OhioEPA

State of Ohio Environmental Protection Agency

Street Address:
1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

Mailing Address:
P.O. Box 1049
Columbus, OH 43216-1049

07/24/97

CERTIFIED MAIL

06-84-01-0003

RE: Final Chapter 3745-35 Permit To Operate

Huntsman Chemical Corporation
Mark Cunningham
Township Road 97
P.O. Box 600
Belpre, OH 45714

Dear Mark Cunningham

The enclosed Permit(s) to Operate allow you to operate the described emissions unit(s) in the manner indicated in the Permit(s). Because each permit contains several terms and conditions, I urge you to read them carefully.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Review Appeals Commission within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
236 East Town Street
Room 300
Columbus, Ohio 43215

If you have any questions, please contact the Southeast District Office at (614) 385-8501

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

cc: Southeast District Office
Becky Castle, DAPC PMU

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P001 (Polystyrene Production Line 1)
Continuous process line for producing polystytrene.

PART I General Terms & Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner

a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. The permittee is also subject to the attached special terms and conditions.

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #1	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and .07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

ii The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4 The following process condensers on the reaction and material recovery sections of process line P001 shall be in operation at all times that P001 is in operation:

a. PV1 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used.

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8 A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P001 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P001, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

12.a EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

i. Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service;

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

12.i When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

i. Tightening of bonnet bolts

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

12.k When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

12. The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e. July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P001 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1 The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60 Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P001 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

7.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production.

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P002 (Polystyrene Production Line 2)
Continuous process line for producing polystyrene

PART I General Terms & Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner

Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions.**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #2	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following.

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P002 shall be in operation at all times that P002 is in operation:

   a. PV1 (reaction section); and

   b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

   c. E3526 (material recovery section) when Vacuum System 4 is used; or

   d. E3716 (material recovery section) when Vacuum System 5 is used; or

   e. E3926 (material recovery section) when Vacuum System 7 is used.

   A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P002 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P002, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

12.a EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

12.b Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

i. Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service;

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

12.c For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected

(a) "Repair delayed" and the reason for the delay

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

12.l The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e. July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period.

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P002 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information:

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene, and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1. The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P002 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

7.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production.

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8 Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P003 (Polystyrene Production Line 3)
Continuous process line for producing polystyrene.

PART I General Terms & Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions.**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #3	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following:

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

2.g When the flare is used as the control device, it shall comply with the following requirements

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

The flare shall be operated at all times when emissions should be vented to it

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B Operational Restrictions

The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3 When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P003 shall be in operation at all times that P003 is in operation:

a. PV1 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used.

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11)

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P003 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P003, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

12.a EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

12.b Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

Any pump in light liquid service shall be monitored monthly

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service;

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

12.c For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

12.e Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e., July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period.

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period.

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P003 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information:

The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene, and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1. The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P003 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production.

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P004 (Polystyrene Production Line 4)
Continuous process line for producing polystyrene

PART I General Terms & Conditions

1. **Compliance Requirements**

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. **Reporting Requirements Related to Monitoring and Recordkeeping Requirements**

The permittee shall submit required reports in the following manner

a Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. The permittee is also subject to the attached special terms and conditions.

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #4	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. **Additional Terms and Conditions (continued)**

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P004 shall be in operation at all times that P004 is in operation:

a. PV1 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used.

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P004 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P004, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

12.f Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

12.i When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

Tightening of bonnet bolts

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e. July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P004 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1 The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P004 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

7.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production.

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P005 (Polystyrene Production Line 5)
Continuous process line for producing polystyrene.

PART I General Terms & Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions.**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #5	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following:

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. **Additional Terms and Conditions (continued)**

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P005 shall be in operation at all times that P005 is in operation:

a. PV1 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used.

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II, Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7 When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P005 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P005, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

12.c For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

12.g A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

12.h When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

12.k When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

12.l The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e., July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period.

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P005 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene, and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1. The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P005 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

7.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production.

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1 Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P006 (Polystyrene Production Line 6)
Continuous process line for producing polystyrene

PART I General Terms & Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions.**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #6	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

The combined emission rates from the extruders for P001-P011 shall not exceed the following:

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

ii The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1 The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P006 shall be in operation at all times that P006 is in operation:

a. PV1 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II, Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9 Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P006 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P006, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only)

EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

Any pump in light liquid service shall be monitored monthly

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service;

(b) Any valve in heavy liquid service

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

12.e Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

12.f Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

12.g A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

i. Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e., July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period.

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period.

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P006 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information:

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8 ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E Testing Requirements

1 The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60 Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P006 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler.

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

7.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P007 (Polystyrene Production Line 7)
Continuous process line for producing polystyrene.

