Firmenich Incorporated (06242)

Date: 8/6/2020

New Jersey Department of Environmental Protection
Reason for Application

Permit Being Modified

Permit Class: PCP **Number:** 170002

Description of Modifications:

The purpose of this application is to modify an existing batch permit at the Firmenich facility in Newark, New Jersey (facility 06242). The permit being modified is designated BP72 Autoclave Batch Reactor System. The existing permit was approved on 2-24-17 (PCP170002).

The purpose of the modification is as follows:
Add three equipment items to the permit;
Add three emission points to the permit;
Create new equipment item sets and emission point sets that includie the new and existing equipment items and emission points;
Modify existing operating scenarios to incorporate the new emission points into them;
Add one new operating scenario to the permit (for acetone cleaning the new equipment);
Add one emission control device to the permit (for the new operating scenario);
Add the batch emissions of the new operating scenario (acetone) to the permit;
Add an annual acetone emission to the air permit potential to emit.

For questions regarding this application, please contact Ronald Kurtz (973/589-3443; Ron.Kurtz@Firmenich.com) or Tim Sekulic (973/593-4877; tsekulic@verizon.net).

New Jersey Department of Environmental Protection
Facility Profile (General)

Facility Name (AIMS): Firmenich Incorporated

Facility ID (AIMS): 06242

Street Address: FIRMENICH INCORPORATED
150 FIRMENICH WAY
NEWARK, NJ 07114

Mailing Address: FIRMENICH INCORPORATED
150 FIRMENICH WAY
NEWARK, NJ 07114

State Plane Coordinates:

X-Coordinate:

Y-Coordinate:

Units:

Datum:

Source Org.:

Source Type:

County: Essex

Location Description: East of Doremus Avenue.
North of Turnpike Extension.

Industry:

Primary SIC:

Secondary SIC:

NAICS: 325199

New Jersey Department of Environmental Protection
Facility Profile (General)

Contact Type: Air Permit Information Contact

Organization: Firmenich Incorporated
Org. Type: Corporation
Name: Ronald Kurtz
NJ EIN:
Title: Manager, Health Safety and Environmental
Phone: (973) 589-3443 x
Fax: (973) 274-0652 x
Other: ( ) - x
Type:
Email: Ron.Kurtz@Firmenich.com

Mailing Address: Firmenich Incorporated
150 Firmenich Way
Newark, NJ 07114

Contact Type: Fees/Billing Contact

Organization: Firmenich Incorporated
Org. Type: Corporation
Name: Ronald Kurtz
NJ EIN:
Title: Manager, Health Safety and Environmental
Phone: (973) 589-3443 x
Fax: (973) 274-0652 x
Other: ( ) - x
Type:
Email: Ron.Kurtz@Firmenich.com

Mailing Address: Firmenich Incorporated
150 Firmenich Way
Newark, NJ 07114

Contact Type: Responsible Official

Organization: Firmenich Incorporated
Org. Type: Corporation
Name: Ronald Kurtz
NJ EIN:
Title: Manager, Health Safety and Environmental
Phone: (973) 589-3443 x
Fax: (973) 274-0652 x
Other: ( ) - x
Type:
Email: Ron.Kurtz@Firmenich.com

Mailing Address: Firmenich Incorporated
150 Firmenich Way
Newark, NJ 07114

Firmenich Incorporated (06242) Date: 8/6/2020

New Jersey Department of Environmental Protection
Facility Profile (Permitting)

1. Is this facility classified as a small business by the USEPA?	No
2. Is this facility subject to N.J.A.C. 7:27-22?	No
3. Are you voluntarily subjecting this facility to the requirements of Subchapter 22?	No
4. Has a copy of this application been sent to the USEPA?	No
5. If not, has the EPA waived the requirement?	No
6. Are you claiming any portion of this application to be confidential?	No
7. Is the facility an existing major facility?	No
8. Have you submitted a netting analysis?	No
9. Are emissions of any pollutant above the SOTA threshold?	No
10. Have you submitted a SOTA analysis?	No
11. If you answered "Yes" to Question 9 and "No" to Question 10, explain why a SOTA analysis was not required	
12. Have you provided, or are you planning to provide air contaminant modeling?	No

