

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

N723826660

FACILITY: Polytech Moulding Industries Inc.		SRN / ID: N7238
LOCATION: 1609 BIDDLE AVE, WYANDOTTE		DISTRICT: Detroit
CITY: WYANDOTTE		COUNTY: WAYNE
CONTACT: Eric Ley, Production Superintendent		ACTIVITY DATE: 07/02/2014
STAFF: Jeffrey Korniski	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Scheduled Inspection		
RESOLVED COMPLAINTS:		

INSPECTION REPORT
(PCE for an FCE source)

Date of Inspection: July 2, 2014
Date of Report: August 28, 2014
Source: Polytech Moulding Industries Inc.
SRN: N7238
Address: 1609 Biddle Ave., Wyandotte, Michigan 48192
Subject: Scheduled Inspection
Author: Jeff Korniski, Air Quality Division, Detroit Office

Safety Equipment/Safety Training/Security:

Hard hat, steel-toed boots, and safety glasses are required in process areas of the plant. Hearing protection is required near the tricalcium phosphate bag dump area when in operation. Visitors must sign in at the administration building, which services visitors to BASF Corporation, Polytech Moulding Industries, and Abbott Laboratories. A visitor will be issued a Visitor's Badge which must be worn at all times. A visitor is required to observe an orientation and safety video; an orientation card is then issued to the visitor which remains valid for one year.

Facility Background:

Polytech Moulding Industries (Polytech), also known as Concepp Technologies, is a plastics processing plant located on the grounds of the BASF Corporation site at 1609 Biddle in Wyandotte, Michigan, specializing in the expansion of polypropylene pellets (EPP process or plant). Formerly owned by BASF and part of SRN M4777, on April 30, 2003, control of the operations was passed to Concepp Technologies and the EPP process became a separate stationary source assigned SRN N7238. On August 1, 2009, Polytech Moulding Industries located in Granby, Quebec purchased the plant.

The facility comprises two expanded polyolefin (EPO) process lines known as EPOI and EPOII. Polypropylene solids are extruded, cut into pellets, and charged into a process vessel with water, tricalcium phosphate (TCP) powder, and a nitrogen/butane gas mixture. The gas migrates into the pellets under pressure; subsequent depressurization expands the gas and thus expands the pellets. Nitric acid washes the pellets of TCP, which is recovered from the wash through pH adjustment. The pellets are dried, held for a time in batch silos to allow residual butane to off-gas, and finally transferred to bulk storage silos to await shipment.

Fabric filters control particulate emissions at the TCP bag dump station and at the batch silos. Butane/nitrogen gas is drawn from the process vessels to collection tanks and the butane recovered in a nitrogen condensation system for reuse in the process vessels. Off-gassing residual butane vents unrecovered and is replaced with fresh butane from storage as needed. The nitric acid storage tank is equipped with a water scrubber control.

Alterations to the polypropylene/butane ratio and modifications to the temperature and pressure within the process vessels produce expanded polypropylene pellets with different densities and physical characteristics. The products are marketed under the Concepp Technologies business unit; according to the company's website, 15 products are currently offered with densities ranging from 1 to 7 pounds per cubic foot.

Summary of Facility Visit:

I arrived at the BASF campus on 7/2/2014 at 10:20 AM and signed in at the administration building; I remained on-site until approximately 11:30 AM. The safety video was not viewed because my site orientation card issued 9/26/2013 was active. Based on flags in the area, the wind was from the southwest to the northeast at 10 to 20

miles per hour during the visit, therefore, odor observations were not performed in the neighborhood upwind to the west of Polytech's operations. Mr. Eric Ley, Production Superintendent, was my escort for the inspection and accompanied by Mr. Mark Knowles, who has recently been appointed as the Plant Manager for the site.

The equipment in and about the Bulk Loading Facility (BLF) was observed. A single plastic extruder was observed installed and operating, producing pre-expanded pellets from a black-colored polypropylene raw material. The product line currently listed on the company's website is outdated and only black products are being manufactured, therefore, the same raw material is used for the entire product line. Expanded product pellets manufactured in the Expanded Polyolefin Process (EPP) building are housed in the forty mesh-product storage silos installed within the BLF. A Graymills tool bath has recently been purchased for the maintenance area of the BLF; it is not yet in use and no fluid was in it. I indicated to Mr. Ley that I would provide a copy of the cold cleaner requirements and that I would ask for further information on the bath and its cleaning fluid.

Production equipment is housed within the EPP building and around its perimeter. Polytech monitors production and pollution control equipment on computer consoles displaying valve position, temperature/pressure controls, tank levels, pressure drops, etc. on EPOI, EPOII, and raw material equipment in the plant. These parameters were viewed in the control room. EPOII was in operation at the time of the site visit and EPOI shut down.

