



State of Ohio Environmental Protection Agency

STREET ADDRESS:

Lazarus Government Center
50 W. Town St., Suite 700
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.ohio.gov

MAILING ADDRESS:

P.O. Box 1049
Columbus, OH 43216-1049

12/8/2009

Certified Mail

Richard Cutrell
FRANKLIN INTERNATIONAL
2020 Bruck Street
Columbus, OH 43207

| | |
|-----|----------------------|
| Yes | TOXIC REVIEW |
| No | PSD |
| No | SYNTHETIC MINOR |
| No | CEMS |
| No | MACT |
| No | NSPS |
| No | NESHAPS |
| No | NETTING |
| No | MAJOR NON-ATTAINMENT |
| Yes | MODELING SUBMITTED |

RE: FINAL AIR POLLUTION PERMIT-TO-INSTALL AND OPERATE
Facility ID: 0125040070
Permit Number: P0104737
Permit Type: OAC Chapter 3745-31 Modification
County: Franklin

Dear Permit Holder:

Enclosed please find a final Air Pollution Permit-to-Install and Operate ("PTIO") which will allow you to install, modify, and/or operate the described emissions unit(s) in the manner indicated in the permit. Because this permit contains conditions and restrictions, please read it very carefully. Please complete a survey at www.epa.ohio.gov/dapc/permitsurvey.aspx and give us feedback on your permitting experience. We value your opinion.

Ohio EPA maintains a document entitled "Frequently Asked Questions about the PTIO". The document can be downloaded from the DAPC Web page, www.epa.ohio.gov/dapc, from the "Permits" link. This document contains additional information related to your permit, such as what activities are covered under the PTIO, who has enforcement authority over the permit and Ohio EPA's authorization to inspect your facility and records. Please contact the Office of Compliance Assistance and Pollution Prevention at (614) 644-3469 if you need assistance.

The issuance of this PTIO is a final action of the Director and may be appealed to the Environmental Review Appeals Commission ("ERAC") under Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and describe the action complained of and the grounds for the appeal. The appeal must be filed with the ERAC within thirty (30) days after notice of the Director's action. A filing fee of \$70.00 must be submitted to the ERAC with the appeal, although the ERAC, has discretion to reduce the amount of the filing fee if you can demonstrate (by affidavit) that payment of the full amount of the fee would cause extreme hardship. If you file an appeal of this action, you must notify Ohio EPA of the filing of the appeal (by providing a copy to the Director) within three (3) days of filing your appeal with the ERAC. Ohio EPA requests that a copy of the appeal also be provided to the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the ERAC at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, OH 43215

If you have any questions regarding this permit, please contact the Ohio EPA DAPC, Central District Office. This permit has been posted to the Division of Air Pollution Control (DAPC) Web page www.epa.ohio.gov/dapc.

Sincerely,

Michael W. Ahern
Michael W. Ahern, Manager
Permit Issuance and Data Management Section, DAPC

Cc: Ohio EPA-CDO

Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director



**State of Ohio Environmental Protection Agency
Division of Air Pollution Control**

FINAL

**Air Pollution Permit-to-Install and Operate
for
FRANKLIN INTERNATIONAL**

Facility ID: 0125040070
Permit Number: P0104737
Permit Type: OAC Chapter 3745-31 Modification
Issued: 12/8/2009
Effective: 12/8/2009
Expiration: 12/8/2014



Air Pollution Permit-to-Install and Operate
for
FRANKLIN INTERNATIONAL

Table of Contents

Authorization 1

A. Standard Terms and Conditions 4

 1. What does this permit-to-install and operate ("PTIO") allow me to do?..... 5

 2. Who is responsible for complying with this permit? 5

 3. What records must I keep under this permit? 5

 4. What are my permit fees and when do I pay them?..... 5

 5. When does my PTIO expire, and when do I need to submit my renewal application? 5

 6. What happens to this permit if my project is delayed or I do not install or modify my source? 6

 7. What reports must I submit under this permit? 6

 8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit? 6

 9. What are my obligations when I perform scheduled maintenance on air pollution control equipment? ... 6

 10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report? 6

 11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located? 7

 12. What happens if one or more emissions units operated under this permit is/are shut down permanently? 7

 13. Can I transfer this permit to a new owner or operator?..... 7

 14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"? 8

 15. What happens if a portion of this permit is determined to be invalid? 8

B. Facility-Wide Terms and Conditions..... 9

C. Emissions Unit Terms and Conditions 12

 1. P124, Reactor 6 System 13

 2. P125, Reactor 11 System 24

 3. P126, Polyurethane Prepolymer Reactor 35

 4. P128, Pilot Reactor - Polymer Division..... 43

 6. Emissions Unit Group - Reactor systems 10, 9, 8, 7, 2: P106, P107, P115, P116, P127,..... 57



State of Ohio Environmental Protection Agency
Division of Air Pollution Control

Draft Permit-to-Install and Operate

Permit Number: P0104737

Facility ID: 0125040070

Effective Date: To be entered upon final issuance

Authorization

Facility ID: 0125040070
Application Number(s): A0037018, A0037399
Permit Number: P0104737
Permit Description: Synthetic minor restrictions on 9 polymer reactors to limit HAP emissions below the Title V and MACT applicability thresholds.
Permit Type: OAC Chapter 3745-31 Modification
Permit Fee: \$400.00
Issue Date: 12/8/2009
Effective Date: 12/8/2009
Expiration Date: 12/8/2014
Permit Evaluation Report (PER) Annual Date: July 1 - June 30, Due Aug 15

This document constitutes issuance to:

FRANKLIN INTERNATIONAL
2020 Bruck Street
Columbus, OH 43207

of a Permit-to-Install and Operate for the emissions unit(s) identified on the following page.

Ohio EPA District Office or local air agency responsible for processing and administering your permit:

Ohio EPA DAPC, Central District Office
50 West Town Street, 6th Floor
P.O. Box 1049
Columbus, OH 43216-1049
(614)728-3778

The above named entity is hereby granted this Permit-to-Install and Operate for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and federal laws and regulations.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Chris Korleski
Director



Authorization (continued)

Permit Number: P0104737

Permit Description: Synthetic minor restrictions on 9 polymer reactors to limit HAP emissions below the Title V and MACT applicability thresholds.

Permits for the following emissions unit(s) or groups of emissions units are in this document as indicated below:

- | | |
|-----------------------------------|----------------------------------|
| Emissions Unit ID: | P124 |
| Company Equipment ID: | Reactor 6 System |
| Superseded Permit Number: | 01-05232 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P125 |
| Company Equipment ID: | Reactor 11 System |
| Superseded Permit Number: | 01-06303 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P126 |
| Company Equipment ID: | Polyurethane Prepolymer Reactor |
| Superseded Permit Number: | |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P128 |
| Company Equipment ID: | Pilot Reactor - Polymer Division |
| Superseded Permit Number: | |
| General Permit Category and Type: | Not Applicable |

Group Name: PTI 01-12038

| | |
|-----------------------------------|---------------------------|
| Emissions Unit ID: | P103 |
| Company Equipment ID: | Continuous Reactor System |
| Superseded Permit Number: | 01-12038 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P113 |
| Company Equipment ID: | Reactor 4 System |
| Superseded Permit Number: | 01-12038 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P114 |
| Company Equipment ID: | Reactor 5 System |
| Superseded Permit Number: | 01-12038 |
| General Permit Category and Type: | Not Applicable |

Group Name: Reactor systems 10, 9, 8, 7, 2

| | |
|-----------------------------------|-------------------|
| Emissions Unit ID: | P106 |
| Company Equipment ID: | Reactor 10 System |
| Superseded Permit Number: | 01-05683 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P107 |
| Company Equipment ID: | Reactor 9 System |
| Superseded Permit Number: | 01-05683 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P115 |
| Company Equipment ID: | Reactor 7 System |



State of Ohio Environmental Protection Agency
 Division of Air Pollution Control

Draft Permit-to-Install and Operate

Permit Number: P0104737

Facility ID: 0125040070

Effective Date: To be entered upon final issuance

| | |
|-----------------------------------|------------------|
| Superseded Permit Number: | 01-08402 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P116 |
| Company Equipment ID: | Reactor 8 System |
| Superseded Permit Number: | 01-05683 |
| General Permit Category and Type: | Not Applicable |
| Emissions Unit ID: | P127 |
| Company Equipment ID: | Reactor 2 System |
| Superseded Permit Number: | 01-08188 |
| General Permit Category and Type: | Not Applicable |



State of Ohio Environmental Protection Agency
Division of Air Pollution Control

Draft Permit-to-Install and Operate

Permit Number: P0104737

Facility ID: 0125040070

Effective Date: To be entered upon final issuance

A. Standard Terms and Conditions



1. What does this permit-to-install and operate ("PTIO") allow me to do?

This permit allows you to install and operate the emissions unit(s) identified in this PTIO. You must install and operate the unit(s) in accordance with the application you submitted and all the terms and conditions contained in this PTIO, including emission limits and those terms that ensure compliance with the emission limits (for example, operating, recordkeeping and monitoring requirements).

2. Who is responsible for complying with this permit?

The person identified on the "Authorization" page, above, is responsible for complying with this permit until the permit is revoked, terminated, or transferred. "Person" means a person, firm, corporation, association, or partnership. The words "you," "your," or "permittee" refer to the "person" identified on the "Authorization" page above.

The permit applies only to the emissions unit(s) identified in the permit. If you install or modify any other equipment that requires an air permit, you must apply for an additional PTIO(s) for these sources.

3. What records must I keep under this permit?

You must keep all records required by this permit, including monitoring data, test results, strip-chart recordings, calibration data, maintenance records, and any other record required by this permit for five years from the date the record was created. You can keep these records electronically, provided they can be made available to Ohio EPA during an inspection at the facility. Failure to make requested records available to Ohio EPA upon request is a violation of this permit requirement.

4. What are my permit fees and when do I pay them?

There are two fees associated with permitted air contaminant sources in Ohio:

- PTIO fee. This one-time fee is based on a fee schedule in accordance with Ohio Revised Code (ORC) section 3745.11, or based on a time and materials charge for permit application review and permit processing if required by the Director.

You will be sent an invoice for this fee after you receive this PTIO and payment is due within 30 days of the invoice date. You are required to pay the fee for this PTIO even if you do not install or modify your operations as authorized by this permit.

- Annual emissions fee. Ohio EPA will assess a separate fee based on the total annual emissions from your facility. You self-report your emissions in accordance with Ohio Administrative Code (OAC) Chapter 3745-78. This fee assessed is based on a fee schedule in ORC section 3745.11 and funds Ohio EPA's permit compliance oversight activities. For facilities that are permitted as synthetic minor sources, the fee schedule is adjusted annually for inflation. Ohio EPA will notify you when it is time to report your emissions and to pay your annual emission fees.

5. When does my PTIO expire, and when do I need to submit my renewal application?

This permit expires on the date identified at the beginning of this permit document (see "Authorization" page above) and you must submit a renewal application to renew the permit. Ohio EPA will send a renewal notice to you approximately six months prior to the expiration date of this permit. However, it is



very important that you submit a complete renewal permit application (postmarked prior to expiration of this permit) even if you do not receive the renewal notice.

If a complete renewal application is submitted before the expiration date, Ohio EPA considers this a timely application for purposes of ORC section 119.06, and you are authorized to continue operating the emissions unit(s) covered by this permit beyond the expiration date of this permit until final action is taken by Ohio EPA on the renewal application.

6. What happens to this permit if my project is delayed or I do not install or modify my source?

This PTIO expires 18 months after the issue date identified on the "Authorization" page above unless otherwise specified if you have not (1) started constructing the new or modified emission sources identified in this permit, or (2) entered into a binding contract to undertake such construction. This deadline can be extended by up to 12 months, provided you apply to Ohio EPA for this extension within a reasonable time before the 18-month period has ended and you can show good cause for any such extension.

7. What reports must I submit under this permit?

An annual permit evaluation report (PER) is required in addition to any malfunction reporting required by OAC rule 3745-15-06 or other specific rule-based reporting requirement identified in this permit. Your PER due date is identified in the Authorization section of this permit.

8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit?