PART I General Terms & Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions.**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #7	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following:

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P007 shall be in operation at all times that P007 is in operation:

a. PV2 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used.

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II, Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P007 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P007, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service;

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

12.c For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, proyided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

12.e Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

i. Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

12.l The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e. July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P007 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1. The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P007 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for

P008 (Polystyrene Production Line 8)
Continuous process line for producing polystyrene

PART I General Terms & Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. The permittee is also subject to the attached special terms and conditions.

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #8	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following:

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P008 shall be in operation at all times that P008 is in operation:

   a. PV2 (reaction section); and

   b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

   c. E3526 (material recovery section) when Vacuum System 4 is used; or

   d. E3716 (material recovery section) when Vacuum System 5 is used; or

   e. E3926 (material recovery section) when Vacuum System 7 is used.

   A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following:

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P008 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P008, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

i. Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service;

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

12.c For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. **Monitoring and/or Record Keeping Requirements (continued)**

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09;

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

12.f Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

12.i When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

i. Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e., July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period.

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P008 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene, and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1. The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P008 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

7.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P009 (Polystyrene Production Line 9)
Continuous process line for producing polystyrene

PART I General Terms & Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner

Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #9	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following:

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P009 shall be in operation at all times that P009 is in operation:

a. PV2 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used.

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II, Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P009 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

    a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

    b. discharge pressure of the cooling system (for brine systems).

    Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P009, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only).

EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

i. Any pump in light liquid service shall be monitored monthly

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

12.f Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

12.i When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

i. Tightening of bonnet bolts;

ii. Replacement of bonnet bolts

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e., July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period.

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P009 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information:

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene, and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P009 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3 The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

7.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

7.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production.

7.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P010 (Polystyrene Production Line 10)
Continuous process line for producing polystyrene

PART I General Terms & Conditions

Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

7. **Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions.**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #10	OAC 3745-35-07	See Additional Terms and Conditions 2.c through 2.f. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.e.

2. Additional Terms and Conditions

2.a The permittee shall connect the process vents from the reaction sections of P001-P010 and the final condenser vents from the material recovery sections of P001-P010 to a flare and/or process heater(s)/boiler(s), designed and operated as described in Additional Terms and Conditions 2.g and 2.h.

2.b The permittee shall operate the process vent and material recovery section condensers as specified in Part II, Section B.4 at all times when the emission unit is in operation. The permittee shall operate and maintain the condensers in accordance with good engineering practices.

2.c The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

2.d The combined emission rates from the extruders for P001-P011 shall not exceed the following:

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

2.e The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2.f The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2. Additional Terms and Conditions (continued)

2.g When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

iv. The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.h When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. The following process condensers on the reaction and material recovery sections of process line P010 shall be in operation at all times that P010 is in operation:

a. PV2 (reaction section); and

b. E3116 (material recovery section) when Vacuum System 1 or 2 is used; or

c. E3526 (material recovery section) when Vacuum System 4 is used; or

d. E3716 (material recovery section) when Vacuum System 5 is used; or

e. E3926 (material recovery section) when Vacuum System 7 is used.

A process condenser will be considered to be in operation when it is "valved in" to the process (see Part II, Section C.9) and a cooling system is supplying cooling media to the condenser (see Part II, Section C.11).

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature

   b. flare or pilot light flame sensing monitoring

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6 When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7 When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8 A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9 Once per week, the permittee shall record whether the process condensers on the reaction and material recovery sections of process line P010 as specified in Part II, Section B.4 are "valved in" to the process. A condenser will be considered to be "valved in" to the process if the cooling media valves are observed to be positioned to direct cooling media flow through the condenser.

10. The permittee shall install, operate and maintain equipment to continuously monitor the following parameters for the process condensers:

   a. inlet and outlet temperatures of the cooling media in the cooling system (for brine systems); and

   b. discharge pressure of the cooling system (for brine systems).

   Each monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

C. Monitoring and/or Record Keeping Requirements (continued)

11. Once each day, the permittee shall record the information below to document whether the cooling system is supplying cooling media to the process condensers on the reaction and material recovery sections of process line P010, if the process line is in operation. A cooling system will be considered to be supplying cooling media to the process condensers (when "valved in" as described in Part II, Section C.9) based on:

a. a visual indication of flow across the cooling system (for cooling towers only); or

b. a record of the inlet and outlet temperatures of cooling media in the cooling system and the discharge pressure of the system (for brine systems only)

12.a EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

i. Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service

(b) Any valve in heavy liquid service;

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector.

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

i. Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e., July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period.

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period.

6. REPORTING REQUIREMENTS FOR CONDENSERS

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which any of the process condensers on the reaction and material recovery sections of process line P010 as specified in Part II, Section B.4 are not in operation and/or not functioning properly when the process line is in operation.

LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information:

7.b The process unit identification;

The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

D. Reporting Requirements (continued)

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

8. ANNUAL EMISSIONS

The permittee shall submit annual reports to the Southeast District Office which estimate total styrene, toluene, and non-speciated HAP emissions for P001-P011. These reports shall be submitted by the fifteenth day of March for the previous calendar year.

E. Testing Requirements

1. The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s) and/or boiler(s) in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P010 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

b. Continuous records of pilot flame sensing monitoring; and

c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

a. The combustion temperatures, which may be used as limits in a subsequent permit.

E. Testing Requirements (continued)

5. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

6. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.c) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

7. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.d) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

7.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

(a) 1.691 E-02 lb styrene/1000 lb PS production;

(b) 1.045 E-02 lb toluene/1000 lb PS production; and

(c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production

i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

8. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.7, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

E. Testing Requirements (continued)

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

   The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.e) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

   Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.

OhioEPA

PERMIT TO OPERATE AN EMISSIONS UNIT

Effective Date: 07/24/97

Facility ID: 06-84-01-0003

Expiration Date: 07/24/00

FINAL ISSUE

This document constitutes issuance for:

Huntsman Chemical Corporation
Township Road 97
P.O. Box 600
Belpre, OH 45714

of a permit to operate for:

P011 (Polystyrene Production Line 11)
Continuous process line for producing polystyrene

PART I General Terms & Conditions

1. Compliance Requirements

The above-described emissions unit is and shall remain in full compliance with all applicable State and federal laws and regulations and the terms and conditions of this permit.

2. Permit to Install Requirement

Prior to the "installation" or "modification" of any "air contaminant source," as those terms are defined in OAC rule 3745-31-01, a permit to install must be obtained from the Ohio EPA pursuant to OAC Chapter 3745-31.

3. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quar terly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

4. **Records Retention Requirements**

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of three years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Such records may be maintained in computerized form.

5. **Inspections and Information Requests**

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State and federal air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

6. **Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions unit or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of this emissions unit(s) that is (are) served by such control system(s).

Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permittee. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

8. **Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. **Permit Renewal**

Approximately six months prior to the expiration date of this permit, a notice regarding the renewal of this permit will be sent to the permittee's designated facility contact. If you are not contacted, please contact the appropriate Ohio EPA District Office or local air agency. It is the permittee's responsibility to renew this permit even if no notice of its expiration is received.

The following Ohio EPA District Office or local air agency has jurisdiction in the area in which the facility is located:

Southeast District Office
2195 Front Street
Logan, OH 43138
(614) 385-8501

You will be contacted approximately six months prior to expiration date regarding the renewal of this permit. If you are not contacted, please contact the appropriate DO or LAA.

10. **The permittee is also subject to the attached special terms and conditions.**

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R Schregardus

Director

Part II: Special Terms and Conditions

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
Polystyrene Manufacturing Line #11	PTI # 06-2366	The emission limitations/control requirements contained in 40 CFR 60 Subpart DDD are applicable to P011 and are included in the terms and conditions of this permit.
	OAC 3745-35-07	See Additional Terms and Conditions 2.b through 2.e. [The control measures contained in this permit also limit VOC emissions since the HAPs that are emitted (styrene, toluene, and non-speciated HAPs) are also VOCs. No VOCs are emitted from P001-P011 other than the HAPs specified in this permit. The potential to emit (PTE) from emissions units other than P001-P011 is less than 15 tons VOC/year. The facility-wide PTE for VOCs, with the restrictions in this permit, is less than the major source threshold of 100 tons VOC/year. The facility-wide PTE for HAPs, with the restrictions in this permit, is less than the major source threshold of 10 tons/year for a single HAP and 25 tons/year for the combination of all HAPs.]
	OAC 3745-21-09 (CC)	The emission limitation specified in OAC rule 3745-21-09 (CC) of 0.12 pound of VOC from the material recovery section of the process per one thousand pounds of polystyrene resin produced is less stringent than the emission limits contained in this permit.

Operations, Property, and/or Equipment	Applicable Rules/ Requirements	Applicable Emissions Limitations/Control Measures
	OAC 3745-21-09 (DD)	The permittee shall maintain a leak detection and repair progam in accordance with the terms and conditions of this permit, except that the provisions of OAC rule 3745-21-09 (DD)(5)(b) (pertaining to the sampling of process fluid) shall not apply to process streams that are partially or totally polymerized. Compliance with the terms and conditions of this permit shall be considered to limit fugitive emissions for equipment leaks from P001-P011 combined to less than the lbs/hr and tons/year emission limits specified in Additional Term and Condition 2.d.