Emissions of butane, a volatile organic compound (VOC), are the predominant air emission at the plant. At 3,800 cubic feet for TK-780 in EPOI and 5,500 cubic feet for TK-880 in EPOII, each of the two waste gas tanks has the capacity to accommodate an entire waste gas vent from its respective process vessel. A computer interlock prevents the pressure/temperature from rising above specified levels in a process vessel until the respective waste tank registers sufficient capacity to accept the volume of waste gas to be released after a completed batch.

A one pass condensation system recovers butane from the gas stored in the waste gas tanks. A non-contact water chiller, two (alternating) dehydrators, a nitrogen-coolant condenser, and a butane collection tank constitute the condensation system. The chiller and a dehydrator condense out the water vapor and the nitrogen condenser liquefies the butane for collection. The remaining waste gas, composed almost entirely of nitrogen, is vented to atmosphere at a discharge point approximately 10 feet above ground. The liquid butane is collected in the in-process butane collection tank and reused in the process. The liquid nitrogen coolant is stored in a vertical storage tank. An interlock prevents the release of butane from a waste gas tank if one or more indicators reflect a malfunction in the condensation system, such as a gas temperature exiting the condenser in excess of -50°F. Taken with the interlock linked to the waste gas tanks, this system is designed to prevent an emergency release of butane to atmosphere due to a breakdown in either a waste gas tank or the condensation system; upon detection of an irregularity operations are halted at points where the butane gas may be contained until the problem is corrected.

The condensation system recovers approximately 99% of the butane entering the system if the top of the condensation column maintains a temperature of -186°F or lower. From the computer display in the control room, the temperature gauge at the top of the column registered -230°F at the time of the inspection. Overall, the condensation recovers approximately 85% of the butane used in a given batch; the remainder is lost as fugitive emissions emitted after the expanded beads exit the process vessels. Butane lost to atmosphere is replaced with fresh butane from a 16,000 gallon storage tank. At the time of the inspection, the tank contained 44,000 pounds butane and was slightly over 50% of capacity.

The condensation unit is a part of the ambient butane monitoring system installed at the plant wherein 32 butane detectors are placed at locations of known possible butane release points. All sensors are set to alarm and shutdown that section of the process should the sensor read a butane concentration of 1100 ppm or greater, 10% of butane's lower explosive limit. Four of the butane sensors are installed at the condensation system – one near the waste gas vent and three near ground level (because butane is heavier than air at ambient conditions). None of the sensors were displaying an alarm in the control room when observed during the inspection.

A pressure drop gauge is installed across each of the three baghouses (F-880, F-780, and F-841) and the pressure readouts are on display in the control room. All three baghouses vent vertically unobstructed to the ambient air. F-780 was not in operation because EPOI was down. F-841 was not in operation because TCP powder was not being added at the time of the inspection (TCP powder addition is a brief operation that occurs approximately once per day). The EPOII batch silos were in use but the process was not in a stage where the fan drawing to the baghouse was blowing; therefore, pressure drop across the F-880 baghouse registered only 0.1" WC.

The packed bed water scrubber installed on the nitric acid storage tanks was observed operating with a flowrate of six gallons per minute. An Armostat brand anti-static agent is applied to the finished beads. No emergency generators are currently installed at the plant.

No spillage was noted in the EPP Building, in the BLF, or on the surrounding grounds. No odors were noted and no opacity emissions were observed from the process equipment viewed.

Compliance Status:

Polytech Moulding Industries was issued an initial ROP on 2/23/2005 and the permit was last renewed as MI-ROP-N7238-2011 on 5/26/2011. Prior to 7/2/2014, the last inspection occurred on 9/25/2012; this inspection report covers compliance activities occurring since 10/1/2012. A request for information from Polytech was received on 8/21/2014.

The ROP covers flexible groups FGPEO and FGRULE290. FGPEO comprises emission units EUEPOI, EUEPOII, EUEPORAWMATERIAL, and EUEPOBULKSTORAGE; these emission units represent the EPOI equipment, EPOII equipment, raw material storage equipment (including the TCP hopper, blower, conveyor, slurry tank, and baghouse F-841), and the Bulk Loading Facility, respectively. FGRULE290 comprises emission units EUEPOACIDTK702 and EURULE290. The Armostat addition was evaluated in the permitting process and is permitted as a part of the EPO emission units (please see permit file for Wayne County Installation Permits C-10235 through C-10241 and C-10580 through C-10586 issued to BASF Corporation).

