



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

NORTHEAST DISTRICT
8800 BAYMEADOWS WAY WEST, SUITE 100
JACKSONVILLE, FLORIDA 32256

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SECRETARY

Sent by Electronic Mail – Received Receipt Requested

PERMITTEE

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

Authorized Representative:
Dr. Paul Kremer, Site Director

Air Permit No. 0010049-016-AC
Permit Expires: **October 31, 2015**

SiVance, LLC
Air Construction Permit
New Distillation Column and Tanks

This is the final air construction permit, which authorizes the facility to construct EP35 a New Distillation Column (S-2026), which will have a primary and a secondary condenser. Uncondensed vapor will be routed into the existing scrubber system EP21 (Caustic vertical pack bed fume scrubber (WS 26-5) or EP22 (WS 26-6)). This project will also add four storage tanks (T-4426, T-4526, T-4626 and T-4826) in the Prosil area that will be used in conjunction with the recently converted EP24 Reactor (R-2026) authorized under Air Permit No. 0010049-014-AC issued on January 30, 2014. The four storage tanks will be of fixed-roof design, with pressure relief valves and will store Diethoxymethylsilane (DEMS), a product currently made by SiVance. This project will not result in the creation of additional emission points.

The proposed work will be conducted at the SiVance, LLC. This facility is a Specialty Organic Chemical Manufacturing facility – (Standard Industrial Classification Code 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.

AIR CONSTRUCTION PERMIT (FINAL)

This air pollution construction 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 conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and is not subject to the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

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.

Executed in Jacksonville, Florida



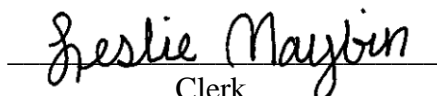
Richard S. Rachal III, P.G.

Program Administrator

Waste and Air Resource Management Program

FILING AND ACKNOWLEDGEMENT & CERTIFICATE OF SERVICE

Filed on this date pursuant to § 120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged. The undersigned hereby certifies that this construction permit and all copies were sent before the close of business on October 31, 2014 to the listed persons.


Clerk

October 31, 2014

Date

Dr. Paul Kremer, Site Director- SiVance, LLC (paul.kremer@Milliken.com)

Bill Carpenter, Environmental and Process Safety Manager- SiVance, LLC (bill.carpenter@Milliken.com)

Dave Buff, P.E. - Golder and Associates (dbuff@golder.com)

FACILITY AND PROJECT DESCRIPTION

Existing Facility

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 5 (Pilot plant) process area
- 2) Building 18 process area;
- 3) Building 20 (Autoclave) process area
- 4) Building 21 (Uracil) process area
- 5) Buildings 25/26 (Prosil) Process Areas;
- 6) Building 32 Process Water and Storm Water Treatment area;
- 7) Building 39 Manufacturing/ammoniation Process Area
- 8) Building 43 (Norbornadiene) Process Area

The air pollutant emissions from the facility are Hazardous Air Pollutants (HAP) Volatile Organic Compounds (VOC) and Ammonia(NH₃). Significant emissions are controlled by a series of control devices as described below.

Control Devices:

Vertical venturi/packed-bed fume scrubbers with demister (WS 18-1, WS 18-2): Vanaire Model VT-550 control emissions from Building No. 18 EP 08 – EP 10 and EP 34. Caustic is used as the scrubbing media to remove chlorosilanes and hydrochloric acids emissions from alkoxysilanes 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 an 11” diameter stack that is 80’ tall.

Vertical venturi scrubber/vertical packed-bed fume scrubbers (WS 39- 1, WS 39- 2): Met-Pro Corp Duall Division control emissions from Building No. 39 from EP 28 and EP 30 Ammoniation processes. Caustic and water is used as the scrubbing media to remove ammonia or allylamine emissions. Nominal scrubber flow rate is 80 gallons per minute. The design airflow rate is 4600 acfm 60’ tall stack height and a 14”stack diameter.

Carbon bed absorber (CA 18-4) used only during Tetramethyl (TMT) production controls emissions from Building No. 18 EP 11. Carbon is used as the scrubbing media with a flow rate of 100-900 acfm.

Caustic vertical pack bed fume scrubber (WS 26-5): Met-Pro Corp Duall Division control emissions from Building No. 26, EP 21. EP 16 through EP 20, EP 22 intermediate device controlled emissions are also vented to this emission unit (WS 26-5). Caustic is used as the scrubbing media to remove chlorosilanes and hydrochloric acids emissions from alkoxysilanes production. Nominal scrubber flow rate is 80 gallons per minute with a design airflow rate is 80 – 200 acfm 76’ tall stack height and a 10”stack diameter.