Firmenich Incorporated (06242) Date: 8/6/2020

New Jersey Department of Environmental Protection
Equipment Inventory

Equip. NJID	Facility's Designation	Equipment Description	Equipment Type	Certificate Number	Install Date	Grand-Fathered	Last Mod. (Since 1968)	Equip. Set ID
E7206	F-260	Filter F-260	Manufacturing and Materials Handling Equipment		9/1/2020	No		ES3 ES4 ES5
E7207	T-313	T-313 Autoclave Process Receiver/Filter Feed Tank	Manufacturing and Materials Handling Equipment			No		ES5 ES3 ES2 ES6
E7208	T-313 Tote	T-313 Tote Stateion	Manufacturing and Materials Handling Equipment		9/1/2020	No		ES6

Firmenich Incorporated (06242) Date: 8/6/2020

New Jersey Department of Environmental Protection
Control Device Inventory

CD NJID	Facility's Designation	Description	CD Type	Install Date	Grand-Fathered	Last Mod. (Since 1968)	CD Set ID
CD7201	T-313 Cndens	T-313 Vent Condenser	Condenser	9/1/2020	No		

Firmenich Incorporated (06242)

Date: 8/6/2020

New Jersey Department of Environmental Protection
Emission Points Inventory

PT NJID	Facility's Designation	Description	Config.	Equiv. Diam. (in.)	Height (ft.)	Dist. to Prop. Line (ft)	Exhaust Temp. (deg. F)			Exhaust Vol. (acfm)			Discharge Direction	PT Set ID
							Avg.	Min.	Max.	Avg.	Min.	Max.		
PT7203	T-316 Vent													PS 2
PT7204	T-250 Vent													PS 3
PT7205	F-260 Vent	F-260 atmospheric vent	Round	2	35	170	56.0	0.0	100.0	50.0	0.0	100.0	Horizontal	PS 3
PT7206	T-313 Vemt	T-313 atmospheric vent	Round	4	48	200	56.0	0.0	100.0	10.0	0.0	15.0	Horizontal	PS 2
PT7207	T-313 Tote	T-313 tote station vent	Round	1	48	200	56.0	0.0	100.0	2.0	0.0	5.0	Horizontal	PS 2

Firmenich Incorporated (06242)

Date: 8/6/2020

New Jersey Department of Environmental Protection
Emission Unit/Batch Process Inventory

BP72

OS2 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST13				ES2		PS2								
ST15				ES4		PS3								

OS6 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

OS7 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

Firmenich Incorporated (06242)

Date: 8/6/2020

New Jersey Department of Environmental Protection
Emission Unit/Batch Process Inventory

BP72

OS10 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

OS15 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

OS16 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

Firmenich Incorporated (06242)

Date: 8/6/2020

New Jersey Department of Environmental Protection
Emission Unit/Batch Process Inventory

BP72

OS20 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

OS21 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

OS26 BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 0.0* *Max. Calc. Time: 0.0* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST12				ES2		PS2								
ST14				ES4		PS3								

Firmenich Incorporated (06242)

Date: 8/6/2020

New Jersey Department of Environmental Protection
Emission Unit/Batch Process Inventory

BP72

OS28 F-260 Aceton Filter F-260 Acetone/Water Cleaning and Pickling BPOS Type: Batch Manufacturing

Batch Process Operating Scenario Run Time (hours) *Min. Calc. Time: 2.9* *Max. Calc. Time: 5.6* *Min. User Time:* *Max. User Time:*

Step NJID	Facility's Designation	Step Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Step Run Time Hours Min.	Step Run Time Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
ST1	Charging	Charging acetone to T-313	Normal - Steady State	E7207	CD7201 (P)	PT7206		0.1	0.3		4.0	7.0	0.0	50.0
ST2	Recirculate	Recirculating acetone through F-216	Normal - Steady State	ES5				0.7	1.2					
ST3	Withdrawing	Withdrawing acetone from T-313 to a tote	Normal - Steady State	ES6		PT7207		0.2	0.4		2.0	4.0	0.0	100.0
ST4	Charging	Charging water to T-313	Normal - Steady State	E7207	CD7201 (P)	PT7206		0.1	0.3		4.0	7.0	0.0	100.0
ST5	Recirculate	Recirculating water through F-216	Normal - Steady State	ES5				0.7	1.2					
ST6	Withdrawing	Withdrawing water from T-313 to a tote	Normal - Steady State	ES6		PT7207		0.2	0.4		2.0	4.0	0.0	100.0
ST7	Charging	Charging pickling material to T-313	Normal - Steady State	E7207		PT7206		0.1	0.3		4.0	7.0	0.0	100.0
ST8	Recirculate	Recirculating pickling material through F-216	Normal - Steady State	ES5				0.7	1.2					
ST9	Withdrawing	Withdrawing pickling material from T-313 to storage tank	Normal - Steady State	E7207				0.1	0.3					

