

**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
AIR QUALITY DIVISION**

May 5, 2022

PERMIT TO INSTALL
37-20A

ISSUED TO
Corteva Agriscience LLC

LOCATED AT
701 Washington Street
1200 Building
Midland, Michigan 48674

IN THE COUNTY OF
Midland

STATE REGISTRATION NUMBER
P1028

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environment, Great Lakes, and Energy. 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 13, 2022	
DATE PERMIT TO INSTALL APPROVED: May 5, 2022	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

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COMMON ACRONYMS

AQD	Air Quality Division
BACT	Best Available Control Technology
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
COMS	Continuous Opacity Monitoring System
Department/department/EGLE	Michigan Department of Environment, Great Lakes, and Energy
EU	Emission Unit
FG	Flexible Group
GACS	Gallons of Applied Coating Solids
GC	General Condition
GHGs	Greenhouse Gases
HVLP	High Volume Low Pressure*
ID	Identification
IRSL	Initial Risk Screening Level
ITSL	Initial Threshold Screening Level
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
MAERS	Michigan Air Emissions Reporting System
MAP	Malfunction Abatement Plan
MSDS	Material Safety Data Sheet
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutants
NSPS	New Source Performance Standards
NSR	New Source Review
PS	Performance Specification
PSD	Prevention of Significant Deterioration
PTE	Permanent Total Enclosure
PTI	Permit to Install
RACT	Reasonable Available Control Technology
ROP	Renewable Operating Permit
SC	Special Condition
SCR	Selective Catalytic Reduction
SNCR	Selective Non-Catalytic Reduction
SRN	State Registration Number
TBD	To Be Determined
TEQ	Toxicity Equivalence Quotient
USEPA/EPA	United States Environmental Protection Agency
VE	Visible Emissions

*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 psig.

POLLUTANT / MEASUREMENT ABBREVIATIONS

acfm	Actual cubic feet per minute
BTU	British Thermal Unit
°C	Degrees Celsius
CO	Carbon Monoxide
CO ₂ e	Carbon Dioxide Equivalent
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
°F	Degrees Fahrenheit
gr	Grains
HAP	Hazardous Air Pollutant
Hg	Mercury
hr	Hour
HP	Horsepower
H ₂ S	Hydrogen Sulfide
kW	Kilowatt
lb	Pound
m	Meter
mg	Milligram
mm	Millimeter
MM	Million
MW	Megawatts
NMOC	Non-Methane Organic Compounds
NO _x	Oxides of Nitrogen
ng	Nanogram
PM	Particulate Matter
PM10	Particulate Matter equal to or less than 10 microns in diameter
PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
pph	Pounds per hour
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
psia	Pounds per square inch absolute
psig	Pounds per square inch gauge
scf	Standard cubic feet
sec	Seconds
SO ₂	Sulfur Dioxide
TAC	Toxic Air Contaminant
Temp	Temperature
THC	Total Hydrocarbons
tpy	Tons per year
µg	Microgram
µm	Micrometer or Micron
VOC	Volatile Organic Compounds
yr	Year

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 Environment, Great Lakes, and Energy, 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 Rule 210 (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 Rule 219 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 Rule 219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy. **(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 condition 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 Rule 301, 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 Rule 303 (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 Rule 370(2). **(R 336.1370)**
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001. **(R 336.2001)**

EMISSION UNIT 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 (Including Process Equipment & Control Device(s))	Installation Date / Modification Date	Flexible Group ID
EU1200	The spinosyns manufacturing process at 1200 Building with storage tanks, transfer racks, and equipment for fermentation, crystallization, filtration, product drying, water treatment, and extraction. Process vents are exhausted to a regenerative thermal oxidizer. Product drying includes a recovery filter followed by an emission control fabric filter dust collector. This emission unit is subject to the requirements of 40 CFR Part 63, Subpart FFFF (MON) and 40 CFR Part 63, Subpart EEEE (OLD). EU1200 is also subject to the equipment leak provisions of the HON (i.e., 40 CFR Part 63, Subpart H). This emission unit was permitted in PTI No. 37-20A.	6/2/2020	FGHONFUGITIVES, FGMONMACT, FGOLDMACT

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 336.1291.

**EU1200
 EMISSION UNIT CONDITIONS**

DESCRIPTION

The spinosyns manufacturing process at 1200 Building with storage tanks, transfer racks, and equipment for fermentation, crystallization, filtration, product drying, water treatment, and extraction. Process vents are exhausted to a regenerative thermal oxidizer. Product drying includes a recovery filter followed by an emission control fabric filter dust collector. This emission unit is subject to the requirements of 40 CFR Part 63, Subpart FFFF (MON) and 40 CFR Part 63, Subpart EEEE (OLD). EU1200 is also subject to the equipment leak provisions of the HON (i.e., 40 CFR Part 63, Subpart H). This emission unit was permitted in PTI No. 37-20A.