2. **Additional Terms and Conditions**

2.a The permittee shall connect the reaction section process vent and the material recovery section vent from P011 to a flare and/or process heater(s)/boiler(s) designed and operated as described in Additional Terms and Conditions 2.f and 2.g, or to the Process Vent Final Vent Condenser for P011 designed and operated as described in Additional Term and Condition 2.h when used as the sole control device for P011.

2.b The combined emission rates for P001-P011, measured at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011, shall not exceed the following:

i. styrene -
0.24 pound per hour and 1.07 tons per year;

ii. toluene -
0.75 pound per hour and 3.29 tons per year; and

iii. total non-speciated HAPs -
1.00 pound per hour and 4.39 tons per year.

The combined emission rates from the extruders for P001-P011 shall not exceed the following

i. styrene -
0.26 pound per hour and 1.15 tons per year;

ii. toluene -
0.17 pound per hour and 0.76 ton per year; and

iii. total non-speciated HAPs -
0.45 pound per hour and 1.95 tons per year.

The combined fugitive emission rates from leaks of process equipment serving P001-P011 shall not exceed the following:

i. styrene -
0.74 pound per hour and 3.26 tons per year;

ii. toluene -
0.50 pound per hour and 2.20 ton per year; and

iii. total non-speciated HAPs -
1.30 pounds per hour and 5.70 tons per year.

2. Additional Terms and Conditions (continued)

2.e The total combined emission rates for P001-P011 (i.e., emissions from the outlet of the flare and/or the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 when used as the control device for P011 + emissions from the extruders + fugitive emissions) shall not exceed the following:

i. styrene -
1.24 pounds per hour and 5.48 tons per year;

ii. toluene -
1.43 pounds per hour and 6.25 tons per year; and

iii. total non-speciated HAPs -
2.75 pounds per hour and 12.04 tons per year.

2.f When the flare is used as the control device, it shall comply with the following requirements:

i. The flare shall be operated and maintained in conformance with the manufacturer's design specifications.

The flare shall be operated at all times when emissions should be vented to it.

iii. The flare shall be designed and operated so that there are no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

The flare shall be operated with a flame present at all times when emissions should be vented to it.

v. The air-assisted flare shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in paragraph 40 CFR 60.18(f)(6).

2.g When a process heater/boiler is used as the control device, it shall comply with the following requirements:

i. The heater/boiler shall be operated and maintained in conformance with the manufacturer's design specifications.

ii. Any heater/boiler with design capacity greater than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by introducing the vent stream into the flame zone of the boiler or process heater.

iii. Any heater/boiler with design capacity less than 150 million Btu/hour shall reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If the permittee elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

2.h When the Process Vent Final Vent Condenser for P011 is used as the control device, the vent condenser shall be operated and maintained in conformance with manufacturer's design specifications.

B. Operational Restrictions

1. The permittee shall not exceed a total production rate of 47.3 MM pounds of polystyrene production in any given month from P001-P011 combined.

2. When the flare is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the combustion temperature established during the most recent compliance test.

3. When a process heater/boiler is the control device, it shall be operated at a combustion temperature no less than 50 degrees F below the average combustion temperature established during the most recent compliance test. The temperature shall be measured between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

4. When the Process Vent Final Vent Condenser for P011 is used as the control device, it shall be operated to maintain an exhaust temperature no more than 10 degrees F above the average operating temperature established during the most recent compliance test.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall maintain on-site records of the following.

   a. any changes in production capacity, feedstock type, or of any replacement, removal or addition of product recovery equipment;

   b. all performance tests conducted on the control equipment;

   c. monthly records of the total production rate from P001-P011 combined;

   d. separate monthly records of the total production rate from P001, P002, P003, P004, P007, and P011; and

   e. separate monthly records of the hours of operation of P001, P002, P003, P004, P007, and P011.

2. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the flare. Flame presence in the flare shall be monitored through the use of a thermocouple or equivalent device. Each monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

3. When the flare is being used as the control device, the permittee shall maintain records of the following parameters for the flare:

   a. flare operating temperature;

   b. flare or pilot light flame sensing monitoring;

   c. all periods of operation during which the pilot flame is absent; and

   d. annual hours of operation of the flare.

4. When the flare is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the flare operating temperature was more than 50 degrees F below the average temperature established during the most recent compliance test.

5. The permittee shall install, operate and maintain equipment to continuously monitor and record the operating temperature of the process heater/boiler. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

6. When a process heater/boiler is being used as the control device, the permittee shall maintain records of the following parameters for the process heater/boiler:

   a. process heater/boiler operating temperature; and

   b. annual hours of operation of the process heater/boiler.

