

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

N694436050

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: 08/19/2016
STAFF: Sebastian Kallumkal	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Onsite Inspection		
RESOLVED COMPLAINTS:		

On Friday, August 19, 2016, Michigan Department of Environmental Quality-Air Quality Division staff Sebastian Kallumkal and Tyler Salamasick conducted a targeted, annual inspection at the REX Performance Products, Inc. (previously Michigan Foam & Fabrication, LLC.) 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-N6944-2011b, AQD Consent Order No. 21-2010 and Permit to Install No. 162-00F for the installation of EUEXTRUDER4 and EURECLAIM2. The ROP Renewal application is currently under technical review. PTI No. 162-00F will be incorporated into the ROP during renewal.

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.

We arrived at the facility about 10:50 am. I met Mr. John vonZellen, Maintenance Supervisor and Ms. Marsha Hicks, Environmental and Quality Coordinator. We introduced ourselves and provided the "DEQ Environmental Inspections: Rights and Responsibilities" brochure.

During pre-inspection meeting, we discussed the installation of the new extruder, RATA test, Malfunction Abatement Plan submittal, Monitor maintenance, control equipment maintenance, etc. He informed me that the EUEXTRUDER4 and the EURECLAIM2 was installed on June 24, 2016, and an acceptable product was produced on July 11, 2016. The EUEXTRUDER4 is not currently in operation. I reminded him of the requirement (PTI No. 162-00F, SC VII.1) to send notification within 30 days after the installation of EUEXTRUER4 and EURECLAIM2, in writing, regarding the completion of the activity. The completion of the installation is considered to occur no later than commencement of trial operation of EUEXTRUDER4 and EURECLAIM2. AQD received a notification of the completion of the installation of these processes via email on August 31, 2016.

I also informed them that the new PTI has an 8-hr VOC limit and they should start calculating, recordkeeping and reporting VOC emissions on a rolling 8-hr limit and Tons per year. I also mentioned that they may request to void the AQD Consent Order No. 21-2010 if they are in compliance with the requirements. I advised them to send a letter to AQD Division Chief for the request.

We also discussed the revised Malfunction Abatement Plan (MAP) required by PTI No. 162-00F, SC III.1 which requires a revised MAP to be submitted within 60 days of issuance of this permit (issued May 17, 2016). Facility has not submitted a revised MAP after the permit was issued. It submitted a MAP on March 11, 2016, prior to the issuance of PTI, and as part of the ROP renewal application submittal. I informed them the MAP needs to include more details about control equipment maintenance and monitoring, and it should include all the items listed in SC III.1. John emailed a revised MAP/PMP on September 7, 2016. This PM/MAP is under review.

They told us that they upgraded their ionization control system and added four more air makeup units.

Each air makeup unit contains eight ion producing units (pods). Each ion producing unit has 5 bulbs. Each month they change the bulbs in each air makeup unit (40 bulbs).

The newly installed eco-ducts which disperse ions into various areas of the facility are of better quality material. They also installed fans on the ground level (floor sweepers) which would help the supply and dispersion of ions to the floor level. He told me the floor level ion dispersion increased the efficiency of the control equipment. They also added more eco-ducts in the inventory (storage) areas.

The facility has light signal which is connected to the VOC emission monitor. The bulb is usually "yellow", but when the monitor measures 40 lb/hr or more, the color changes from yellow to red. When the signal is changed to "red", the operators look for the cause(s) for the elevated VOC levels and take immediate actions. The facility also has 16 isobutane sensors (sniffers) in the main extrusion area. The bulb light yellow normally, but changes to "red" when isobutane concentration is high. The isobutane pump is shut off when the signal turns to red.

The ionization control system currently has eight air makeup units with eight ion producer units in each and 5 bulbs in ion producers unit. 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.

During the second quarter, facility reported that they had 14.63 hours of monitor downtime. However during evaluation of the data by AQD-Technical Program Unit staff evaluated the data and found another 32 hours of data was missing. The facility explained that the monitor was operating during that time, but data was not saved to the system for retrieval due to an electronic virus attack. They contacted the monitor technician, but he was not able to retrieve the data for review. In order to prevent this happening again the facility is keeping the monitor computer off line. TPU decided to consider the whole time when data was not available as downtime and requested an explanation from the facility. On September 7, 2016, John emailed an explanation to Mark Dziadosz, TPU. The information is under review by TPU Staff. (See attached emails for details).