Flexible Group ID: FGHONFUGITIVES, FGMONMACT, FGOLDMACT

POLLUTION CONTROL EQUIPMENT

Two identical regenerative thermal oxidizers (RTOs), each with a maximum heat input rating of 5.78 MMBTU/hr and an average heat input rating of 3.83 MMBTU/hr. One RTO provides adequate capacity for the process emissions. The process normally operates with both RTOs online to ensure continuous process operation if one must be shut down.

- a) RTO-1870
- b) RTO-1875

The F-1586 filter is a cartridge filter using pulsed nitrogen to knock down accumulated dust. The F-1586 filter receives the exhaust from the product recovery filter. The exhaust from the F-1586 filter is pulled through a vacuum pump and sent to the RTOs.

The DC-1583 industrial hygiene filter exhausts to the in-plant environment. It is an industrial vacuum equipped with a HEPA filter.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Organic HAP*	20 ppmv or 98% destruction	Hourly	EU1200 emissions exhausted through RTO-1870	SC VI.2	40 CFR 63.2455(a)
2. Organic HAP*	20 ppmv or 98% destruction	Hourly	EU1200 emissions exhausted through RTO-1875	SC VI.2	40 CFR 63.2455(a)
3. VOC and acetone combined	20 ppmv	Hourly	EU1200 process vents	SC VI.2	R 336.1205(1), R 336.1702(a)
4. VOC and acetone combined	18.5 tpy**	12-month rolling time period as determined at the end of each calendar month	EU1200	SC VI.3	R 336.1224, R 336.1702(a)
5. PM	0.006 lb/1000 lb of exhaust gas, calculated on a dry gas basis	Hourly	EU1200	SC V.1	R 336.1331
6. PM10	1.3 tpy	12-month rolling time period as determined at the end of each calendar month	EU1200	SC VI.5	40 CFR 52.21(c)&(d)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
7. PM2.5	1.3 tpy	12-month rolling time period as determined at the end of each calendar month	EU1200	SC VI.5	40 CFR 52.21(c)&(d)
8. Ammonia (CAS Number 7664-41-7)	0.75 lb/hr ^{1, **}	Hourly	EU1200	SC V.1	R 336.1224, R 336.1225
9. Formic acid (CAS Number 64-18-6)	1,889 lb/yr ^{1, **}	12-month rolling time period as determined at the end of each calendar month	EU1200	SC VI.6	R 336.1225
10. Formaldehyde (CAS Number 50-00-0)	0.40 lb/hr ^{1, **}	Hourly	EU1200	SC V.1	R 336.1225 R 336.1226(d)
* "Organic HAP" refers to organic HAP listed in section 112(b) of the federal Clean Air Act. ** This emission limit does not include fugitive emissions (i.e., emissions from leaking valves, flanges, etc.) from the emission unit.					

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall not operate equipment that vents to the RTOs or the F-1586 dust collector unless a malfunction abatement plan (MAP) for the RTOs and the F-1586 dust collector, as described in Rule 911(2), has been submitted within 90 days of commencement of trial operation of either RTO, and is implemented and maintained. If at any time the MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the MAP within 45 days if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the MAP and any amendments to the MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended MAP shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits. **(R 336.1224, R 336.1225, R 336.1226(d), R 336.1331, R 336.1702(a), R 336.1910, R 336.1911, 40 CFR 52.21(c)&(d))**
2. The permittee shall not operate the portions of EU1200 ducted to the RTOs unless at least one RTO is installed, maintained, and operated in a satisfactory manner, as described below. Satisfactory operation of each RTO includes all the following. **(R 336.1224, R 336.1225, R 336.1226(d), R 336.1702(a), R 336.1331, R 336.1910)**
 - a) A maximum combined VOC and acetone outlet concentration of 20 ppmv.
 - b) Maintaining a minimum combustion chamber temperature as specified in the approved MAP.
 - c) Maintaining within the ranges specified in the MAP as indicating satisfactory operation of an RTO any other operating parameters identified in the MAP as pertaining to satisfactory operation of an RTO.
3. The permittee shall not operate the product dryer unless dust collector F-1586 and at least one RTO are installed, maintained, and operated in a satisfactory manner. Satisfactory operation of dust collector F-1586 includes a pressure drop across the filter within the range specified in the MAP as representing satisfactory operation of the dust collector. Satisfactory operation of any RTO includes meeting the requirements in SC III.2.b and III.2.c for that RTO. **(R 336.1331, R 336.1910)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall install, calibrate, maintain, and operate in a satisfactory manner a device to monitor and record the temperature of each RTO on a continuous basis. For the purpose of this condition, monitoring and recording of data "on a continuous basis" is defined as an instantaneous data point recorded at least once every 15 minutes for at least 90% of the operating time during an operating calendar day. In the event the permittee collects more than one data point during the 15-minute period, the data point recorded may be the average (rolling or block) of all data points recorded during the 15-minute period. Any response to an excursion of the corresponding operational parameter set point or range specified in this permit shall be based upon these 15-minute values. Unless otherwise noted in this permit, the permittee is not required to monitor and record operational parameter data during periods of non-operation of the device resulting in cessation of the emissions to which the monitoring applies. **(R 336.1224, R 336.1225, R 336.1226(d), R 336.1331, R 336.1910)**
2. The permittee shall equip and maintain dust collector F-1586 with a pressure drop indicator. **(R 336.1331, R 336.1910)**

V. TESTING/SAMPLING

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

1. Within 365 days after transfer of an inoculated broth to the first fermenter, the permittee shall verify the PM emission rate, the formaldehyde emission rate, and the combined VOC and acetone emission rate from each RTO by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below.