If you are required to obtain a Title V permit under OAC Chapter 3745-77 in the future, the permit-to-operate portion of this permit will be superseded by the issued Title V permit. From the effective date of the Title V permit forward, this PTIO will effectively become a PTI (permit-to-install) in accordance with OAC rule 3745-31-02(B). The following terms and conditions will no longer be applicable after issuance of the Title V permit: Section B, Term 1.b) and Section C, for each emissions unit, Term a)(2).

The PER requirements in this permit remain effective until the date the Title V permit is issued and is effective, and cease to apply after the effective date of the Title V permit. The final PER obligation will cover operations up to the effective date of the Title V permit and must be submitted on or before the submission deadline identified in this permit on the last day prior to the effective date of the Title V permit.

9. What are my obligations when I perform scheduled maintenance on air pollution control equipment?

You must perform scheduled maintenance of air pollution control equipment in accordance with OAC rule 3745-15-06(A). If scheduled maintenance requires shutting down or bypassing any air pollution control equipment, you must also shut down the emissions unit(s) served by the air pollution control equipment during maintenance, unless the conditions of OAC rule 3745-15-06(A)(3) are met. Any emissions that exceed permitted amount(s) under this permit (unless specifically exempted by rule) must be reported as deviations in the annual permit evaluation report (PER), including nonexempt excess emissions that occur during approved scheduled maintenance.

10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report?



If you have a reportable malfunction of any emissions unit(s) or any associated air pollution control system, you must report this to the Ohio EPA DAPC, Central District Office in accordance with OAC rule 3745-15-06(B). Malfunctions that must be reported are those that result in emissions that exceed permitted emission levels. It is your responsibility to evaluate control equipment breakdowns and operational upsets to determine if a reportable malfunction has occurred.

If you have a malfunction, but determine that it is not a reportable malfunction under OAC rule 3745-15-06(B), it is recommended that you maintain records associated with control equipment breakdown or process upsets. Although it is not a requirement of this permit, Ohio EPA recommends that you maintain records for non-reportable malfunctions.

11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located?

Yes. Under Ohio law, the Director or his authorized representative may inspect the facility, conduct tests, examine records or reports to determine compliance with air pollution laws and regulations and the terms and conditions of this permit. You must provide, within a reasonable time, any information Ohio EPA requests either verbally or in writing.

12. What happens if one or more emissions units operated under this permit is/are shut down permanently?

Ohio EPA can terminate the permit terms associated with any permanently shut down emissions unit. "Shut down" means the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31.

You should notify Ohio EPA of any emissions unit that is permanently shut down by submitting a certification that identifies the date on which the emissions unit was permanently shut down. The certification must be submitted by an authorized official from the facility. You cannot continue to operate an emission unit once the certification has been submitted to Ohio EPA by the authorized official.

You must comply with all recordkeeping and reporting for any permanently shut down emissions unit in accordance with the provisions of the permit, regulations or laws that were enforceable during the period of operation, such as the requirement to submit a PER, air fee emission report, or malfunction report. You must also keep all records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, for at least five years from the date the record was generated.

Again, you cannot resume operation of any emissions unit certified by the authorized official as being permanently shut down without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31.

13. Can I transfer this permit to a new owner or operator?

You can transfer this permit to a new owner or operator. If you transfer the permit, you must follow the procedures in OAC Chapter 3745-31, including notifying Ohio EPA or the local air agency of the change in ownership or operator. Any transferee of this permit must assume the responsibilities of the transferor permit holder.



State of Ohio Environmental Protection Agency
Division of Air Pollution Control

Draft Permit-to-Install and Operate

Permit Number: P0104737

Facility ID: 0125040070

Effective Date: To be entered upon final issuance

14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"?

This permit and OAC rule 3745-15-07 prohibit operation of the air contaminant source(s) regulated under this permit in a manner that causes a nuisance. Ohio EPA can require additional controls or modification of the requirements of this permit through enforcement orders or judicial enforcement action if, upon investigation, Ohio EPA determines existing operations are causing a nuisance.

15. What happens if a portion of this permit is determined to be invalid?

If a portion of this permit is determined to be invalid, the remainder of the terms and conditions remain valid and enforceable. The exception is where the enforceability of terms and conditions are dependent on the term or condition that was declared invalid.



State of Ohio Environmental Protection Agency
Division of Air Pollution Control

Draft Permit-to-Install and Operate

Permit Number: P0104737

Facility ID: 0125040070

Effective Date: To be entered upon final issuance

B. Facility-Wide Terms and Conditions



1. This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

a) For the purpose of a permit-to-install document, the facility-wide terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) None.

b) For the purpose of a permit-to-operate document, the facility-wide terms and conditions identified below are enforceable under state law only with the exception of those listed as B.1.b)(1), (2), and (3) below, which are federally enforceable.

(1) Facility-wide emissions shall not exceed 99.9 tons of OC, 9.9 tons of individual hazardous air pollutant (IHAP) emissions and 24.9 tons of total combined hazardous air pollutant (TCHAP) emissions per rolling, 12-month period.

Facility-wide emissions shall be determined from a summation of monthly emissions from the following emission units: P002, P003, P004, P005, P006, P007, P020, P021, P022, P023, P024, P026, P027, P028, P029, P030, P031, P039, P040, P041, P103, P106, P107, P113, P114, P115, P116, P124, P125, P126, P127, P128 and all emissions units that are exempt or permit by rule (OAC rule 3745-31-03), or de minimis (OAC rule 3745-15-05).

Therefore, the provisions for Title V permitting, the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Miscellaneous Organic Chemical Manufacturing in 40 CFR Part 63 Subpart FFFF, and for the Miscellaneous Coating Manufacturing in 40 CFR Part 63 Subpart HHHHH are not applicable.

A listing of HAPs can be found in Section 112(b) of the Clean Air Act or can be obtained by contacting your Ohio EPA field office or local air agency contact.

(2) The operational restriction on the facility-wide potential to emit for VOC, IHAP and TCHAP that establish federally enforceable limitations on emission units P103, P106, P107, P113, P114, P115, P116, P124, P125, P126, P127 and P128 are as follows:

a. the permittee shall equip each pre-emulsion tank with a hatch cover that must be closed at all times when the unit is in operation, except for solids addition and/or material sampling. The captured OC emissions shall be vented to a condenser to achieve a minimum 50% reduction of OC emissions; and

b. the permittee shall equip each reactor with a tightly fitting cover that must be closed at all times when the unit is in operation except for non-solvent material addition and/or material sampling. The captured OC emissions shall be vented to a reflux condenser that achieves a minimum 90% reduction of OC emissions.

(3) The permittee shall maintain the following monthly records on-site to document compliance with the VOC, IHAP, and TCHAP emission limitation for each emissions unit and the facility-wide operational restrictions for emission units P002, P003, P004, P005, P006, P007, P020, P021, P022, P023, P024, P026, P027, P028, P029, P030, P031,



P039, P040, P103, P106, P107, P113, P114, P115, P116, P124, P125, P126, P127, P128 and any permit exempt and de minimis emissions units:

- a. the calculated OC emissions for the current month, in pounds or tons, for each the above emissions units;
- b. the rolling, 12-month summation of OC emissions (i.e., the OC emissions from the current month added to the summation of the OC emissions from the previous 11 months) for each of the above emissions units;
- c. the rolling, 12-month summation of OC emissions (i.e., the OC emissions from the current month added to the summation of the OC emissions from the previous 11 months) for all of the above emissions units;
- d. the calculated IHAP emissions for the current month, in pounds or tons, for each the above emissions units;
- e. the calculated TCHAP emissions for the current month, in pounds or tons, for each the above emissions units;
- f. the rolling 12-month summation of IHAP emissions (i.e., the IHAP emissions from the current month added to the summation of the IHAP emissions from the previous 11 months) for all the above emissions units; and
- g. the rolling 12-month summation of TCHAP emissions (i.e., the TCHAP emissions from the current month added to the summation of the TCHAP emissions from the previous 11 months) for all the above emissions units.



State of Ohio Environmental Protection Agency
Division of Air Pollution Control

Draft Permit-to-Install and Operate

Permit Number: P0104737

Facility ID: 0125040070

Effective Date: To be entered upon final issuance

C. Emissions Unit Terms and Conditions



1. P124, Reactor 6 System

Operations, Property and/or Equipment Description:

Reactor 6 System w/pre-emulsion tank

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. See d)(7), (8), (9) and (10).

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. See b)(1)b, c)(1) and d)(1).

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operations(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|--|---|
| a. | OAC rule 3745-31-05(A)(3) (PTI 01-05232) | Organic compound (OC) emissions from this emissions unit shall not exceed 4.0 tons per year. See b)(2)a, b)(2)b, c)(1) and c)(2). The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(D) and OAC rule 3745-21-07(M). |
| b. | OAC rule 3745-31-05(D) (synthetic minor to avoid Title V permitting and MACT) | See B.1.b)(1), b)(2), and b)(3). |
| c. | OAC rule 3745-21-07(M)(3)(d)(v)(h) | Organic compound (OC) emissions from each emissions unit shall not exceed 4.38 lbs/hr and 21.92 lbs/day. |
| d. | OAC rule 3745-15-07(A) | See c)(4) and c)(5). |
| e. | ORC 3704.03(F)(4)(c) | See d)(7), (8), (9) and (10). |



(2) Additional Terms and Conditions

- a. The chilled water and/or refrigerated condensers on the pre-emulsion tank and reactor for this emissions unit shall be operated and maintained in accordance with federally enforceable restrictions as required by this permit.
- b. This permit supercedes PTI 01-05232 modified on July 10, 2001 and restricts the facility-wide hazardous air pollutant (HAP) emissions to less than the MACT applicability threshold of 10 tons individual HAP and/or 25 tons per year total combined HAPs emissions, respectively.
- c. The emission limitations and control requirements from the amended 21-07 rule, and the associated operational restrictions and the monitoring, record keeping, and reporting requirements contained in this permit, shall become federally enforceable on the date the U.S. EPA approves the revised OAC rule 3745-21-07 as a revision to the Ohio State Implementation Plan. The following terms shall become federally enforceable after U.S. EPA approves the rule revision:

b)(1)c

[OAC rule 3745-21-07]

c) Operational Restrictions

- (1) See B.1.b)(1) and B.1.b)(2).
- (2) The maximum temperature of the exhaust gases from the reactor's condenser shall not exceed 42 degrees Celsius during any hour in which the average temperature is 35 degrees Celsius or above, if the condenser is used to demonstrate compliance with allowable VOC emission limitations. If these conditions are exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used.
- (3) The maximum temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s) shall not exceed 17 degrees Celsius at any time, or that temperature established during the most recent emissions test that demonstrated that the condenser achieved a 50% reduction of VOC emissions vented to it, if a pre-emulsion tank's condenser is used to demonstrate compliance with allowable VOC limitations. This temperature shall be monitored at the point the chilled water enters the building containing the reactor. If this temperature is exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used.
- (4) The pressure setting of the conservation vent, if used on the pre-emulsion tank vent, shall be set by the manufacturer at a minimum of 2 inches of water, and the permittee shall perform annual inspections to ensure that the vents are clean and unobstructed.
- (5) The permittee shall maintain an emergency containment system capable of preventing the release of any liquid or solid materials from these emissions units. The purpose of the emergency containment system is public safety and the design shall be adequate to prevent any release of liquid or solid materials.



d) Monitoring and/or Recordkeeping Requirements

(1) See B.1.b)(3).

(2) The permittee shall collect and record the following information for each day for each batch of product processed in this emissions unit:

- a. the company name, code, and/or identification number for each batch of product processed; the date of production; and the number of batches of each product processed;
- b. the amount, in pounds, of each organic material added to pre-emulsion tank(s) and the reactor (this may be maintained on the batch sheet);
- c. the highest operating temperature reached during the batch run;
- d. the start and stop time for each batch run, recorded on each batch sheet, from which the duration of each batch run (hrs/batch) and the total hours of operation for this emissions unit (hrs/day) can be determined;
- e. the actual number of batches of each product processed each day;
- f. the VOC and HAP emission rates for each batch to be calculated by summing the emissions from the pre-emulsion tank (if applicable) with those from the reactor, plus the general exhaust of fugitives, as determined during the most recent emission test .

If the reactor contents are not heated above the boiling point of the chemical with the lowest boiling point in the batch, the reactor emissions may be calculated using ideal gas law equations. The maximum control efficiency applied for the condenser shall not exceed the 97% or that determined during the most recent emission testing.

