MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

October 30, 2015

PERMIT TO INSTALL
78-02B

ISSUED TO
Polychemie Inc.

LOCATED AT
38070 Van Born Road
Wayne, Michigan

IN THE COUNTY OF
Wayne

STATE REGISTRATION NUMBER
N7161

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 Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. 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: **September 22, 2015**	
DATE PERMIT TO INSTALL APPROVED: **October 30, 2015**	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

Table of Contents

Section **Page**

Common Abbreviations / Acronyms

Common Acronyms		Pollutant / Measurement Abbreviations	
AQD	Air Quality Division	acfm	Actual cubic feet per minute
BACT	Best Available Control Technology	BTU	British Thermal Unit
CAA	Clean Air Act	°C	Degrees Celsius
CAM	Compliance Assurance Monitoring	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	CO_2e	Carbon Dioxide Equivalent
CFR	Code of Federal Regulations	dscf	Dry standard cubic foot
COM	Continuous Opacity Monitoring	dscm	Dry standard cubic meter
Department/ department	Michigan Department of Environmental Quality	°F	Degrees Fahrenheit
		gr	Grains
EU	Emission Unit	HAP	Hazardous Air Pollutant
FG	Flexible Group	Hg	Mercury
GACS	Gallons of Applied Coating Solids	hr	Hour
GC	General Condition	HP	Horsepower
GHGs	Greenhouse Gases	H_2S	Hydrogen Sulfide
HVLP	High Volume Low Pressure*	kW	Kilowatt
ID	Identification	lb	Pound
IRSL	Initial Risk Screening Level	m	Meter
ITSL	Initial Threshold Screening Level	mg	Milligram
LAER	Lowest Achievable Emission Rate	mm	Millimeter
MACT	Maximum Achievable Control Technology	MM	Million
MAERS	Michigan Air Emissions Reporting System	MW	Megawatts
MAP	Malfunction Abatement Plan	NMOC	Non-methane Organic Compounds
MDEQ	Michigan Department of Environmental Quality	NO_x	Oxides of Nitrogen
		ng	Nanogram
MSDS	Material Safety Data Sheet	PM	Particulate Matter
NA	Not Applicable	PM10	Particulate Matter equal to or less than 10 microns in diameter
NAAQS	National Ambient Air Quality Standards		
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
NSPS	New Source Performance Standards	pph	Pounds per hour
NSR	New Source Review	ppm	Parts per million
PS	Performance Specification	ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration	ppmw	Parts per million by weight
PTE	Permanent Total Enclosure	psia	Pounds per square inch absolute
PTI	Permit to Install	psig	Pounds per square inch gauge
RACT	Reasonable Available Control Technology	scf	Standard cubic feet
ROP	Renewable Operating Permit	sec	Seconds
SC	Special Condition	SO_2	Sulfur Dioxide
SCR	Selective Catalytic Reduction	TAC	Toxic Air Contaminant
SNCR	Selective Non-Catalytic Reduction	Temp	Temperature
SRN	State Registration Number	THC	Total Hydrocarbons
TEQ	Toxicity Equivalence Quotient	tpy	Tons per year
USEPA/EPA	United States Environmental Protection Agency	µg	Microgram
		µm	Micrometer or Micron
VE	Visible Emissions	VOC	Volatile Organic Compounds
		yr	Year

*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 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. **(R 336.1201(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 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(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 R 336.1210, 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. **(R 336.1201(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. **(R 336.1201(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 R 336.1219 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 R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**

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. **(R 336.1901)**

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). **(R 336.1912)**

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 R 336.1301, 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 R 336.1303. **(R 336.1301)**
    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 R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Flexible Group ID
EU-MANNICH	Mannich polymer production consisting of three major steps: production of polyacrylamide, which is controlled by scrubber SC-1 and vents through stack SV1; production of dimethylaminomethanol, which is controlled by scrubber SC-1 and vents through stack SV1; and production of Mannich polymer; which is controlled by scrubber SC-1 and vents through stack SV1. The three 5,500 gallon acrylamide storage tanks, which are controlled by scrubber SC-2 and vent through stack SV2, and the 6,500 gallon formaldehyde storage tank, which vents inside the process building, are part of this emission unit.	NA
EU-COPOLYMER	Acrylamide and diallyldimethylammonium chloride are reacted together to produce copolymer and this reactor is controlled by SC-1 and vents through stack SV1. The three 5,500 gallon acrylamide storage tanks, which are controlled by scrubber SC-2 and vent through stack SV2, are part of this emission unit as well as an approximately 3,000 gallon tank for final product adjustment which vents inside the building.	NA
EU-ADAMQUAT	Acrylamide and dimethylaminoethylacrylate-methyl chloride (ADAM-MeCl) are reacted together to produce ADAM-Quat copolymer and this reactor is controlled by SC-1 and vents through stack SV1. The three 5,500 gallon acrylamide storage tanks, which are controlled by scrubber SC-2 and vent through stack SV2, are part of this emission unit.	NA
EU-MELFORM	Melamine formaldehyde copolymer production including the syrup reactor, acid reactor, melamine-formaldehyde storage tanks, and melamine-formaldehyde tank truck loading vents, all of which vent through scrubber SC-2 for odor control and stack SV2, and the 6,500 gallon formaldehyde storage tank.	NA
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.		