06242 Firmenich Incorporated Date: 8/6/2020

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: **BP72**

Operating Scenario: **OS0 Summary**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
Acetone		0.10000000	0.10000000	0.10000000	tons/yr	No
VOC (Total)					tons/yr	No

Subject Item: **BP72**

Operating Scenario: **OS28 F-260 Aceton**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
Acetone		2.58000000	2.58000000	2.58000000	lb/batch	No
VOC (Total)		D	D	0.00000000	lb/batch	No

Subject Item: **BP72**

Operating Scenario: **OS28 F-260 Aceton**

Step: **ST1 Charging**

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
Acetone		0.90400000	0.90400000	0.90400000	lb/step	No

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: **BP72**

Operating Scenario: **OS28 F-260 Aceton**

Step: **ST3 Withdrawing**

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
Acetone		0.90400000	0.90400000	0.90400000	lb/step	No

Subject Item: **BP72**

Operating Scenario: **OS28 F-260 Aceton**

Step: **ST4 Charging**

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
Acetone		0.77500000	0.77500000	0.77500000	lb/step	No

Subject Item: **BP72**

Operating Scenario: **OS28 F-260 Aceton**

Step: **ST6 Withdrawing**

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
Acetone		D	D	0.00000000	lb/step	No
VOC (Total)					lb/step	No

Subject Item: **BP72**

Operating Scenario: **OS28 F-260 Aceton**

Step: **ST7 Charging**

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
VOC (Total)		D	D	0.00000000	lb/step	No

000000 E7206 (Manufacturing and Materials Handling Equipment)
Print Date: 8/6/2020

Make:	Funda Filter Type R
Manufacturer:	Steri Technologies
Model:	R-5M2-11-800-50
Type of Manufacturing and Materials Handling Equipment:	Filter
Capacity:	7.40E+02
Units:	other units
Description (if other):	liters filter vessel volume
Have you attached a diagram showing the location and/or the configuration of this equipment?	Yes
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E7207 (Manufacturing and Materials Handling Equipment)
Print Date: 8/6/2020

Make:	Custom-Made Tank
Manufacturer:	Dusenbery Engineering Co.
Model:	NA - Custom-Made
Type of Manufacturing and Materials Handling Equipment:	Process Receiver / Feed Tank
Capacity:	1.84E+03
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	Yes
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E7208 (Manufacturing and Materials Handling Equipment)
Print Date: 8/6/2020

Make:	Tote Station
Manufacturer:	NA - Made In House
Model:	NA
Type of Manufacturing and Materials Handling Equipment:	Tote station for withdrawing liquid into totes
Capacity:	4.00E+02
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	Yes
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 CD7201 (Condenser)
Print Date: 8/6/2020

Make:	Vent Condenser
Manufacturer:	Rubicon Industries Corp.
Model:	VT6B1-48V
Condenser Type:	Shell & Tube
Type of Material of Which Shell Is Constructed:	stainless steel
Type of Material of Which Tubes Are Constructed:	stainless steel
Minimum Gas Inlet Temperature (°F):	0.0
Maximum Gas Inlet Temperature (°F):	100.0
Heat Transfer (Contact) Surface Area (ft^2):	23.1
Maximum Gas Flow (acfm):	7.0
Minimum Cooling Medium Flow Rate (gpm):	2.0
Maximum Cooling Medium Flow Rate (gpm):	4.7
Minimum Heat Removal Capacity (BTU/hr):	
Liquid to Gas Flow Ratio for Optimal Efficiency:	670.00
Minimum Cooling Medium Inlet Temperature (°F):	10.0
Maximum Cooling Medium Inlet Temperature (°F):	30.0
Minimum Cooling Medium Outlet Temperature (°F):	12.0
Maximum Cooling Medium Outlet Temperature (°F):	30.0
Minimum Gas Outlet Temperature (°F):	30.0
Maximum Gas Outlet Temperature (°F):	50.0
Minimum Condensate Outlet Temperature (°F):	30.0
Maximum Condensate Outlet Temperature (°F):	50.0
Type of Cooling Medium:	40 percent ethylene glycol
Use of Condensate:	Air Pollution Control
Maximum Number of Sources Using this Apparatus as a Control Device (Include Permitted and Non-Permitted Sources):	1
Alternative Method to Demonstrate Control Apparatus is Operating Properly:	Method to demonstrate apparatus is working should not be required. If it were to be required, it could be done by measuring coolant temperature.
Have you attached data from recent performance testing?	○ Yes ● No
Have you attached any manufacturer's data or specifications in support of the feasibility and/or effectiveness of this control apparatus?	○ Yes ● No

000000 CD7201 (Condenser)
Print Date: 8/6/2020

Have you attached a diagram showing the location and/or configuration of this control apparatus?