If the pre-emulsion tank's condenser operates at 6 degrees Celsius or greater, the pre-emulsion tank emissions shall be calculated with a control efficiency of no greater than 70 percent, or that percentage determined during the most recent emission testing. At chilled water temperatures of less than 6 degrees Celsius, a batch emission rate (see table below) in lbs of vinyl acetate (VOC) from the pre-emulsion tank condenser (from emission test data) may be applied in the calculation of VOC emissions contributed to the reactor system by the pre-emulsion tank.

This calculation and record may be maintained in the facility records and may be adjusted downward depending in the recorded highest temperature of the refrigerated coolant temperature entering the condenser serving the reactor pre-emulsion tank.

| Avg. Condenser Emission Temp. (C) | VOC lb/batch (vinyl acetate) |
|-----------------------------------|------------------------------|
| -2.5 | 0.759 |



| | |
|----|------|
| -1 | 1.09 |
| 0 | 1.31 |
| 1 | 1.53 |
| 2 | 1.8 |
| 3 | 2.02 |
| 4 | 2.24 |
| 5 | 2.52 |

- (3) At the end of each calendar month, the permittee shall calculate and record the following information for each day of the preceding month:
- a. the total number of batches of each individual product (identified as required in d)(2)a) processed in this emissions unit during the calendar quarter, for each day of operation;
 - b. an identification of how the emissions were calculated for each day, showing each batch or all batches calculated using one of the following methods:
 - i. product batches are representative of normal operations and the estimated emissions are calculated by using existing documented, conservative and/or worst-case variables for each product batch or product batch group, and records maintained under d)(2)f;
 - ii. product batch(es) is/are individually calculated because an existing record, maintained as required in d)(2)f, does not exist;
 - iii. product batch(es) deviate(s) from normal operating parameters and is/are individually calculated, including adjustments to the efficiency due to condenser temperature deviations; and/or
 - iv. product batch(es) is/are made without the condenser control or during a malfunction of the condenser and the control efficiency is not applied;
 - c. the total actual VOC and HAP emissions for each day of operation (lbs/day), from all product batches produced each day, calculated as specified in d)(2)f, and calculated using one of the following methods:
 - i. the sum of the actual VOC and HAP emissions calculated from all batches run for each day of operation; or
 - ii. the sum of the actual VOC and HAP emissions from all batches run each day, calculated by multiplying the conservatively calculated or worst-case emissions for one batch of each product or product group times the number of batches of each product run, and adding the resultant VOC



and HAP emissions for all products made in this emissions unit each day, including those calculated individually for abnormal operations or for new products.

- d. the VOC emissions from this emissions unit for each month of operation, calculated by summing the emissions recorded in d)(3)c for each day; and
- e. the rolling, 12-month summation of VOC emissions from this emissions unit, calculated by summing the emissions recorded in d)(3)d for each month.

* The controlled emissions from each batch produced under normal operating conditions shall be calculated for each product batch or product batch group, calculated under f)(1)a. The calculated controlled VOC emissions of each organic chemical component shall be added to get the total VOC/batch. The controlled emissions, in pounds/batch, maintained in d)(2)f for each product or product batch group, may be added for each day to satisfy this requirement.

- (4) If the reactor's condenser is used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the exhaust gases from the condenser serving the reactor, when the emissions unit is in operation. Units shall be in degrees Celsius. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.
- (5) The permittee shall collect and maintain the following information each day for each batch:
 - a. the computer record of the continuous temperature monitor, which shall document the average temperature of the exhaust gases from the condenser serving the reactor, during each one-hour period of operation when the maximum temperature exceeded 42 degrees Celsius;
 - b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the reactor and its associated condenser, temperature control device, and monitoring equipment for each product batch; and
 - c. for any batch in which the peak temperature of the exhaust gases from the condenser serving the reactor exceeded 42 degrees Celsius in any hour in which the average temperature was 35 degrees Celsius or above.
- (6) If the pre-emulsion tanks' condenser are used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s) when the emissions unit is in operation. Units shall be in degrees Celsius. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is



greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals, and may be monitored at the point the chilled water enters the building containing the reactor.

The permittee shall collect and maintain the following information each day for each batch:

- a. the computer record of the continuous temperature monitor which shall document the peak temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s);
- b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the pre-emulsion tank(s) and its/their associated condenser, temperature control device, and monitoring equipment for each product batch*; and
- c. for any batch in which the peak temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s) exceeded 17 degrees Celsius at any time or that temperature established during the most recent emissions test that demonstrated that the condenser effectively limited VOC emissions.

* If the pre-emulsion tank(s) has/have operated in association with the reactor in the production of any batch, and during the same period of time, the log for the reactor may so indicate this, to alleviate the second record for the pre-emulsion tank(s).

(7) The PTI application for this/these emissions unit, P124, was evaluated based on the actual materials and the design parameters of the emissions unit's(s') exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:

- a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit(s), (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):
 - i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; or



- ii. STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.
- iii. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).
- iv. This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., "24" hours per day and "5" days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

$$TLV/10 \times 8/X \times 5/Y = 4 TLV/XY = MAGLC$$

- b. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic Contaminant: butyl acrylate (product code 2099)

TLV (mg/m3): 10.4

Maximum Hourly Emission Rate (lb/hr): 1.0 (reactor condenser vent)

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 184

MAGLC (ug/m3): 347

The permittee, has demonstrated that emissions of vinyl acetate from emissions unit(s) P124, is calculated to be less than eighty per cent of the maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

- (8) Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration", the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
 - a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;



- b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and
 - c. physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).
- (9) If the permittee determines that the “Toxic Air Contaminant Statute” will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a “modification”, the permittee shall apply for and obtain a final PTIO prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.
- a. The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F):
 - i. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);
 - ii. the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F);
 - iii. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and
 - iv. the documentation of the initial evaluation of compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.
- (10) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.
- e) Reporting Requirements



- (1) The permittee shall submit quarterly deviation (excursion) reports for the following emissions unit that identify:
 - a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the Potential to Emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

| Emissions unit ID | Term & Condition |
|-------------------|--------------------|
| P124 | c)(1), (2) and (3) |

- b. the probable cause of each deviation (excursion);
- c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and
- d. the magnitude and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted (postmarked) each year by the thirty-first of January (covering October to December), the thirtieth of April (covering January to March), the thirty-first of July (covering April to June), and the thirty-first of October (covering July to September), unless an alternative schedule has been established and approved by the director (the appropriate district office or local air agency).

- (2) The permittee shall include any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with the Toxic Air Contaminant Statute, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration, in the quarterly deviation (excursion) reports. If no changes to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect.
- (3) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

f) Testing Requirements

- (1) Compliance with the emission limitations in b)(1) of the terms and conditions of this permit shall be determined in accordance with the following methods:
 - a. Emission Limitation:

OC emissions from this emissions unit shall not exceed 4.38 lbs/hr and/or 32.3 lbs/day.



Applicable Compliance Method:

Compliance with the hourly emission limitation was demonstrated during emission testing in November 2004 and 2005 during poly vinyl acetate production. If required, the permittee shall demonstrate compliance with these emission limitations through emission tests performed in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 4 and 18. Compliance with the daily VOC emission limitations shall be demonstrated based on the record keeping requirements in d)(2) and d)(3).

If the reactor contents are heated up to and/or above the boiling point of the chemical with the lowest boiling point in the batch, the ideal gas law no longer applies. In this case, emissions shall be calculated using an emission factor of 1.27 pounds of OC per hour, derived from the stack test conducted on 5/12/94, for Reactor 9 (P107), in which the batch exceeded this temperature. This emission factor shall be multiplied by the time (hours) the chemical was above its boiling point to calculate the pounds of the lower boiling point chemical emitted during this time period. To calculate emissions for chemicals with higher boiling points than the batch temperature during this period of time, the emissions calculated using the emission factor above (lbs) shall be multiplied by the ratio of the weight (lbs) of each higher boiling point chemical, to the weight of the lower boiling point chemical in the batch. Each fraction of the higher boiling point chemicals' emissions, calculated in this way, shall be added to the emissions calculated for the chemical that's boiling point was exceeded, to document a conservative estimate of OC emissions for the time period operating under these conditions.

The total uncontrolled OC emission rate from each method of loss for each batch shall be calculated by summing all volatile components to equal the total pounds OC emitted per batch from the reactor.

Alternative methods to the emission calculations above may be used with prior approval from the Ohio EPA, Central District Office.

For the purpose of calculating annual emissions, the control efficiency for each product or product type made during the year may be calculated by using the average temperatures from the four calendar quarters or the average of all batches made during the year of record; or may be calculated using the average temperatures by season, if batch records are so segregated; or may be calculated by using worst-case temperatures, causing the highest emissions. The average temperatures shall be derived from the records of each product batch (to derive the inlet vapor temperature), and from the continuous temperature monitor installed after the reactor, prior to the chiller (to derive the outlet vapor temperature), and the efficiency calculated as per the method above.

b. Emission Limitation:

OC from this emissions unit shall not exceed 4.0 tons per year.

Applicable Compliance Method:



Compliance with the annual OC emission limitation for this emissions unit shall be demonstrated based on the record keeping requirements in B.1.b)(3).

c. Emission Limitations

The facility-wide individual and combined HAP emissions shall not exceed 9.9 tons and 24.9 tons per rolling, 12-month period, respectively.

Applicable Compliance Method:

Compliance with the facility-wide HAP emission limitations shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

d. Emission Limitation:

The facility-wide OC emissions shall not exceed 99.9 tons per rolling, 12- month period.

Applicable Compliance Method:

Compliance with the facility-wide OC emission limitation shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

g) Miscellaneous Requirements

- (1) None.



2. P125, Reactor 11 System

Operations, Property and/or Equipment Description:

Reactor 11 System with pre-emulsion tank

- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
 - (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - a. See d)(6), (7), (8) and (9).
 - (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
 - a. See b)(1)b, c(1) and d)(1).
- b) Applicable Emissions Limitations and/or Control Requirements
 - (1) The specific operations(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|--|---|
| a. | OAC rule 3745-31-05(A)(3) (PTI 01-06303) | Organic compound (OC) emissions from this emissions unit shall not exceed 7.1 tons per year. See b)(2)a., c)(1), and c)(2) below. The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(D) and OAC rule 3745-21-07(M). |
| b. | OAC rule 3745-31-05(D) (synthetic minor to avoid Title V permitting and MACT) | See B.1.b)(1). |
| c. | OAC rule 3745-21-07(M)(3)(d)(v)(i) | Organic compound (OC) emissions from each emissions unit shall not exceed 7.8 lbs/hr and 39.0 lbs/day. |
| d. | OAC rule 3745-15-07(A) | See c)(4) and c)(5). |



(2) Additional Terms and Conditions

- a. The chilled water and/or refrigerated condensers on the pre-emulsion tank and reactor for this emissions unit shall be operated and maintained in accordance with federally enforceable restrictions as required by this permit.
- b. This permit supercedes PTI 01-06303 modified on August 28, 2001 and restricts the facility-wide hazardous air pollutant (HAP) emissions to less than the MACT applicability threshold of 10 tons individual HAP and/or 25 tons per year total combined HAPs emissions, respectively.
- c. The emission limitations and control requirements from the amended 21-07 rule, and the associated operational restrictions and the monitoring, record keeping, and reporting requirements contained in this permit, shall become federally enforceable on the date the U.S. EPA approves the revised OAC rule 3745-21-07 as a revision to the Ohio State Implementation Plan. The following terms shall become federally enforceable after U.S. EPA approves the rule revision:

b)(1)c

[OAC rule 3745-21-07]

c) Operational Restrictions

- (1) See B.1.b)(1) and B.1.b)(2).
- (2) The maximum temperature of the exhaust gases from the reactor's condenser shall not exceed 42 degrees Celsius during any hour in which the average temperature is 35 degrees Celsius or above, if the condenser is used to demonstrate compliance with allowable VOC emission limitations. If these conditions are exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used;
- (3) The maximum temperature of the chilled water and or refrigerant entering the condenser serving the pre-emulsion tank(s) shall not exceed 17 degrees Celsius at any time, or that temperature established during the most recent emissions test that demonstrated that the condenser achieved a 50% reduction of VOC emissions vented to it, if a pre-emulsion tank's condenser is used to demonstrate compliance with allowable VOC limitations. This temperature shall be monitored at the point the chilled water enters the building containing the reactor. If this temperature is exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used;
- (4) The pressure setting of the conservation vent, if used on the pre-emulsion tank vent, shall be set by the manufacturer at a minimum of 2 inches of water, and the permittee shall perform annual inspections to ensure that the vents are clean and unobstructed.
- (5) The permittee shall maintain an emergency containment system capable of preventing the release of any liquid or solid materials from these emissions units. The purpose of the emergency containment system is public safety and the design shall be adequate to prevent any release of liquid or solid materials.



d) Monitoring and/or Recordkeeping Requirements

(1) See B.1.b)(3).

