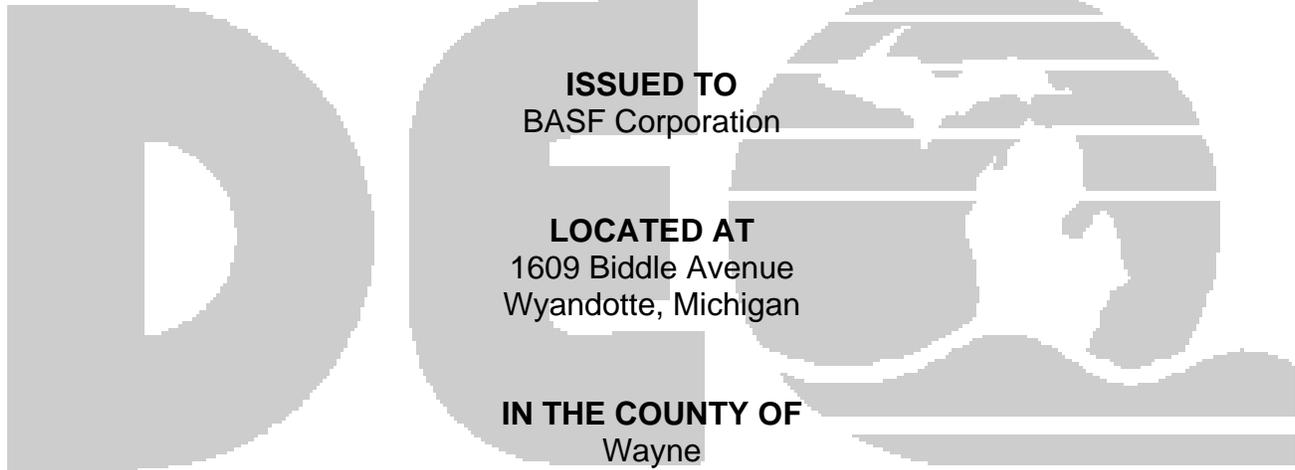


**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

January 19, 2005

NEW SOURCE REVIEW PERMIT TO INSTALL

272-04



STATE REGISTRATION NUMBER

B4359

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Part 5505(1) of Article II, Chapter I, Part 55 (Air Pollution Control) of P.A. 451 of 1994. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

| | |
|--|------------|
| DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: November 22, 2004 | |
| DATE PERMIT TO INSTALL APPROVED: January 19, 2005 | SIGNATURE: |
| DATE PERMIT VOIDED: | SIGNATURE: |
| DATE PERMIT REVOKED: | SIGNATURE: |

PERMIT TO INSTALL

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Common Abbreviations / Acronyms

| Common Acronyms | | Pollutant/Measurement Abbreviations | |
|------------------------|---|--|--|
| AQD | Air Quality Division | Btu | British Thermal Unit |
| ANSI | American National Standards Institute | °C | Degrees Celsius |
| BACT | Best Available Control Technology | CO | Carbon Monoxide |
| CAA | Clean Air Act | dscf | Dry standard cubic foot |
| CEM | Continuous Emission Monitoring | dscm | Dry standard cubic meter |
| CFR | Code of Federal Regulations | °F | Degrees Fahrenheit |
| COM | Continuous Opacity Monitoring | gr | Grains |
| EPA | Environmental Protection Agency | Hg | Mercury |
| EU | Emission Unit | hr | Hour |
| FG | Flexible Group | H ₂ S | Hydrogen Sulfide |
| GACS | Gallon of Applied Coating Solids | hp | Horsepower |
| GC | General Condition | lb | Pound |
| HAP | Hazardous Air Pollutant | m | Meter |
| HVLP | High Volume Low Pressure * | mg | Milligram |
| ID | Identification | mm | Millimeter |
| LAER | Lowest Achievable Emission Rate | MM | Million |
| MACT | Maximum Achievable Control Technology | MW | Megawatts |
| MAERS | Michigan Air Emissions Reporting System | NO _x | Oxides of Nitrogen |
| MAP | Malfunction Abatement Plan | PM | Particulate Matter |
| MDEQ | Michigan Department of Environmental Quality | PM-10 | Particulate Matter less than 10 microns diameter |
| MIOSHA | Michigan Occupational Safety & Health Administration | pph | Pound per hour |
| MSDS | Material Safety Data Sheet | ppm | Parts per million |
| NESHAP | National Emission Standard for Hazardous Air Pollutants | ppmv | Parts per million by volume |
| NSPS | New Source Performance Standards | ppmw | Parts per million by weight |
| NSR | New Source Review | psia | Pounds per square inch absolute |
| PS | Performance Specification | psig | Pounds per square inch gauge |
| PSD | Prevention of Significant Deterioration | scf | Standard cubic feet |
| PTE | Permanent Total Enclosure | sec | Seconds |
| PTI | Permit to Install | SO ₂ | Sulfur Dioxide |
| RACT | Reasonable Available Control Technology | THC | Total Hydrocarbons |
| ROP | Renewable Operating Permit | tpy | Tons per year |
| SC | Special Condition Number | µg | Microgram |
| SCR | Selective Catalytic Reduction | VOC | Volatile Organic Compounds |
| SRN | State Registration Number | yr | Year |
| TAC | Toxic Air Contaminant | | |
| VE | Visible Emissions | | |