The following conditions apply to: EU-MANNICH

DESCRIPTION: Mannich polymer production consisting of three major steps: production of polyacrylamide, which is controlled by scrubber SC-1 and vents through stack SV1; production of dimethylaminomethanol, which is controlled by scrubber SC-1 and vents through stack SV1; and production of Mannich polymer; which is controlled by scrubber SC-1 and vents through stack SV1. The three 5,500 gallon acrylamide storage tanks, which are controlled by scrubber SC-2 and vent through stack SV2, and the 6,500 gallon formaldehyde storage tank, which vents inside the process building, are part of this emission unit.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT:
Scrubbers SC-1 and SC-2

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. VOC	1.1 tpy	12-month rolling time period as determined at the end of each calendar month	EU-MANNICH	SC VI.1, VI.2, and VI.3	R 336.1702(a)
2. Acrylamide	3.7 lbs per year	12-month rolling time period as determined at the end of each calendar month	EU-MANNICH	SC VI.1, VI.2, and VI.3	R 336.1225, R 336.1702(a)
3. Formaldehyde	113 lbs per year	12-month rolling time period as determined at the end of each calendar month	EU-MANNICH	SC VI.1, VI.2, and VI.3	R 336.1225, R 336.1702(a)
4. Dimethylamine	538 lbs per year	12-month rolling time period as determined at the end of each calendar month	EU-MANNICH	SC VI.1, VI.2, and VI.3	R 336.1225, R 336.1702(a)

II. MATERIAL LIMITS

1. The EU-MANNICH throughput shall not exceed the following: **(R 336.1225, R 336.1702(a))**
   a) 19,920,000 pounds of 48 to 53 weight percent acrylamide solution per 12-month rolling time period, as determined at the end of each calendar month,
   b) 7,700,000 pounds of 37 percent or less formaldehyde solution per 12-month rolling time period, as determined at the end of each calendar month, and
   c) 4,280,000 pounds of dimethylamine (100 weight percent basis) per 12-month rolling time period, as determined at the end of each calendar month.

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall not produce dimethylaminomethanol or Mannich polymer unless the liquid flow rate and pressure drop in scrubber SC-1 are maintained as specified in the scrubber operation and maintenance plan. **(R 336.1225, R 336.1702(a), R 336.1910)**

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall not operate the formaldehyde storage tank unless the associated vapor balance system is installed, maintained, and operated in a satisfactory manner. **(R 336.1225, R 336.1702(a), R 336.1910)**

2. The permittee shall not operate the acrylamide storage tanks or the Mannich reactors unless the associated scrubber, SC-2 for the storage tanks or SC-1 for the reactors, respectively, is installed, maintained, and operated in a satisfactory manner. **(R 336.1225, R 336.1702(a), R 336.1910)**

3. The permittee shall equip and maintain the scrubber SC-1 with a water flow rate monitor and with a pressure drop monitor. **(R 336.1225, R 336.1702(a), R 336.1910)**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall calculate the VOC, acrylamide, formaldehyde, and dimethylamine emission rates from EU-MANNICH for each month and the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period records of the acrylamide, formaldehyde, and dimethylamine throughput for EU-MANNICH. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

3. The permittee shall record, in a satisfactory manner, the scrubber SC-1 water flow rate and pressure drop at least once per batch. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1225, R 336.1702(a), R 336.1910)**

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV1	10[1]	33[1]	R 336.1225
2. SV2	10[1]	33[1]	R 336.1225

IX. OTHER REQUIREMENTS

NA

Footnotes:

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

The following conditions apply to: EU-COPOLYMER

DESCRIPTION: Acrylamide and diallyldimethylammonium chloride are reacted together to produce copolymer and this reactor is controlled by SC-1 and vents through stack SV1. The three 5,500 gallon acrylamide storage tanks, which are controlled by scrubber SC-2 and vent through stack SV2, are part of this emission unit as well as an approximately 3,000 gallon tank for final product adjustment which vents inside the building.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT:
Scrubbers SC-1 and SC-2