(2) The permittee shall collect and record the following information for each day for each batch of product processed in this emissions unit:

- a. the company name, code, and/or identification number for each batch of product processed; the date of production; and the number of batches of each product processed;
- b. the amount, in pounds, of each organic material added to pre-emulsion tank(s) and the reactor(this may be maintained on the batch sheet);
- c. the highest operating temperature reached during the batch run;
- d. the start and stop time for each batch run, recorded on each batch sheet, from which the duration of each batch run (hrs/batch) and the total hours of operation for this emissions unit (hrs/day) can be determined;
- e. the actual number of batches of each product processed each day;
- f. the VOC and HAP emission rates for each batch to be calculated by summing the emissions from the pre-emulsion tank (if applicable) with those from the reactor, plus the general exhaust of fugitives, as determined during the most recent emission test .

If the reactor contents are not heated above the boiling point of the chemical with the lowest boiling point in the batch, the reactor emissions may be calculated using ideal gas law equations. The maximum control efficiency applied for the condenser shall not exceed the 97% or that determined during the most recent emission testing.

If the pre-emulsion tank's condenser operates at 6 degrees Celsius or greater, the pre-emulsion tank emissions shall be calculated with a control efficiency of no greater than 70 percent, or that percentage determined during the most recent emission testing. At chilled water temperatures of less than 6 degrees Celsius, a batch emission rate (see table below) in lbs of vinyl acetate (VOC) from the pre-emulsion tank condenser (from emission test data) may be applied in the calculation of VOC emissions contributed to the reactor system by the pre-emulsion tank.

This calculation and record may be maintained in the facility records and may be adjusted downward depending in the recorded highest temperature of the refrigerated coolant temperature entering the condenser serving the reactor pre-emulsion tank.

| Avg. Condenser Emission Temp. (C) | VOC lb/batch (vinyl acetate) |
|-----------------------------------|------------------------------|
| -2.5 | 0.759 |



| | |
|----|------|
| -1 | 1.09 |
| 0 | 1.31 |
| 1 | 1.53 |
| 2 | 1.8 |
| 3 | 2.02 |
| 4 | 2.24 |
| 5 | 2.52 |

- (3) At the end of each calendar month the permittee shall calculate and record the following information for each day of the preceding month:
- a. the total number of batches of each individual product (identified as required in d)(1)e. processed in this emissions unit during the calendar quarter, for each day of operation;
 - b. an identification of how the emissions were calculated for each day, showing each batch or all batches calculated using one of the following methods:
 - i. product batches are representative of normal operations and the estimated emissions are calculated by using existing documented, conservative and/or worst-case variables for each product batch or product batch group, and records maintained under d)(2)f;
 - ii. product batch(s) is/are individually calculated because an existing record, maintained as required in d)(2)f, does not exist;
 - iii. product batch(s) deviate(s) from normal operating parameters and is/are individually calculated, including adjustments to the efficiency due to condenser temperature deviations; and/or
 - iv. product batch(s) is/are made without the condenser control or during a malfunction of the condenser and the control efficiency is not applied ;
 - c. the total actual VOC and HAP emissions for each day of operation (lbs/day), from all product batches produced each day, calculated as specified in d)(2)f, and calculated using one of the following methods:
 - i. the sum of the actual VOC and HAP emissions calculated from all batches run for each day of operation; or
 - ii. the sum of the actual VOC and HAP emissions from all batches run each day, calculated by multiplying the conservatively calculated or worst-case emissions for one batch of each product or product group times the number of batches of each product run, and adding the resultant VOC



and HAP emissions for all products made in this emissions unit each day, including those calculated individually for abnormal operations or for new products.

- d. the VOC emissions from this emissions unit for each month of operation, calculated by summing the emissions recorded in d)(3)c for each day; and
- e. the rolling, 12-month summation of VOC emissions from this emissions unit, calculated by summing the emissions recorded in d)(3)d for each month.

* The controlled emissions from each batch produced under normal operating conditions shall be calculated by multiplying the emissions for each product batch or product batch group, calculated under f)(1)a. The calculated controlled VOC emissions of each organic chemical component shall be added to get the total VOC/batch. The controlled emissions, in pounds/batch, maintained in d)(2)f for each product or product batch group, may be added for each day to satisfy this requirement.

- (4) If the reactor's condenser is used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the exhaust gases from the condenser serving the reactor, when the emissions unit is in operation. Units shall be in degrees Celsius. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.

The permittee shall collect and maintain the following information each day for each batch:

- a. the computer record of the continuous temperature monitor, which shall document the average temperature of the exhaust gases from the condenser serving the reactor, during each one-hour period of operation when the maximum temperature exceeded 42 degrees Celsius;
- b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the reactor and its associated condenser, temperature control device, and monitoring equipment for each product batch; and
- c. for any batch in which the peak temperature of the exhaust gases from the condenser serving the reactor exceeded 42 degrees Celsius in any hour in which the average temperature was 35 degrees Celsius or above.

- (5) If the pre-emulsion tanks' condenser are used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s) when the emissions unit is in operation. Units shall be in degrees Celsius. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is



greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals, and may be monitored at the point the chilled water enters the building containing the reactor.

The permittee shall collect and maintain the following information each day for each batch:

- a. the computer record of the continuous temperature monitor which shall document the peak temperature of the chilled water entering the condenser serving the pre-emulsion tank(s);
- b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the pre-emulsion tank(s) and its/their associated condenser, temperature control device, and monitoring equipment for each product batch*; and
- c. for any batch in which the peak temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s) exceeded 17 degrees Celsius at any time or that temperature established during the most recent emissions test that demonstrated that the condenser effectively limited VOC emissions.

* If the pre-emulsion tank(s) has/have operated in association with the reactor in the production of any batch, and during the same period of time, the log for the reactor may so indicate this, to alleviate the second record for the pre-emulsion tank(s).

(6) The PTI application for this/these emissions unit, P125, was evaluated based on the actual materials and the design parameters of the emissions unit's(s') exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:

- a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit(s), (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):
 - i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices";
 - or



- ii. STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.
- iii. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).
- iv. This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., "X" hours per day and "Y" days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

$$TLV/10 \times 8/X \times 5/Y = 4 TLV/XY = MAGLC$$

- b. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic Contaminant: Vinyl Acetate.

TLV (mg/m3): 35.2

Maximum Hourly Emission Rate (lbs/hr): 6.02

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 619

MAGLC (ug/m3): 838

The permittee, has demonstrated that emissions of vinyl acetate from emissions unit(s) P125, is calculated to be less than eighty per cent of the maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

- (7) Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration", the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
 - a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;



- b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and
 - c. physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).
- (8) If the permittee determines that the “Toxic Air Contaminant Statute” will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a “modification”, the permittee shall apply for and obtain a final PTIO prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.
- a. The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F):
 - i. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);
 - ii. the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F);
 - iii. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and
 - iv. the documentation of the initial evaluation of compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.
- (9) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.



e) Reporting Requirements

(1) The permittee shall submit quarterly deviation (excursion) reports for the following emissions unit(s) that identify:

a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the Potential to Emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

| Emissions unit ID | Term & Condition |
|-------------------|--|
| P125 | b)(2)a & b, c)(1), (2), (3), (4) & (5) |

b. the probable cause of each deviation (excursion);

c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and

d. the magnitude and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted (postmarked) each year by the thirty-first of January (covering October to December), the thirtieth of April (covering January to March), the thirty-first of July (covering April to June), and the thirty-first of October (covering July to September), unless an alternative schedule has been established and approved by the director (the appropriate district office or local air agency).

(2) The permittee shall include any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with the Toxic Air Contaminant Statute, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration, in the quarterly deviation (excursion) reports. If no changes to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect.

[OAC rule 3745-15-03(B)(1)(b)] and [OAC rule 3745-15-03(C)]

(3) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

[OAC rule 3745-15-03(B)(2)] and [OAC rule 3745-15-03(D)].



f) Testing Requirements

(1) Compliance with the emission limitations in b)(1) of the terms and conditions of this permit shall be determined in accordance with the following methods:

a. Emission Limitation:

OC emissions from each emissions unit shall not exceed 7.8 lbs/hr and 39.0 lbs/day.

Applicable Compliance Method:

Compliance with the hourly emission limitation was demonstrated during emission testing in November 2004 and 2005 for vinyl acetate production. If required, the permittee shall demonstrate compliance with this emission limitation through emission tests performed in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 4 and 18.

Compliance with the daily OC emission limitations shall be demonstrated based on the record keeping requirements in d)(2) and d)(3).

Emissions from each batch shall be calculated as follows:

If the reactor contents are heated up to and/or above the boiling point of the chemical with the lowest boiling point in the batch, the ideal gas law no longer applies. In this case, emissions shall be calculated using an emission factor of 1.27 pounds of OC per hour, derived from the stack test conducted on 5/12/94, for Reactor 9 (P107), in which the batch exceeded this temperature. This emission factor shall be multiplied by the time (hours) the chemical was above its boiling point to calculate the pounds of the lower boiling point chemical emitted during this time period. To calculate emissions for chemicals with higher boiling points than the batch temperature during this period of time, the emissions calculated using the emission factor above (lbs) shall be multiplied by the ratio of the weight (lbs) of each higher boiling point chemical, to the weight of the lower boiling point chemical in the batch. Each fraction of the higher boiling point chemicals' emissions, calculated in this way, shall be added to the emissions calculated for the chemical that's boiling point was exceeded, to document a conservative estimate of OC emissions for the time period operating under these conditions.

The total uncontrolled OC emission rate from each method of loss for each batch shall be calculated by summing all volatile components to equal the total pounds OC emitted per batch from the reactor.

Alternative methods to the emission calculations above may be used with prior approval from the Ohio EPA, Central District Office.

For the purpose of calculating annual emissions, the control efficiency for each product or product type made during the year may be calculated by using the average temperatures from the four calendar quarters or the average of all batches made during the year of record; or may be calculated using the average



temperatures by season, if batch records are so segregated; or may be calculated by using worst-case temperatures, causing the highest emissions. The average temperatures shall be derived from the records of each product batch (to derive the inlet vapor temperature), and from the continuous temperature monitor installed after the reactor, prior to the chiller (to derive the outlet vapor temperature), and the efficiency calculated as per the method above.

b. Emission Limitation:

OC emissions from this emissions unit shall not exceed 7.1 tons per year

Applicable Compliance Method:

Compliance with the annual OC emission limitation for this emissions unit shall be demonstrated based on the record keeping requirements in B.1.b)(3), above.

c. Emission Limitations

The facility-wide individual and combined HAP emissions shall not exceed 9.9 tons and 24.9 tons per rolling, 12-month period, respectively.

Applicable Compliance Method:

Compliance with the facility-wide HAP emission limitations shall be demonstrated by the record keeping requirements specified in B.1.b)(3), above.

d. Emission Limitation:

The facility-wide OC emissions shall not exceed 99.9 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the facility-wide OC emission limitation shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

g) Miscellaneous Requirements

- (1) None.