(●) Yes ( ) No

Comments:

This condenser is used only when acetone is fed to T-313. This condenser is used as a safety precaution; not for air pollution control. Credit for an emission reduction is not taken in the estimated acetone emissions.

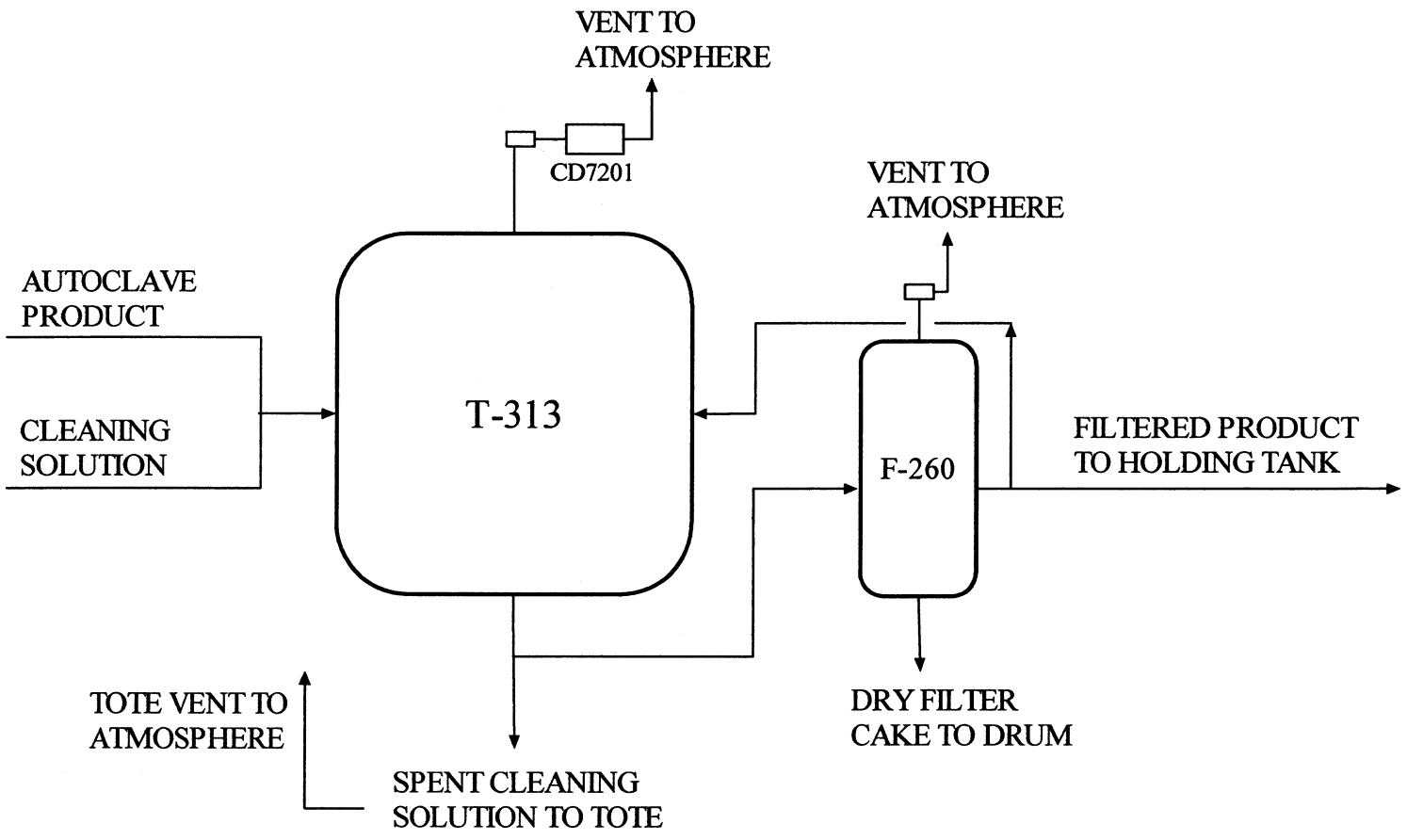
ATTACHMENTS

APPLICATION TO MODIFY
MINOR FACILITY BATCH PROCESS AIR PERMIT
BP72 AUTOCLAVE BATCH REACTOR SYSTEM
FIRMENICH 06242
AUGUST 2020

