



Florida Department of Environmental Protection

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PERMITTEE:

SiVance, LLC
P.O. Box 1466
Gainesville, Florida 32602

Air Permit Number: 0010049-012-AF
Issue Date: October 20, 2011
Expiration Date: February 23, 2012

Authorized Representative:
Dr. Paul Kremer, Site Director

Small Scale Organic Chemical Manufacturing
FESOP

PROJECT AND LOCATION

Project 012 is for the incorporation of Permit No. 0010049-011-AC into the current Federally Enforceable State Operation Permit (FESOP) No. 0010049-009-AF for the continued operation of a Small Scale Organic Chemical Manufacturing Facility (EU 005). The revised FESOP will be issued as Permit No. 0010049-012-AF.

The existing facility is an Organic Chemical Manufacturing Facility (Standard Industrial Classification No. 2869). The facility is located in Alachua County at 5002 N.E. 54th Place Gainesville, Alachua County, Florida. The UTM coordinates are Zone 17, 377.6 km East, and 3286.7 km North.

This final permit is organized by the following sections:

Section 1. General Information

Section 2. Administrative Requirements

Section 3. Emissions Unit Specific Conditions

Section 4. Appendices

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of Section 4 of this permit.

This air pollution operation permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to operate the facility in accordance with the conditions of this permit.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

SECTION 2. ADMINISTRATIVE REQUIREMENTS

FACILITY AND PROJECT DESCRIPTION

SiVance, LLC operates a Specialty Organic Chemical Manufacturing facility (EU 005) which manufactures customized chemical products, primarily organofunctional silanes and organofluorine intermediates on laboratory and larger scale.

Manufacturing areas consist of: **1)** Building 25/26 (Prosil) process area; **2)** Process Water and Storm Water Treatment area; **3)** Building 21 (Uracil) process area; **4)** Building 18 process area; **5)** Building 39 process area; **6)** Building 5 (Pilot plant) process area; **7)** Building 20a (Autoclave) process area; **8)** Building 43 (Norbornadiene) process area.

Ammonia emissions from the HMDS process are captured by an ammonia absorber followed by a scrubber. Aqueous ammonium chloride waste is sent offsite for disposal.

The new vertical packed bed type Hydrogen Chloride Absorber (HCL) absorber (scrubber) with Ejector is located in Building 26 Production Area (Prosil Manufacturing). The new unit designated as WS 26-7 is equipped with a venturi type ejector for improved efficiency controls HCL emissions from the R-14 reactor system. Emissions from the WS 26-4 are vented through emission point 20 (EP-20). EP-20 does not vent directly to atmosphere but vents into the process caustic scrubber identified as WS 26-5. Discharge to the atmosphere from this scrubber (WS 26-5) is through EP-21.

Emission Points are identified as follows:

02 Building 5: Reactor emissions vented to vertical packed bed fume scrubber (WS 5-1)

03 Building 5: Reactor emissions vented to aspirator/venturi scrubber

05 Building 25/26: Distillation Columns S-5 and S-6 emissions (Ammoniation processes) are vented to this emission point.

06-07 Building 18: Aspirators (A-1 and A-2) vented to vertical packed-bed fume scrubber with demister (WS 18-1)

08 Building 18: Vanaire, Model VT-550 vertical venturi/packed bed fume scrubber with demister. Caustic is used as the scrubbing media to remove chlorosilanes and hydrochloric acids emissions from alkoxy silanes production, or sulfuric acid is used as the scrubbing media to remove ammonia or allylamine emissions. Nominal scrubber flow rate is 17-28 gallons per minute through the venture and 25-55 gallons per minute through the packed bed. The design airflow rate is 2000 acfm. Exhaust gases exit at approximately 100° F from a 0.9' diameter stack that is 80' tall. Removal efficiency is estimated to be 99% or greater for chlorosilanes, hydrogen chloride, ammonium chloride, alkoxy silane and siloxanes and amines (allylamine) emissions (WS 18-1).

