STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

Pioneer Plastics Corporation **Androscoggin County** **Auburn, Maine** **A-448-77-13-M**	**Departmental** **Findings of Fact and Order** **New Source Review** **NSR #13**

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (the Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Pioneer Plastics Corporation (Pioneer)
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Revision
NAICS CODES	325211, 322222, 326130
NATURE OF BUSINESS	Manufacturer of decorative laminate, melamine coated paper, and specialty resins
FACILITY LOCATION	One Pionite Rd, Auburn, Maine

B. NSR License Description

Pioneer Plastics Corporation (Pioneer) has requested a New Source Review (NSR) license revision to allow the production of polyamide resin in the reactors currently licensed for polyester resin production.

C. Emission Equipment

The following existing equipment is modified by this project:

Equipment	Unit Capacity	Primary Product	Pollution Control Equipment
Polyester Reactor #1 (K4)	3,500 gallons	Polyester Resins	Boiler #5/TO or RTO #1
Polyester Reactor #2 (K5)	3,500 gallons		
Letdown Reactor (K6)	5,000 gallons		
Pilot Reactor (K7)	100 gallons		
Polyester Reactor #3 (K8)	3,500 gallons		

The following existing equipment is affected, but not modified, by this project:

Equipment	Maximum Heat Input Capacity (MMBtu/hr)	Max. Firing Rate	Fuel Type	Date of Manuf.	Date of Install.
Boiler #4	55.5 MMBtu/hr	370 gal/hr	#4, #6 fuel oil, Natural gas	1975	1977
Boiler #6	96.6 MMBtu/hr (fuel oil) 96.8 MMBtu/hr (natural gas)	644 gal/hr 93,980 scf/hr	#4, #6 fuel oil, Natural gas	1981	1995
Process Heater #8	5.0 MMBtu/hr	4,854 scf/hr	Natural gas	1994	1994
Boiler#5/ Thermal Oxidizer	39.5 MMBtu/hr 50.0 MMBtu/hr	263.3 gal/hr 48,550 scf/hr	#4, #6 fuel oil, Natural gas	1982	1983
RTO #1	1.5 MMBtu/hr	1500 scf/hr	Natural gas	2000	2014

D. Project Description

Pioneer's current license allows the production of polyester resin in reactors K4-K8. Reactor K8 is also licensed to manufacture melamine resin. The facility has requested the flexibility to manufacture polyamide resin in this equipment in addition to polyester resin. The polyamide resin will be produced in addition to the polyester resin (i.e., not in lieu of polyester resin production) by increasing the reactor operating time and producing additional batches.

The boilers, thermal oxidizers, and Process Heater #8 are considered affected units because increased usage of the reactors will result in an increase in combustion emissions from this equipment.

E. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the issued date of this license.

The application for Pioneer does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing, or recordkeeping requirements.

The proposed change must be evaluated to determine whether it is a major or minor modification because it involves a change in the method of operation of the reactors that will result in an actual increase in emissions.

A change to a major source is considered a major modification based on whether or not expected emissions increases exceed the "Significant Emission Increase" levels as given in *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100.

Emissions per batch of polyamide resin are assumed to be equivalent to emissions per batch of polyester resin. The polyamide resin process involves a condensation reaction similar to the polyester process and uses feedstocks with similar physical properties. The process essentially replaces the glycol addition in the polyester reaction process with an amine in the polyamide reaction process.

Pioneer has estimated that the increased usage of the reactors is equivalent to one resin reactor operating 365 days per year with a batch cycle of 24 hours. Based on historical testing of polyester resin production, uncontrolled emissions of VOC are calculated to be 180 lb/batch or 32.85 tpy. Emissions from Reactors K4 – K8 are captured and controlled by either RTO #1 or Boiler #5/TO. This equipment has a combined capture and control efficiency of 98%. Therefore, the estimated increase in VOC emissions from Reactors K4 - K8 is estimated to be 0.7 tpy.

Affected equipment includes any upstream or downstream activities such as the increased use of the boilers, thermal oxidizers, and Process Heater #8. Below is a summary of the estimated emission increases due to this modification.

Equipment	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)
Process Heater #8	0.01	0.01	0.01	–	0.18	0.15	–
Boilers/TO	0.03	0.03	0.03	–	1.37	1.15	–
Reactors K4 – K8	–	–	–	–	–	–	0.7
Total	**0.04**	**0.04**	**0.04**	**–**	**1.55**	**1.30**	**0.7**

Emissions increases are compared to the significant emissions increase levels.

Pollutant	Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	0.04	25
PM_{10}	0.04	15
$PM_{2.5}$	0.04	10
SO_2	–	40
NO_x	1.55	40
CO	1.30	100
VOC	0.7	40

The proposed change will not result in an emission increase of greater than 4 tons/year of a single pollutant or 8 tons/year total pollutants, both excluding greenhouse gases. Therefore, the NSR license amendment is determined to be a minor revision under *Minor and Major Source Air Emission License Regulations,* 06-096 C.M.R. ch. 115. An

application to incorporate the requirements of this NSR license into the Part 70 air emission license shall be submitted no later than 12 months from commencement of production of polyamide resin.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

B. Addition of Polyamide Resins

Reactors K4 – K8 are used to produce polyester resins. Reactor K8 is also licensed to produce melamine resins.

Generally, powdered raw materials are added (charged) to liquid raw materials in the reactors through a charging hatch or a direct line. Charging operations last approximately one to three hours for Reactors K4 - K8, during which time minimal amounts of powder are vented to the atmosphere. For all reactors, the charging hatch is closed while the chemical reaction takes place. Process testing occurs as samples are collected during each cook cycle.