ATTACHMENT 1
PROCESS SCHEMATIC DIGRAM

APPLICATION TO MODIFY
MINOR FACILITY BATCH PROCESS AIR PERMIT
BP72 AUTOCLAVE BATCH REACTOR SYSTEM
FIRMENICH 06242
AUGUST 2020

FIGURE 1. F-260 AUTOCLAVE FILTER SYSTEM SCHEMATIC DIAGRAM



ATTACHMENT 2
SUPPLEMENTAL INFORMATION

APPLICATION TO MODIFY
MINOR FACILITY BATCH PROCESS AIR PERMIT
BP72 AUTOCLAVE BATCH REACTOR SYSTEM
FIRMENICH 06242
AUGUST 2020

1.0 Purpose of Application

The purpose of this application is to modify an existing batch permit at the Firmenich facility in Newark, New Jersey (facility 06242). The permit being modified is designated BP72 Autoclave Batch Reactor System. The existing permit was approved on 2-24-17 (PCP170002). The purpose of the modification is as follows:

Add three equipment items to the permit;
Put two of the new equipment items into existing equipment item sets;
Create two equipment item sets for a new operation to clean the new equipment items;
Add three emission points to the permit;
Create emission point sets with the new emission points and existing emission points;
Modify existing operating scenarios to incorporate the new emission points into them;
Add one new operating scenario to the permit (for acetone cleaning the new equipment);
Add one emission control device to the permit (for the new operating scenario);
Add the batch emissions of the new operating scenario (acetone) to the permit;
Add an annual acetone emission to the air permit potential to emit.

2.0 Equipment Items Being Added to Permit

2.1 Filter F-260 (E7206)

Filter F-260 will be used to remove catalyst from the product at the end of an autoclave production batch. When an autoclave production operation is complete, the product is pumped into a filter feed tank. The product is then recirculated through the filter to remove the catalyst. When the filtering is complete, the product is pumped from the filter into an existing product holding tank. After a few autoclave production batches have been filtered, the filter will be cleaned and the filter cake will be dried and dropped into a drum.

The new filter (F-260) will serve the same function as the existing filter (F-250). For the catalyst filtering step of an operating scenario, either of these two filters can be used.

Therefore, the new filter is being added to the equipment sets that the existing filter is in (ES3 and ES4).

Additionally, a new equipment item set (ES5) is being created for a new cleaning operation being added to the permit for cleaning the new filter.

2.2 Tank T-313 (E7207)

Tank T-313 will be a filter feed tank for F-260. Tank T-313 will serve the same function as the existing filter feed tank (T-316) except that Tank T-316 feeds filter F-250 and tank T-313 will feed filter F-260. The new tank (T-313) is being added to the two equipment sets that the existing filter feed tank is in (ES2 and ES3). Additionally, T-313 is being put into two new equipment sets (ES5 and 6) for a new operating scenario for cleaning the new filter.

2.3 Tote Station (E7208)

A tote station is being added to the permit. The tote station will be used for draining the cleaning solution from the new filter and filter feed tank at the end of the new operation being added for cleaning the new filter. The tote station will be in the equipment set being created for cleaning the new equipment items (ES6)

3.0 Emission Points Being Added to Permit

Three emission points are being added to the permit:

PT7205 for the vent of the new filter (F-260);
PT7206 for the vent of the new filter feed tank (T-313);
PT7207 for the vent of the filter cleaning solution tote station.

A new emission point set is being created (PS2) to include the three new emission points and the emission point of the existing filter feed tank (T-316; PT7203).
A new emission point set is being created (PS3) to include the new F-260 vent (PT7205) and existing filter tank T-250 vent (PT7204).
Existing operating scenarios will be modified to add PS2 to the filter feed tank charging step ("Product Withdrawal to Holding Tank") and PS3 to the filter solids removal step.