7. When a process heater/boiler is being used as the control device, the permittee shall maintain records of all 3-hour periods of operation during which the average combustion temperature in the process heater/boiler was more than 50 degrees F below the average combustion temperature established during the most recent compliance test.

8. A temperature monitoring device shall be installed between the radiant section and the convection zone if a watertube boiler is used or between the combustion zone and firetubes if a firetube boiler is used. This device shall be used to continuously monitor and record the operating temperature of the process heater or boiler when the process heater/boiler is being used as the control device.

9. The permittee shall install, operate and maintain equipment to continuously monitor the operating temperature of the Process Vent Final Vent Condenser for P011. The monitoring device and any recorder shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

10. When the Process Vent Final Vent Condenser for P011 is being used as the sole control device for P011, the permittee shall maintain records of the following parameters in conjunction with operations of the Process Vent Final Vent Condenser for P011:

    a. condenser exhaust temperature; and

    b. annual hours of operation of the condenser.

C Monitoring and/or Record Keeping Requirements (continued)

11. When the Process Vent Final Vent Condenser for P011 is being used as the sole control device for P011, the permittee shall maintain records of all 3-hour periods of operation during which the average condenser exhaust temperature is more than 10 degrees F above the average operating temperature established during the most recent compliance test.

12.a EQUIPMENT LEAKS

The permittee shall collect and maintain the information required for the LDAR program as specified under OAC rule 3745-21-09 (DD).

Except as otherwise provided in paragraphs (DD)(2)(c) and (DD)(2)(d) of OAC rule 3745-21-09, equipment shall be monitored for leaks in accordance with the method specified in paragraph (F) of rule 3745-21-10 of the Administrative Code, as follows:

i. Any pump in light liquid service shall be monitored monthly.

ii. Any valve in gas/vapor service or in light liquid service shall be monitored monthly, except that quarterly monitoring may be employed anytime after no leaks are detected during two consecutive months. The quarterly monitoring shall begin with the next calendar quarter following the two consecutive months of no detected leaks and shall be conducted in the first month of each calendar quarter. The quarterly monitoring may continue until a leak is detected, at which time monthly monitoring shall be employed again.

iii. Any of the following equipment shall be monitored within five calendar days after evidence of a leak or potential leak from the equipment by visual, audible, olfactory, or other detection method:

(a) Any pump in heavy liquid service

(b) Any valve in heavy liquid service

(c) Any pressure relief device in light liquid service or in heavy liquid service; and

(d) Any flange or other connector

iv. Any equipment in which a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 shall be monitored within five working days after each attempt to repair, unless the owner or operator believes that the equipment was not successfully repaired.

12.c For any valve in gas/vapor service or in light liquid service, an alternative monitoring schedule may be employed in lieu of the monitoring schedule specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 as follows:

i. The valve is designated as difficult to monitor and is monitored each calendar year, provided the following conditions are met:

(a) Construction of the process unit commenced prior to May 9, 1986.

(b) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than six feet above a support surface.

(c) The owner or operator of the valve has a written plan that requires monitoring of the valve at least once per year.

ii. The valve is designated as unsafe to monitor and is monitored as frequently as practical during safe to monitor times, provided the following conditions are met:

(a) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of monitoring on a monthly basis.

(b) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practical during safe to monitor times.

iii. The valve is subject to an alternative monitoring schedule based on a skip period as specified in paragraph (DD)(12) of OAC rule 3745-21-09.

C. Monitoring and/or Record Keeping Requirements (continued)

12.d Excluded from the monitoring requirements of paragraph (DD)(2)(b) of OAC rule 3745-21-09 are the following equipment:

i. Any pump that has no externally actuated shaft penetrating the pump housing and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09:

ii. Any pump that is equipped with a dual mechanical seal which has a barrier fluid system and sensor that comply with the requirements specified in paragraph (DD)(8) of OAC rule 3745-21-09;

iii. Any pump that is equipped with a closed vent system capable of capturing and transporting any leakage from the pump seal to control equipment, provided the closed vent system and the control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09;

iv. Any valve that has no externally actuated stem penetrating the valve and that is designated for no detectable emissions as provided in paragraph (DD)(7) of OAC rule 3745-21-09; and

v. Any valve that is subject to the alternative monitoring standard for valves based on the percentage of valves leaking as provided in paragraph (DD)(13) of OAC rule 3745-21-09.

Any pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, unless the pump is equipped with a closed vent system capable of transporting any leakage from the pump seal to control equipment, and the closed vent system and control equipment comply with the requirements specified in paragraphs (DD)(9) and (DD)(10) of OAC rule 3745-21-09.

Any sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 shall be checked daily, unless the sensor is equipped with an audible alarm.