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Acrylamide	0.02 lb per year	12-month rolling time period as determined at the end of each calendar month	EU-COPOLYMER	SC VI.1 and VI.2	R 336.1225, R 336.1702(a)

II. MATERIAL LIMITS

1. The EU-COPOLYMER throughput of 48 to 53 weight percent acrylamide solution shall not exceed 1,240,000 pounds per 12-month rolling time period, as determined at the end of each calendar month. **(R 336.1225, R 336.1702(a))**

III. PROCESS/OPERATIONAL RESTRICTIONS

NA

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall not operate the acrylamide storage tanks unless scrubber SC-2 is installed, maintained, and operated in a satisfactory manner. **(R 336.1225, R 336.1702(a))**

2. The permittee shall equip and maintain scrubber SC-2 with a water flow rate monitor and with a pressure drop monitor. (**R 336.1225, R 336.1702(a), R 336.1910)**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall calculate the acrylamide emission rates from EU COPOLYMER for each month and the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period records of the acrylamide throughput for EU-COPOLYMER. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTIONS

NA

IX. OTHER REQUIREMENTS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV1	10[1]	33[1]	R 336.1225
2. SV2	10[1]	33[1]	R 336.1225, R 336.1901

Footnotes:
[1]This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

The following conditions apply to: EU-ADAMQUAT

DESCRIPTION: Acrylamide and dimethylaminoethylacrylate-methyl chloride (ADAM-MeCl) are reacted together to produce ADAM-Quat copolymer and this reactor is controlled by SC-1 and vents through stack SV1. The three 5,500 gallon acrylamide storage tanks, which are controlled by scrubber SC-2 and vent through stack SV2, are part of this emission unit.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT:
Scrubbers SC-1 and SC-2

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Acrylamide	0.02 lb per year	12-month rolling time period as determined at the end of each calendar month	EU-ADAMQUAT	SC VI.1 and VI.2	R 336.1225, R 336.1702(a)

II. MATERIAL LIMITS

1. The EU-ADAMQUAT throughput of 48 to 53 weight percent acrylamide solution shall not exceed 1,270,000 pounds per 12-month rolling time period, as determined at the end of each calendar month. **(R 336.1225, R 336.1702(a))**

III. PROCESS/OPERATIONAL RESTRICTIONS

NA

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall not operate the acrylamide storage tanks unless scrubber SC-2 is installed, maintained, and operated in a satisfactory manner. **(R 336.1225, R 336.1702(a))**

2. The permittee shall equip and maintain scrubber SC-2 with a water flow rate monitor and with a pressure drop monitor. (**R 336.1225, R 336.1702(a), R 336.1910)**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall calculate the acrylamide emission rates from EU-ADAMQUAT for each month and the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period records of the acrylamide throughput for EU-ADAMQUAT. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1225, R 336.1702(a))**

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTIONS

NA

IX. OTHER REQUIREMENTS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV1	10[1]	33[1]	R 336.1225
2. SV2	10[1]	33[1]	R 336.1225, R 336.1901

Footnotes:
[1]This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

The following conditions apply to: EU-MELFORM

DESCRIPTION: Melamine formaldehyde copolymer production including the syrup reactor, acid reactor, melamine-formaldehyde storage tanks, and melamine-formaldehyde tank truck loading vents, all of which vent through scrubber SC-2 for odor control and stack SV2, and the 6,500 gallon formaldehyde storage tank.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT:
Scrubber SC-2

I. EMISSION LIMITS

NA

II. MATERIAL LIMITS

NA

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall not operate EU-MELFORM unless the liquid flow rate and pressure drop in scrubber SC-2 are maintained as specified in the scrubber operation and maintenance plan.[1] **(R 336.1901)**

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall not operate the formaldehyde storage tank unless the vapor balance system is installed, maintained, and operated in a satisfactory manner. **(R 336.1225, R 336.1702(a), R 336.1910)**

2. The permittee shall not operate EU-MELFORM unless scrubber SC-2 is installed, maintained, and operated in a satisfactory manner.[1] **(R 336.1901)**

3. The permittee shall equip and maintain scrubber SC-2 with a water flow rate monitor.[1] **(R 336.1901)**

4. The permittee shall equip and maintain the scrubber SC-2 with a pressure drop monitor.[1] **(R 336.1901)**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall record, in a satisfactory manner, the scrubber SC-2 water flow rate and pressure drop at least once per batch. The permittee shall keep all records on file and make them available to the Department upon request.[1] **(R 336.1901)**

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV2	10[1]	33[1]	R 336.1225, R 336.1901

IX. OTHER REQUIREMENTS

NA

Footnotes:
[1]This condition is state only enforceable and was established pursuant to Rule 201(1)(b).