4.0 Batch Process Operating Scenario Being Added

The batch process operating scenario being added to the permit is designated OS28 Filter F-260 Acetone/Water Cleaning and Pickling. The operating scenario will consist of the steps detailed in Section 6.3.2 below.

5.0 Emission Control Device Being Added (CD7201)

The emission control device being added to the permit (CD7201) is a glycol-chilled condenser for the vent of T-313. This emission control device will only be used when T-313 is charged with a small amount of acetone during the Filter F-260 acetone/water cleaning and pickling (OS28). This condenser is being installed as a safety precaution because of the flammability hazard of acetone; it is not being installed to control emission. As detailed in Section 6 below, this emission control device will not be used to reduce calculated acetone emissions.

6.0 Air Pollutant Emissions

6.1 Filtering Emissions

As noted above in Section 2.1, the new filter (F-260) will serve the same function that is served by the existing filter (F-250). In the existing operating scenario emissions, no emission was shown to occur for the filter F-250 operation. This will be the case for filter F-260 operation as well. The filter vent is kept closed during filtering. When the filter is initially being charged, there is a line to return gas/vapor from the filter to the tank from which it is being filled (T-313). During initial (pre) filtration, as liquid is fed to the filter, liquid is returned back to the feed tank. During final filtration, liquid flows from the filter to a storage tank.

6.2 Filter Solids Removal Emissions

In the existing operating scenario emissions, a small VOC emission is presented for the filter solids removal. This is due to a small amount of nitrogen used to loosen the filter cake from the filter. This will be the case for the new filter as well, and these emissions are already included in the filter cake removal step of the existing operating scenarios.

6.3 Filter F-260 Acetone/Water Cleaning and Pickling Emissions

6.3.1 Air Pollutants Emitted

Acetone vapors will be emitting from this operating scenario. Acetone is an air poll utant, but it is not a regulated hazardous air pollutant (HAP) and it is not a regulated volatile organic compound (VOC) (40CFR51.100(s)).

Additionally, a very small (de minimis) VOC emission will occur when T-313 is charged with pickling material.

6.3.2 Air Pollutant Emission Rates

Step 1 – Charging Acetone to T-313

When T-313 is charged with acetone for cleaning, acetone vapors are emitted to the atmosphere in the gas (nitrogen) displaced from T-313 by the liquid acetone added.

The amount of acetone charged to T-313 will be 350 gallons. An estimate of the amount of gas displaced from T-313 by the liquid added can be calculated as follows:

Volume of Gas Displaced from T-313 by Acetone Charged
= (350 gallons)(0.1337 acf/gallon) = 46.8 acf ~ 46.8 scf

A worst-case maximum potential emission estimate can be calculated based on an ambient temperature of 100°F. The vapor pressure of acetone at this temperature is approximately 392 mm Hg. The gas displaced from T-313 contains acetone vapors, but it is not saturated with vapor because T-313 did not contain acetone prior to charging, and there was not sufficient time during charging for saturation to occur. A saturation factor of 0.25 is used to account for this. This situation is comparable to a storage tank with a high turnover rate, in which the head space vapor concentration is well below saturation. In the USEPA AP-42 organic liquid storage tank emission calculation procedures, this was accounted for by a "turnover factor" which related the approach to saturation to the frequency of turnovers. A "saturation factor" of 0.25, corresponding to a "turnover factor" for a high turnover frequency, is used to estimate the approach to saturation when T-313 is charged with acetone. Accordingly, an estimate of the maximum potential acetone vapor emission during charging can be calculated as follows:

Maximum Potential Acetone Emission During Charging
= (0.25)(46.8 scf gas)(392 scf acetone/760 scf gas)
x (1 mole acetone/387 scf gas)(58 lb acetone/mole acetone)

= 0.904 lb

Step 2 – Acetone Recirculation Through F-260

Gas is not displaced from T-313 or F-260 as the acetone is recirculated through F-260. Therefore, vapor is not emitted during the acetone recirculation.

Step 3 – Withdrawing Acetone from T-313 to a Tote

When acetone cleaning is complete, the acetone is withdrawn from T-313 to a tote. The volume of acetone withdrawn to the tote is 350 gallons. A shown above, this is equal to approximately 46.8 scf.