12.g A leak is detected:

i. When a concentration of ten thousand ppmv or greater is measured from a potential leak interface of any equipment that is monitored for leaks using the method in paragraph (F) of rule 3745-21-10 of the Administrative Code;

ii. When there is an indication of liquids dripping from the seal of a pump in light liquid service; or

iii. When a sensor employed pursuant to paragraph (DD)(2)(d)(ii) or (DD)(3)(b) of OAC rule 3745-21-09 indicates failure of the seal system, the barrier fluid system, or both.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the following procedures shall be followed:

i. A weatherproof and readily visible identification tag, marked with the equipment identification number, is immediately attached to the leaking equipment.

ii. A record of the leak and any attempt to repair the leak is entered into the leak repair log kept pursuant to paragraph (DD)(2)(k) of OAC rule 3745-21-09.

iii. The identification tag attached to the leaking equipment, other than a valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, may be removed after the leaking equipment is repaired.

iv. The identification tag attached to a leaking valve that is monitored pursuant to paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09 may be removed after the leaking valve is repaired, monitored for leaks for two consecutive months as specified in paragraph (DD)(2)(b)(ii) of OAC rule 3745-21-09, and found to have no detected leaks during those two consecutive months.

When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, the leaking equipment shall be repaired as soon as practicable, but no later than fifteen calendar days after the leak is detected, except for a delay of repair as provided in paragraph (DD)(11) of OAC rule 3745-21-09. Leaking equipment shall be deemed repaired if the maximum concentration measured pursuant to paragraph (DD)(2)(b)(iv) of OAC rule 3745-21-09 is less than ten thousand ppmv.

C. Monitoring and/or Record Keeping Requirements (continued)

12.j When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09, a first attempt at repair shall be made no later than five calendar days after the leak is detected; and the first attempts at repair shall include, but are not limited to, the following best practices where practicable:

Tightening of bonnet bolts;

ii. Replacement of bonnet bolts;

iii. Tightening of packing gland nuts; and

iv. Injection of lubricant into lubricated packing.

12.k When a leak is detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09 (DD), the following information shall be recorded in a leak repair log:

i. The identification number of the leaking equipment and, for leaks based on monitoring, the identification numbers of the leak detection instrument and its operator;

ii. The basis for the detection of the leak; for example, monitoring, visual inspection, or sensor;

iii. The date on which the leak was detected and the date of each attempt to repair the leaking equipment;

iv. The methods of repair applied in each attempt to repair the leaking equipment;

v. One of the following entries within five working days after each attempt to repair the leaking equipment:

(a) "Not monitored," denoting the leaking equipment was presumed to still be leaking and it was not monitored; or

(b) If the leaking equipment was monitored with a leak detection instrument, the maximum concentration that was measured as follows:

(i) The actual reading in ppmv; or

(ii) "Below 10,000," denoting less than ten thousand ppmv; or

(iii) "Above 10,000," denoting not less than ten thousand ppmv;

(iv) If the leak is not repaired within fifteen calendar days after the date on which it was detected:

(a) "Repair delayed" and the reason for the delay;

(b) If repair is being delayed until the next process unit shutdown due to technical infeasibility of repair, the signature of the owner or operator whose decision it was that repair is technically infeasible without a process unit shutdown;

(c) The expected date of successful repair of the leak;

(d) The dates of process unit shutdowns that occured.

12.l The leak repair log shall be retained by the owner or operator of the process unit in a readily accessible location for a minimum of two years after the date on which the record was made.

D. Reporting Requirements

1. All semi-annual reports shall be submitted to the Southeast District Office by the first day of March and September of each year and shall include the information required for the preceding six-month periods (i.e., July-December and January-June).

2. Semiannually, the permittee shall submit reports of any changes in production capacity and feedstock type, and of any replacement, removal or addition of product recovery equipment.

3. PRODUCTION CAPACITY

Semiannually, the permittee shall submit deviation (excursion) reports that identify any exceedance of the monthly production limit for P001-P011 combined.

D. Reporting Requirements (continued)

4. FLARE

Semiannually, the permittee shall submit deviation (excursion) reports that identify the following:

a. all time periods during which the pilot flame was absent when the flare is being used as the control device; and

b. all 3-hour periods during which the flare operating temperature was more than 50 degrees F lower than the average temperature established during the most recent compliance test when the flare is being used as the control device.

The reports shall include the date, time, and duration of each such period.

5. PROCESS HEATER(S)/BOILER(S)

Semiannually, the permittee shall submit deviation (excursion) reports that identify all 3-hour periods of operation during which the average combustion temperature was more than 50 degrees F below the average combustion temperature established during the most recent compliance test when the process heater/boiler is being used as the control device.

The reports shall include the date, time, and duration of each such period.

