

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

May 6, 2011

**PERMIT TO INSTALL**  
22-97C

**ISSUED TO**  
Silbond Corporation

**LOCATED AT**  
9901 Sand Creek Highway  
Weston, Michigan

**IN THE COUNTY OF**  
Lenawee

**STATE REGISTRATION NUMBER**  
B2952

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:

**April 28, 2011**

DATE PERMIT TO INSTALL APPROVED:

**May 6, 2011**

SIGNATURE:

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

**PERMIT TO INSTALL**  
**Table of Contents**

<b>Section</b>	<b>Page</b>
Alphabetical Listing of Common Abbreviations / Acronyms .....	2
General Conditions .....	3
Special Conditions .....	5
Emission Unit Summary Table.....	5
Flexible Group Summary Table .....	7
Special Conditions for FGNAME1 .....	8

**Common Abbreviations / Acronyms**

<b>Common Acronyms</b>		<b>Pollutant/Measurement Abbreviations</b>	
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 <sub>2</sub> 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	ng	Nanogram
MAP	Malfunction Abatement Plan	NO <sub>x</sub>	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality (Department)	PM	Particulate Matter
MIOSHA	Michigan Occupational Safety & Health Administration	PM10	PM less than or equal to 10 microns diameter
MSDS	Material Safety Data Sheet	PM2.5	PM less than or equal 2.5 microns diameter
NESHAP	National Emission Standard for Hazardous Air Pollutants	pph	Pound per hour
NSPS	New Source Performance Standards	ppm	Parts per million
NSR	New Source Review	ppmv	Parts per million by volume
PS	Performance Specification	ppmw	Parts per million by weight
PSD	Prevention of Significant Deterioration	psia	Pounds per square inch absolute
PTE	Permanent Total Enclosure	psig	Pounds per square inch gauge
PTI	Permit to Install	scf	Standard cubic feet
RACT	Reasonably Available Control Technology	sec	Seconds
ROP	Renewable Operating Permit	SO <sub>2</sub>	Sulfur Dioxide
SC	Special Condition	THC	Total Hydrocarbons
SCR	Selective Catalytic Reduction	tpy	Tons per year
SRN	State Registration Number	µg	Microgram
TAC	Toxic Air Contaminant	VOC	Volatile Organic Compounds
TEQ	Toxicity Equivalence Quotient	yr	Year
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. **(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.

<b>Emission Unit ID</b>	<b>Emission Unit Description (Process Equipment &amp; Control Devices)</b>	<b>Stack Identification</b>
EUBOILER1	200 hp natural gas fired boiler, exempt under Rule R 336.1282(b)(i).	SV0001
EUBOILER2	200 hp natural gas fired boiler, exempt under Rule R 336.1282(b)(i).	SV0002
EUBOILER 3	500 hp natural gas fired boiler, exempt under Rule R 336.1282(b)(i).	SV0003
EUHOTOILHEATER	Direct process hot oil heater, exempt under Rule R 336.1290.	SV0013
EUWWEVAPCOND	Waste water evaporator and condenser in building 701, exempt under Rule R 336.1290.	SV0018
EUREACTOR502-101	500 gallon reactor, R-502-101 in building 502, used for producing Ultra High Purity tetraethyl orthosilicate (TEOS) (UHPT). This reactor is controlled by a chilled water condenser.	SV0022
EUREACTOR102-100	4000 gallon reactor, R-102-100, located in building 102, is used for the ethyl silicate and catalyst production. This reactor is controlled by condensers and a flare.	SV0014 (FLARE)
EUGRINDING	Grinding, exempt under Rule R 336.1285(l)(vi).	SV0019
EUREACTOR102-80	2000 gallon reactor, R-102-80, located in building 102, a two column vacuum distillation process used for manufacturing Silbond Pure, EG and LBEG. This process is controlled by a chilled water condenser.	SV0016
EUREACTOR102-200	500 gallon hydrolyzing reactor, R-102-200, located in building 102, used for manufacturing ethyl polysilicate products Silbond 40 and 50.	SV0017
EUREACTOR102-300	2000 gallon neutralizer reactor, R-102-300, located in building 102, used for manufacturing ethyl polysilicate products Silbond 40 and 50.	SV0017
EUREACTOR102-10	2000 gallon color treatment reactor, R102-10, located in building 102, used for manufacturing ethyl polysilicate products Silbond 40 and 50.	SV0017
EUREACTOR102-30	2000 gallon reactor, R-102-30, located in building 102, used for manufacturing conventional binders which are Silbond H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE but is also used for manufacturing Silbond H-803 and the hybrid binders; HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor is controlled by a single condenser.	SV0012