09 Building 18: Vanaire, Model VT-550 vertical venturi/packed bed fume scrubber with demister. Caustic is used as the scrubbing media to remove chlorosilanes and hydrochloric acids emissions from alkoxy silanes production, or sulfuric acid is used as the scrubbing media to remove ammonia or allylamine emissions. Nominal scrubber flow rate is 17-28

gallons per minute through the venture and 25-55 gallons per minute through the packed bed. The design airflow rate is 2000 acfm. Exhaust gases exit at approximately 100° F from a 0.9' diameter stack that is 80' tall. Removal efficiency is estimated to be 99% or greater for chlorosilanes, hydrogen chloride, ammonium chloride, alkoxy silane and siloxanes and amines (allylamine) emissions (WS 18-2)

10 Building 18: Various reactor emissions vented to (2) vertical packed bed fume scrubbers in series (WS 18-3).

11 Building 18: Carbon bed absorber (used only during TMT production)

13 Building 20a: 200 and 500 gallon high-pressure autoclaves vented to scrubbers (WS 20-1)

15a Building 25: Distillation column S-4 emissions vented to Aspirator

SECTION 2. ADMINISTRATIVE REQUIREMENTS

21 Building 25/26: Distillation columns S-5 and S-6 (non-ammoniation processes), silane absorber, a venturi vertical packed-bed fume scrubber, and two HCl absorbers emissions vented to caustic vertical packed-bed fume scrubber (WS 26-5).

22 Building 25/26: Distillation columns S-5 and S-6 (non-ammoniation processes), silane absorber, a venturi vertical packed-bed fume scrubber, and two HCl absorbers, tank farm and drumming operations emissions vented to venturi vertical packed-bed fume scrubber (WS 26-6)

26 Process Water Treatment: Packed bed VOC stripper for process water treatment

28 Building 39: Venturi scrubber (WS 39-1) followed by a vertical packed-bed fume scrubber (WS 39-2); Ammoniation processes are vented to this emission point.

31 Building 39: R-14 Ammoniation process vent

33 Building 27, 27a: (2) Natural Gas Fired Boilers for steam generation (**Exempt Emissions Points**)

The air pollutant emissions from the facility are Hazardous Air Pollutants (HAP) Volatile Organic Compounds (VOC) and Ammonia(NH₃).

This facility is considered a synthetic Non-Title V source base on federally enforceable facilitywide emissions limits of Less than 100 tons per year of VOC, Less than 100 tons per year NH₃, Less than 10 tons per year of individual HAPs, and less than 25 tons per year of total HAPs emissions.

The facility consists of the following emissions unit:

Facility ID No. 0010049	
ID No.	Emission Unit Description
005	Batch Organic Chemical Manufacturing

FACILITY REGULATORY CLASSIFICATION

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is not a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is not a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.

Applicable Federal Regulations

Norbornadiene Process is subject to the record keeping and reporting requirements of 40 CFR 60 Subpart NNN Standards of Performance for Volatile Organic Compounds (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, continuous distillation process in the Norbornadiene process.

A BACT Determination Dated 12-12-96 applies for the two small boilers.

SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The permitting authority for this project is the Northeast District Air Program, Florida Department of Environmental Protection (Department). The Northeast District's mailing address is 7825 Baymeadows Way, Suite B200, Jacksonville, Florida 32256-7590. All documents related to applications for permits to operate an emissions unit shall be submitted to the Northeast District.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the North East District Office. The mailing address and phone number of the District Office is: 7825 Baymeadows Way, Suite B200, Jacksonville, Florida 32256. The Permitting Authority's telephone number is 904/256-1700.
3. Appendices: The following Appendices are attached as part of this permit:
 - a. Appendix A. Citation Formats and Glossary of Common Terms;
 - b. Appendix B. General Conditions;
 - c. Appendix C. Common Conditions;
 - d. Appendix D. Common Testing Requirements
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.
5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time.