6. PROCESS VENT FINAL VENT CONDENSER FOR P011

Semiannually, the permittee shall submit deviation (excursion) reports that identify all periods of time during which the three-hour average vent condenser exhaust temperature for Process Vent Final Vent Condenser for P011 (when the Process Vent Final Vent Condenser for P011 is being used as the sole control device for P011) is more than 10 degrees F above the average operating temperature established during the most recent compliance test.

The reports shall include the date, time, and duration of each such period.

7.a LEAK DETECTION AND REPAIR PROGRAM

Semiannual reports shall be submitted which include the following information:

7.b The process unit identification;

7.c The number of pumps in light liquid service excluding those pumps designated for no detectable emissions under the provision of paragraph (DD)(2)(d)(i) of OAC rule 3745-21-09 and those pumps complying with paragraph (DD)(2)(d)(iii) of OAC rule 3745-21-09;

7.d The number of valves in gas/vapor service or in light liquid service excluding those valves designated for no detectable emission under the provision of paragraph (DD)(2)(d)(iv) of OAC rule 3745-21-09 and those valves subject to the alternative standard for monitoring under the provision of paragraph (DD)(2)(d)(v) of OAC rule 3745-21-09;

7.e The number of compressors excluding those compressors designated for no detectable emissions under the provision of paragraph (DD)(3)(c) of OAC rule 3745-21-09 and those compressors complying with paragraph (DD)(3)(d) or (DD)(3)(e) of OAC rule 3745-21-09;

D. Reporting Requirements (continued)

7.f For each month during the semiannual period:

i. The number of pumps in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09;

ii. The number of pumps in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

iii. The number of valves in gas/vapor service or in light liquid service for which leaks were detected as described in paragraph (DD)(2)(g) of OAC rule 3745-21-09.

iv. The number of valves in gas/vapor service or in light liquid service for which leaks were not repaired within fifteen calendar days after the date of leak detection;

v. The number of compressors for which leaks were detected

vi. The number of compressors for which leaks were not repaired within fifteen calendar days after the date of leak detection; and

vii. The facts that explain each delay of repair allowed pursuant to paragraph (DD)(11) of OAC rule 3745-21-09 The dates of process unit shutdowns that occurred within the semiannual period.; and

7.g The dates of process unit shutdowns that occurred within the semiannual period.

7.h An estimate for the semiannual period of the lbs/hr and tons/year emission rates for styrene, toluene, and total non-speciated HAPs for P001-P011 combined from equipment leaks for process equipment serving P001-P011. These estimates shall be based on the actual number of leaking components in each chemical (HAP) service and calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13 1996.

E. Testing Requirements

1. The permittee shall conduct, or have conducted, emission testing of the flare, and/or process heater(s), and/or boiler(s), and/or Process Vent Final Vent Condenser for P011 for this emissions unit in accordance with the following requirements:

a. The emission testing shall be conducted within 6 months after initial permit issuance and again within 6 months prior to permit renewal.

b. The emission testing shall be conducted to demonstrate compliance with the allowable mass emission rate(s) for styrene, toluene, and total non-speciated HAPs.

c. Method 18 or an equivalent method approved by the Director shall be employed to demonstrate compliance with the allowable mass emission rate(s) for HAPs. Method 25 or Method 25A, 40 CFR Part 60, Appendix A, may be used to demonstrate the destruction efficiency achieved by the flare.

d. The test(s) shall be conducted while P011 is operating at or near its maximum capacity, unless otherwise approved in writing by the Southeast District Office.

E. Testing Requirements (continued)

2. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Southeast District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the test(s), and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Southeast District Office's refusal to accept the results of the emission test(s).

   Personnel from the Southeast District Office shall be permitted to witness the test(s), examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment.

   A comprehensive written report on the results of the emissions test(s) shall be signed by the person or persons responsible for the tests and submitted to the Southeast District Office within 30 days following completion of the test(s). If warranted, additional time may be obtained from the Southeast District Office for the submission of the test results.

3. The permittee shall collect the following information during each performance test of the flare:

   a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the test;

   b. Continuous records of pilot flame sensing monitoring; and

   c. Records of when the pilot flame is absent.

4. The permittee shall collect the following information during each performance test of the process heater/boiler:

   a. The combustion temperatures, which may be used as limits in a subsequent permit.

5. The permittee shall collect the following information during each performance test of the Process Vent Final Vent Condenser for P011:

   a. Continuous records of the temperature of the vent condenser exit stream.

6. Compliance with the lbs/hr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.b) shall be based on the results of the compliance tests conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011.