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 2 is run alone or Extruder 1 and Extruder 2 run combined with a single die. The Extruder 3 and Extruder 4 are always run separately. The extruders produce packaging materials, swim noodles, sheets for mattresses, etc.

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 so the beads are instantly cooled so they do not stick together and are then 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 eight air makeup units and eight ionization unit in each. It has a total of 64 ionization units (pods) with five bulbs per pod for a total of 320 bulbs. The bulbs are changed in an eight month cycle. The bulbs in one air makeup unit (40 bulbs = eight ionization unit and five bulbs in each ionization unit) are changed every month and in eight month all 320 bulbs are changed. The ionization tubes provides positive and negative charged ions to the air supply fans located at three 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 two 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.

INSPECTION:

After the pre-inspection meeting, they accompanied us for an inspection of the facility. We visited the storage, laminating, reclamation area, extrusion area and CEMS area. One of the storage rooms near the product extrusion was closed and sealed off.

At the time of the inspection EXTRUDER 1, EXTRUDER 2 and EXTRUDER4 were not operating, EXTRUDER 3 was operating.

Production Data at the time of inspection:

EXTRUDER3: Isobutane 23 kg/hr; Polyethylene: 530 lb/hr

East Vent dP = 0.14"WC, West Vent dP = 0.16 "WC

I observed that few of the ECODUCTs were damaged. I advised them to replace all the damaged ECODUCTs to get good air (ion) flow in required areas. He told me they are in the process of replacing the damaged eco-ducts.

I also observed that a door in the production area (reaction chamber) is open to a maintenance room and the door of this room was open to outside. I pointed this to John and told him that this not acceptable as a permanent total enclosure. He closed the outside door and informed me that the he will make sure that won't happen again. He showed me the locks for the switches for the wall fans located above the vents.

The switch locks were fitted so that someone does not accidentally turn on the fans and bypass the monitor.

Next we inspected the scrap reclaim area. The facility has two grinders and two reclaim extruders (EURECLAIM and EURECLAIM2). This area is equipped with ECODUCTS.

Next we inspected the CEMS. The monitor was reading 34 lb/hr and 209 PPM VOC at that time.

REX Performance currently operates 24 hours per day and 7 days per week. Its current main production is sheets for the Sealy Mattresses. They also manufacture swim noodles 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 copy of the CAMS hourly emission report. Later they send me copies of June-August CAMS reports, Daily, Monthly, Quarterly, Semi-Annually, and Annually checklist for the CAMS. The isobutane usage, smoke tests, quarterly CGA, etc. are submitted quarterly with the excess emission reports.

Compliance

MI-ROP-N6944-2011b and PTI No. 162-00F

Both permits have similar requirements except for the emission limits. The PTI will be incorporated into the ROP during renewal. The compliance with the requirements is discussed below.

FGFACILITY

ROP Special conditions (SC) I.1 and I.2 limit the facility's annual VOC emission rate to 220 tpy and daily emissions to 1670 ppd. The PTI SC I.1 and I.2 limits the VOC emissions to 178.0 tons per year on 12-month rolling time period basis and 476 lb/8-hr. The submitted quarterly excess emission report (includes emission calculations for July 2015 through June 2016) showed that the facility has not exceeded daily and annual VOC emission limits. The highest daily VOC emissions were 1543 lbs on January 9, 2016. The highest June-July 2016 daily emissions were 1,145 pounds (July 13, 2016). So the 8-hr emissions were about 382 pounds which is compliance with the 8-hr emission limit. As of July 2016, the 12 month rolling VOC emissions was 158.96 tons which is in compliance with the annual emission limits.

ROP Special condition II-1 limits the isobutane usage to 1,670,400 pounds per 12-month rolling time period as determined at the end of each calendar month. The records show that the facility used 1,054,565 pounds of isobutane during July 2015-June 2016. The PTI has no limit on the isobutane usage.