3. P126, Polyurethane Prepolymer Reactor

Operations, Property and/or Equipment Description:

Pilot reactor (200 gallon w/agitator)

- a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
 - (1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - a. See d)(4), (5), (6) and (7) below.
 - (2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
 - a. See b)(1)b, c(1) and d)(1).
- b) Applicable Emissions Limitations and/or Control Requirements
 - (1) The specific operations(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|--|---|
| a. | OAC rule 3745-31-05(A)(3) (PTI 01-07879) | Organic compound (OC) emissions from this emissions unit shall not exceed 2.74 tons per year. See b)(2)a. and c)(1). The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(D). |
| b. | OAC rule 3745-21-07(M)(4) | Organic compound (OC) emissions from this emissions unit shall not exceed 3 lbs/hr and 15 lbs/day. |
| c. | OAC rule 3745-31-05(D) (synthetic minor to avoid Title V permitting and MACT) | See B.1.b)(1) and B.1.b)(2). |



(2) Additional Terms and Conditions

- a. This permit supercedes PTI 01-07879 issued on July 8, 1999. and restricts the facility-wide hazardous air pollutant (HAP) emissions to less than the MACT applicability threshold of 10 tons individual HAP and/or 25 tons per year total combined HAPs emissions, respectively.
- b. The emission limitations and control requirements from the amended 21-07 rule, and the associated operational restrictions and the monitoring, record keeping, and reporting requirements contained in this permit, shall become federally enforceable on the date the U.S. EPA approves the revised OAC rule 3745-21-07 as a revision to the Ohio State Implementation Plan. The following terms shall become federally enforceable after U.S. EPA approves the rule revision:

b)(1)b

[OAC rule 3745-21-07]

c) Operational Restrictions

- (1) The maximum daily production for this emissions unit shall not exceed 3 batches.

d) Monitoring and/or Recordkeeping Requirements

- (1) See B.1.b)(3).
- (2) The permittee shall collect and record the following information for each day for each batch of product processed in this emissions unit:
 - a. the company name, code, and/or identification number for each batch of product processed; the date of production; and the number of batches of each product processed;
 - b. the amount, in pounds, of each organic material added to pre-emulsion tank(s) and the reactor(this may be maintained on the batch sheet);
 - c. the highest operating temperature reached during the batch run;
 - d. the start and stop time for each batch run, recorded on each batch sheet, from which the duration of each batch run (hrs/batch) and the total hours of operation for this emissions unit (hrs/day) can be determined; and
 - e. the actual number of batches of each product processed each day.
- (3) At the end of each calendar month the permittee shall calculate and record the following information for each day of the preceding month:
 - a. the total number of batches of each individual product (identified as required in d)(2)e processed in this emissions unit during the calendar quarter, for each day of operation;



- b. an identification of how the emissions were calculated for each day, showing each batch or all batches calculated using one of the following methods:
 - i. product batches are representative of normal operations and the estimated emissions are calculated by using existing documented, conservative and/or worst-case variables for each product batch or product batch group, and records maintained per 3.f)(1)a;
 - ii. product batch(s) is/are individually calculated because an existing record, does not exist;
 - iii. product batch(s) deviate(s) from normal operating parameters and is/are individually calculated, including adjustments to the efficiency due to condenser temperature deviations; and/or
 - iv. product batch(s) is/are made without the condenser control or during a malfunction of the condenser and the control efficiency is not applied.
 - c. the total actual OC and HAP emissions for each day of operation (lbs/day), from all product batches produced each day, calculated as specified in f)(1)a, and calculated using one of the following methods:
 - i. the sum of the actual OC and HAP emissions calculated from all batches run for each day of operation; or
 - ii. the sum of the actual OC and HAP emissions from all batches run each day, calculated by multiplying the conservatively calculated or worst-case emissions for one batch of each product or product group times the number of batches of each product run, and adding the resultant VOC and HAP emissions for all products made in this emissions unit each day, including those calculated individually for abnormal operations or for new products.
 - d. the OC emissions from this emissions unit for each month of operation, calculated by summing the emissions recorded in d)(3)c for each day; and
 - e. the rolling, 12-month summation of OC emissions from this emissions unit, calculated by summing the emissions recorded in d)(3)d for each month.
 - * The controlled emissions from each batch produced under normal operating conditions shall be calculated by multiplying the emissions for each product batch or product batch group, calculated under f)(1)a. The calculated controlled VOC emissions of each organic chemical component shall be added to get the total VOC/batch. The controlled emissions, in pounds/batch, maintained in f)(1)a for each product or product batch group, may be added for each day to satisfy this requirement.
- (4) The PTI application for this emissions unit, P126, was evaluated based on the actual materials and the design parameters of the emissions unit's exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule



3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled “Review of New Sources of Air Toxic Emissions, Option A”, as follows:

- a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit(s), (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):
 - i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists’ (ACGIH) “Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices”; or
 - ii. STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists’ (ACGIH) “Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices”; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.
 - iii. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).
 - iv. This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., “X” hours per day and “Y” days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

$$TLV/10 \times 8/X \times 5/Y = 4 TLV/XY = MAGLC$$

- b. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or “worst case” toxic contaminant(s):

Toxic Contaminant: n-butyl acetate.

TLV (mg/m3): 713

Maximum Hourly Emission Rate (lbs/hr): 13.5

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 3,297

MAGLC (ug/m3): 16,976



The permittee, has demonstrated that emissions of n-butyl acetate, from emissions unit P126, is calculated to be less than eighty per cent of the maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

- (5) Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration", the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
- a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;
 - b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and
 - c. physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).
- (6) If the permittee determines that the "Toxic Air Contaminant Statute" will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a "modification", the permittee shall apply for and obtain a final PTIO prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.
- a. The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F):
 - i. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);
 - ii. the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F);



- iii. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and
 - iv. the documentation of the initial evaluation of compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.
- (7) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports for the following emissions unit(s) that identify:
 - a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the Potential to Emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

| Emissions unit ID | Term & Condition |
|-------------------|--------------------------------------|
| P126 | b)(1), b)(2)a and b, 3.c)(1) and (2) |

- b. the probable cause of each deviation (excursion);
- c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and
- d. the magnitude and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted (postmarked) each year by the thirty-first of January (covering October to December), the thirtieth of April (covering January to March), the thirty-first of July (covering April to June), and the thirty-first of October (covering July to September), unless an alternative schedule has been established and approved by the director (the appropriate district office or local air agency).

- (2) The permittee shall include any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with the Toxic Air Contaminant Statute, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration, in the quarterly deviation (excursion) reports. If no changes



to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect.

[OAC rule 3745-15-03(B)(1)(b)] and [OAC rule 3745-15-03(C)]

f) Testing Requirements

(1) Compliance with the emission limitations in b)(1) of the terms and conditions of this permit shall be determined in accordance with the following methods:

a. Emission Limitation:

OC emissions from this emissions unit shall not exceed 3 lbs/hr and 15 lbs/day.

Applicable Compliance Method:

Compliance with the daily emission limitation demonstrated based on the record keeping requirements in d)(2) and d)(3).

If the reactor contents are heated up to and/or above the boiling point of the chemical with the lowest boiling point in the batch, the ideal gas law no longer applies. In this case, emissions shall be calculated using an emission factor of 1.27 pounds of OC per hour, derived from the stack test conducted on 5/12/94, for Reactor 9 (P107), in which the batch exceeded this temperature. This emission factor shall be multiplied by the time (hours) the chemical was above its boiling point to calculate the pounds of the lower boiling point chemical emitted during this time period. To calculate emissions for chemicals with higher boiling points than the batch temperature during this period of time, the emissions calculated using the emission factor above (lbs) shall be multiplied by the ratio of the weight (lbs) of each higher boiling point chemical, to the weight of the lower boiling point chemical in the batch. Each fraction of the higher boiling point chemicals' emissions, calculated in this way, shall be added to the emissions calculated for the chemical that's boiling point was exceeded, to document a conservative estimate of OC emissions for the time period operating under these conditions.

The total uncontrolled OC emission rate from each method of loss for each batch shall be calculated by summing all volatile components to equal the total pounds VOC emitted per batch from the reactor.

Alternative methods to the emission calculations above may be used with prior approval from the Ohio EPA, Central District Office.

For the purpose of calculating annual emissions, the control efficiency for each product or product type made during the year may be calculated by using the average temperatures from the four calendar quarters or the average of all batches made during the year of record; or may be calculated using the average temperatures by season, if batch records are so segregated; or may be calculated by using worst-case temperatures, causing the highest emissions. The average temperatures shall be derived from the records of each product batch (to derive the inlet vapor temperature), and from the continuous



temperature monitor installed after the reactor, prior to the chiller (to derive the outlet vapor temperature), and the efficiency calculated as per the method above.

b. Emissions Limitation:

OC emissions from this emissions unit shall not exceed 2.74 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the annual OC emission limitation for this emissions unit shall be demonstrated based on the record keeping requirements in section d)(3).

c. Emissions Limitation:

The facility-wide individual and combined HAP emissions shall not exceed 9.9 tons and 24.9 tons per rolling, 12-month period, respectively.

Applicable Compliance Method:

Compliance with the facility-wide HAP emission limitations shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

d. Emissions Limitation:

The facility-wide OC emissions shall not exceed 99.9 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the facility-wide OC emission limitation shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

g) Miscellaneous Requirements

- (1) None.



4. P128, Pilot Reactor - Polymer Division

Operations, Property and/or Equipment Description:

Pilot reactor (58 gallons) with condenser and 2 pre-emulsion tanks

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. None.

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. See b)(1)b, c(1) and d)(1).

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operations(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|--|---|
| a. | OAC rule 3745-31-05(A)(3)(a)(ii) | Organic Compound (OC) emissions from this emissions unit shall not exceed 2.74 tons per rolling, 12-month period. See b)(2)a. below. |
| b. | OAC rule 3745-21-07(M)(4) | Organic compound (OC) emissions from this emissions unit shall not exceed 3 lbs/hr and 15 lbs/day. |
| c. | OAC rule 3745-31-05(D) (synthetic minor to avoid Title V permitting and MACT) | See B.1.b)(1). |

(2) Additional Terms and Conditions

a. The chilled water and/or refrigerated condensers on the pre-emulsion tank and reactor for this emissions unit shall be operated and maintained in accordance with federally enforceable restrictions as required by this permit.



- b. The emission limitations and control requirements from the amended 21-07 rule, and the associated operational restrictions and the monitoring, record keeping, and reporting requirements contained in this permit, shall become federally enforceable on the date the U.S. EPA approves the revised OAC rule 3745-21-07 as a revision to the Ohio State Implementation Plan. The following terms shall become federally enforceable after U.S. EPA approves the rule revision:

b)(1)b

[OAC rule 3745-21-07]

c) Operational Restrictions

- (1) See B.1.b)(1) and B.1.b)(2).

d) Monitoring and/or Recordkeeping Requirements

- (1) See B.1.b)(3).

- (2) The permittee shall collect and record the following information for each day for each batch of product processed in this emissions unit:

- a. the company name, code, and/or identification number for each batch of product processed; the date of production; and the number of batches of each product processed;
- b. the amount, in pounds, of each organic material added to pre-emulsion tank(s) and the reactor(this may be maintained on the batch sheet);
- c. the highest operating temperature reached during the batch run;
- d. the start and stop time for each batch run, recorded on each batch sheet, from which the duration of each batch run (hrs/batch) and the total hours of operation for this emissions unit (hrs/day) can be determined; and
- e. the actual number of batches of each product processed each day.

- (3) At the end of each calendar month the permittee shall calculate and record the following information for each day of the preceding month:

- a. the total number of batches of each individual product (identified as required in d)(2)e processed in this emissions unit during the calendar quarter, for each day of operation;
- b. an identification of how the emissions were calculated for each day, showing each batch or all batches calculated using one of the following methods:
 - i. product batches are representative of normal operations and the estimated emissions are calculated by using existing documented, conservative and/or worst-case variables for each product batch or product batch group, and records maintained per 3.f)(1)a;



- ii. product batch(s) is/are individually calculated because an existing record, does not exist;
 - iii. product batch(s) deviate(s) from normal operating parameters and is/are individually calculated, including adjustments to the efficiency due to condenser temperature deviations; and/or
 - iv. product batch(s) is/are made without the condenser control or during a malfunction of the condenser and the control efficiency is not applied.
- c. the total actual OC and HAP emissions for each day of operation (lbs/day), from all product batches produced each day, calculated as specified in f)(1)a, and calculated using one of the following methods:
- i. the sum of the actual OC and HAP emissions calculated from all batches run for each day of operation; or
 - ii. the sum of the actual OC and HAP emissions from all batches run each day, calculated by multiplying the conservatively calculated or worst-case emissions for one batch of each product or product group times the number of batches of each product run, and adding the resultant VOC and HAP emissions for all products made in this emissions unit each day, including those calculated individually for abnormal operations or for new products.
- d. the OC emissions from this emissions unit for each month of operation, calculated by summing the emissions recorded in d)(3)c for each day; and
- e. the rolling, 12-month summation of OC emissions from this emissions unit, calculated by summing the emissions recorded in d)(3)d for each month.