7. Compliance with the tons/yr emission limits for styrene, toluene, and total non-speciated HAPs for P001-P011 combined (as specified in Additional Term and Condition 2.b) shall be based on the results of the most recent compliance test conducted at the outlet of the flare and/or at the outlet(s) of the process heater(s)/boiler(s) and/or at the outlet of the Process Vent Final Vent Condenser for P011 multiplied by the actual annual hours of operation of the flare and/or the process heater(s)/boiler(s) and/or the Process Vent Final Vent Condenser for P011.

8. The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders (as specified in Additional Term and Condition 2.c) for P001-P011 have been established based on prior testing of the P001-P004 Extruder Scrubber Vent (serving P001, P002, P003 and P004), and the P007/P011 Extruder Scrubber Vent (serving P007 and P011). The following emission factors for styrene, toluene, and total non-speciated HAPs were calculated for each extruder based on the highest tested emission rates obtained during emission testing of the extruders conducted in 1995 and the annual production rates of the individual emission units served by each extruder:

8.a i. The emission factors for the P001-P004 Extruder Scrubber Vent (serving P001-P004) are:

   (a) 1.691 E-02 lb styrene/1000 lb PS production;

   (b) 1.045 E-02 lb toluene/1000 lb PS production; and

   (c) 2.765 E-02 lb total non-speciated HAPs/1000 lb PS production.

E. Testing Requirements (continued)

8.b i. The emission factors for the extrusion sections of P005, P006, P008, P009, and P010 are:

(a) 0.00 lb styrene/1000 lb PS production;

(b) 0.00 lb toluene/1000 lb PS production; and

(c) 0.00 lb total non-speciated HAPs/1000 lb PS production.

(NOTE: The extrusion section of P005, P006, P008, P009, and P010 extrude only under water face-cut impact grade polystyrene which does not emit VOCs or HAPs during the extrusion process).

8.c i. The emission factors for the extrusion section of P007 are:

(a) 4.701 E-03 lb styrene/1000 lb PS production;

(b) 3.895 E-03 lb toluene/1000 lb PS production; and

(c) 8.820 E-03 lb total non-speciated HAPs/1000 lb PS production.

8.d i. The emission factors for the extrusion section of P011 are:

(a) 1.167 E-03 lb styrene/1000 lb PS production;

(b) 9.670 E-04 lb toluene/1000 lb PS production; and

(c) 2.190 E-03 lb total non-speciated HAPs/1000 lb PS production.

9. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from the extruders for P001-P011 combined shall be based on the emission factors specified in Part II, Section E.8, the monthly production rate recorded pursuant to Part II, Section C.1.d, and the monthly hours of operation of the extruders recorded pursuant to Part II, Section C.1.e. Extruder emissions shall be calculated as follows:

Calculate the monthly extruder emissions from P001, P002, P003, P004, P007, and P011 by multiplying the appropriate emission factor by the monthly production rate for P001, P002, P003, P004, P007, and P011, respectively, to yield the monthly styrene, toluene, and total non-speciated HAPs emission rates in units of lbs/month. Divide the monthly emission rates for each process line by the actual hours of operation of each process line to calculate extruder emissions in units of lbs/hr. Sum the hourly values for all process lines. Sum the monthly values for all process lines to calculate the annual extruder emissions in units of tons/year.

10. Compliance with the lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs from leaks of process equipment serving P001-P011 shall be based on the emission estimates obtained from the most recent semiannual Leak Detection and Repair (LDAR) report required pursuant to Part II, Section D.7.h of this permit. These calculations shall be performed in accordance with the methodology detailed in Section 7 of the document entitled "Analysis of Facility-Wide Potential To Emit" prepared by IT Corporation, dated February 13, 1996.

The lbs/hr and tons/year emission limits for styrene, toluene, and total non-speciated HAPs (as specified in Additional Term and Condition 2.d) represent the highest expected combined fugitive emission rates for P001-P011 from equipment leaks for process equipment serving P001-P011. These emission limits were developed based on the maximum number of leaking components in each chemical (HAP) service (developed from 1994 screening program data) and the maximum expected screening value for each type of component (developed from screening program data from 1991-1994).

Fugitive emissions were calculated for each component type in each type of chemical service using the USEPA Correlation Approach (EPA-453/R 93-026, Table 2-7) and additional correlations for pumps in styrene, toluene, and total non-speciated HAP service developed from a 1991 bagging study of pumps at the facility.

F. Miscellaneous Requirements

1. Pursuant to OAC rule 3745-35-07(B)(2), terms and conditions A-F of this permit to operate shall be federally enforceable, except that the tons per year emission limitations specified in Part II, Section A.2 are State-only enforceable. The applicant has requested that such restrictions, as specified in OAC rule 3745-35-07(C), be imposed in order to limit their potential to emit.