[Rule 62-4.080, F.A.C.]

6. Modifications: No new emissions unit shall be constructed and no existing emissions unit shall be modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification.

[Rules 62-210.300(1), and 62-212.300, (1) (a), F.A.C.]

7. A completed Application for Non Title V Air Permit Renewal (DEP Form No. 62-210.900(4), F.A.C.), shall be submitted to the Department at least 60 days prior to the expiration date of this operation permit. To properly apply for an operation permit, the permittee shall submit the appropriate application form, processing fee, and compliance test reports as required by this permit.

[Rule 62-4.090, F.A.C.] [Rules 62-4.055 and 62-4.220, F.A.C.]

SECTION 3. EMISSIONS UNITS SPECIFIC CONDITIONS

ESSENTIAL POTENTIAL TO EMIT (PTE) PARAMETERS

1. Hours of Operation: The hours of operation are not restricted.

[Rules 62-4.160(2), 62-210.200(PTE), F.A.C.]

EMISSION LIMITATIONS AND PERFORMANCE STANDARDS

2. Exempt Boilers (EP33): The firing of natural gas shall be the BACT for both boilers located in Buildings 27 and 27a.

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3. Maximum Allowable Emissions Rate: The permitted maximum allowable emission rate for each pollutant is as follows:

Pollutant	Location	Emissions Rate	FAC Rule
Total Volatile Organic Compounds	Facility-wide	Less than 100 tons per year NOTE (1)	62-210.200(PTE)
Individual Hazardous Air Pollutants NOTES (2)	Facility-wide	Less than 10 tons per year NOTE (1) (3)	62-210.200(PTE)
Total Combined Hazardous Air Pollutants NOTES (2)	Facility-wide	Less than 25 tons per year NOTE (1)	62-210.200(PTE)
Ammonia	Facility-wide	Less than 100 tons per year NOTE (1)	62-210.200(PTE)

NOTE (1) Limit established to escape Title V classification.

NOTE (2) Hazardous Air Pollutants (HAPs), as defined in Section 112(g) of the Clean Air Act. Emissions are not to exceed the limits specified above.

NOTE (3) Limit established to escape Title III classification.

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SECTION 3. EMISSIONS UNITS SPECIFIC CONDITIONS

4. General Visible Emissions Standard – Facility-wide: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions elsewhere in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density of which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). If a special compliance test is required; the test method for visible emissions shall be EPA Method 9, incorporated and adopted by reference in Chapter 62-297, F.A.C.

[Rule 62-296.320(4)(b)1., F.A.C.]

5. Air Pollution Control Equipment Operation: The permittee shall operate and maintain the Scrubbers, WS 18-1 and WS 18-2 in accordance with the Operation and Maintenance Plan submitted May 3, 2006.

[Rule 62-4.070(3), F.A.C. and Air Operating Permit No. 0010049-009-AF]

6. Method of Operation Control Equipment: The air pollution control equipments specified in this permit shall be operated at all times during which the process equipment associated with the control equipment is operated under conditions where there is a potential to emit HAPs, VOCs, or any regulated air pollutant, except during periods of malfunctions or emergencies when operation of such equipment is not feasible.

[Rule 62-4.070(3), F.A.C. and Air Operating Permit No. 0010049-009-AF]

7. Control Equipment-Maintenance: The Permittee shall conduct all necessary maintenance and make all necessary attempts to maintain air pollution control equipments in proper operating condition at all times in accordance with manufacturer's requirements.

[Rule 62-4.070, F.A.C.; Air Operating Permit No. 0010049-009-AF]

8. Considering operational variations in types of industrial equipment operations affected by this rule, the Department may adjust maximum and minimum factors to provide reasonable and practical regulatory controls consistent with the public interest.

[Rule 62-210.700(5), F.A.C and Permit No. 0010049-009-AF]

9. The Permittee is authorized to operate equipment, vary production rates and schedules, and make operating adjustments as needed to support its business activity provided that Specific Condition 3 is adhered to at all times.