MI-ROP-N7238-2011, General Conditions

9, 10 – Compliance – Air cleaning devices shall be installed, maintained and operating properly; collected air contaminants shall be removed to maintain the control at the required operating efficiency; the collection and disposal of air contaminants shall minimize introduction of air contaminants to the outer air.

The ROP emission unit conditions require proper operation of the primary pollution control devices: the baghouses at EUEPOI and EUEPOII, the baghouse at EUEPORAWMATERIAL, the butane condensation system at FGPEO, and the scrubber for EUEPOACIDTK702. These requirements will be addressed individually within each emission unit or flexible group.

11 – Compliance – Visible emissions from process stacks and vents are limited to 20% opacity over a six-minute average, except for one six-minute average per hour of not more than 27% opacity – During the inspection of 7/2/2014, I viewed the stacks and did not note visible emissions. I judged Method 9 readings unnecessary to determine compliance.

12 – Compliance – Nuisance dust and odors are prohibited – No citizen complaints have been received by AQD alleging nuisance dusts or odors from this source since the last compliance inspection in 2012.

19 through 23, 25 (and under individual EU/FG tables at SCs III.B.IV.1 through 3) – Compliance – Certification of reports and prompt reporting of deviations – Annual certification and semiannual deviation reports were received 4/14/2014, 4/14/2014, and 3/14/2013. Zero deviations are reported for the semiannual periods. Please see reports N723824926 and N723820721.

24 – Compliance – Submissions to the Emissions Inventory – The AQD received this facility's 2013 and 2012 MAERS databases on (or postmarked) 3/6/2014 and 3/14/2013. Please see reports N723824925 and N723821119.

MI-ROP-N7238-2011, FGPEO Special Conditions

I.1, II.1, VI.3 – Compliance – Volatile organic compound emissions limited to 129 tons per 12-month rolling time period; fresh butane usage limited to 129 tons per 12-month rolling time period; records of fresh butane usage.

In the information submittal received 8/21/2014 Polytech reports fresh butane usage from 1/2012 through 6/2014. Since installation of the condensation system in 2006, the highest reported 12-month rolling total for fresh butane use remains the 120 tons utilized within the period ending 5/2012. The highest amount reported in the evaluation period from 10/2012 through 6/2014 occurred at the end of 10/2012 with 106 tons butane. The 85 tons reported for calendar year 2013 matches the amount reported to MAERS 2013. The available information demonstrates VOC emissions have not exceeded 129 tons per 12-month rolling time period.

III.1, IV.1, VI.1 and 2 – Compliance – EPOI, EPOII, or the raw material storage shall not be operated unless the baghouse operating procedures are installed and implemented; F-780, F-880, F-841 shall be installed and operating properly, including maintaining pressure drops within specified ranges; pressure drops shall be monitored and recorded daily.

An operating procedure is maintained for the three dust collectors (8/21/2014 submittal). The proper ranges are quoted at 0.2 to 5 inches water column for F-780 (during pellet transfer), 0.4 to 5 inches water column for F-880 (during pellet transfer), and 0.1 to 5 inches water column for F-841 (when making a tricalcium phosphate batch). Pressure drop data for 3/2014 is given in the 8/21/2014 information submittal; recorded readings are within the range specified for each collector. None of the three collectors were in a period of active filtration during the inspection. I have not noted visible emissions or fallout from these dust collectors during plant visits in 2014, 2012, 2010, 2008, 2006, 2004, 2003, and 2002.

III.2, III.3, IV.2, IV.3 – Compliance – EPOI or EPOII shall not be operated unless the butane collection system and condensation system are installed and operating properly and in accordance with operating procedures required to be developed and implemented; EPOI or EPOII shall not be operated unless the two systems are installed and operating properly and in accordance with operating procedures required to be developed and implemented.

Operating procedures have been developed (8/21/2014 submittal). These procedures, and others concerning the rundown vessels, etc., are carried over with slight modifications from previous BASF procedures (see reports A-WC-01587 and A-WC-00653). The levels in hold tanks TK-780 and TK-880 are measured by dual monitors in each tank. The computer logic, operating the control of valves and blowers, etc., will not allow transfer to a hold tank unless the tank can accommodate the transfer, will abort a transfer from a hold tank to the condensation system if the hold tank is nearly empty, will abort a transfer if one of the area monitors detects a butane release, and will abort a transfer if the condensation system ("Polaris" system) alarms. The condensation system operates at its peak efficiency when the temperature at the top of the condensation column is less than -186°F; the monitored temperature at the top of the column was observed to be -230°F during the 7/2/2014 inspection. It is noted the temperature at the top of the column is less than the melting point of butane (approximately -220°F). The Polaris manual, at page 5, addresses this point by stating the condenser is designed to accept the formation of solid material without issue.