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Stack Identification
EUREACTOR102-40	2000 gallon reactor, R-102-40, located in building 102, used for manufacturing conventional binders; H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE but is also used for manufacturing Silbond 40 and 50, Silbond H-803 and the hybrid binders; HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor is controlled by two chilled water condensers in series.	SV0017
EUREACTOR102-50	Building 102, this reactor is used to store the conventional binder H-803 during production after it has been processed in reactor R-102-30 but prior to being transferred to reactor R-102-40 to be distilled.	SV0012, SV0017
EUREACTOR501-10	Building 501, single process reactor, R-501-10 used for manufacturing hybrid binders which are Silbond HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor may also be used for manufacturing Silbond H-803 and the conventional binders H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE. This reactor is controlled by a condenser.	SV0021
EUREACTOR501-50	Building 501, single process reactor, R-501-50 used for manufacturing hybrid binders which are Silbond HT28-A, HT21.5PM, HT-30, HT-33 and HT-50. This reactor may also be used for manufacturing Silbond H-803 and the conventional binders H-4, H-5, SARCOLH-5, H6-C, H12A1, H-18IC, H-25 and ESPE. This reactor is controlled by a condenser.	SV0011
EUDRUMMING	Transfer of products from tanks to drums, this process is exempt under Rule 336.1290.	SV0024
EUTMB-70	Repackaging of products from bulk into drums, controlled by a hood, this process is exempt under Rule 336.1290.	N/A
STORAGE TANKS	See attached list, various size storage tanks ranging from 55 gallons to 50,000 gallons. As specified on the list, a number of these tanks are exempt from permitting but the VOC emissions from these tanks shall be included in calculating VOC emissions from FGFACILITY. Some of these tanks are used for storing only raw materials and some only store finished products but a number of these tanks can be used for storing both raw materials and finished products.	N/A
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.		
All of these emission units are part of "FGFACILITY".		

### FLEXIBLE GROUP SUMMARY TABLE

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

<b>Flexible Group ID</b>	<b>Flexible Group Description</b>	<b>Associated Emission Unit IDs</b>
FGFACILITY	All process equipment source-wide including equipment covered by other permits, grandfathered equipment and exempt equipment.	See above

**The following conditions apply to: FGFACILITY**

**DESCRIPTION:** All process equipment source-wide including equipment covered by other permits, grandfathered equipment and exempt equipment.

**Emission Units:** EUBOILER1, EUBOILER2, EUBOILER3, EUHOTOILHEATER, EUWWEVAPCOND, EUREACTOR502-101, EUREACTOR102-100, EUGRINDING, EUREACTOR102-80, EUREACTOR102-200, EUREACTOR102-300, EUREACTOR102-10, EUREACTOR102-30, EUREACTOR102-40, EUREACTOR102-50, EUREACTOR501-50, EUDRUMMING, EUTMB-70, and STORAGE TANKS.

**POLLUTION CONTROL EQUIPMENT:** chilled water condenser(s), slurry tank vent condenser, and flare.

**I. EMISSION LIMITS**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. VOC	65 tpy	12-month rolling time period*	FGFACILITY	SC VI.4	R 336.1205(3), R 336.1225, R 336.1702(a)
2. Each (individual) HAP	Less than 8 tpy	12-month rolling time period*	FGFACILITY	SC VI.4	R 336.1205(3), R 336.1225
3. Total HAP	Less than 18 tpy	12-month rolling time period*	FGFACILITY	SC VI.4	R 336.1205(3), R 336.1225

\* as determined at the end of each calendar month.