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SECTION 3. EMISSIONS UNITS SPECIFIC CONDITIONS

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

10. Testing Frequency: the owner or operator shall meet the requirements for testing as specified below: Test the emissions for the following pollutant(s) within 60 days prior to the date specified below, notify the Department 15 days prior to testing [FAC Rule 297.310(7)(a)9], and submit the test report documentation to the Department with the operation permit application within 45 days after completion of the testing.

POLLUTANT	LOCATION IDENTIFICATION	TEST METHOD	TEST DATE
VOC	Emissions Point 21	Method 25 or 25A	Upon Permit Renewal (Every 5 Years)
VOC	Emissions Point 28	Method 25 or 25A	Upon Permit Renewal (Every 5 Years)
VOC	Emissions Point 26	NOTE (1)	Upon Permit Renewal (Every 5 Years)
HCL	Emissions Point 21	Method 26	Upon Permit Renewal (Every 5 Years)

NOTE (1) Compliance shall be demonstrated by sampling and analyzing the influent and effluent water stream of the air strippers. Tests and test reports shall comply with the requirements of FAC Rules 62-297.310(8) and 62-297.401, respectively.

[Rule 297.310(8)(b) F. A.C. and Permit No. 0010049-009-AF]

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

11. Compliance Testing: Each emissions point shall be tested for hydrogen chloride emissions while manufacturing HMDS. The control efficiency of each scrubber shall be determined from the stack testing results and the predicted uncontrolled HCl emissions of 0.22 lbs of HCl per pound of HMDS produced¹. The testing shall be conducted as stated in Specific Condition No. 09.

¹ Emission estimate provided in facility Title V Application received June 13, 1996.

[Rule 62-4.070(3), F.A.C. and Permit No. 0010049-009-AF]

12. Compliance Test Methods: Testing for demonstration of compliance shall be performed in accordance with EPA Reference Method 26 or 26A for each emissions point. Each test shall consist of three samples runs in accordance with Rule 62-297.310(1), F.A.C. The sampling time of each run shall be in accordance with Rule 62-297.310(4)(a), F.A.C.

[Rule 62-296.414(3), 62-297.310(4)(a)2., and 2.a., F.A.C.]

SECTION 3. EMISSIONS UNITS SPECIFIC CONDITIONS

13. Applicable Test Procedures: Required Sampling Time: Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes.

Minimum Sample Volume: Unless otherwise specified in the applicable rule, the minimum sample volume per run shall be 25 dry standard cubic feet.

Calibration of Sampling Equipment: Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C.

[Rule 62-297.310(4)(a),(b), and (d), F.A.C. and Permit No. 0010049-009-AF]

CONTINUOUS EMISSIONS MONITORING REQUIREMENTS

14. Continuous Emissions Monitoring Requirements: The pH of the scrubbing liquid for the scrubber shall be monitored in accordance with the Operation and Maintenance Plan submitted May 3, 2006. The pH shall be 14 when caustic is used as the scrubbing liquid. When sulfuric acid is used as the scrubbing liquid, the percentage shall be monitored in accordance with the Operation and Maintenance Plan submitted May 3, 2006. The percentage shall be between 21- 32% in accordance with the O&M Plan.

[Rule 62-4.070(3), F.A.C. and Permit No. 0010049-009-AF]

NOTIFICATION, RECORDKEEPING AND REPORTING REQUIREMENTS

15. Compliance Test Notification: The permittee shall notify the Air Compliance Section of this office in writing at least 15 days prior to any required tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit.

[Rule 62-297.310(7)(a)9., F.A.C.]

16. Scrubbing Liquid – pH/Percent Sulfuric Acid Record: The owner or operator shall maintain records of the pH and percentage of sulfuric acid measurements for the scrubbers.