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **[R336.1201(1)]**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **[R336.1201(4)]**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **[R336.1201(6)(b)]**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **[R336.1201(8), Section 5510 of Act 451, PA 1994]**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R336.1219. The written request shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **[R336.1219]**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **[R336.1901]**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **[R336.1912]**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.

9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.
11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R336.1303. **[R336.1301]**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this permit to install.
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R336.1370(2). **[R336.1370]**
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R336.2001 and R336.2003, under any of the conditions listed in R336.2001. **[R336.2001]**

SPECIAL CONDITIONS

| TABLE C-3.2 EUCHEPOLYOL EMISSION UNIT REQUIREMENTS | | | | | |
|--|---|--|----------------------|--------------------------------|-------------------------------|
| EMISSION UNIT | Polyether polyol synthesis process carried out in Buildings 53Z and 55T. Equipment includes reactors systems R-20, R-30, and R-100, and oxide storage tanks TK-73 and TK-78 or tank cars. Emissions from vacuum jets are controlled by non-contact condensers and emissions from depressurization, liquid transfers, and line priming are controlled by the oxide scrubber. | | | | |
| Flexible Group ID | FGCHEFACILITY | | | | |
| I. DESIGN PARAMETERS | | | | | |
| A. Pollution Control Equipment | Surface Temperature Condensers, Wet scrubber | | | | |
| B. Stack/Vent Parameters | Exhaust gases shall be discharged unobstructed vertically upwards unless otherwise noted. | | | | |
| Stack/Vent ID | a. Minimum Height (feet) | b. Maximum Exhaust Dimension (inches) | c. Temp. (°F) | d. Air Flow Rate (acfm) | Applicable Requirement |
| 1. SVCHE054 | 50 ¹ | 1.5 ¹ | NA | NA | R336.1225 |
| 2. SVCHE057 | 53 ¹ | 36 ¹ | NA | NA | R336.1225 |
| 3. SVCHE525 | 50 ¹ | 2 ¹ | NA | NA | R336.1225 |
| 4. SVCHE526 | 27.7 ¹ | 1.5 ¹ | NA | NA | R336.1225 |
| 5. SVCHE527 | 31 ¹ | 6 ¹ | NA | NA | R336.1225 |
| 6. SVCHE528 | 55 ¹ | 1.61 ¹ | NA | NA | R336.1225 |
| 7. SVCHET-110 | 41 ¹ | 2.1 ¹ | NA | NA | R336.1225 |
| 8. SVCHEWJET | 52 ¹ | 3.1 ¹ | NA | NA | R336.1225 |
| C. Other Design Parameters | | | | | |
| NA | | | | | |
| II. MATERIAL USAGE/EMISSION LIMITS | | | | | |
| A. Material | Maximum Usage Rate | | | | |
| NA | NA | | | | |
| B. Pollutant | Maximum Emission Limit | | | | |
| 1. VOC | 7.22 tons per year based on a 12-month rolling average as determined at the end of each calendar month ² (R336.1702(a)) | | | | |
| 2. Ethylene oxide (EO) | 0.8 tons per year based on a 12-month rolling average as determined at the end of each calendar month ² (R336.1225, R336.1702(a)) | | | | |
| 3. Propylene oxide (PO) | 3.5 tons per year based on a 12-month rolling average as determined at the end of each calendar month ² (R336.1225, R336.1702(a)) | | | | |
| 4. Butylene oxide (BO) | 0.89 tons per year based on a 12-month rolling average as determined at the end of each calendar month ² (R336.1225, R336.1702(a)) | | | | |
| III. COMPLIANCE EVALUATION | | | | | |
| Records of all of the following shall be maintained on file for a period of 5 years. (R336.1213(3)(b)(ii)) | | | | | |
| A. MONITORING/RECORDKEEPING (R336.1213(3)) | | | | | |
| 1. Continuous Emission Monitoring (CEM) System and Recordkeeping | NA | | | | |
| 2. Process Monitoring System and Recordkeeping | 1. The permittee shall equip and maintain T-110 wet scrubber pump with a flow alarm. ² (R336.1225, R336.1702(a)), R336.1910) | | | | |