ROP Special Condition III.1 requires the facility to submit a malfunction abatement plan/preventive maintenance plan (MAP/PMP). AQD received a revised, approvable plan on October 11, 2010. PTI requires facility to submit a revised MAP/PMP within 30 days of initial start of EUEXTRUDER4 and EURECLAIM2. As of the date of inspection the facility has not submitted the revised MAP/PMP. I informed John of this requirement. I provided him details of the plan. He agreed to submit it soon. The facility submitted a MAP/PMP on September 7, 2016. The PM/MAP is currently under review.

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.

Next RATA test should be completed in the 3rd Quarter 2017. The flow rate will be compared during that test to verify compliance.

The PTI has no similar condition.

ROP SC IV.1 and PTI SC IV.1 require 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. See discussion above.

ROP SC IV-2 and PTI SC IV.1 require 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 and PTI SC IV require 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. The condition also 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 Appendix A of the PTI 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 last RATA test on August 4, 2015. The RA limit is 20% and each parameter (VOC ppm and VOC lb/hr) was less than 20%. The facility submits quarterly CGA reports with its quarterly excess emission reports. PTI Appendix A requires the facility to perform quality assurance procedures in Appendix F of 40 CFR Part 60. 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's emission rate test and RATA test to verify the VOC emissions and the accuracy of the monitor. The last RATA was conducted on October 10, 2013 and report was received on December 9, 2013. The report showed that the CAMS barely passed the RATA. The relative accuracy was 19% with the limit being 20%. AQD reminded the facility in a letter dated December 19, 2013, that the monitor may require adjustment, maintenance or repair to improve relative accuracy. Facility's August 4, 2015, RATA test showed 1.1% of RA for VOC ppm and 2.9% RA for VOC (lb/hr).

Facility had conducted a performance test during the 2011 RATA test due to the installation of the new process equipment, EXTRUDER3. The emission rate showed compliance with the VOC emission limit. Facility's initial performance test and emission rate test were done when the CAMS was installed. The CAMS provides VOC emissions in PPM and calculates the lb/hr emission rate using exhaust flow rate.

The new PTI was issued for the installation of a new extruder and reclaim extruder. However VOC emission verification was not included in the PTI because the RATA also measures the VOC emissions and the facility has a continuous VOC emissions monitor. The VOC emission verification is required if

requested by AQD (PTI SC V.2).

ROP SC V.2- Facility verifies that VOC monitor meets the requirements of Performance Specification 8. Facility submits the notifications and test reports as required.

ROP SC V.3 and PTI SC V.1 - Facility is required 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.

ROP SC VI.1- Facility keeps daily records of the amount of blowing agent (isobutane) used in FGFACILITY. PTI does not have similar requirement.

ROP SC VI.2 and PTI 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.3 and PTI 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 and PTI SC VI.2 The facility keeps records of blowing agent (isobutane) usage on a daily basis and calculates VOC emissions in pounds per day. It also calculates the 12-month rolling VOC emission rate in tons per year. The facility is reminded to keep records of the 8-hr VOC emissions as required by the PTI. The PTI has no requirement to keep records of isobutane usage.

PTI SC VII.1- The facility is required to notify the AQD District Supervisor, within 30 days after completion of the installation of EUEXTRUDER4 and EURECLAIM2, in writing, of the completion of the activity. Completion of the installation is considered to occur no later than commencement of trial operation of EUEXTRUDER4 and EURECLAIM2. We discussed this notification requirement during the inspection and John agreed to submit the notification.

Conclusion:

Based on the inspection and review of the submitted reports, the facility appears to be in compliance with the applicable air quality requirements. John emailed the installation notification letter on August 31, 2016 and the MAP/PMP of September 7, 2016.

The facility shall install and maintain the Eco-ducts for ion dispersion where ever necessary. The facility shall also calculate and keep records of the 8-hr VOC emission rate to show compliance with PTI SC I.2.

NAME Sebastian J Kallunkal

DATE 9/14/2016

SUPERVISOR