[Rule 62-4.070(3), F.A.C. and Permit No. 0010049-009-AF]

17. Norbornadiene Process Record: The Permittee shall maintain up-to-date, readily accessible records of any change made in equipment or process operation that increases the design production capacity of the Norbornadieneprocess. In addition, the Permittee shall comply with the requirements of 40 CFR 60.665(l)(6) for any increase in the design production capacity above 1 gigagram per year.

[40 CFR 60.665(j), Subpart NNN - SOCM I Distillation Operations and Permit No. 0010049-009-AF]

18. Record Keeping: The Permittee will calculate the cumulative 12-month rolling average emissions of VOC, each HAP and Ammonia, on a monthly basis to facilitate the emissions tracking needed to document compliance with Specific Condition 3. The calculations will be based on the following method:

SECTION 3. EMISSIONS UNITS SPECIFIC CONDITIONS

- a. A roster of all processes run in each piece of equipment will be prepared and kept current. The roster will include a traceable identification code and title for each process, the nominal product amount (in pounds), for each process, and factors for determining the emissions of each listed pollutant emitted by the process each time it is run.
- b. The factors for determining the emissions of each air pollutant emitted by the process each time it is run will be based on scientifically sound engineering calculations or estimates and will be expressed in terms of the pounds of pollutant emitted each time the process is run.
- c. A traceable record of all production batches run in each piece of equipment will be documented in a production summary for the purpose of calculating the cumulative 12-month rolling average emissions of each pollutant.
- d. The cumulative 12-month rolling average emissions of each pollutant will be calculated using the process emission factors and the production summary.
- e. A monthly summation of the cumulative 12-month rolling average emissions of each pollutant emitted by the facility will be maintained.
- f. Air emissions associated with small scale laboratory productions (i.e., batches less than 50 gallons), can be estimated through a conservative, simplified approach based on sound engineering estimates as an alternative to the procedure specified in Specific Conditions 16a through 16.e.

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19. Record Keeping Review: The Permittee will regularly review the cumulative 12-month rolling average emissions of VOC, each HAP, and Ammonia, and compare them to the limitations stated in Specific Condition 3 in order to verify compliance. This review will also enable the Permittee to operate equipment, vary production rates and schedules, and make operating adjustments in a manner that is consistent with meeting the limitations stated in Specific Condition 3.

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20. Compliance Report: Reports of the required compliance tests shall be submitted as soon as practical but no later than 45 days after the last test is completed. Each test report shall include the maximum input / production rate at which this source was operated since the most recent test.

[Rule 62-297.310(8)(b), F.A.C.]

21. Quarterly Reports: The Permittee shall **submit quarterly reports** to the **Northeast District Office** which summarize the emissions for the previous quarter and the cumulative 12-month rolling average emissions for VOC, each HAP, and ammonia, and compare these emissions to the emission limits in Specific Condition 3.

SECTION 3. EMISSIONS UNITS SPECIFIC CONDITIONS

The report shall also contain a summary of all significant physical changes associated with the emission units at the facility which occurred during the quarter, excluding changes due to routine repair, replacement and maintenance. This summary must include equipment removed during the month. Quarterly reports will be due the 28th day following the end of each quarter. During the construction period of any permitted facility projects, this report shall include a description of construction activities which occurred during the quarter, and shall identify construction which has been completed.

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22. Annual Operating Report (AOR): The facility is subject to Section 4. Appendix C- Common Conditions Condition No. 10.b.(4)c., Annual Operating Report for Air Pollutant Emitting Facility.

[Rule 62-210.370(3) F.A.C.]

23. Record keeping Retention: The owner or operator shall maintain a complete file of all measurements, including continuous emissions monitoring system, monitoring device, and performance testing measurements; all continuous emissions monitoring system performance evaluations; all continuous emissions monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required, recorded in a permanent legible form available for inspection. The file shall be retained for at least two (5) years following the date of such measurements, maintenance, reports and records.

[Rule 62-4.160(14), F.A.C.]