. I calculated the 8-hr emissions using the highest daily emissions.

ROP SC VI.5 requires the facility to daily, monthly and 12- month rolling time period records of VOC blowing agent (isobutane). The facility keeps records of blowing agent (isobutane) usage on a daily basis. The facility calculates VOC emissions in pounds per hour and day. It also calculates the 12-month rolling VOC emission rate in tons per year.

ROP SC VI.6- The facility keeps records of the daily, monthly, quarterly and semi-annual maintenance and inspections of the control system and monitoring system.

**Conclusion:**

Based on the inspection and review of the submitted reports, the facility appears to be in compliance with the applicable air quality requirements. The RATA would be reviewed upon receipt of the report.

NAME Sebastian Kallunki

DATE 9/1/17

SUPERVISOR Jorge St