**II. MATERIAL LIMITS**

Material	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**III. PROCESS/OPERATIONAL RESTRICTIONS**

NA

**IV. DESIGN/EQUIPMENT PARAMETERS**

1. The permittee shall not operate any of the reactors in FGFACILITY unless the associated chilled water condenser(s) is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes but is not limited to maintaining the exhaust gases from each vent condenser at or below 20 degrees centigrade. **(R 336.1225, R 336.1702(a), R 336.1910)**
2. The permittee shall not operate EUREACTOR102-100 unless the slurry tank vent condenser and the flare are installed, maintained, and operated in a satisfactory manner. Satisfactory operation of the flare includes but is not limited to submitting an operation and maintenance plan within 30 calendar days of the permit approval date that describes the proper operation and maintenance procedures for the flare to the District for review and approval. **(R 336.1225, R 336.1702(a), R 336.1910)**

3. The permittee shall equip and maintain each reactor controlled by a condenser(s) in FGFACILITY with a temperature gauge to monitor the vent gas exhaust temperature. **(R 336.1225, R 336.1702(a), R 336.1910)**
4. The permittee shall not operate any storage tanks at FGFACILITY that are used to store materials with a vapor pressure greater than 1.5 psia or contain HAP compounds unless those tanks are equipped and maintained with conservation vents. **(R 336.1225, R 336.1702(a), R 336.1910)**

#### **V. TESTING/SAMPLING**

NA

#### **VI. MONITORING/RECORDKEEPING**

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

1. The permittee shall monitor the vent gas exhaust temperature for each reactor on a continuous basis during operation of the reactor. **(R 336.1225, R 336.1702(a), R 336.1910)**
2. The permittee shall continue to keep in-place the Leak Detection and Repair (LDAR) monitoring program for all pipe fittings, flanges and pump seals in FGFACILITY. Except as otherwise provided in this condition, the LDAR monitoring shall be conducted once every two years (biennial) using methods and procedures acceptable to the District Supervisor, Air Quality Division. If the biennial LDAR monitoring demonstrates leaks of greater than five (5) percent of all monitored components, then the AQD may require LDAR monitoring on a quarterly basis until the permittee demonstrates that the monitored components can achieve a leak rate of less than five (5) percent for two consecutive quarters and then the following two consecutive years, then the permittee may return to biennial monitoring. The permittee may petition the AQD by demonstrating that quarterly monitoring is unnecessary because of an error in sampling, monitoring or statistical evaluations; corrections or modifications; or other circumstances. A summary of results of any quarterly, annual or biennial monitoring shall be sent to the District Supervisor within 30 days after completion of the monitoring event. **(R 336.1225, R 336.1702(a), R 336.1205(3))**
3. All required calculations shall be completed in a format acceptable to the AQD District Supervisor and made available by the 15th day of the calendar month, for the previous calendar month, unless otherwise specified in any recordkeeping, reporting or notification special condition. **(R 336.1205(3))**
4. The permittee shall keep, in a satisfactory manner, records of monthly and 12-month rolling time period VOC, individual HAP and total HAP emission rate calculations for FGFACILITY, as required by SC I.1, SC I.2 and SC I.3. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **(R 336.1225, R 336.1702(a), R 336.1205(3))**
5. The permittee shall keep, in a satisfactory manner, records of the number, weight and composition of batches produced in each reactor in FGFACILITY on a daily and monthly basis and a 12-month rolling time period basis as determined at the end of each calendar month. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **(R 336.1225, R 336.1702(a))**

#### **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:

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Diameter/Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
1. SV0011	2	30	R 336.1225
2. SV0012	2	50	R 336.1225
3. SV0014	2	20	R 336.1225
4. SV0016	2	40	R 336.1225
5. SV0017	2	35	R 336.1225
6. SV0021	2	30	R 336.1225
7. SV0022	2	16	R 336.1225
The exhaust gases shall be discharged unobstructed vertically upwards to the ambient air.			

**IX. OTHER REQUIREMENTS**

NA

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).