**TABLE C-3.2 EUCHEPOLYOL
 EMISSION UNIT REQUIREMENTS**

| | |
|---|--|
| | <ol style="list-style-type: none"> 2. The permittee shall visually inspect all equipment in EO, PO, and BO service, during the first batch of each calendar month, to ensure there are no leaks. The permittee shall repair or replace any leaking equipment prior to the start of any subsequent batch.² (R336.1225, R336.1702(a)) 3. The permittee shall verify the pH of the T-110 wet scrubber solution at the beginning of each calendar month and whenever the scrubber solution is replaced.² (R336.1225, R336.1702(a)) 4. The permittee shall determine the percent water, by weight, in the T-110 wet scrubber solution at the beginning of each calendar month and calculate the theoretical number of batches that can be completed without depleting the water concentration below 60 percent by weight. The permittee shall replace the scrubber solution prior to the start of the batch when the water concentration is calculated to fall below 60 percent by weight.² (R336.1225, R336.1702(a)) 5. The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor the exhaust gas temperature of each vacuum jet condenser system on a continuous basis.² (R336.1225, R336.1702(a), R336.1910) 6. The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor the T-110 wet scrubber pump outlet pressure on a continuous basis.² (R336.1225, R336.1702(a), R336.1910) |
| <p>3. Other Monitoring and/or Recordkeeping</p> | <p>See Appendix 3-4 of RO Permit MI-ROP-B4359-2003</p> |
| <p>B. TESTING/RECORDKEEPING (R336.1213(3))</p> | |
| <p>1. Parameter to be Tested/Recorded</p> | <ol style="list-style-type: none"> 1. EO (R336.1213(3)) 2. PO (R336.1213(3)) 3. BO (R336.1213(3)) |
| <p>2. Method/Analysis</p> | <ol style="list-style-type: none"> 1. Scientific calculations acceptable to the Department (R336.1213(3)) 2. Scientific calculations acceptable to the Department (R336.1213(3)) 3. Scientific calculations acceptable to the Department (R336.1213(3)) |
| <p>3. Frequency and Schedule of Testing/Recordkeeping</p> | <ol style="list-style-type: none"> 1. Annual emission rate for EO emissions (R336.1213(3)) 2. Annual emission rate for PO emissions (R336.1213(3)) 3. Annual emission rate for BO emissions (R336.1213(3)) |
| <p>IV. REPORTING</p> | |
| <p>Reports and Schedules</p> | <p>NA</p> |
| <p>V. OPERATIONAL PARAMETERS</p> | |
| <ol style="list-style-type: none"> 1. Permittee shall not produce more than 220 batches of polyether polyol products per 12-month rolling time period as determined at the end of each calendar month.² (R336.1225, R336.1702(a)) 2. Permittee shall not produce more than 3,300,000 pounds of polyether polyol products per 12-month rolling time period as determined at the end of each calendar month.² (R336.1225, R336.1702(a)) | |

TABLE C-3.2 EUCHEPOLYOL

EMISSION UNIT REQUIREMENTS

3. The permittee shall not vent any equipment through the north or south vacuum jet unless the corresponding vacuum jet condenser system is installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the north and south vacuum jet condenser systems includes maintaining a condenser system exhaust gas temperature of 113°F or less.² **(R336.1225, R336.1702(a), R336.1910)**
4. The permittee shall not vent any equipment through the east or west vacuum jet unless the corresponding vacuum jet condenser system is installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the east and west vacuum jet condenser systems includes maintaining a condenser system exhaust gas temperature of 140°F or less. **(R336.1225, R336.1702(a), R336.1910)**
5. The permittee shall not operate any equipment during process steps involving emission of EO, PO, and/or BO unless the T-110 wet scrubber is installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the T-110 wet scrubber includes the following:² **(R336.1225, R336.1702(a), R336.1910)**
 - a) The pH of the T-110 wet scrubber solution shall be maintained at 3.0 or less,
 - b) The T-110 wet scrubber pump outlet pressure shall be maintained at 2.0 bar gauge or less, and
 - c) The water concentration in the T-110 wet scrubber solution shall be maintained at 60 percent by weight or more.
6. The permittee shall not use more than 77,000 pounds of magnesium silicate while producing polyether polyol products in EUCHEPOLYOL per 12-month rolling time period as determined at the end of each calendar month.¹ **[R336.1224, R336.1225, R336.1227(2)]**

VI. OTHER REQUIREMENTS

1. The permittee shall comply with all provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60 Subparts A and Kb, as they apply to the storage tanks in EUCHEPOLYOL. **(40 CFR Part 60 Subparts A and Kb)**

Footnotes:

¹This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

APPENDICES

Appendix 3-4 of RO Permit MI-ROP-B4359-2003 (Modified). Recordkeeping

The permittee shall use the following approved formats and procedures for the recordkeeping requirements referenced in Table {EUCHEPOLYTHF}. Alternative formats must be approved by the AQD District Supervisor.