Pollutant	Test Method Reference
PM	40 CFR Part 60, Appendix A; Part 10 of the Michigan Air Pollution Control Rules
Formaldehyde	40 CFR Part 60, Appendix A; 40 CFR Part 63, Appendix A
Combined VOC and acetone	40 CFR Part 60, Appendix A; 40 CFR Part 63, Appendix A

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD-approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. The permittee must submit a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1205, R 336.1224, R 336.1225, R 336.1226(d), R 336.1702(a), R 336.1902, R 336.2001, R 336.2003, R 336.2004)**

2. No later than 365 days after transfer of an inoculated broth to the first fermenter, the permittee shall conduct a one-time test at owner's expense, in accordance with Department requirements, to verify the ammonia emission rate and determine the emission factor for formic acid (CAS Number 64-18-6) from each RTO. Testing shall be performed using an approved EPA Method listed in the table below.

Pollutant	Test Method Reference
Ammonia	40 CFR Part 63, Appendix A, ASTM D6348, Conditional Test Method 027
Formic acid	Method M320 or ASTM D6348

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD-approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. The permittee must submit a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1224, R 336.1225, R 336.1902, R 336.2001, R 336.2003, R 336.2004)**

VI. MONITORING/RECORDKEEPING

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

1. The permittee shall complete all required calculations and records in a format acceptable to the AQD District Supervisor by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1224, R 336.1226(d), R 336.1702(a), R 336.1910)**
2. The permittee shall monitor and record, in a satisfactory manner, the combustion chamber temperature for each RTO. The frequency of monitoring and recording of temperatures shall be as described in SC IV.1. **(R 336.1226(d), R 336.1910)**
3. The permittee shall calculate the combined VOC and acetone emission rate from EU1200 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. **(R 336.1224, R 336.1702(a))**
4. The permittee shall maintain a current list of the materials emitted from EU1200 that are determined to be exempt from the health-based screening level requirement of Rule 225 pursuant to Rule 226(a). The list shall include the compound name and CAS number and a calculation demonstrating the emission rate of each material. The permittee shall keep all records on file at the facility and make them available to the Department upon request.¹ **(R 336.1225)**
5. The permittee shall calculate the PM10 and PM2.5 emission rates from EU1200 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor. **(40 CFR 52.21(c)&(d))**
6. The permittee shall calculate the emission rate of formic acid (CAS Number 64-18-6) from EU1200 monthly, for the preceding 12-month rolling time period, using a method acceptable to the AQD District Supervisor.¹ **(R 336.1225)**
7. The permittee shall monitor dust collector DC-1583 to verify it is operating properly, by taking visible emission readings for its exhaust a minimum of once each shift during packaging activities. Either a certified or non-certified reader shall take each visible emission reading during routine operating conditions. If any visible emissions (other than uncombined water vapor) are observed, the permittee shall immediately inspect dust collector DC-1583A and perform any required maintenance. **(R 336.1910)**
8. The permittee shall keep, in a satisfactory manner, records of all visible emission readings for dust collector DC-1583. At a minimum, records shall include the date, time, name of observer/reader, whether the reader is certified, the status of visible emissions, and any maintenance performed as a result of the visible emissions reading. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1910)**

VII. REPORTING

1. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than transfer of an inoculated broth to the first fermenter. **(R 336.1201(7)(a))**
2. The permittee shall notify the Department if a change in land use occurs for the Tittabawassee River to the southwest of the TTU vents, where this classification was relied upon to demonstrate compliance with Rule 225. The permittee shall submit the notification to the AQD District Supervisor, within 30 days of the actual land use change. Within 60 days of the land use change, the permittee shall submit to the AQD District Supervisor a plan for complying with the requirements of Rule 225. The plan shall require compliance with Rule 225 no later than one year after the due date of the plan submittal.¹ **(R 336.1226(d))**

VIII. STACK/VENT RESTRICTION(S)

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. SV-12001 (RTO-1870)	36 x 78	35	R 336.1225, R 336.1226(d), 40 CFR 52.21(c)&(d)
2. SV-12002 (RTO-1875)	36 x 78	35	R 336.1225, R 336.1226(d), 40 CFR 52.21(c)&(d)

IX. OTHER REQUIREMENT(S)

NA

Footnotes:

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