* The controlled emissions from each batch produced under normal operating conditions shall be calculated by multiplying the emissions for each product batch or product batch group, calculated under f)(1)a. The calculated controlled VOC emissions of each organic chemical component shall be added to get the total VOC/batch. The controlled emissions, in pounds/batch, maintained in f)(1)a for each product or product batch group, may be added for each day to satisfy this requirement.

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports for the following emissions unit(s) that identify:
- a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the Potential to Emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

| Emissions unit ID | Term & Condition |
|-------------------|--------------------------------------|
| P126 | b)(1), b)(2)a and b, 3.c)(1) and (2) |



- b. the probable cause of each deviation (excursion);
- c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and
- d. the magnitude and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted (postmarked) each year by the thirty-first of January (covering October to December), the thirtieth of April (covering January to March), the thirty-first of July (covering April to June), and the thirty-first of October (covering July to September), unless an alternative schedule has been established and approved by the director (the appropriate district office or local air agency).

f) **Testing Requirements**

- (1) Compliance with the emission limitations in b)(1) of the terms and conditions of this permit shall be determined in accordance with the following methods:

- a. Emissions Limitation:

OC emissions from this emissions unit shall not exceed 3 lbs/hr and 15 lbs/day.

Applicable Compliance Method:

Compliance with the daily emission limitation demonstrated based on the record keeping requirements in d)(2) and d)(3).

If the reactor contents are heated up to and/or above the boiling point of the chemical with the lowest boiling point in the batch, the ideal gas law no longer applies. In this case, emissions shall be calculated using an emission factor of 1.27 pounds of OC per hour, derived from the stack test conducted on 5/12/94, for Reactor 9 (P107), in which the batch exceeded this temperature. This emission factor shall be multiplied by the time (hours) the chemical was above its boiling point to calculate the pounds of the lower boiling point chemical emitted during this time period. To calculate emissions for chemicals with higher boiling points than the batch temperature during this period of time, the emissions calculated using the emission factor above (lbs) shall be multiplied by the ratio of the weight (lbs) of each higher boiling point chemical, to the weight of the lower boiling point chemical in the batch. Each fraction of the higher boiling point chemicals' emissions, calculated in this way, shall be added to the emissions calculated for the chemical that's boiling point was exceeded, to document a conservative estimate of OC emissions for the time period operating under these conditions.

The total uncontrolled OC emission rate from each method of loss for each batch shall be calculated by summing all volatile components to equal the total pounds VOC emitted per batch from the reactor.



Alternative methods to the emission calculations above may be used with prior approval from the Ohio EPA, Central District Office.

For the purpose of calculating annual emissions, the control efficiency for each product or product type made during the year may be calculated by using the average temperatures from the four calendar quarters or the average of all batches made during the year of record; or may be calculated using the average temperatures by season, if batch records are so segregated; or may be calculated by using worst-case temperatures, causing the highest emissions. The average temperatures shall be derived from the records of each product batch (to derive the inlet vapor temperature), and from the continuous temperature monitor installed after the reactor, prior to the chiller (to derive the outlet vapor temperature), and the efficiency calculated as per the method above.

b. Emissions Limitation:

OC emissions from this emissions unit shall not exceed 2.74 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the annual OC emission limitation for this emissions unit shall be demonstrated based on the record keeping requirements in section d)(3).

c. Emissions Limitation:

The facility-wide individual and combined HAP emissions shall not exceed 9.9 tons and 24.9 tons per rolling, 12-month period, respectively.

Applicable Compliance Method:

Compliance with the facility-wide HAP emission limitations shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

d. Emissions Limitation:

The facility-wide OC emissions shall not exceed 99.9 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the facility-wide OC emission limitation shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

g) Miscellaneous Requirements

- (1) None.



5. Emissions Unit Group - PTI 01-12038: P103, P113, P114,

| EU ID | Operations, Property and/or Equipment Description |
|--------------|--|
| P103 | Continuous Reactor System w/ 2 pre-emulsion tanks |
| P113 | Reactor 4 System w/pre-emulsion tank |
| P114 | Reactor 5 System w/pre-emulsion tank |

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. None.

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operations(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|--|--|
| a. | OAC rule 3745-31-05(A)(3) (PTI 01-12038) | Organic Compound (OC) emissions from each emissions unit shall not exceed Organic compound (OC) emissions shall not exceed 6.5 lbs/hr, 32.3 lbs/day and 6.0 tons per year. See 5.b)(2)a., 5.c)(1), and 5.c)(2) below. The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(D) and OAC rule 3745-21-07(M). |
| b. | OAC rule 3745-31-05(D) (synthetic minor to avoid Title V permitting and MACT) | See B.1.b)(1). |
| c. | OAC rule 3745-21-07(M)(3)(d)(v)(a), (d), (e). | The emission limitation specified by this rule is less stringent than the emission |



| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|-------------------------------|---|
| | | limitation established pursuant to OAC rule 3745-31-05(A)(3). |
| d. | OAC rule 3745-15-07(A) | See c)(4) and c)(5). |
| e. | ORC 3704.03(F)(4)(c) | See b)(2)c below. |

(2) Additional Terms and Conditions

- a. The chilled water and/or refrigerated condensers on the pre-emulsion tank and reactor for this emissions unit shall be operated and maintained in accordance with federally enforceable restrictions as required by this permit.
- b. This permit supercedes PTI 01-12038 issued on July 5, 2007 for P103, P113, and P114 and restricts the facility-wide hazardous air pollutant (HAP) emissions to less than the MACT applicability threshold of 10 tons individual HAP and/or 25 tons per year total combined HAPs emission, respectively.
- c. Modeling to demonstrate compliance with, the "Toxic Air Contaminant Statute", ORC 3704.03(F)(4)(b), was not conducted because the emissions units were installed prior to promulgation of OAC rule 3745-15-01 on February 15, 1972 and OAC rule 3745-31-05 on January 1, 1974. OAC Chapter 3745-31 requires permittees to apply for and obtain a new or modified PTIO prior to making a "modification" as defined by OAC rule 3745-31-01. The permittee is hereby advised that changes in the composition of the materials, or use of new materials, that would cause the emissions of any toxic air contaminant to increase to above 1.0 ton per year may require the permittee to apply for and obtain a new PTIO.

c) Operational Restrictions

- (1) See B.1.b)(1) and B.1.b)(2).
- (2) The maximum temperature of the exhaust gases from the reactor's condenser shall not exceed 42 degrees Celsius during any hour in which the average temperature is 35 degrees Celsius or above, if the condenser is used to demonstrate compliance with allowable VOC emission limitations. If these conditions are exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used;
- (3) The maximum temperature of the chilled water and or refrigerant entering the condenser serving the pre-emulsion tank(s) shall not exceed 17 degrees Celsius at any time, or that temperature established during the most recent emissions test that demonstrated that the condenser achieved a 50% reduction of VOC emissions vented to it, if a pre-emulsion tank's condenser is used to demonstrate compliance with allowable VOC limitations. This temperature shall be monitored at the point the chilled water enters the building containing the reactor. If this temperature is exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used;



- (4) The pressure setting of the conservation vent, if used on the pre-emulsion tank vent, shall be set by the manufacturer at a minimum of 2 inches of water, and the permittee shall perform annual inspections to ensure that the vents are clean and unobstructed.
 - (5) The permittee shall maintain an emergency containment system capable of preventing the release of any liquid or solid materials from these emissions units. The purpose of the emergency containment system is public safety and the design shall be adequate to prevent any release of liquid or solid materials.
- d) Monitoring and/or Recordkeeping Requirements
- (1) See B.1.b)(3).
 - (2) The permittee shall collect and record the following information for each day for each batch of product processed in this emissions unit:
 - a. the company name, code, and/or identification number for each batch of product processed; the date of production; and the number of batches of each product processed;
 - b. the amount, in pounds, of each organic material added to pre-emulsion tank(s) and the reactor(this may be maintained on the batch sheet);
 - c. the highest operating temperature reached during the batch run;
 - d. the start and stop time for each batch run, recorded on each batch sheet, from which the duration of each batch run (hrs/batch) and the total hours of operation for this emissions unit (hrs/day) can be determined;
 - e. the actual number of batches of each product processed each day;
 - f. the OC and HAP emission rates for each batch to be calculated by summing the emissions from the pre-emulsion tank (if applicable) with those from the reactor, plus the general exhaust of fugitives, as determined during the most recent emission test .

If the reactor contents are not heated above the boiling point of the chemical with the lowest boiling point in the batch, the reactor emissions may be calculated using ideal gas law equations. The maximum control efficiency applied for the condenser shall not exceed the 97% or that determined during the most recent emission testing.

If the pre-emulsion tank's condenser operates at 6 degrees Celsius or greater, the pre-emulsion tank emissions shall be calculated with a control efficiency of no greater than 70 percent, or that percentage determined during the most recent emission testing. At chilled water temperatures of less than 6 degrees Celsius, a batch emission rate (see table below) in lbs of vinyl acetate (VOC) from the pre-emulsion tank condenser (from emission test data) may be applied in the calculation of OC emissions contributed to the reactor system by the pre-emulsion tank.



This calculation and record may be maintained in the facility records and may be adjusted downward depending in the recorded highest temperature of the refrigerated coolant temperature entering the condenser serving the reactor pre-emulsion tank.

| Avg. Condenser Emission Temp. (C) | VOC lb/batch (vinyl acetate) |
|-----------------------------------|------------------------------|
| -2.5 | 0.759 |
| -1 | 1.09 |
| 0 | 1.31 |
| 1 | 1.53 |
| 2 | 1.8 |
| 3 | 2.02 |
| 4 | 2.24 |
| 5 | 2.52 |

- (3) At the end of each calendar month the permittee shall calculate and record the following information for each day of the preceding month:
- a. the total number of batches of each individual product (identified as required in d)(1)e) processed in each emissions unit during the calendar quarter, for each day of operation;
 - b. an identification of how the emissions were calculated for each day, showing each batch or all batches calculated using one of the following methods:
 - i. product batches are representative of normal operations and the estimated emissions are calculated by using existing documented, conservative and/or worst-case variables for each product batch or product batch group, and records maintained per 5.d)(2)f;
 - ii. product batch(s) is/are individually calculated because an existing record, maintained as required in 5.d)(2)f, does not exist;
 - iii. product batch(s) deviate(s) from normal operating parameters and is/are individually calculated, including adjustments to the efficiency due to condenser temperature deviations; and/or
 - iv. product batch(s) is/are made without the condenser control or during a malfunction of the condenser and the control efficiency is not applied.



- c. the total actual OC and HAP emissions for each day of operation (lbs/day), from all product batches produced each day, calculated as specified in f)(1), and calculated using one of the following methods:
 - i. the sum of the actual OC and HAP emissions calculated from all batches run for each day of operation; or
 - ii. the sum of the actual OC and HAP emissions from all batches run each day, calculated by multiplying the conservatively calculated or worst-case emissions for one batch of each product or product group times the number of batches of each product run, and adding the resultant OC and HAP emissions for all products made in this emissions unit each day, including those calculated individually for abnormal operations or for new products.
- d. the OC emissions from this emissions unit for each month of operation, calculated by summing the emissions recorded in d)(3)c for each day; and
- e. the rolling, 12-month summation of OC emissions from this emissions unit, calculated by summing the emissions recorded in d)(3)d for each month.

* The controlled emissions from each batch produced under normal operating conditions shall be calculated by multiplying the emissions for each product batch or product batch group, calculated under f)(1)a. The calculated controlled VOC emissions of each organic chemical component shall be added to get the total VOC/batch. The controlled emissions, in pounds/batch, maintained in d)(2)f for each product or product batch group, may be added for each day to satisfy this requirement.

- (4) If the reactor's condenser is used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the exhaust gases from the condenser serving the reactor, when the emissions unit is in operation. Units shall be in degrees Celsius. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.