1. The permittee shall keep, in a satisfactory manner, the following records for EUCHEPOLYTHF for each month and 12-month rolling time period. All records shall be kept on file for a period of at least five years and made available to the Department upon request.²

| | Record | Applicable Requirement |
|----|--|------------------------------------|
| 1a | Number of batches of poly-THF 2900 produced. ² | R336.1225, R336.1702(a) |
| 1b | Number of batches of poly-THF 250 produced. ² | R336.1225, R336.1702(a) |
| 1c | All leak detection and repair activities. ² | R336.1225, R336.1702(a) |
| 1d | Amount of make-up methanol and cyclohexane added for each calendar month and 12-month rolling time period. ² | R336.1225, R336.1702(a) |
| 1e | Exhaust gas temperature of each vacuum jet condenser system. ² | R336.1225, R336.1702(a), R336.1910 |
| 1f | Exhaust gas temperature of condenser system E-4 during process steps involving emission of methanol and/or cyclohexane. ² | R336.1225, R336.1702(a), R336.1910 |
| 1g | Exhaust gas temperature of condenser system E-6 during poly-THF 2900 process steps F.1 and F.13 and poly-THF 250 process steps 4.7, 5.3, 5.4, 5.5, 7.8, 12.5, 12.6, 12.7, and 12.8. ² | R336.1225, R336.1702(a), R336.1910 |
| 1h | Exhaust gas temperature of condenser system E-12 during poly-THF 2900 process steps D.6 and E.2 and poly-THF 250 process steps 6.4, 6.5, 6.6, and 8.1. ² | R336.1225, R336.1702(a), R336.1910 |
| 1i | Calculations of the VOC emission rates. ² | R336.1702(a) |
| 1j | Calculations of the methanol emission rates. ² | R336.1225, R336.1702(a) |
| 1k | Calculations of the cyclohexane emission rates. ² | R336.1225, R336.1702(a) |

The permittee shall use the following approved formats and procedures for the recordkeeping requirements referenced in Table {EUCHEPOLYOL}. Alternative formats must be approved by the AQD District Supervisor.

2. The permittee shall keep, in a satisfactory manner, the following records for EUCHEPOLYOL for each month and 12-month rolling time period. All records shall be kept on file for a period of at least five years and made available to the Department upon request.

| | Record | Applicable Requirement |
|----|---|------------------------------------|
| 2a | Number of batches of polyether polyol products produced. ² | R336.1225, R336.1702(a) |
| 2b | Pounds of polyether polyol products produced. ² | R336.1225, R336.1702(a) |
| 2c | All leak detection and repair activities. ² | R336.1225, R336.1702(a) |
| 2d | T-110 wet scrubber solution pH. ² | R336.1225, R336.1702(a), R336.1910 |

| | Record | Applicable Requirement |
|----|--|------------------------------------|
| 2e | T-110 wet scrubber solution weight percent water, calculated theoretical number of batches that can be completed in the ensuing calendar month, and scrubber solution replacements. ² | R336.1225, R336.1702(a), R336.1910 |
| 2f | T-110 wet scrubber pump alarm conditions and steps taken to correct each alarm condition. ² | R336.1225, R336.1702(a), R336.1910 |
| 2g | Exhaust gas temperature of north and south vacuum jet condenser system. ² | R336.1225, R336.1702(a), R336.1910 |
| 2h | Exhaust gas temperature of east and west vacuum jet condenser system. ² | R336.1225, R336.1702(a), R336.1910 |
| 2i | T-110 wet scrubber pump outlet pressure. ² | R336.1225, R336.1702(a), R336.1910 |
| 2j | Calculations of the VOC emission rates. ² | R336.1702(a) |
| 2k | Calculations of the EO emission rates. ² | R336.1225, R336.1702(a) |
| 2l | Calculations of the PO emission rates. ² | R336.1225, R336.1702(a) |
| 2m | Calculations of the BO emission rates. ² | R336.1225, R336.1702(a) |
| 2n | Pounds of magnesium silicate used. ¹ | R336.1224, R336.1225, R336.1227(2) |

Footnotes:

¹This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).