SECTION 1. GENERAL INFORMATION (FINAL)

Flare for Norbornadiene Process Building 43: Manufactured by Zeeco with an air flow rate of 1,985 acfm, 60' stack and 10" in diameter.

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.

This facility is considered a synthetic Non-Title V source based on federally enforceable facility-wide 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 existing facility consists of the following emissions units.

Facility ID No. 0010049			
EU 005 Batch Organic Chemical Manufacturing			
Building No.	Building Name	EP No.	Description
2	R & D Labs	01	Lab fume hood emissions vented to atmosphere or to vertical packed-bed fume scrubbers (west end to WS 2-1 and east end to WS 35-1)
3	Analytical Wet Lab		Laboratory
5	Pilot Plant	03	< 50 gallon glass-lined reactors vented to vertical packed bed fume scrubber (WS 5-1)
5	Pilot Plant	02	Reactor emissions vented to vertical packed bed fume scrubber (WS 5-1)
5	Pilot Plant	03	Reactor emissions vented to aspirator/venturi scrubber (WS 5-1)
6	Analytical Lab	N/A	Fume hood emissions vented to atmosphere
7	R & D Lab	04	Fume hood emissions vented to atmosphere
13	Oil heater	N/A	30 HP Hot Oil Heater
15	Material control	N/A	Shipping/receiving, bottling operations, lab chemical storage
18	Drum wash	N/A	Pressurized H ₂ O cleaning of empty drums
18	Manufacturing	N/A	Non-contact H ₂ O chiller
18	Manufacturing	06	Aspirator (A-1 East) emissions vented to atmosphere
18	Manufacturing	08	Various reactors and NH ₃ absorber emissions vented to vertical pack bed fume scrubber w/ demister (WS18-1)
18	Manufacturing	09	Various reactors emissions vented to vertical pack bed fume scrubber w/ demister (WS 18-2)

SECTION 1. GENERAL INFORMATION (FINAL)

Building No.	Building Name	EP No.	Description
18	Manufacturing	10	Various reactors emissions vented to vertical pack bed fume scrubber w/ demister (WS18-1 or WS 18-2)
18	Manufacturing	11	Carbon bed absorber (used only during TMT production) (CA-18-4)
18	Commercial Reactor	34	vertical pack bed fume scrubber vents through WS 18-1(WS 18-5)
19	Haz waste staging area	N/A	Secondary containment drum storage pad
20 South	R & D	12	1 to 20 gal high pressure autoclaves vented to scrubber(WS 20-1)
20a East	Manufacturing	13	200-500 gal high pressure autoclaves vented to scrubber(WS 20-1or WS 20-2)
21	Building 21	14	Sulfuric acid mist eliminator (WS 21-1)
21	Building 21	15a	Aspirator
23, 26,33	Mechanical chiller	N/A	Non-contact H ₂ O cooling with ethyl glycol & H ₂ O
24	Material storage	N/A	Exterior storage building
25	Prosil Manufacturing	16	Distillation columns: S-4 emissions vented to EP 5 or 15a, S-5, & S-6 emissions vented to EP 5 (ammoniation process) or EP 21 or EP 22(non ammoniation process)
26	Prosil Manufacturing	05	NH ₃ process vents for Buildings 25 & 26
26	Prosil Manufacturing	31	R-14 Ammonia process vent
26	Prosil Manufacturing	17	Silane absorber (WS 26-1) emissions vented to EP 21 or EP 22
26	Prosil Manufacturing	18	Venturi vertical pack bed fume scrubber (WS 26-2) vented to EP 21 or EP 22
26	Prosil Manufacturing	19	R 8 HCL absorber (WS 26-4) vented to EP 21 or EP 22
26	Prosil Manufacturing	20	R 14 HCL absorber (WS 26-7) vented to EP 21 or EP 22

SECTION 1. GENERAL INFORMATION (FINAL)