The gas displaced from the tote as the acetone is fed to it contains vapors of the acetone added. The gas is not saturated with vapor, however, because the tote was empty prior to charging, and there was not sufficient time during charging for saturation to occur. A saturation factor of 0.25 is used to account for this. This situation is comparable to a storage tank with a high turnover rate, in which the head space vapor concentration is well below saturation. In the USEPA AP-42 organic liquid storage tank emission calculation procedures, this was accounted for by a "turnover factor" which related the approach to saturation to the frequency of turnovers. A "saturation factor" of 0.25, corresponding to a "turnover factor" for a high turnover frequency, is used to estimate the approach to saturation when the tote is charged with acetone from T-313. Accordingly, an estimate of the maximum potential acetone vapor emission when acetone is withdrawn to a tote can be calculated as follows:

Maximum Potential Acetone Emission
When Acetone is Withdrawn to a Tote

= ((0.25)(46.8 scf gas)(392 scf acetone/760 scf gas)
x (1 mole acetone/387 scf gas)(58 lb acetone/mole acetone)

= 0.904 lb

Step 4 – Charging Water to T-313

A charge of 300 gallons of water is fed to T-313 for washing the filter with water. The gas (nitrogen) in T-313 contains a small concentration of acetone vapor from the previous acetone washing operation. The concentration of acetone vapor in the gas is very low because the acetone had been drained from T-313 at the end of the previous operation. A conservative estimate of the acetone emission when T-313 is charged with water can be based on the concentration of vapor present in the gas during the previous operation.

An estimate of the amount of gas displaced from T-313 by the water added can be calculated as follows:

Volume of Gas Displaced from T-313 by Water Charged
= (300 gallons)(0.1337 acf/gallon) = 40.1 acf ~ 40.1 scf

Based on the above information, an estimate of the amount of acetone vapor emitted when T-313 is charged with water can be calculated as follows:

Maximum Potential Acetone Emission During Water Charging
= (0.25)(40.1 scf gas)(392 scf acetone/760 scf gas)
x (1 mole acetone/387 scf gas)(58 lb acetone/mole acetone)

= 0.775 lb

Step 5 – Water Recirculation Through F-260

Gas is not displaced from T-313 or F-260 as the water is recirculated through F-260. Therefore, vapor is not emitted during the water recirculation.

Step 6 – Withdrawing Water from T-313 to a Tote

When the water washing is complete, the water is withdrawn from T-313 to a tote. The volume of water withdrawn to the tote is 300 gallons. The water contains a very low concentration of acetone, so a very small amount of acetone vapor is emitted from the tote as the water flows into it. Since the amount of acetone in the water is very small, the amount of acetone vapor emitted from the tote is very small and is it well below the de minimis amount above which the emission would be required to be reported in an air permit.

Step 7 – Charging T-313 with Product for Pickling

After the water washing is complete, a small amount of autoclave product material is used to remove residual water from T-313 and F-260. This operation is referred to as pickling.

A small charge of approximately 350 gallons of autoclave product material is fed to T-313 for the pickling operation. A very small amount of vapor of the product is emitted to the atmosphere in the gas (nitrogen) displaced from T-313 by the liquid added. The autoclave products have a very low vapor pressures, so very little vapor is created when the material is fed to T-313. Therefore, the amount of vapor emitted is very small and the emission is well below the de minimis level above which emissions must be reported in an air permit.

For comparison, the vapor pressures of most of the autoclave products are less than 1 mm Hg, and the vapor pressure of the most volatile product being produced in less than 5 mm Hg. This is a very small fraction of the vapor pressure of acetone (392 mm Hg) used to calculated the T-313 acetone charging emission in Step 1 above (0.904 lb). Therefore, the vapor emission during T-313 product pickling charging is a very small fraction of the calculated acetone emission.

Step 8 – Recirculating Pickling Material Through F-260

Gas is not displaced from T-313 or F-260 as the pickling material is circulated through F-260. Therefore, vapor is not emitted during this recirculation.

Step 9 – Withdrawing Pickling Material to Storage Tank

When the pickling operation is complete, the pickling material is sent to a product storage tank. There are no emissions from the T-313 or F-216 during this process.

6.3.3 Total Acetone/Water Cleaning and Pickling Operating Scenario Batch Emissions

Based on the above information, estimates of the total emissions per batch can be calculated as follows:

Total Acetone Emission per Batch

= (0.904 + 0.904 + 0.775) lb = 2.58 lb

Total VOC Emission per Batch

= De Minimis

5.3 BP72 Air Permit OS0 Summary Potential to Emit

An annual acetone emission of 0.1 ton is being added to the air permit OS0 Summary Potential to Emit.