During the manufacture of polyester resin in Reactors K4 – K8, the reactor vessels are closed, and emissions are captured and conveyed to RTO #1 or Boiler #5/TO for destruction. Polyester resins are discharged, or letdown, from the reactors into drums as a liquid or into pans to cool and solidify. The solidified resins are then crushed into specified particle sizes.

During the blending of polyester resins in Reactors K4 – K8, emissions from the main outlet vent on each reactor exhausts through a separating column and vapor condenser, which is operated to maximize the condensation of any emissions.

Pioneer proposes to use the existing polyester reactors (Reactors K4 – K8) to also produce polyamide resins. As discussed earlier, emissions per batch of polyamide resin are assumed to be equivalent to emissions per batch of polyester resin. The polyamide resin process

involves a condensation reaction similar to the polyester process and uses feedstocks with similar physical properties. The process essentially replaces the glycol addition in the polyester reaction process with an amine in the polyamide reaction process.

Since the emissions from polyamide resin production are expected to be equivalent to emissions from polyester resin production, Pioneer has proposed the same control strategies for the polyamide process. Thermal oxidation will reduce emissions of VOC from the reactors by at least 98%. This control strategy is as efficient, if not more so, than any other technical option.

The Department has determined that the following represents BACT for control of VOC from Reactors K4 – K8 when manufacturing polyamide resins:

1. At all times that K4, K5, K6, K7, and/or K8 are producing polyester or polyamide resins, Pioneer shall vent the emissions from the main outlet vent on each reactor to Boiler #5/TO or RTO #1 for destruction.

2. At all times that K4, K5, K6, K7, and/or K8 are blending polyester or polyamide resins, Pioneer shall vent the emissions from the main outlet vent on each reactor through the separating column and vapor condenser which shall be operated to maximize the condensation of any emissions. The temperature of the coolant on the inlet side of the vapor condensers to K4, K5, K6, K7, and/or K8 shall be maintained below 100 °F while the reactors are blending polyester or polyamide resins. Pioneer shall record the date and length of time in minutes when each reactor is blending polyester or polyamide resins.

3. At all times that K4, K5, K6, K7, and K8 are blending polyester or polyamide resins, Pioneer shall monitor and record every six hours the temperature of the coolant on the inlet side of the vapor condensers to the reactor.

With the above VOC controls for both polyester and polyamide resin production and blending operations, Pioneer shall continue to meet requirements of *Reasonably Available Control Technology for Facilities that Emit Volatile Organic Compounds,* 06-096 C.M.R. ch. 134 as addressed in A-448-71-P-A (June 16, 1997).

C. Incorporation Into the Part 70 Air Emission License

Per *Part 70 Air Emission License Regulations*, 06-096 C.M.R. ch. 140 § 1(C)(8), for a modification at the facility that has undergone NSR requirements or been processed through 06-096 C.M.R. ch. 115, the source must apply for an amendment to their Part 70 license within one year of commencing the proposed operations, as provided in 40 C.F.R. Part 70.5.

D. Annual Emissions

This NSR license will not change the facility's licensed annual emissions.

ORDER

The Department hereby grants New Source Review Minor Revision A-448-77-13-M pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the standard and specific conditions below.

Severability. The invalidity or unenforceability of any provision of this License Amendment or part thereof shall not affect the remainder of the provision or any other provisions. This License Amendment shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

(1) **Polyester and Polyamide Resin Production: Reactors K4, K5, K6, and K7**
Polyester, Polyamide, and Melamine Resin Production: Reactor K8

A. Visible emissions from each of Reactors K4 – K8 shall be limited to 20% opacity on a six (6) minute block average basis. [06-096 C.M.R. ch. 101, § 3(B)(4)]

B. At all times that K4, K5, K6, K7, and/or K8 are producing polyester or polyamide resins, Pioneer shall vent the emissions from the main outlet vent on each reactor to the Boiler #5/TO or RTO #1 for destruction. [06-096 C.M.R. ch. 115, BACT and 06-096 C.M.R. ch. 134 (A-448-71-P-A, 6/16/1997)]

C. At all times that K4, K5, K6, K7, and/or K8 are blending polyester or polyamide resins, Pioneer shall vent the emissions from the main outlet vent on each reactor through the separating column and vapor condenser which shall be operated to maximize the condensation of any emissions. The temperature of the coolant on the inlet side of the vapor condensers to K4, K5, K6, K7, and K8 shall be maintained below 100 °F while the reactors are blending polyester or polyamide resins. Pioneer shall record the date and length of time in minutes when each reactor is blending polyester or polyamide resins. [06-096 C.M.R. ch. 115, BACT and 06-096 C.M.R. ch. 134 (A-448-71-P-A, 6/16/1997)]

D. At all times that K4, K5, K6, K7, and/or K8 are blending polyester or polyamide resins, Pioneer shall monitor and record every six hours the temperature of the coolant on the inlet side of the vapor condensers to the reactor. [06-096 C.M.R. ch. 115, BACT and 06-096 C.M.R. ch. 134 (A-448-71-P-A, 6/16/1997)]

(2) Pioneer shall submit an application to incorporate this NSR license amendment into the facility's Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 C.M.R. ch. 140 § 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS 9th DAY OF March , 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____ For
GERALD D. REID, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 2/10/2020
Date of application acceptance: 2/11/2020

Date filed with the Board of Environmental Protection:

This Order prepared by Lynn Muzzey, Bureau of Air Quality.

FILED

MAR 9 2020

State of Maine
Board of Environmental Protection