Building No.	Building Name	EP No.	Description
26	Prosil Manufacturing	21	Caustic vertical pack bed fume scrubber (WS 26-5)
26	Prosil Manufacturing	22	Caustic vertical pack bed fume scrubber (WS 26-6)
26	Prosil Manufacturing	24	Reactor (R-20) vented to Caustic vertical pack bed fume scrubber EP21 (WS 26-5) or EP22 (WS 26-6)
26	Prosil Manufacturing	35	New Distillation Column (S-2026), which will have a primary and a secondary condenser, vented to Caustic vertical pack bed fume scrubber (WS 26-5) or EP22 (WS 26-6)
28	Maintenance West	N/A	Batch cold cleaner for cleaning mechanical parts
32	Process H ₂ O treatment	N/A	Tank & aeration pond for final pH control
32	Process H ₂ O treatment	23	Above ground NaOH & HCl storage tanks, HCl storage tank venturi eductor
32	Process H ₂ O treatment	N/A	Bulk pH control tanks
32	Process H ₂ O treatment	26	VOC Stripper for process H ₂ O treatment
33	Research chemical manufacturing	N/A	Manufacture of small quantities of chemicals, counter top & walk in fume hoods vented to atmosphere or vertical packed bed scrubber (WS 33-1)
35	manufacturing	27	Manufacture of small quantities of catalog chemicals, vented to vertical packed bed scrubber (WS 35-1)
37	Material control	N/A	Warehouse of drummed & bottled material
38	Material control	N/A	Drummed material storage pad (raw mat, intermediates & haz waste)
39	Manufacturing R-10 R-12 process	28	Venturi scrubber (WS 39-1) followed by a vertical packed-bed fume scrubber (WS 39-2)
39	Manufacturing R-10 R-12 Ammoniation process	30	Ammoniation process vented to EP 28 or atmosphere
40	Material control	N/A	Drummed material storage pad (East)
41	Material control	N/A	Drummed material storage pad (West)
43	Norbornadiene (NBD)	29	Flare for Norbornadiene
27	Steam Generation	33	Exempt Boilers

Proposed Project

This is an air construction permit, which authorizes the facility to construct EP35 a New Distillation Column (S-2026), which will have a primary and a secondary condenser. Uncondensed vapor will be routed into the existing scrubber system EP21 (Caustic vertical pack bed fume scrubber (WS 26-5) or EP22 (WS 26-6)). This project will also add four storage tanks (T-4426, T-4526, T-4626 and T-4826) in the Prosil area that will be used in conjunction with the recently converted EP24 Reactor (R-2026) authorized under Air Permit No. 0010049-014-AC issued on January 30, 2014. The four storage tanks will be of fixed-roof design, with pressure relief valves and will store Diethoxymethylsilane (DEMS), a product currently made by SiVance.

Reactor R-20 from Permit No. 0010049-014-AC and the new distillation column S-2026 in this permit requires that the distillation column and primary and secondary condenser be tested. These EPs are all part of the same chemical production system. SiVance will test for VOC emissions while producing diethoxymethylsilane (DEMS), which would involve a cycle where a portion of the time emissions would not be routed through the distillation column (would be routed through EP24) and a portion of the time emission would be routed through the distillation column and condensers (EP35). EP21 would be the measurement point during the entire cycle. The manufacturing process will require that both systems be engaged; therefore a single initial test should be required for both projects.

This project will modify the following emissions units.

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

The proposed storage tanks will not be subject to Title 40, Code of Federal Regulations (CFR) Part 60, New Source Performance Standards (NSPS), Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984. NSPS Subpart Kb is applicable to storage vessels with a capacity greater than or equal to 75 m³ (or 19,813 gallon). The largest tank proposed in this project is a 5,000-gallon tank, which is smaller than the size threshold of Subpart Kb.

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.

SECTION 2. ADMINISTRATIVE REQUIREMENTS (FINAL)

1. Permitting Authority: The permitting authority for this project is the Northeast District, Waste and Air Resource Management, Florida Department of Environmental Protection (Department). The Northeast District's mailing address is 8800 Baymeadows Way West, Suite 100, Jacksonville, Florida 32256, (904) 256-1700. All documents related to applications for permits to operate an emissions unit shall be submitted to the Northeast District Office.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Northeast District's Air Compliance Assurance at 8800 Baymeadows Way West, Suite 100, Jacksonville, Florida 32256, (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; and
 - d. Appendix D. Common Testing Requirements.
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and 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, 62-213, 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: The permittee shall notify the Compliance Authority upon commencement of construction. 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.]
[Rule 62-212.400(12), F.A.C.]
7. Application for Non-Title V Permit: This permit authorizes construction of the permitted emissions unit and initial operation to determine compliance with Department rules. A completed Application for Air Permit - Non Title V Source (DEP Form No. 62-210.900(3), F.A.C.), shall be submitted to the Department at least 90 days prior to the expiration date of this construction permit. To properly apply for a construction permit, the permittee shall submit the appropriate application form, processing fee, and compliance test reports as required by this permit. [Rules 62-4.050 and 62-4.220, F.A.C.]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS (FINAL)