The permittee shall collect and maintain the following information each day for each batch:

- a. the computer record of the continuous temperature monitor, which shall document the average temperature of the exhaust gases from the condenser serving the reactor, during each one-hour period of operation when the maximum temperature exceeded 42 degrees Celsius;
- b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the reactor and its associated condenser, temperature control device, and monitoring equipment for each product batch; and



- c. for any batch in which the peak temperature of the exhaust gases from the condenser serving the reactor exceeded 42 degrees Celsius in any hour in which the average temperature was 35 degrees Celsius or above.
- (5) If the pre-emulsion tanks' condenser are used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s) when the emissions unit is in operation. Units shall be in degrees Celsius. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals, and may be monitored at the point the chilled water enters the building containing the reactor.

The permittee shall collect and maintain the following information each day for each batch:

- a. the computer record of the continuous temperature monitor which shall document the peak temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s);
- b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the pre-emulsion tank(s) and its/their associated condenser, temperature control device, and monitoring equipment for each product batch*; and
- c. for any batch in which the peak temperature of the chilled-water entering the condenser serving the pre-emulsion tank(s) exceeded 17 degrees Celsius at any time or that temperature established during the most recent emissions test that demonstrated that the condenser effectively limited OC emissions.

* If the pre-emulsion tank(s) has/have operated in association with the reactor in the production of any batch, and during the same period of time, the log for the reactor may so indicate this, to alleviate the second record for the pre-emulsion tank(s).

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports for the following emissions unit(s) that identify:
 - a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the Potential to Emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

| Emissions unit ID | Term & Condition |
|-------------------|------------------------------------|
| P103 | b)(1), b)(2)a, c)(1), (2) and (3). |
| P113 | b)(1), b)(2)a, c)(1), (2) and (3). |



| | |
|------|------------------------------------|
| P114 | b)(1), b)(2)a, c)(1), (2) and (3). |
|------|------------------------------------|

- b. the probable cause of each deviation (excursion);
- c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and
- d. the magnitude and duration of each deviation (excursion).

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted (postmarked) each year by the thirty-first of January (covering October to December), the thirtieth of April (covering January to March), the thirty-first of July (covering April to June), and the thirty-first of October (covering July to September), unless an alternative schedule has been established and approved by the director (the appropriate district office or local air agency).

- (2) The permittee shall include any changes made to a parameter or value used in the dispersion model, that would be used to demonstrate compliance with the Toxic Air Contaminant Statute, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration, in the quarterly deviation (excursion) reports. If no changes to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect.
- (3) [ORC 3704.03(F)(3)(c) and F(4)], Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

[OAC rule 3745-15-03(B)(2)] and [OAC rule 3745-15-03(D)]

f) Testing Requirements

- (1) Compliance with the emission limitations in b)(1) of the terms and conditions of this permit shall be determined in accordance with the following methods:

a. Emission Limitation:

OC emissions from each emissions unit shall not exceed 6.5 lbs/hr and/or 32.3 lbs/day.

Applicable Compliance Method:

Compliance with the hourly emission limitation was demonstrated during emission testing in November 2004 and 2005 for vinyl acetate production. If required, the permittee shall demonstrate compliance with this emission limitation through emission tests performed in accordance with 40 CFR Part 60, Appendix



A, Methods 1 through 4 and 18. Compliance with the daily OC emission limitations shall be demonstrated based on the record keeping requirements in d)(2) and d)(3).

Emissions from each batch shall be calculated as follows:

If the reactor contents are heated up to and/or above the boiling point of the chemical with the lowest boiling point in the batch, the ideal gas law no longer applies. In this case, emissions shall be calculated using an emission factor of 1.27 pounds of VOC per hour, derived from the stack test conducted on 5/12/94, for Reactor 9 (P107), in which the batch exceeded this temperature. This emission factor shall be multiplied by the time (hours) the chemical was above its boiling point to calculate the pounds of the lower boiling point chemical emitted during this time period. To calculate emissions for chemicals with higher boiling points than the batch temperature during this period of time, the emissions calculated using the emission factor above (lbs) shall be multiplied by the ratio of the weight (lbs) of each higher boiling point chemical, to the weight of the lower boiling point chemical in the batch. Each fraction of the higher boiling point chemicals' emissions, calculated in this way, shall be added to the emissions calculated for the chemical that's boiling point was exceeded, to document a conservative estimate of OC emissions for the time period operating under these conditions.

The total uncontrolled OC emission rate from each method of loss for each batch shall be calculated as summed for all volatile components = total pounds VOC emitted per batch

Alternative methods to the emission calculations above may be used with prior approval from the Ohio EPA, Central District Office.

For the purpose of calculating annual emissions, the control efficiency for each product or product type made during the year may be calculated by using the average temperatures from the four calendar quarters or the average of all batches made during the year of record; or may be calculated using the average temperatures by season, if batch records are so segregated; or may be calculated by using worst-case temperatures, causing the highest emissions. The average temperatures shall be derived from the records of each product batch (to derive the inlet vapor temperature), and from the continuous temperature monitor installed after the reactor, prior to the chiller (to derive the outlet vapor temperature), and the efficiency calculated as per the method above.

b. Emission Limitation:

OC emissions from this emissions unit shall not exceed 6.0 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the annual OC emission limitation for this emissions unit shall be demonstrated based on the record keeping requirements in d)(5)b.



c. Emission Limitations

The facility-wide individual and combined HAP emissions shall not exceed 9.9 tons and 24.9 tons per rolling, 12-month period, respectively.

Applicable Compliance Method:

Compliance with the facility-wide HAP emission limitations shall be demonstrated by the record keeping requirements specified in B.1.b)(3) and g above.

d. Emission Limitation:

The facility-wide OC emissions shall not exceed 99.9 tons per rolling, 12- month period.

Applicable Compliance Method:

Compliance with the facility-wide OC emission limitation shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.



6. Emissions Unit Group - Reactor systems 10, 9, 8, 7, 2: P106, P107, P115, P116, P127,

| EU ID | Operations, Property and/or Equipment Description |
|--------------|--|
| P106 | Reactor 10 System w/pre-emulsion tank |
| P107 | Reactor 9 System w/pre-emulsion tank |
| P115 | Reactor 7 System w/pre-emulsion tank |
| P116 | Reactor 8 System w/pre-emulsion tank |
| P127 | Reactor 2 system w/pre-emulsion tank |

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. See d)(6), (7), (8) and (9).

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. See b)(1)b, c(1) and d)(1).

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operations(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|--|---|
| a. | OAC rule 3745-31-05(A)(3) (PTI 01-05683, PTI 01-08188, PTI 01-08402) | Organic Compound (OC) emissions from each emissions unit shall not exceed 5.9 tons per year. See 5.b)(2)a., 5.c)(1), and 5.c)(2) below. The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(D) and OAC rule 3745-21-07(M). |
| b. | OAC rule 3745-31-05(D) (synthetic minor to avoid Title V permitting and MACT) | See B.1.b)(1). |
| c. | OAC rule 3745-21-07(M)(3)(d)(v)(b), (c) & (g) | Organic Compound (OC) emissions from emissions unit P106, P107 and P116 |



| | Applicable Rules/Requirements | Applicable Emissions Limitations/Control Measures |
|----|-------------------------------------|--|
| | | shall not exceed 6.5 lbs/hr and 32.3 lbs/day. |
| d. | OAC rule 3745-21-07(M)(3)(d)(v)(j) | Organic Compound (OC) emissions from emissions unit P127, shall not exceed 6.92 lbs/hr and 32.3 lbs/day. |
| e. | OAC rule 3745-21-07(M)(3)(d)(v)(f), | Organic Compound (OC) emissions from emissions unit P115 shall not exceed 7.3 lbs/hr and 32.3 lbs/day. |
| f. | OAC rule 3745-15-07(A) | See c)(4) and c)(5). |
| g. | ORC 3704.03(F)(4)(c) | See b)(2)c below. |

(2) Additional Terms and Conditions

- a. The chilled water and/or refrigerated condensers on the pre-emulsion tank and reactor for this emissions unit shall be operated and maintained in accordance with federally enforceable restrictions as required by this permit.
- b. This permit supercedes PTI 01-05683 issued on June 28, 1995 for P106, P107 and P116, PTI 01-08188 issued on July 11, 2000 for P127, and PTI 01-08402 issued on June 26, 2001 for P115 and restricts the facility-wide hazardous air pollutant (HAP) emissions to less than the MACT applicability threshold of 10 tons individual HAP and/or 25 tons per year total combined HAPs emission, respectively.
- c. In order to demonstrate compliance with the "Toxic Air Contaminant Statute", the Director has established, per ORC 3704.03(F)(4)(c), a limit for P106, P107, P116 and P127, which shall not exceed 32.3 pound(s) per day. This daily allowable emissions rate was calculated by multiplying the approved daily operating schedule submitted in the permit application, by the emission rate modeled (to determine the ground level concentration).
- d. The emission limitations and control requirements from the amended 21-07 rule, and the associated operational restrictions and the monitoring, record keeping, and reporting requirements contained in this permit, shall become federally enforceable on the date the U.S. EPA approves the revised OAC rule 3745-21-07 as a revision to the Ohio State Implementation Plan. The following terms shall become federally enforceable after U.S. EPA approves the rule revision:

b)(1)c, b)(1)d, and b)(1)e.

[OAC rule 3745-21-07]

c) Operational Restrictions

- (1) See B.1.b)(1) and B.1.b)(2).



- (2) The maximum temperature of the exhaust gases from the reactor's condenser shall not exceed 42 degrees Celsius during any hour in which the average temperature is 35 degrees Celsius or above, if the condenser is used to demonstrate compliance with allowable VOC emission limitations. If these conditions are exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used;
 - (3) The maximum temperature of the chilled water and or refrigerant entering the condenser serving the pre-emulsion tank(s) shall not exceed 17 degrees Celsius at any time, or that temperature established during the most recent emissions test that demonstrated that the condenser achieved a 50% reduction of VOC emissions vented to it, if a pre-emulsion tank's condenser is used to demonstrate compliance with allowable VOC limitations. This temperature shall be monitored at the point the chilled water enters the building containing the reactor. If this temperature is exceeded, the control efficiency shall be calculated for the batch and the record of representative emissions maintained for the product batch shall not be used;
 - (4) The pressure setting of the conservation vent, if used on the pre-emulsion tank vent, shall be set by the manufacturer at a minimum of 2 inches of water, and the permittee shall perform annual inspections to ensure that the vents are clean and unobstructed.
 - (5) The permittee shall maintain an emergency containment system capable of preventing the release of any liquid or solid materials from these emissions units. The purpose of the emergency containment system is public safety and the design shall be adequate to prevent any release of liquid or solid materials.
- d) **Monitoring and/or Recordkeeping Requirements**
- (1) See B.1.b)(3).
 - (2) The permittee shall collect and record the following information for each day for each batch of product processed in this emissions unit:
 - a. the company name, code, and/or identification number for each batch of product processed; the date of production; and the number of batches of each product processed;
 - b. the amount, in pounds, of each organic material added to pre-emulsion tank(s) and the reactor(this may be maintained on the batch sheet);
 - c. the highest operating temperature reached during the batch run;
 - d. the start and stop time for each batch run, recorded on each batch sheet, from which the duration of each batch run (hrs/batch) and the total hours of operation for this emissions unit (hrs/day) can be determined;
 - e. the actual number of batches of each product processed each day;
 - f. the OC and HAP emission rates for each batch to be calculated by summing the emissions from the pre-emulsion tank (if applicable) with those from the reactor,



plus the general exhaust of fugitives, as determined during the most recent emission test .

If the reactor contents are not heated above the boiling point of the chemical with the lowest boiling point in the batch, the reactor emissions may be calculated using ideal gas law equations. The maximum control efficiency applied for the condenser shall not exceed the 97% or that determined during the most recent emission testing.

If the pre-emulsion tank's condenser operates at 6 degrees Celsius or greater, the pre-emulsion tank emissions shall be calculated with a control efficiency of no greater than 70 percent, or that percentage determined during the most recent emission testing. At chilled water temperatures of less than 6 degrees Celsius, a batch emission rate (see table below) in lbs of vinyl acetate (VOC) from the pre-emulsion tank condenser (from emission test data) may be applied in the calculation of OC emissions contributed to the reactor system by the pre-emulsion tank.