VI.4 – Compliance – Monthly records kept of all instances where butane collection and tank or condensation system fails to capture butane as designed, including amount failed to capture – Polytech reports there were no instances since 10/1/2012 wherein the collection and condensation system failed to capture butane as designed (8/21/2014 submittal).

R 336.1201, R 336.1278, R 336.1278a, R 336.1284(b) & (h) & (i), R 336.1286(a), FGRULE290

The following exemptions from the requirement to obtain a permit to install apply to the nitric acid storage tank, butane storage tank, acid neutralization tank, tricalcium phosphate tank, and plastic extrusion system provided the equipment is not excluded from exemption pursuant to R 336.1278 and provided records are maintained according to R 336.1278a.

R 336.1278 excludes from exemption any of the following activities: PSD and nonattainment NSR activities, significant actual emissions increases, new or reconstructed major HAP sources subject to case-by-case MACT standards, NESHAP sources. R 336.1278a specifies that to be eligible for an exemption, the owner or operator must be able to provide the following within 30 days of a written request for information:

1. A description of the exempt process or process equipment, including the date of installation;
2. The specific exemption being used by the process or process equipment.
3. An analysis demonstrating that R 336.1278 does not apply to the process or process equipment.
4. Any other records required for a specific exemption.

R 336.1284(b) – Compliance – Storage of butane, propane, or liquefied petroleum gas in a vessel with a capacity less than 40,000 gallons – This exemption applies to the 16,000 gallon capacity liquid butane storage tank and the small butane recovery tank within the condensation system.

R 336.1284(h) – Compliance – Storage of water solutions of inorganic salts and bases and of water solutions of sulfuric acid not more than 99% by weight, phosphoric acid not more than 99% by weight, nitric acid not more than 20% by weight, hydrochloric acid not more than 11% by weight – The acid water neutralization tank and the tricalcium phosphate tank are water solutions of inorganic salts and thus exempt by this rule.

R 336.1284(j) – Compliance – Pressurized storage of gases, including nitrogen, with boiling points less than 0°C – The nitrogen storage tanks used in the condensation system are exempt by this rule.

R 336.1286(a) – Compliance – Plastic extrusion, rotocasting, and pultrusion equipment and associated plastic resin, storage and drying equipment – The extruder system in the Bulk Loading Facility appears to qualify for exemption under this rule. Please see the information submittal of 9/15/2010 for details.

FGRULE290, R 336.1290(a), (b), (c), (d) – Compliance – Emissions limited to 1000 lbs. uncontrolled and 500 lbs. controlled, please see rules for specifics under (a)(1), (2), and (3). Description maintain on file; records maintained – The nitric acid storage tank, not eligible for exemption under R 336.1284(h)(iii) due its high nitric acid weight percentage (exceeds the exemption eligibility limit of 20% nitric acid), is claimed exempt under R 336.1290(a)(ii)(A) and in the ROP under FGRULE290; nitric acid has ITSL of 50 micrograms per cubic meter on an eight-hour averaging time.

In the submittal of 8/21/2014, Polytech calculates nitric acid emissions at approximately 0.15 pounds per month. These figures are consistent with past estimates. The computer system monitoring the scrubber will alarm if the water flowrate down through the scrubber falls below 15 pounds per minute (1.8 gallons per minute). The scrubber was in operation during the 7/2/2014 inspection with a flowrate of 6 gallons per minute.

R 336.1201, R 336.1278a, R 336.1281(h), R 336.1707

A cold cleaner has been installed at the plant but has not yet been in use. Polytech is investigating the cleaning medium to be used in the cleaner (8/21/2014 submittal).

R 336.1281(h) – Compliance – A cold cleaner with an air/vapor interface of not more than 10 square feet is exempt from the requirement to obtain a permit to install provided the cold cleaner is not excluded from the exemption under R 336.1278 and R 336.1278a – According to the 8/21/2014 submittal, the Graymills cold cleaner has an air/vapor interface of less than 10 square feet. If a non-organic cleaning medium is selected, then R 336.1281(e) will likely be the applicable exemption.

R 336.1707 – Undetermined – The cold cleaner is recently installed and not yet in use. The applicability of R 336.1707 is dependent upon the vapor pressure of the organic solvent selected (if an organic solvent is selected) and whether that solvent is heated or agitated. The rule is not applicable until the cleaner is filled with a cleaning solution and becomes operational.

Conclusion:

At the completion of the investigation Polytech Moulding Technologies appears to be in compliance with its applicable requirements.

NAME Jff Komrad

DATE 8/28/2014

SUPERVISOR N. W.