B. EU005 Batch Organic Chemical Manufacturing

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
005	Batch Organic Chemical Manufacturing

1. **Relation to Other Permits.** The conditions of this permit supplements all other previously issued air construction and operation permits for these emissions units. These conditions are in addition to all other applicable permit conditions and regulatory requirements. The Permittee shall continue to comply with the conditions of those permits, which include restrictions and standards regarding capacities, production, operation, fuels, emissions, monitoring, recordkeeping, reporting, and the like.

[Rules 62-4.210, 62-4.030, and 62-210.300(1)(b), F.A.C.]

EQUIPMENT

2. **Equipment Name.** The permittee is authorized to construct EP35 a New Distillation Column (S-2026), which will have a primary and a secondary condenser. Vapors from the previous constructed reactor (R-20) will pass through this distillation column. This project will not result in the creation of additional emission points.

- Any piping needed to route the uncondensed vapor to the existing scrubber system EP21 (Caustic vertical pack bed fume scrubber (WS 26-5) and EP22 (WS 26-6).
- Install four storage tanks: (T-4426: 5,000 gallon, fixed roof, 316 stainless steel pressure vessel 100 psig), T-4526: 2,000 gallon, fixed roof, 316 stainless steel pressure vessel 100 psig, T-4626: 2,000 gallon, fixed roof, 316 stainless steel pressure vessel 100 psig and T-4826: 5,000 gallon, fixed roof, 316 stainless steel pressure vessel 100 psig). Emissions from the new storage tanks will be vented along with the other tanks to WS 26-5 and WS 26-6;
- Pressure relief valves, piping, vents and etc.

[Application No. 0010049-016-AC]

ESSENTIAL POTENTIAL TO EMIT (PTE) PARAMETERS

3. **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

4. **General Visible Emissions.** No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20% opacity. This regulation does not impose a specific testing requirement.

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

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS (FINAL)

B. EU005 Batch Organic Chemical Manufacturing

5. **Maximum Allowable Emissions Rate (Facility-wide).** This permit does not change any or establish any new permitting emissions limits for this EU. 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.

[Permit No. 0010049-009-AF]

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

6. **Initial Compliance Test EP35.** The Distillation Column, primary and a secondary condenser shall be tested in conjunction with the testing of Reactor R-20 (EP24) required by permit No. 0010049-014-AC to determine actual VOC emissions. The initial test shall be conducted prior to applying for an operating permit and in accordance with **Specific Condition No. 7.**

[Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

7. **Initial Testing Requirements.** The tests shall be conducted no later than 180 days after the initial startup of the new Distillation Column, primary and a secondary condenser. Notify the Department 15 days prior to testing [FAC Rule 297.310(7)(a)9], and submit the test report documentation to the Department 45 days after completion of the testing. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit.

POLLUTANT	LOCATION IDENTIFICATION	TEST METHOD
VOC	EP21	Method 25 or 25A

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

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS (FINAL)

B. EU005 Batch Organic Chemical Manufacturing

8. **Subsequent Testing.** Thereafter, a compliance test shall be conducted for VOC upon Permit Renewal (Every 5 Years).

[Rules 62-4.070(3), 62-297.310(7)(a)1., F.A.C.]

9. **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.]

10. **Method of Operation Control Equipment.** This permit does not change any or establish any new requirements. 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.]

REPORTING AND RECORDKEEPING REQUIREMENTS

11. This permit does not change any or establish any new Record Keeping and Reporting for this EU.

12. **Commencement of Construction/Operation.** The permittee shall submit to the Air Compliance Authority of this Office written notification of the date of commencement of construction and operation of the Distillation Column, primary and a secondary condenser, and tanks. This notification shall be submitted or postmarked within as many days prior to the date of construction/operation commencement as practical, but no later than thirty (30) business day following commencement of construction/operation.

[Rule 62-4.070(3), F.A.C.]

13. This Facility is subject to SECTION 2. Administrative Requirements of this permit and also, the attached Combined Appendices.