This calculation and record may be maintained in the facility records and may be adjusted downward depending in the recorded highest temperature of the refrigerated coolant temperature entering the condenser serving the reactor pre-emulsion tank.

| Avg. Condenser Emission Temp. (C) | VOC lb/batch (vinyl acetate) |
|-----------------------------------|------------------------------|
| -2.5 | 0.759 |
| -1 | 1.09 |
| 0 | 1.31 |
| 1 | 1.53 |
| 2 | 1.8 |
| 3 | 2.02 |
| 4 | 2.24 |
| 5 | 2.52 |

- (3) At the end of each calendar month the permittee shall calculate and record the following information for each day of the preceding month:
 - a. the total number of batches of each individual product (identified as required in d)(1)e) processed in each emissions unit during the calendar quarter, for each day of operation;



- b. an identification of how the emissions were calculated for each day, showing each batch or all batches calculated using one of the following methods:
 - i. product batches are representative of normal operations and the estimated emissions are calculated by using existing documented, conservative and/or worst-case variables for each product batch or product batch group, and records maintained per 5.d)(2)f;
 - ii. product batch(s) is/are individually calculated because an existing record, maintained as required in 5.d)(2)f, does not exist;
 - iii. product batch(s) deviate(s) from normal operating parameters and is/are individually calculated, including adjustments to the efficiency due to condenser temperature deviations; and/or
 - iv. product batch(s) is/are made without the condenser control or during a malfunction of the condenser and the control efficiency is not applied.
 - c. the total actual OC and HAP emissions for each day of operation (lbs/day), from all product batches produced each day, calculated as specified in f)(1), and calculated using one of the following methods:
 - i. the sum of the actual OC and HAP emissions calculated from all batches run for each day of operation; or
 - ii. the sum of the actual OC and HAP emissions from all batches run each day, calculated by multiplying the conservatively calculated or worst-case emissions for one batch of each product or product group times the number of batches of each product run, and adding the resultant OC and HAP emissions for all products made in this emissions unit each day, including those calculated individually for abnormal operations or for new products.
 - d. the OC emissions from this emissions unit for each month of operation, calculated by summing the emissions recorded in d)(3)c for each day; and
 - e. the rolling, 12-month summation of OC emissions from this emissions unit, calculated by summing the emissions recorded in d)(3)d for each month.
 - * The controlled emissions from each batch produced under normal operating conditions shall be calculated by multiplying the emissions for each product batch or product batch group, calculated under f)(1)a. The calculated controlled VOC emissions of each organic chemical component shall be added to get the total VOC/batch. The controlled emissions, in pounds/batch, maintained in d)(2)f for each product or product batch group, may be added for each day to satisfy this requirement.
- (4) If the reactor's condenser is used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the exhaust gases from the condenser serving the reactor, when the emissions unit is in operation. Units shall be in degrees Celsius. The



accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.

The permittee shall collect and maintain the following information each day for each batch:

- a. the computer record of the continuous temperature monitor, which shall document the average temperature of the exhaust gases from the condenser serving the reactor, during each one-hour period of operation when the maximum temperature exceeded 42 degrees Celsius;
 - b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the reactor and its associated condenser, temperature control device, and monitoring equipment for each product batch; and
 - c. for any batch in which the peak temperature of the exhaust gases from the condenser serving the reactor exceeded 42 degrees Celsius in any hour in which the average temperature was 35 degrees Celsius or above.
- (5) If the pre-emulsion tanks' condenser are used to demonstrate compliance, the permittee shall operate and maintain a continuous temperature monitor and recorder which measures and records the temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s) when the emissions unit is in operation. Units shall be in degrees Celsius. The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within + or - 1 percent of the temperature being measured or + or - 2.8 degrees Celsius, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals, and may be monitored at the point the chilled water enters the building containing the reactor.

The permittee shall collect and maintain the following information each day for each batch:

- a. the computer record of the continuous temperature monitor which shall document the peak temperature of the chilled water and/or glycol refrigerant entering the condenser serving the pre-emulsion tank(s);
- b. a record (continuous temperature monitoring graph or equivalent) of the operating time for the pre-emulsion tank(s) and its/their associated condenser, temperature control device, and monitoring equipment for each product batch*; and
- c. for any batch in which the peak temperature of the chilled-water entering the condenser serving the pre-emulsion tank(s) exceeded 17 degrees Celsius at any time or that temperature established during the most recent emissions test that demonstrated that the condenser effectively limited OC emissions.



* If the pre-emulsion tank(s) has/have operated in association with the reactor in the production of any batch, and during the same period of time, the log for the reactor may so indicate this, to alleviate the second record for the pre-emulsion tank(s).

(6) The PTI applications for these emissions units, P106, P107, P115, P116, and P127, were evaluated based on the actual materials and the design parameters of the emissions units' exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute", ORC 3704.03(F), was applied to this/these emissions unit(s) for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant(s) emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A", as follows:

- a. the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit(s), (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):
 - i. threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; or
 - ii. STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices"; the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.
 - iii. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).
 - (a) This standard is/was then adjusted to account for the duration of the exposure or the operating hours of the emissions unit(s), i.e., "8" hours per day and "7" days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

$$TLV/10 \times 8/X \times 5/Y = 4 TLV/XY = MAGLC$$

b. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):



Toxic Contaminant: vinyl acetate (P106, P107, P116)

TLV (mg/m³): 35

Maximum Hourly Emission Rate (lbs/hr): 6.5

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m³): 770

MAGLC (ug/m³): 833

The permittee, having demonstrated that emissions of vinyl acetate, from emissions units P106, P107, P116, is estimated to be equal or greater than eighty per cent, but less than 100 per cent of the maximum acceptable ground level concentration (MAGLC), shall not operate the emissions units at a rate that would exceed the daily emissions rate, process weight rate, and/or restricted hours of operations, as allowed in this permit; and any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

- c. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic Contaminant: N-butyl acrylate (P115).

TLV (mg/m³): 10.5

Maximum Hourly Emission Rate (lbs/hr): 1.05

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m³): 166

MAGLC (ug/m³): 250

The permittee, has demonstrated that emissions of N-butyl acrylate, from emissions unit P115, is calculated to be less than eighty per cent of the maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F).

- d. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic Contaminant: vinyl acetate (P127).

TLV (mg/m³): 35

Maximum Hourly Emission Rate (lbs/hr): 6.9

Predicted 1-Hour Maximum Ground-Level Concentration (ug/m³): 791



MAGLC (ug/m3): 833

The permittee, has demonstrated that emissions of vinyl acetate, from emissions unit P127, is estimated to be equal or greater than eighty per cent, but less than 100 per cent of the maximum acceptable ground level concentration (MAGLC), shall not operate the emissions units at a rate that would exceed the daily emissions rate, process weight rate, and/or restricted hours of operations, as allowed in this permit; and any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute", ORC 3704.03(F)..

- (7) Prior to making any physical changes to or changes in the method of operation of the emissions unit(s), that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration", the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
- a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;
 - b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and
 - c. physical changes to the emissions unit(s) or its/their exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the "Toxic Air Contaminant Statute" will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a "modification", the permittee shall apply for and obtain a final PTIO prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.

- (8) The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F):
- a. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);



- b. the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F);
- c. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and
- d. the documentation of the initial evaluation of compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.

For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

- (9) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the “Toxic Air Contaminant Statute”, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.

e) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports for the following emissions unit(s) that identify:
 - a. all deviations (excursions) of the following emission limitations, operational restrictions and/or control device operating parameter limitations that restrict the Potential to Emit (PTE) of any regulated air pollutant and have been detected by the monitoring, record keeping and/or testing requirements in this permit:

| Emissions unit ID | Term & Condition |
|-------------------|------------------------------------|
| P106 | b)(1), b)(2)a, c)(1), (2) and (3). |
| P107 | b)(1), b)(2)a, c)(1), (2) and (3). |
| P115 | b)(1), b)(2)a, c)(1), (2) and (3). |
| P116 | b)(1), b)(2)a, c)(1), (2) and (3) |
| P127 | b)(1), b)(2)a, c)(1), (2) and (3) |

- b. the probable cause of each deviation (excursion);
- c. any corrective actions that were taken to remedy the deviations (excursions) or prevent future deviations (excursions); and
- d. the magnitude and duration of each deviation (excursion).



If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states that no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted (postmarked) each year by the thirty-first of January (covering October to December), the thirtieth of April (covering January to March), the thirty-first of July (covering April to June), and the thirty-first of October (covering July to September), unless an alternative schedule has been established and approved by the director (the appropriate district office or local air agency).

- (2) The permittee shall submit quarterly reports to the appropriate Ohio EPA District Office, documenting any changes made to a parameter or value used in the dispersion model, that was used to demonstrate compliance with the "Toxic Air Contaminant Statute", ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. If no changes to the emissions, emissions unit(s), or the exhaust stack have been made, then the report shall include a statement to this effect. These quarterly reports shall be submitted by April 30, July 31, October 31, and January 31, and shall cover the records for the previous calendar quarters.
- (3) Annual Permit Evaluation Report (PER) forms will be mailed to the permittee at the end of the reporting period specified in the Authorization section of this permit. The permittee shall submit the PER in the form and manner provided by the director by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit.

[OAC rule 3745-15-03(B)(2)] and [OAC rule 3745-15-03(D)]

f) Testing Requirements

- (1) Compliance with the emission limitations in b)(1) of the terms and conditions of this permit shall be determined in accordance with the following methods:

a. Emission Limitation:

OC emissions from each emissions unit shall not exceed 6.5 lbs/hr and/or 32.3 lbs/day.

Applicable Compliance Method:

Compliance with the hourly emission limitation was demonstrated during emission testing in November 2004 and 2005 for vinyl acetate production. If required, the permittee shall demonstrate compliance with this emission limitation through emission tests performed in accordance with 40 CFR Part 60, Appendix A, Methods 1 through 4 and 18. Compliance with the daily OC emission limitations shall be demonstrated based on the record keeping requirements in d)(2) and d)(3).

Emissions from each batch shall be calculated as follows:

If the reactor contents are heated up to and/or above the boiling point of the chemical with the lowest boiling point in the batch, the ideal gas law no longer



applies. In this case, emissions shall be calculated using an emission factor of 1.27 pounds of VOC per hour, derived from the stack test conducted on 5/12/94, for Reactor 9 (P107), in which the batch exceeded this temperature. This emission factor shall be multiplied by the time (hours) the chemical was above its boiling point to calculate the pounds of the lower boiling point chemical emitted during this time period. To calculate emissions for chemicals with higher boiling points than the batch temperature during this period of time, the emissions calculated using the emission factor above (lbs) shall be multiplied by the ratio of the weight (lbs) of each higher boiling point chemical, to the weight of the lower boiling point chemical in the batch. Each fraction of the higher boiling point chemicals' emissions, calculated in this way, shall be added to the emissions calculated for the chemical that's boiling point was exceeded, to document a conservative estimate of OC emissions for the time period operating under these conditions.

The total uncontrolled OC emission rate from each method of loss for each batch shall be calculated as summed for all volatile components = total pounds VOC emitted per batch

Alternative methods to the emission calculations above may be used with prior approval from the Ohio EPA, Central District Office.

For the purpose of calculating annual emissions, the control efficiency for each product or product type made during the year may be calculated by using the average temperatures from the four calendar quarters or the average of all batches made during the year of record; or may be calculated using the average temperatures by season, if batch records are so segregated; or may be calculated by using worst-case temperatures, causing the highest emissions. The average temperatures shall be derived from the records of each product batch (to derive the inlet vapor temperature), and from the continuous temperature monitor installed after the reactor, prior to the chiller (to derive the outlet vapor temperature), and the efficiency calculated as per the method above.

b. Emission Limitation:

OC emissions from this emissions unit shall not exceed 5.9 tons per rolling, 12-month period.

Applicable Compliance Method:

Compliance with the annual OC emission limitation for this emissions unit shall be demonstrated based on the record keeping requirements in d)(5)b.

c. Emission Limitations

The facility-wide individual and combined HAP emissions shall not exceed 9.9 tons and 24.9 tons per rolling, 12-month period, respectively.



Applicable Compliance Method:

Compliance with the facility-wide HAP emission limitations shall be demonstrated by the record keeping requirements specified in B.1.b)(3) and g above.

d. Emission Limitation:

The facility-wide OC emissions shall not exceed 99.9 tons per rolling, 12- month period.

Applicable Compliance Method:

Compliance with the facility-wide OC emission limitation shall be demonstrated by the record keeping requirements specified in B.1.b)(3) above.

g) Miscellaneous Requirements

(1) None